

Bibliography on the skew-normal and other symmetry-modulated distributions

Adelchi Azzalini

The update of 29th September 2023

Note Since technically the class of ‘symmetry-modulated distributions’ encompasses all distributions, the above-indicated target would be far too ambitious, or even meaningless, if taken literally. The actual target is to account for those formulations where the connection with the symmetry-modulation mechanism is transparent or at least not remote.

Abe, T., Fujisawa, H., Kawashima, T., & Ley, C. (2021). EM algorithm using overparameterization for the multivariate skew-normal distribution. *Econometric and Statistics*, 19, 151–168.

Abe, T., Miyata, Y., & Shiohama, T. (2017). On mode and antimode preserving circular distributions. In *Japanese Joint Statistical Meeting 2017: Japanese Federation of Statistical Science Associations*.

Abe, T. & Pewsey, A. (2011). Sine-skewed circular distributions. *Statist. Papers*, 52, 683–707.

Abid, S. H., Quaez, U. J., & Contreras-Reyes, J. E. (2021). An information-theoretic approach for multivariate skew- t distributions and applications. *Mathematics*, 9(2), 146.

Abtahi, A., Behboodian, J., & Sharafi, M. (2012). A general class of univariate skew distributions considering Stein’s lemma and infinite divisibility. *Metrika*, 75(2), 193–206.

Abtahi, A. & Towhidi, M. (2013). The new unified representation of multivariate skewed distributions. *Statistics*, 47(1), 126–140. Available online 09 Jun 2011.

Abtahi, A., Towhidi, M., & Behboodian, J. (2011). An appropriate empirical version of skew-normal density. *Stat. Papers*, 52, 462–489. Available on line 03 July 2009.

Adcock, C. (2021). Copulaesque versions of the skew-normal and skew-Student distributions. *Symmetry*, 13, 815.

Adcock, C. & Azzalini, A. (2020). A selective overview of skew-elliptical and related distributions and of their applications. *Symmetry*, 12, 118.

Adcock, C., Eling, M., & Loperfido, N. (2015). Skewed distributions in finance and actuarial science: a review. *European J. Finance*, 21(13–14), 1253–1281. Available online 25 Oct 2012.

- Adcock, C. J. (2004). Capital asset pricing in UK stocks under the multivariate skew-normal distribution. In M. G. Genton (Ed.), *Skew-elliptical Distributions and Their Applications: a Journey Beyond Normality* chapter 11, (pp. 191–204). Chapman & Hall/CRC.
- Adcock, C. J. (2005). Exploiting skewness to build an optimal hedge fund with a currency overlay. *European J. Finance*, 11(5), 445–462.
- Adcock, C. J. (2007). Extensions of Stein’s lemma for the skew-normal distribution. *Communications in Statistics – Theory & Methods*, 36(9), 1661–1671.
- Adcock, C. J. (2010). Asset pricing and portfolio selection based on the multivariate extended skew-Student- t distribution. *Ann. Oper. Res.*, 176(1), 221–234.
- Adcock, C. J. (2013). Stein’s lemma for skew-normal distributions: A comment and an example. *Journal of Applied Probability and Statistics*, 8, 67–73.
- Adcock, C. J. (2014). Mean-variance-skewness efficient surfaces, Stein’s lemma and the multivariate extended skew-Student distribution. *European J. Operational Research*, 234(2), 392–401. Available online 20 July 2013.
- Adcock, C. J. (2022). Properties and limiting forms of the multivariate extended skew-normal and skew-student distributions. *Stats*, 5, 270–311.
- Adcock, C. J. (2023). The linear skew- t distribution and its properties. *Stats*, 6, 381–410.
- Adcock, C. J. & Shutes, K. (1999). Portfolio selection based on the multivariate skew normal distribution. In A. M. J. Skulimowski (Ed.), *Financial Modelling: Proceedings of the 23th meeting of the EURO Working Group for Commodities and Financial Modelling* (pp. 167–177). Kraków: Progress and Business Publishers. Available in 2001.
- Adcock, C. J. & Shutes, K. (2012). On the multivariate extended skew-normal, normal-exponential, and normal-gamma distributions. *J. Stat. Theory and Practice*, 6(4), 636–664.
- Adrian, T., Boyarchenko, N., & Giannone, D. (2019). Vulnerable growth. *American Economic Review*, 109, 1263–1289.
- Aghamohammadi, A. & Meshkani, M. R. (2017). Bayesian quantile regression for skew-normal linear mixed models. *Communications in Statistics – Theory & Methods*, 46, 10953–10972.
- Ahfock, D., Pyne, S., & McLachlan, G. J. (2022). Statistical file-matching of non-Gaussian data: A game theoretic approach. *Computational Statistics and Data Analysis*, 168, 107387. Available online 9 November 2021.
- Ahmad, O. S. & Pinoli, J.-C. (2013). Lipschitz-Killing curvatures of the excursion sets of skew Student’s t random fields. *Stochastic Models*, 29, 273–289.

- Ahmadi Balef, H., Kamal, M., Afzali-Kusha, A., & Pedram, M. (2016). All-region statistical model for delay variation based on log-skew-normal distribution. *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems*, 35(9), 1503–1508. Available online 22 December 2015.
- Ahmadi Mousavi, S., Amirzadeh, V., Rezapour, M., & Sheikhy, A. (2019). Multivariate tail conditional expectation for scale mixtures of skew-normal distribution. *Journal of Statistical Computation and Simulation*, 89, 3167–3181.
- Aigner, D. J., Lovell, C. A. K., & Schmidt, P. (1977). Formulation and estimation of stochastic frontier production function model. *J. Econometrics*, 6, 21–37.
- Aitchison, J. & Bacon-Shone, J. (1999). Convex linear combinations of compositions. *Biometrika*, 86, 351–364.
- Akdemir, D. (2009). *A Class of Multivariate Skew Distributions: Properties and Inferential Issues*. Ph.d. thesis, Bowling Green State University.
- Akhgari, O. & Golalizadeh, M. (2021). On seemingly unrelated regression model with skew error. *J. Stat. Theory Appl.*, 20, 97–110.
- Ali, M. M. & Woo, J. (2006). Skew-symmetric reflected distributions. *Soochow J. Math.*, 32(2), 233–240.
- Ali, M. M., Woo, J., & Pal, M. (2008). Some skew-symmetric reflected distributions. *American Journal of Mathematical and Management Sciences*, 28(1–2), 41–59.
- Allard, D. & Naveau, P. (2007). A new spatial skew-normal random field model. *Communications in Statistics – Theory & Methods*, 36(9), 1821–1834.
- Alodat, M. T. & Al Rawwash, M. Y. (2009). Skew-Gaussian random field. *J. Computational and Applied Mathematics*, 232, 496–504.
- Alodat, M. T. & Al Rawwash, M. Y. (2014). The extended skew Gaussian process for regression. *Metron*, 72(3), 317–330.
- Alodat, M. T. & Shakhatreh, M. K. (2020). Gaussian process regression with skewed errors. *J. Comput. Appl. Math.*, 370, 112665. Available online 16 December 2019.
- Alruwaili, B. (2023). The modality of skew t -distribution. *Stat. Papers*, 64, 497–507. Available online 09 June 2022.
- Ameijeiras-Alonso, J. & Ley, C. (2022). Sine-skewed toroidal distributions and their application in protein bioinformatics. *Biostatistics*, 23, 685–704. Available online 02 October 2020.
- Amengual, D., Bei, X., & Sentana, E. (2020). *Hypothesis tests with a repeatedly singular information matrix*. Working paper 2002, Centro de Estudios Monetarios y Financieros, Madrid.
- Amengual, D., Bei, X., & Sentana, E. (2022). Normal but skewed? *J. Appl. Econometrics*, 37, 1295–1313.

- Amiri, M. & Balakrishnan, N. (2022). Hessian and increasing-Hessian orderings of scale-shape mixtures of multivariate skew-normal distributions and applications. *J. Computational and Applied Mathematics*, 402, 113801.
- Amiri, M., Izadkhah, S., & Jamalizadeh, A. (2020). Linear orderings of the scale mixtures of the multivariate skew-normal distribution. *Journal of Multivariate Analysis*, 179, 104647. Available online 6 June 2020.
- Amiri, M., Mehrali, Y., Balakrishnan, N., & Jamalizadeh, A. (2022). Efficient recursive computational algorithms for multivariate t and multivariate unified skew- t distributions with applications to inference. *Computational Statistics*, 37, 125–158. Available online 16 June 2021.
- Amsler, C., Papadopoulos, A., & Schmidt, P. (2021). Evaluating the cdf of the skew normal distribution. *Empirical Economics*, 60, 3171–2002. Available online 15 May 2020.
- Amsler, C., Prokhorov, A., & Schmidt, P. (2016). Endogeneity in stochastic frontier models. *J. Econometrics*, 190, 280–288. Available online 23 June 2015.
- Anceschi, N., Fasano, A., Durante, D., & Zanella, G. (2023). Bayesian conjugacy in probit, tobit, multinomial probit and extensions: a review and new results. *Journal of the American Statistical Association*, 118, 1451–1469.
- Anděl, J., Netuka, I., & Zvára, K. (1984). On threshold autoregressive processes. *Kybernetika*, 20(2), 89–106. Academia, Praha.
- Arellano-Valle, R. B. (2010). The information matrix of the multivariate skew- t distribution. *Metron*, LXVIII, 371–386.
- Arellano-Valle, R. B. & Azzalini, A. (2006). On the unification of families of skew-normal distributions. *Scandinavian Journal of Statistics*, 33, 561–574. Corrigendum in vol. 49 (2022), 1418–1419.
- Arellano-Valle, R. B. & Azzalini, A. (2008). The centred parametrization for the multivariate skew-normal distribution. *Journal of Multivariate Analysis*, 99, 1362–1382. Corrigendum in vol. 100 (2009), p. 816.
- Arellano-Valle, R. B. & Azzalini, A. (2013). The centred parameterization and related quantities of the skew- t distribution. *Journal of Multivariate Analysis*, 113, 73–90. Available online 12 June 2011.
- Arellano-Valle, R. B. & Azzalini, A. (2022). Some properties of the unified skew-normal distribution. *Stat. Papers*, 63, 461–487. Available online 05 July 2021; corrigendum at <https://link.springer.com/article/10.1007/s00362-023-01412-5>.
- Arellano-Valle, R. B., Azzalini, A., Ferreira, C. S., & Santoro, K. (2021). A two-piece normal measurement error model. *Computational Statistics and Data Analysis*, 144, 106863. Available online 14 October 2019.

- Arellano-Valle, R. B., Bolfarine, H., & Lachos, V. H. (2005a). Skew-normal linear mixed models. *J. Data Science*, 3, 415–438.
- Arellano-Valle, R. B., Bolfarine, H., & Lachos, V. H. (2007). Bayesian inference for skew-normal linear mixed models. *Journal of Applied Statistics*, 34, 663–682.
- Arellano-Valle, R. B., Branco, M. D., & Genton, M. G. (2006). A unified view on skewed distributions arising from selections. *Canadian Journal of Statistics*, 34, 581–601.
- Arellano-Valle, R. B., Castro, L. M., Genton, M. G., & Gómez, H. W. (2008). Bayesian inference for shape mixtures of skewed distributions, with application to regression analysis. *Bayesian Analysis*, 3(3), 513–539.
- Arellano-Valle, R. B., Castro, L. M., & Loschi, R. H. (2013a). Change point detection in the skew-normal model parameters. *Communications in Statistics – Theory & Methods*, 42(4), 603–618.
- Arellano-Valle, R. B., Contreras-Reyes, J. E., & Genton, M. G. (2013b). Shannon entropy and mutual information for multivariate skew-elliptical distributions. *Scandinavian Journal of Statistics*, 40, 42–62. Available online 27 Feb 2012 (corrected 04 Apr 2012).
- Arellano-Valle, R. B., Contreras-Reyes, J. E., Quintero, F. O. L., & Valdebenito, A. (2019). A skew-normal dynamic linear model and Bayesian forecasting. *Computational Statistics*, 34, 1055–1085. Available online 16 November 2018.
- Arellano-Valle, R. B., Contreras-Reyes, J. E., & Stehlík, M. (2017). Generalized skew-normal negentropy and its application to fish condition factor time series. *Entropy*, 19(10), 528.
- Arellano-Valle, R. B., del Pino, G., & San Martín, E. (2002). Definition and probabilistic properties of skew-distributions. *Statistics & Probability Letters*, 58(2), 111–121.
- Arellano-Valle, R. B. & del Pino, G. E. (2004). From symmetric to asymmetric distributions: a unified approach. In M. G. Genton (Ed.), *Skew-elliptical Distributions and Their Applications: a Journey Beyond Normality* chapter 7, (pp. 113–130). Chapman & Hall/CRC.
- Arellano-Valle, R. B., Ferreira, C. S., & Genton, M. G. (2018). Scale and shape mixtures of multivariate skew-normal distributions. *Journal of Multivariate Analysis*, 166, 98–110.
- Arellano-Valle, R. B. & Genton, M. G. (2005). On fundamental skew distributions. *Journal of Multivariate Analysis*, 96, 93–116.
- Arellano-Valle, R. B. & Genton, M. G. (2007). On the exact distribution of linear combinations of order statistics from dependent random variables. *Journal of Multivariate Analysis*, 98(10), 1876–1894. Corrigendum in vol. 99 (2008), 1013.
- Arellano-Valle, R. B. & Genton, M. G. (2008). On the exact distribution of the maximum of absolutely continuous dependent random variables. *Statistics & Probability Letters*, 78(1), 27–35.

- Arellano-Valle, R. B. & Genton, M. G. (2010a). An invariance property of quadratic forms in random vectors with a selection distribution, with application to sample variogram and covariogram estimators. *Annals of the Institute Statistical Mathematics*, 62, 363–381.
- Arellano-Valle, R. B. & Genton, M. G. (2010b). Multivariate extended skew- t distributions and related families. *Metron*, LXVIII, 201–234.
- Arellano-Valle, R. B. & Genton, M. G. (2010c). Multivariate unified skew-elliptical distributions. *Chilean Journal of Statistics*, 1(1), 17–33.
- Arellano-Valle, R. B., Genton, M. G., & Loschi, R. H. (2009). Shape mixtures of multivariate skew-normal distributions. *Journal of Multivariate Analysis*, 100(1), 91–101.
- Arellano-Valle, R. B., Gómez, H. W., & Quintana, F. A. (2004). A new class of skew-normal distributions. *Communications in Statistics – Theory & Methods*, 33(7), 1465–1480.
- Arellano-Valle, R. B., Jamalizadeh, A., Mahmoodian, H., & Balakrishnan, N. (2014). l -statistics from multivariate unified skew-elliptical distributions. *Metrika*, 77(4), 559–583.
- Arellano-Valle, R. B., Ozán, S., Bolfarine, H., & Lachos, V. H. (2005b). Skew-normal measurement error models. *Journal of Multivariate Analysis*, 96, 265–281.
- Arellano-Valle, R. B. & Richter, W.-D. (2012). On skewed continuous $l_{n,p}$ -symmetric distributions. *Chilean Journal of Statistics*, 3, 195–214.
- Arevalillo, J. M. & Navarro, H. (2015). A note on the direction maximizing skewness in multivariate skew- t vectors. *Statistics & Probability Letters*, 96, 328–332.
- Arevalillo, J. M. & Navarro, H. (2019). A stochastic ordering based on the canonical transformation of skew-normal vectors. *TEST*, 28, 475–498. Available on line 08 May 2018.
- Arevalillo, J. M. & Navarro, H. (2020). Data projections by skewness maximization under scale mixtures of skew-normal vectors. *Adv. Data Analysis and Classification*, 14, 435–461.
- Arevalillo, J. M. & Navarro, H. (2021). Skewness-kurtosis model-based projection pursuit with application to summarizing gene expression data. *Mathematics*, 9, 954.
- Arevalillo, J. M. & Navarro, H. (2023). New insights on the multivariate skew exponential power distribution. *Mathematica Slovaca*, 73, 529–544.
- Arnold, B. C. (2010). Flexible univariate and multivariate models based on hidden truncation. *Journal of Statistical Planning and Inference*, 139(11), 3741–3749.
- Arnold, B. C. & Beaver, R. J. (2000a). Hidden truncation models. *Sankhyā, series A*, 62(1), 22–35.

- Arnold, B. C. & Beaver, R. J. (2000b). The skew-Cauchy distribution. *Statistics & Probability Letters*, 49(3), 285–290.
- Arnold, B. C. & Beaver, R. J. (2000c). Some skewed multivariate distributions. *Amer. J. of Mathematical and Management Sciences*, 20, 27–38.
- Arnold, B. C. & Beaver, R. J. (2002). Skewed multivariate models related to hidden truncation and/or selective reporting (with discussion). *Test*, 11(1), 7–54.
- Arnold, B. C. & Beaver, R. J. (2004a). Alternative constructions of skewed multivariate distributions. In *Acta et Commentationes Universitatis Tartuensis de Mathematica*, volume 8 (pp. 73–82). Tartu, Estonia.
- Arnold, B. C. & Beaver, R. J. (2004b). Elliptical models subject to hidden truncation and selective sampling. In M. G. Genton (Ed.), *Skew-elliptical Distributions and Their Applications: a Journey Beyond Normality* chapter 6, (pp. 101–112). Chapman & Hall/CRC.
- Arnold, B. C. & Beaver, R. J. (2007). Skewing around: relationships among classes of skewed distributions. *Methodology and Computing in Applied Probability*, 9(2), 153–162.
- Arnold, B. C., Beaver, R. J., Groeneveld, R. A., & Meeker, W. Q. (1993). The nontruncated marginal of a truncated bivariate normal distribution. *Psychometrika*, 58(3), 471–478.
- Arnold, B. C., Castillo, E., & Sarabia, J. M. (2002). Conditionally specified multivariate skewed distributions. *Sankhyā, series A*, 64, 206–226.
- Arnold, B. C., Castillo, E., & Sarabia, J. M. (2007). Distributions with generalized skewed conditionals and mixtures of such distributions. *Communications in Statistics – Theory & Methods*, 36, 1493–1503.
- Arnold, B. C., Gómez, H. W., & Salinas, H. S. (2009). On multiple constraint skewed models. *Statistics: A Journal of Theoretical and Applied Statistics*, 43(3), 279–293.
- Arnold, B. C., Gómez, H. W., & Salinas, H. S. (2015). A doubly skewed normal distribution. *Statistics*, 49(4), 842–858. Available online 29 May 2014.
- Arnold, B. C. & Lin, G. D. (2004). Characterizations of the skew-normal and generalized chi distributions. *Sankhyā*, 66, 593–06.
- Arslan, O. (2008). An alternative multivariate skew-slash distribution. *Statistics & Probability Letters*, 78(16), 2756–2761.
- Arslan, O. (2015). Variance-mean mixture of the multivariate skew normal distribution. *Statist. Papers*, 56(2), 353–378. Available online 02 March 2014.
- Ashani, Z. N. & Bakar, M. R. A. (2016). A skewed truncated Cauchy logistic distribution and its moments. *International Mathematical Forum*, 11(20), 975–988.

- Ashour, S. K. & Abdel-hameed, M. A. (2010). Approximate skew normal distribution. *Journal of Advanced Research*, 1(4), 341–350.
- Asili, S., Rezaei, S., & Najjar, L. (2014). Using skew-logistic probability density function as a model for age-specific fertility rate pattern. *BioMed Res. Intern.*, 2014, Art. ID 790294.
- Asparouhov, T. & Muthén, B. (2016). Structural equation models and mixture models with continuous nonnormal skewed distributions. *Structural Equation Modeling*, 23(1), 1–19. Available online 16 Apr 2015.
- Aziz, M. A. & Gupta, A. K. (2013). Quadratic forms in unified skew normal random vectors. *Journal of Probability and Statistical Science*, 11(1), 1–15.
- Aziz, M. A. S. (2011). *Study of unified multivariate skew normal distribution with applications in finance and actuarial science*. PhD thesis, Bowling Green State University.
- Azzalini, A. (1985). A class of distributions which includes the normal ones. *Scandinavian Journal of Statistics*, 12, 171–178.
- Azzalini, A. (1986). Further results on a class of distributions which includes the normal ones. *Statistica*, XLVI, 199–208. Reprinted with annotations and corrigenda in vol. 80 (2020), pp. 161–175.
- Azzalini, A. (2001). A note on regions of given probability of the skew-normal distribution. *Metron*, LIX(3–4), 27–34.
- Azzalini, A. (2005). The skew-normal distribution and related multivariate families (with discussion). *Scandinavian Journal of Statistics*, 32, 159–188 (C/R 189–200).
- Azzalini, A. (2006a). Skew-normal family of distributions. In S. Kotz, N. Balakrishnan, C. B. Read, & B. Vidakovic (Eds.), *Encyclopedia of Statistical Sciences*, volume 12 (pp. 7780–7785). New York: J. Wiley & Sons, second edition.
- Azzalini, A. (2006b). Some recent developments in the theory of distributions and their applications. In *Atti della XLIII Riunione Scientifica*, volume Sessioni plenarie e specializzate (pp. 51–64). Torino: Società Italiana di Statistica CLEUP.
- Azzalini, A. (2011a). Skew-normal distribution. In M. Lovric (Ed.), *International Encyclopedia of Statistical Sciences*, volume 19 (pp. 1342–1344). New York: Springer.
- Azzalini, A. (2011b). Skew-symmetric families of distributions. In M. Lovric (Ed.), *International Encyclopedia of Statistical Sciences*, volume 19 (pp. 1344–1346). New York: Springer.
- Azzalini, A. (2012). Selection models under generalized symmetry settings. *Annals of the Institute Statistical Mathematics*, 64, 737–750. Available online 05 March 2011.
- Azzalini, A. (2015). Skew-normal family of distributions. In *Wiley StatsRef: Statistics Reference Online*. J. Wiley & Sons. Available online 18 December 2015.

- Azzalini, A. (2016). Flexible distributions as an approach to robustness: the skew- t case. In C. Agostinelli, A. Basu, P. Filzmoser, & D. Mukherjee (Eds.), *Recent Advances in Robust Statistics: Theory and Applications* chapter 1, (pp. 1–16). Springer India.
- Azzalini, A. (2020). Further results on a class of distributions which includes the normal ones – Looking back. *Statistica*, LXXX, 161–175. Annotations and corrigenda to the 1986 paper with the same root title, in connection with its reprint.
- Azzalini, A. (2021). *The R package sn: The Skew-Normal and Related Distributions such as the Skew-t and the SUN (version 2.0.0)*. Università degli Studi di Padova, Italia. <https://cran.r-project.org/package=sn>.
- Azzalini, A. (2022). An overview on the progeny of the skew-normal family — a personal perspective. *Journal of Multivariate Analysis*, 188, 104851. Available online 13 October 2021.
- Azzalini, A. & Arellano-Valle, R. B. (2013). Maximum penalized likelihood estimation for skew-normal and skew- t distributions. *Journal of Statistical Planning and Inference*, 143(2), 419–433. Available online 30 June 2012.
- Azzalini, A. & Bacchieri, A. (2010). A prospective combination of phase II and phase III in drug development. *Metron*, LXVIII, 347–369.
- Azzalini, A., Browne, R. P., Genton, M. G., & McNicholas, P. D. (2016). On nomenclature for, and the relative merits of, two formulations of skew distributions. *Statistics & Probability Letters*, 110, 201–206. Available online 21 December 2015.
- Azzalini, A. & Capitanio, A. (1999). Statistical applications of the multivariate skew normal distribution. *Journal of the Royal Statistical Society, series B*, 61(3), 579–602. Full paper at [arXiv.org:0911.2093](https://arxiv.org/abs/0911.2093).
- Azzalini, A. & Capitanio, A. (2003). Distributions generated by perturbation of symmetry with emphasis on a multivariate skew t distribution. *Journal of the Royal Statistical Society, series B*, 65(2), 367–389. Full paper at [arXiv.org:0911.2342](https://arxiv.org/abs/0911.2342).
- Azzalini, A. & Capitanio, A. (2014). *The Skew-Normal and Related Families*. IMS monographs. Cambridge, UK: Cambridge University Press.
- Azzalini, A. & Chiogna, M. (2004). Some results on the stress-strength model for skew-normal variates. *Metron*, LXII, 315–326.
- Azzalini, A., Dal Cappello, T., & Kotz, S. (2003). Log-skew-normal and log-skew- t distributions as model for family income data. *J. Income Distrib.*, 11(3–4), 12–20.
- Azzalini, A. & Dalla Valle, A. (1996). The multivariate skew-normal distribution. *Biometrika*, 83, 715–726.
- Azzalini, A. & Genton, M. G. (2008). Robust likelihood methods based on the skew- t and related distributions. *International Statistical Review*, 76, 106–129.
- Azzalini, A., Genton, M. G., & Scarpa, B. (2010). Invariance-based estimating equations for skew-symmetric distributions. *Metron*, LXVIII, 275–298.

- Azzalini, A., Kim, H.-M., & Kim, H.-J. (2019). Sample selection models for discrete and other non-Gaussian response variables. *Stat. Methods & Applications*, 28, 27–56. Available online 30 March 2018.
- Azzalini, A. & Regoli, G. (2012a). Some properties of skew-symmetric distributions. *Annals of the Institute Statistical Mathematics*, 64, 857–879. Available online 09 September 2011.
- Azzalini, A. & Regoli, G. (2012b). The work of Fernando de Helguero on non-normality arising from selection. *Chilean Journal of Statistics*, 3, 113–129.
- Azzalini, A. & Regoli, G. (2014). Modulation of symmetry for discrete variables and some extensions. *Stat*, 3, 56–67.
- Azzalini, A. & Regoli, G. (2018). On symmetry-modulated distributions: revisiting an old result and a step further. *Stat*, 7, e171.
- Azzalini, A. & Salehi, M. (2020). Some computational aspects of maximum likelihood estimation of the skew- t distribution. In A. Bekker, D.-G. Chen, & J. T. Ferreira (Eds.), *Computational and Methodological Statistics and Biostatistics* (pp. 3–28). Springer International Publishing.
- Baghfalaki, T. & Ganjali, M. (2015). A Bayesian approach for joint modeling of skew-normal longitudinal measurements and time to event data. *RevStat-Stat. J.*, 13, 169–191.
- Baghfalaki, T., Ganjali, M., & Khounsiavash, M. (2012). A non-random dropout model for analyzing longitudinal skew-normal response. *J. Iranian Stat. Soc.*, 11, 101–129.
- Bagnato, L. & Minozzo, M. (2015). A latent variable approach to modelling multivariate geostatistical skew-normal data. In M. Carpita, E. Brentari, & E. Qannari (Eds.), *Advances in Latent Variables* (pp. 113–126). Springer International Publishing.
- Balakrishnan, N. (2002). Comment to a paper by B. C. Arnold & R. Beaver. *Test*, 11, 37–39.
- Balakrishnan, N. & Ambalagaspitya, R. S. (1994). *On the skew-Laplace distribution*. Technical report, McMaster University, Ontario, Canada.
- Balakrishnan, N. & Capitanio, A. (2008). Discussion: The t family and their close and distant relations. *J Korean Stat. Soc.*, 37, 305–307.
- Balakrishnan, N., Capitanio, A., & Scarpa, B. (2014a). A test for multivariate skew-normality based on its canonical form. *Journal of Multivariate Analysis*, 128, 19–32.
- Balakrishnan, N., Chareh, H. R., & Jamalizadeh, A. (2014b). Regression via order statistics and their concomitants. *Statistics*, 48(2), 436–446.
- Balakrishnan, N. & Scarpa, B. (2012). Multivariate measures of skewness for the skew-normal distribution. *Journal of Multivariate Analysis*, 104, 73–87.

- Baloch, S. H., Krim, H., & Genton, M. G. (2004). Shape representation with flexible skew-symmetric distributions. In M. G. Genton (Ed.), *Skew-elliptical Distributions and Their Applications: a Journey Beyond Normality* chapter 17, (pp. 291–308). Chapman & Hall/CRC.
- Bandyopadhyay, D. & Das, A. (2006). On measures of technical inefficiency and production uncertainty in stochastic frontier production model with correlated error components. *J. Productivity Analysis*, 26, 165–180.
- Bandyopadhyay, D., Lachos, V. H., Abanto-Valle, C. A., & Ghosh, P. (2010). Linear mixed models for skew-normal/independent bivariate responses with an application to periodontal disease. *Statistics in Medicine*, 29, 2643–2655.
- Bandyopadhyay, D., Lachos, V. H., Castro, L. M., & Dey, D. K. (2012). Skew-normal/independent linear mixed models for censored responses with applications to HIV viral loads. *Biometrical J.*, 54(3), 405–405.
- Bandyopadhyay, D., Prates, M. O., Zhao, X., & Lachos, V. H. (2021). Spatial skew-normal/independent models for nonrandomly missing clustered data. *Statistics in Medicine*, 40, 3085–3105.
- Bansal, N. K., Maadooliat, M., & Wang, X. (2008). Empirical Bayes and hierarchical Bayes estimation of skew normal populations. *Communications in Statistics – Theory & Methods*, 37(7), 1024–1037.
- Barbi, M. & Romagnoli, S. (2018). Skewness, basis risk, and optimal futures demand. *Int. Rev. Economics and Finance*, 58, 14–29.
- Barnabani, M. (2009). Marginal distributions of maximum likelihood estimator when one or two components of the true parameter are on the boundary of the parameter space. *Far East J. Theor. Statist.*, 27(2), 193–218.
- Barrett, J., Diggle, P., Henderson, R., & Taylor-Robinson, D. (2015). Joint modelling of repeated measurements and time-to-event outcomes: flexible model specification and exact likelihood inference. *Journal of the Royal Statistical Society, series B*, 77, 131–148. Available online 8 April 2014.
- Bartoletti, S. & Loperfido, N. (2010). Modelling air pollution data by the skew-normal distribution. *Stochastic Environmental Research and Risk Assessment*, 24, 513–517. Available on-line 13 Nov 2009.
- Basso, R. M., Lachos, V. H., Cabral, C. R. B., & Ghosh, P. (2010). Robust mixture modeling based on scale mixtures of skew-normal distributions. *Computational Statistics and Data Analysis*, 54(12), 2926–2941.
- Batiz-Zuk, E., Christodoulakis, G., & Huang Poon, S. (2015). Credit contagion in the presence of non-normal shocks. *International Review of Financial Analysis*, 37, 129–139.
- Bayes, C. L. & Branco, M. D. (2007). Bayesian inference for the skewness parameter of the scalar skew-normal distribution. *Brazilian J. Probab. Stat.*, 21(2), 141–163.

- Bazán, J. L., Bolfarine, H., & Branco, M. D. (2010). A framework for skew-probit links in binary regression. *Communications in Statistics – Theory & Methods*, 39, 678–697.
- Bazán, J. L., Branco, M. D., & Bolfarine, H. (2006). A skew item response model. *Bayesian Analysis*, 1(4), 861–892.
- Behboodian, J., Jamalizadeh, A., & Balakrishnan, N. (2006). A new class of skew-Cauchy distributions. *Statistics & Probability Letters*, 76, 1488–1493.
- Bekker, A., Ferreira, J. T., Arashi, M., & Rowland, B. W. (2020). Computational methods applied to a skewed generalized normal family. *Communications in Statistics – Simulation & Computation*, 49, 2930–2943. Available online 31 December 2018.
- Bekker, A., Nakhaei Rad, N., Arashi, M., & Ley, C. (2022). Generalized skew-symmetric circular and toroidal distributions. In A. SenGupta & B. Arnold (Eds.), *Directional Statistics for Innovative Applications* (pp. 161–186). Springer.
- Benavoli, A., Azzimonti, D., & Piga, D. (2020). Skew Gaussian processes for classification. *Mach. Learn.*, 109, 1877–1902.
- Benavoli, A., Azzimonti, D., & Piga, D. (2021). A unified framework for closed-form nonparametric regression, classification, preference and mixed problems with Skew Gaussian Processes. *Mach. Learn.*, 110, 3095–3133.
- Benedetti, M., Dallago, M., & Santus, C. (2020). Statistical significance of notch fatigue prognoses based on the strain-energy–density method: Application to conventionally and additively manufactured materials. *Theor. Appl. Fracture Mech.*, 109, 102720. Available online 24 July 2020.
- Benedetti, M., Pedranza, M., Berto, F., & C.Santus (2022). Inverse determination and probability distribution of the mode III strain energy density control radius with an optimized V-notched specimen under torsional fatigue loading. *Int. J. Fatigue*, 159, 106787.
- Benedetti, M. & Santus, C. (2020). Statistical properties of threshold and notch derived estimations of the critical distance according to the line method of the theory of critical distances. *Int. J. Fatigue*, 137, 105656. Available online 23 April 2020.
- Bennani, N. & Koehler, S. A. (2010). Longitudinal dispersion in mono- and bidisperse foams. *Soft Matter*, 6, 3841–3850.
- Beranger, B., Padoan, S. A., & Sisson, S. A. (2017). Models for extremal dependence derived from skew-symmetric families. *Scandinavian Journal of Statistics*, 44, 21–45. Available online 13 September 2016.
- Beranger, B., Padoan, S. A., Xu, Y., & Sisson, S. A. (2019a). Extremal properties of the multivariate extended skew-normal distribution, part B. *Statistics & Probability Letters*, 147, 105–114. Available online 7 December 2018.
- Beranger, B., Padoan, S. A., Xu, Y., & Sisson, S. A. (2019b). Extremal properties of the univariate extended skew-normal distribution, part A. *Statistics & Probability Letters*, 147, 73–82. Available online 5 December 2018.

- Beranger, B., Stephenson, A., & Sisson, S. (2021). High-dimensional inference using the extremal skew- t process. *Extremes*, 24, 653–685. Available online 27 July 2020.
- Berlik, S. (2005). Directed mutation by means of the skew-normal distribution. In B. Reusch (Ed.), *Computational Intelligence, Theory and Applications*, volume 33 of *Advances in Soft Computing* (pp. 35–50). Springer. International Conference 8th Fuzzy Days in Dortmund, Germany, Sept. 29–Oct. 01, 2004 Proceedings.
- Berlik, S. (2006). *Directed Evolutionary Algorithms*. Dissertation zur Erlangung des Grades eines Doktors der Naturwissenschaften, Universität Dortmund, Fachbereich Informatik, Dortmund.
- Berlik, S. (2009). Directed evolutionary algorithms by means of the skew-normal distribution. In *Complex Data Modeling and Computationally Intensive Statistical Methods for Estimation and Prediction*, S.Co. (pp. 67–72).
- Bernardi, M. (2013). Risk measures for skew normal mixtures. *Statistics & Probability Letters*, 83, 1819–1824.
- Bevilacqua, M., Caamaño-Carrillo, C., Arellano-Valle, R. B., & Morales-Oñate, V. (2021). Non-Gaussian geostatistical modeling using (skew) t processes. *Scandinavian Journal of Statistics*, 48, 212–245. Available online 17 February 2020.
- Bhat, C. R., Astroza, S., & Hamdi, A. S. (2017). A spatial generalized ordered-response model with skew normal kernel error terms with an application to bicycling frequency. *Transportation Research Part B*, 95, 126–148.
- Bhat, C. R., Dubey, S. K., & Nagel, K. (2015). Introducing non-normality of latent psychological constructs in choice modeling with an application to bicyclist route choice. *Transportation Research Part B: Methodological*, 78, 341–363.
- Bhat, C. R. & Sidharthan, R. (2012). A new approach to specify and estimate non-normally mixed multinomial probit models. *Transportation Research Part B*, 46, 817–833.
- Birnbaum, Z. W. (1950). Effect of linear truncation on a multinormal population. *Annals of Mathematical Statistics*, 21, 272–279.
- Blasi, F. & Scarlatti, S. (2012). From normal vs skew-normal portfolios: FSD and SSD rules. *J. Math. Finance*, 2, 90–95.
- Blasi, F. S. (2008). *Bayesian allocation using the skew normal distribution*. PhD thesis, Facoltà di Scienze Matematiche Fisiche e Naturali, Università di Roma Tor Vergata.
- Bodnar, T. & Gupta, A. K. (2015). Robustness of the inference procedures for the global minimum variance portfolio weights in a skew-normal model. *European J. Finance*, 21(13–14), 1176–1194. Available online 16 July 2012.
- Bolance, C., Guillen, M., Pelican, E., & Vernic, R. (2008). Skewed bivariate models and nonparametric estimation for the CTE risk measure. *Insurance: Mathematics and Economics*, 43(3), 386–393.

- Bolfarine, H. & Lachos, V. (2006). Skew binary regression with measurement errors. *Statistics*, 40(6), 485–494.
- Bolfarine, H. & Lachos, V. H. (2007). Skew probit measurement error models. *Statistical Methodology*, 4, 1–12.
- Bolfarine, H., Montenegro, L. C., & Lachos, V. H. (2007). Influence diagnostics for skew-normal linear mixed models. *Sankhyā*, 69(4), 648–670.
- Boojari, H., Khaledi, M. J., & Rivaz, F. (2016). A non-homogeneous skew-Gaussian Bayesian spatial model. *Stat. Methods & Appl.*, 25, 55–73. Available online 08 August 2015.
- Bookiya, G. T. & Nikitin, Y. Y. (2018). Asymptotic efficiency of new distribution-free tests of symmetry for generalized skew alternatives. *J. Mathematical Sciences*, 229, 651–663. Translated from Zapiski Nauchnykh Seminarov POMI, Vol. 454, 2016, pp. 82–101.
- Bordley, R. F., Tibiletti, L., & Uberti, M. (2013). A target-oriented approach: A 'one-size' model to suit humans and econs behaviors. Social Science Electronic Publishing (<https://ssrn.com/abstract=2354058>).
- Bortot, P. (2010). *Tail dependence in bivariate skew-normal and skew-t distributions*. Working paper, Università di Bologna, Dept Statistical Sciences.
- Bottazzi, G. & Secchi, A. (2006). *Maximum likelihood estimation of the symmetric and asymmetric exponential power distribution*. Technical Report 2006/19, LEM, Sant'Anna School of Advanced Studies, Pisa, Italia.
- Bottazzi, G. & Secchi, A. (2011). A new class of asymmetric exponential power densities with applications to economics and finance. *Industrial and Corporate Change*, 20, 991–1030.
- Braga, A. d. S., Cordeiro, G. M., Ortega, E. M. M., Silva, G. O., & Vasconcelos, J. C. S. (2022). A random-effects regression model based on the odd log-logistic skew normal distribution. *J. Stat. Theory Pract.*, 16, 33.
- Branco, M. D. & Dey, D. K. (2001). A general class of multivariate skew-elliptical distributions. *Journal of Multivariate Analysis*, 79(1), 99–113.
- Branco, M. D. & Dey, D. K. (2002). Regression model under skew elliptical error distribution. *J. Mathematical Sciences*, 1, 151–168.
- Branco, M. D., Genton, M. G., & Liseo, B. (2013). Objective Bayesian analysis of skew- t distributions. *Scandinavian Journal of Statistics*, 40, 63–85.
- Brito, P. & Duarte Silva, A. P. (2012). Modelling interval data with normal and skew-normal distributions. *Journal of Applied Statistics*, 39(1), 3–20.
- Brorsen, B. W. & Kim, T. (2013). Data aggregation in stochastic frontier models: the closed skew normal distribution. *J. Productivity Analysis*, 39, 27–34. Available online 08 March 2012.

- Buccianti, A. (2008). Meaning of the λ parameter of skew-normal and log-skew normal distributions in fluid geochemistry. In G. Mateu i Figueras & C. Barceló i Vidal (Eds.), CODAWORK'05, volume Session 2: Applications to geology and environmental science: La Universitat de Girona.
- Buccianti, A., Mateu-Figueras, G., & Pawlowsky-Glahn, V. (2006). Frequency distributions and natural laws in geochemistry. In *Compositional Data Analysis in the Geosciences: From Theory to Practice*, volume 264 of *Special Publications* (pp. 175–189). London: The Geological Society.
- Bufalo, M., Liseo, B., & Orlando, G. (2022). Forecasting portfolio returns with skew-geometric Brownian motions. *Appl. Stochastic Models Bus. Ind.*, 38, 620–650.
- Cabral, C. R. B., Bolfarine, H., & Pereira, J. R. G. (2008). Bayesian density estimation using skew Student- t -normal mixtures. *Computational Statistics and Data Analysis*, 52(12), 5075–5090.
- Cabral, C. R. B., da Silva, C. Q., & Migon, H. S. (2014a). A dynamic linear model with extended skew-normal for the initial distribution of the state parameter. *Computational Statistics and Data Analysis*, 74, 64–80.
- Cabral, C. R. B., Lachos, V. H., & Madruga, M. R. (2012a). Bayesian analysis of skew-normal independent linear mixed models with heterogeneity in the random-effects population. *Journal of Statistical Planning and Inference*, 142, 181–200.
- Cabral, C. R. B., Lachos, V. H., & Prates, M. O. (2012b). Multivariate mixture modeling using skew-normal independent distributions. *Computational Statistics and Data Analysis*, 56, 126–142.
- Cabral, C. R. B., Lachos, V. H., & Zeller, C. B. (2014b). Multivariate measurement error models using finite mixtures of skew-Student t distributions. *Journal of Multivariate Analysis*, 124, 179–98.
- Cabras, S. & Castellanos, M. E. (2009). Default Bayesian goodness-of-fit tests for the skew-normal model. *Journal of Applied Statistics*, 36(2), 223–232.
- Cabras, S., Racugno, W., Castellanos, M. E., & Ventura, L. (2012). A matching prior for the shape parameter of the skew-normal distribution. *Scandinavian Journal of Statistics*, 39(2), 236–247.
- Cael, B. B. & Mashayek, A. (2021). Log-skew-normality of ocean turbulence. *Phys. Rev. Lett.*, 126, 224502(1–6).
- Cahoy, D. O. (2015). Some skew-symmetric distributions which include the bimodal ones. *Communications in Statistics – Theory & Methods*, 44(3), 554–563. Available online 22 December 2014.
- Calabro, F. J. & Vaina, L. M. (2011). Population anisotropy in area MT explains a perceptual difference between near and far disparity motion segmentation. *Journal of Neurophysiology*, 105, 200–208. Available online 10 November 2010.

- Callegaro, A. & Iacobelli, S. (2012). The Cox shared frailty model with log-skew-normal frailties. *Statistical Modelling*, 12(5), 399–418.
- Canale, A. (2008). Aspetti statistici nella normale asimmetrica estesa. Tesi di laurea specialistica, Facoltà di Scienze Statistiche, Università di Padova, Padova, Italia.
- Canale, A. (2011). Statistical aspects of the scalar extended skew-normal distribution. *Metron*, LXIX(3), 279–295.
- Canale, A. (2015). A note on regions of given probability of the extended skew-normal distribution. *Communications in Statistics – Theory & Methods*, 44(12), 2507–2516.
- Canale, A., Kenne Pagui, E. C., & Scarpa, B. (2016). Bayesian modeling of university first-year students' grades after placement test. *Journal of Applied Statistics*, 43, 3015–3029.
- Canale, A. & Scarpa, B. (2016). Bayesian nonparametric location-scale-shape mixtures. *TEST*, 24, 113–130. Available on line 10 May 2015.
- Cancho, V. G., Lachos, V. H., & Ortega, E. M. M. (2010). A nonlinear regression model with skew-normal errors. *Statist. Papers*, 51, 547–558. Available online 09 May 2008.
- Cao, J., Durante, D., & Genton, M. G. (2022). Scalable computation of predictive probabilities in probit models with Gaussian process priors. *Journal of Computational and Graphical Statistics*, 31, 709–720.
- Cao, X., Wang, D., & Wu, L. (2023). Performance of ridge estimator in skew-normal mode regression model. *Communications in Statistics – Simulation & Computation*, 52, 1164–1177. Available online 25 Jan 2021.
- Cao, X., Wang, G., & Wu, L. (2020). Skew-normal median regression model with applications. *Journal of Physics: Conference Series*, 1616, 012079.
- Capitanio, A. (2010). On the approximation of the tail probability of the scalar skew-normal distribution. *Metron*, LXVIII, 299–308.
- Capitanio, A. (2012). On the canonical form of scale mixtures of skew-normal distributions. [arXiv.org:1207.0797](https://arxiv.org/abs/1207.0797). Reprinted in *Statistica*, vol. 80 (2020), pp. 145–160.
- Capitanio, A., Azzalini, A., & Stanghellini, E. (2003). Graphical models for skew-normal variates. *Scandinavian Journal of Statistics*, 30, 129–144.
- Capitanio, A. & Pacillo, S. (2008). A Wald's test for conditional independence skew normal graphs. In *Proceedings in Computational Statistics: CompStat 2008* (pp. 421–428). Heidelberg: Physica-Verlag.
- Cappuccio, N., Lubian, D., & Raggi, D. (2004). MCMC Bayesian estimation of a skew-GED stochastic volatility model. *Studies in nonlinear dynamics and econometrics*, 8(2), Article 6.
- Carmichael, B. & Coën, A. (2013). Asset pricing with skewed-normal return. *Finance Res. Letters*, 10(2), 50–57.

- Carota, C. (2010). Tests for normality in classes of skew- t alternatives. *Statistics & Probability Letters*, 80(1), 1–8.
- Carreau, J. & Bouvier, C. (2016). Multivariate density model comparison for multi-site flood-risk rainfall in the French Mediterranean area. *Stochastic Environmental Research and Risk Assessment*, 30, 1591–1612. Available online 07 October 2015.
- Cartinhour, J. (1990). One dimensional marginal density function of a truncated multivariate normal density function. *Communications in Statistics – Theory & Methods*, 19, 197–203.
- Castellares, F., Cordeiro, G. M., Santos, M. C., & Montenegro, L. C. (2012). A power series expansion for the SN distribution function. *J. Appl. Prob. Stat.*, 7, 1–16.
- Cavazos-Cadena, R. & González-Farías, G. M. (2012). Optimal reparametrization and large sample likelihood inference for the location-scale skew-normal model. *Periodica Mathematica Hungarica*, 64(2), 181–211.
- Celik, N. (2022). Welch’s ANOVA: Heteroskedastic skew- t error terms. *Communications in Statistics – Theory & Methods*, 51, 3065–3076. Available online 06 July 2020.
- Chai, H. S. & Bailey, K. R. (2008). Use of log-skew-normal distribution in analysis of continuous data with a discrete component at zero. *Statistics in Medicine*, 27(18), 3643–3655.
- Chamroukhi, F. (2017). Skew t mixtures of experts. *Neurocomputing*, 266, 390–408.
- Chang, C.-H., Lin, J.-J., Pal, N., & Chiang, M.-C. (2008). A note on improved approximation of the binomial distribution by the skew-normal distribution. *The American Statistician*, 62(2), 167–170.
- Chang, S.-C. & Zimmerman, D. L. (2016). Skew-normal antedependence models for skewed longitudinal data. *Biometrika*, 103, 363–376.
- Chang, S.-M. & Genton, M. G. (2007). Extreme value distributions for the skew-symmetric family of distributions. *Communications in Statistics – Theory & Methods*, 36(9), 1705–1717.
- Chen, F., Shi, L., Zhu, X., & Zhu, L. (2018). Generalized principal Hessian directions for mixture multivariate skew elliptical distributions. *Journal of Multivariate Analysis*, 168, 142–159.
- Chen, H.-C. & Chen, Y.-C. (2010). A comparative study of discrimination methods for credit scoring. In *40th International Conference on Computers and Industrial Engineering (CIE)* (pp. 1–5).
- Chen, J., Huang, Y., & Wang, Q. (2023+). Semiparametric multivariate joint model for skewed-longitudinal and survival data: A Bayesian approach. *Statistics in Medicine*, to appear. Available online 05 September 2023.
- Chen, J. T. & Gupta, A. K. (2005). Matrix variate skew normal distributions. *Statistics*, 39, 247–253.

- Chen, J. T., Gupta, A. K., & Nguyen, T. T. (2004). The density of the skew normal sample mean and its application. *Journal of Statistical Computation and Simulation*, 74, 487–494.
- Chen, J. T., Gupta, A. K., & Troskie, C. G. (2003). The distribution of stock returns when the market is up. *Communications in Statistics – Theory & Methods*, 32(8), 1541–1558.
- Chen, L., Pourahmadi, M., & Maadooliat, M. (2014a). Regularized multivariate regression models with skew- t error distributions. *Journal of Statistical Planning and Inference*, 149, 125–139.
- Chen, M.-H. (2004). Skewed link models for categorical response data. In M. G. Genton (Ed.), *Skew-elliptical Distributions and Their Applications: a Journey Beyond Normality* chapter 8, (pp. 131–152). Chapman & Hall/CRC.
- Chen, M.-H., Dey, D. K., & Shao, Q.-M. (1999). A new skewed link model for dichotomous quantal response data. *Journal of the American Statistical Association*, 94, 1172–1186.
- Chen, X., Zeng, Q., & Song, Q. (2014b). Likelihood inference of nonlinear models based on a class of flexible skewed distributions. *Abstract and Applied Analysis*, 2014, ID 542985.
- Chen, X., Zeng, Q., & Song, Q. (2014c). Penalized maximum likelihood method to a class of skewness data analysis. *Math. Problems in Engineering*, 2014, ID 824816.
- Chen, Y.-Y., Schmidt, P., & Wang, H.-J. (2014d). Consistent estimation of the fixed effects stochastic frontier model. *J. Econometrics*, 181(2), 65–76.
- Cheng, L., Xu, W., Ren, F., Gong, F., Gupta, P., & He, L. (2014). Statistical timing and power analysis of VLSI considering non-linear dependence. *Integration, the VLSI Journal*, 47(4), 487–498.
- Chiogna, M. (1997). *Notes on estimation problems with scalar skew-normal distributions*. Technical Report 15, Dept Statistical Sciences, University of Padua.
- Chiogna, M. (1998). Some results on the scalar skew-normal distribution. *J. Ital. Statist. Soc*, 7, 1–13.
- Chiogna, M. (2005). A note on the asymptotic distribution of the maximum likelihood estimator for the scalar skew-normal distribution. *Stat. Meth. & Appl.*, 14, 331–341.
- Chou, Y.-M. & Owen, D. B. (1984). An approximation to the percentiles of a variable of the bivariate normal distribution when the other variable is truncated, with applications. *Communications in Statistics – Theory & Methods*, 13, 2535–2547.
- Choudhary, P. K., Sengupta, D., & Cassey, P. (2014). A general skew- t mixed model that allows different degrees of freedom for random effects and error distributions. *Journal of Statistical Planning and Inference*, 147, 235–247.
- Choudhury, K. & Matin, M. A. (2011). Extended skew generalized normal distribution. *Metron*, 69(3), 265–278.

- Christiansen, M. C. & Loperfido, N. (2014). Improved approximation of the sum of random vectors by the skew normal distribution. *Journal of Applied Probability*, 51(2), 466–482.
- Chu, K. K., Wang, N., Stanley, S., & Cohen, N. D. (2001). Statistical evaluation of the regulatory guidelines for use of furosemide in race horses. *Biometrics*, 57, 294–301.
- Clarke, A. D. F. & Tatler, B. W. (2014). Deriving an appropriate baseline for describing fixation behaviour. *Vision Research*, 102, 41–51.
- Coelli, T. J., Prasada Rao, D. S., & Battese, G. E. (1998). *An introduction to efficiency and productivity analysis*. Boston, Dordrecht, London: Kluwer Academic Publishers.
- Coelli, T. J., Prasada Rao, D. S., O'Donnell, C., & Battese, G. E. (2005). *An introduction to efficiency and productivity analysis*. Springer, II edition.
- Colombi, R. (2013). Closed skew normal stochastic frontier models for panel data. In N. Torelli, F. Pesarin, & A. Bar-Hen (Eds.), *Advances in Theoretical and Applied Statistics, Studies in Theoretical and Applied Statistics* chapter 17, (pp. 177–186). Springer.
- Colombi, R., Kumbhakar, S. C., Martini, G., & Vittadini, G. (2014). Closed-skew normality in stochastic frontiers with individual effects and long/short-run efficiency. *J. Productivity Analysis*, 42, 123–136.
- Colombi, R., Martini, G., & Vittadini, G. (2017). Determinants of transient and persistent hospital efficiency: The case of Italy. *Health Economics*, 26(S2), 5–22.
- Contreras-Reyes, J. E. & Arellano-Valle, R. B. (2012). Kullback–Leibler divergence measure for multivariate skew-normal distributions. *Entropy*, 14, 1606–1626.
- Corns, T. R. A. & Satchell, S. E. (2007). Skew Brownian motion and pricing European options. *European J. Finance*, 13(6), 523–544.
- Corns, T. R. A. & Satchell, S. E. (2010). Modelling conditional heteroskedasticity and skewness using the skew-normal distribution one-sided coverage intervals with survey data. *Metron*, LXVIII, 251–263.
- Counsell, N., Cortina-Borja, M., Lehtonen, A., & Stein, A. (2011). Modelling psychiatric measures using skew-normal distributions. *European Psychiatry*, 26, 112–114.
- Crawford, J. R., Garthwaite, P. H., Azzalini, A., Howell, D. C., & Laws, K. R. (2006). Testing for a deficit in single-case studies: Effects of departures from normality. *Neuropsychologia*, 44, 666–677.
- Crocetta, C. & Loperfido, N. (2003). Sampling distribution of the Gini index from a skew normal. Manuscript.
- Crocetta, C. & Loperfido, N. (2005). The exact sampling distribution of L -statistics. *Metron*, LXIII(2), 213–223.

- da Costa Figueiredo, C., Carneiro Sandoval, M., Bolfarine, H., & Lima, C. R. O. P. (2008). Skew-normal linear calibration: a Bayesian perspective. *J. Chemometrics*, 8(22), 472–480.
- da Silva Ferreira, C., Bolfarine, H., & Lachos, V. H. (2011). Skew scale mixtures of normal distributions: Properties and estimation. *Stat. Methodology*, 8(2), 154–171.
- Dagne, G. & Huang, Y. (2012). Bayesian inference for a nonlinear mixed-effects Tobit model with multivariate skew- t distributions: application to AIDS studies. *The International Journal of Biostatistics*, 8(1), Article 27.
- Dagne, G. A. (2013). Bayesian inference for skew-normal mixture models with left-censoring. *J. Biopharmaceutical Stat.*, 23, 1023–1041.
- Dagne, G. A. (2022). Bayesian censored piecewise regression mixture models with skewness. *J. Biopharmaceutical Stat.*, 32, 287–297.
- Dalla Valle, A. (1995). La distribuzione normale asimmetrica doppia. Tesi di laurea, Facoltà di Scienze Statistiche, Università di Padova, Padova, Italia. <http://tesi.cab.unipd.it/1432/>.
- Dalla Valle, A. (1998). *La distribuzione normale asimmetrica: problematiche e utilizzi nelle applicazioni*. Tesi di dottorato, Dipartimento di Scienze Statistiche, Università di Padova, Padova, Italia.
- Dalla Valle, A. (2004). The skew-normal distribution. In M. G. Genton (Ed.), *Skew-elliptical Distributions and Their Applications: a Journey Beyond Normality* chapter 1, (pp. 3–24). Chapman & Hall/CRC.
- Dalla Valle, A. (2007). A test for the hypothesis of skew-normality in a population. *Journal of Statistical Computation and Simulation*, 77, 63–77.
- Dao, N. A. & Genton, M. G. (2021). Skew-elliptical cluster processes. In I. Ghosh, N. Balakrishnan, & H. K. T. Ng (Eds.), *Advances in Statistics – Theory and Applications*, Emerging Topics in Statistics and Biostatistics (pp. 365–393). Springer.
- Das, S. & Genton, M. G. (2020). On the stationary marginal distributions of subclasses of multivariate SETAR processes of order one. *Journal of Time Series Analysis*, 41, 406–420.
- de Alencar, F. H. C., Galarza, C. E., Matos, L. A., & Lachos, V. H. (2022). Finite mixture modeling of censored and missing data using the multivariate skew-normal distribution. *Adv. Data Analysis and Classification*, 16, 521–557. Available online 17 June 2021.
- de Graaff, T. (2020). On the estimation of spatial stochastic frontier models: an alternative skew-normal approach. *Ann. Regional Sci.*, 64, 267–285. Available online 06 August 2019.

- de Helguero, F. (1909a). Sulla rappresentazione analitica delle curve abnormali. In G. Castelnuovo (Ed.), *Atti del IV Congresso Internazionale dei Matematici (Roma, 6–11 Aprile 1908)*, volume III, sezione III-B (pp. 288–299). Roma: R. Accademia dei Lincei. Available at <https://www.mathunion.org/fileadmin/ICM/Proceedings/ICM1908.3/ICM1908.3.ocr.pdf>.
- de Helguero, F. (1909b). Sulla rappresentazione analitica delle curve statistiche. *Giornale degli Economisti*, XXXVIII, serie 2^a, 241–265.
- de Helguero, F. (1972). *Scritti vari*. Padova: Cedam. Collected papers published by the “Istituto di Studi Economici, Finanziari e Statistici dell’Università di Roma” (series II, volume XII).
- De la Cruz, R. (2008). Bayesian non-linear regression models with skew-elliptical errors: Applications to the classification of longitudinal profiles. *Computational Statistics and Data Analysis*, 53(2), 436–449.
- De Luca, G., Genton, M. G., & Loperfido, N. (2005). A multivariate skew-GARCH model. *Advances in Econometrics*, 20, 33–57.
- De Luca, G. & Loperfido, N. (2015). Modelling multivariate skewness in financial returns: a SGARCH approach. *European J. Finance*, 21(13–14), 1113–1131. Available online 06 Feb 2012.
- De Luca, G. & Loperfido, N. M. R. (2004). A skew-in-mean GARCH model. In M. G. Genton (Ed.), *Skew-elliptical Distributions and Their Applications: a Journey Beyond Normality* chapter 12, (pp. 205–222). Chapman & Hall/CRC.
- De Queiroz, M. M., Silva, R. W. C., & Loschi, R. H. (2016). Shannon entropy and Kullback–Leibler divergence in multivariate log fundamental skew-normal and related distributions. *Canadian Journal of Statistics*, 44, 219–237.
- Deelstra, G., Diallo, I., & Vanmaele, M. (2010). Moment matching approximation of Asian basket option prices. *J. Computational and Applied Mathematics*, 234(4), 1006–1016.
- Dette, H., Ley, C., & Rubio, F. (2018). Natural (non-)informative priors for skew-symmetric distributions. *Scandinavian Journal of Statistics*, 45, 405–420. Available online 10 October 2017.
- Dey, D. K. & Liu, J. (2005). A new construction for skew multivariate distributions. *Journal of Multivariate Analysis*, 95(2), 323–344.
- Diallo, M. & Rao, J. N. K. (2014). Small area estimation of complex parameters under unit-level models with skew-normal errors. In *Proceedings of the Survey Research Methods Section, ASA*, volume Session 571: Small Area Estimation of *Proceedings of the Survey Research Methods Section*: American Statistical Association.
- Diallo, M. S. (2014). *Small area estimation under skew-normal nested error models*. PhD thesis, School of Mathematics and Statistics, Carleton University, Ottawa, Ontario, Canada.

- Diallo, M. S. & Rao, J. N. K. (2018). Small area estimation of complex parameters under unit-level models with skew-normal errors. *Scandinavian Journal of Statistics*, 45, 1092–1116.
- Díaz-García, J. A. & González-Farías, G. (2008). Singular extended skew-elliptical distributions. *J. Korean Stat. Soc.*, 37(4), 385–392.
- DiCiccio, T. J. & Monti, A. C. (2004). Inferential aspects of the skew exponential power distribution. *Journal of the American Statistical Association*, 99(466), 439–450.
- DiCiccio, T. J. & Monti, A. C. (2011). Inferential aspects of the skew t -distribution. *Quaderni di Statistica*, 13, 1–21.
- DiCiccio, T. J. & Monti, A. C. (2018). Testing for sub-models of the skew t -distribution. *Stat. Methods & Appl.*, 27, 25–44. Available online 08 July 2017.
- Ding, P. (2014). Bayesian robust inference of sample selection using selection- t models. *Journal of Multivariate Analysis*, 124, 451–464.
- Doğru, F. Z. & Arslan, O. (2017). Robust mixture regression based on the skew t distribution. *Rev. Colomb. Estad.*, 40, 45–64.
- Doğru, F. Z. & Arslan, O. (2019). Joint modelling of the location, scale and skewness parameters of the skew Laplace normal distribution. *Iran J. Sci. Technol. Trans. Sci.*, 43, 1249–1257.
- Doğru, F. Z. & Arslan, O. (2021). Finite mixtures of skew laplace normal distributions with random skewness. *Computational Statistics*, 36, 423–447. Available online 01 September 2020.
- Domínguez-Molina, J. A., González-Farías, G., & Ramos-Quiroga, R. (2004). Skew-normality in stochastic frontier analysis. In M. G. Genton (Ed.), *Skew-elliptical Distributions and Their Applications: a Journey Beyond Normality* chapter 13, (pp. 223–242). Chapman & Hall/CRC.
- Domínguez-Molina, J. A., González-Farías, G., Ramos-Quiroga, R., & Gupta, A. K. (2007). A matrix variate closed skew-normal distribution with applications to stochastic frontier analysis. *Communications in Statistics – Theory & Methods*, 36(9), 1671–1703.
- Domínguez-Molina, J. A. & Rocha-Arteaga, A. (2007). On the infinite divisibility of some skewed symmetric distributions. *Statistics & Probability Letters*, 77, 644–648.
- Donodov, Y. S. & Donodova, Y. A. (2010). Asymmetric item characteristic curve in item response theory: Model construction and application. In *Procedia – Social and Behavioral Sciences*, volume 5 (pp. 1592–1595). World Conference on Psychology, Counselling and Guidance, WCPCG-2010.
- Dumrongpokaphan, T. & Kreinovich, V. (2016). *Why cannot we have a strongly consistent family of skew normal (and higher order) distributions*. Technical Report Technical Report: UTEP-CS-16-42, University of Texas at El Paso, Dept. Computer Science.

- Dunajeva, O., Kollo, T., & Traat, I. (2003). Bias correction for the shape parameter of the skew normal distribution. *Tatra Mt. Math. Publ.*, 26, 281–289.
- Durante, D. (2019). Conjugate Bayes for probit regression via unified skew-normal distributions. *Biometrika*, 106, 765–779.
- Eastaugh, C. S. & Hasenauer, H. (2012). A statistical thinning model for initialising large-scale ecosystem models. *Scand. J. Forest Research*, 27(6), 567–577.
- Eiling, M. (2014). Fitting asset returns to skewed distributions: Are the skew-normal and skew-student good models? *Insurance: Mathematics and Economics*, 59, 45–56.
- Elal-Olivero, D., Gómez, H. W., & Quintana, F. A. (2009). Bayesian modeling using a class of bimodal skew-elliptical distributions. *Journal of Statistical Planning and Inference*, 139, 1484–1492.
- Eling, M. (2012). Fitting insurance claims to skewed distributions: Are the skew-normal and skew-student good models? *Insurance: Mathematics and Economics*, 51, 239–248.
- Eyer, L. & Genton, M. G. (2004). An astronomical distance determination method using regression with skew-normal errors. In M. G. Genton (Ed.), *Skew-elliptical Distributions and Their Applications: a Journey Beyond Normality* chapter 18, (pp. 309–319). Chapman & Hall/CRC.
- Fabrizi, E. & Trivisano, C. (2010). Robust models for mixed effects in linear mixed models applied to small area estimation. *Journal of Statistical Planning and Inference*, 140, 433–443.
- Fang, B. Q. (2003). The skew elliptical distributions and their quadratic forms. *Journal of Multivariate Analysis*, 87(2), 298–314.
- Fang, B. Q. (2005a). Noncentral quadratic forms of the skew elliptical variables. *Journal of Multivariate Analysis*, 95, 410–430.
- Fang, B. Q. (2005b). The t statistic of the skew elliptical distributions. *Journal of Statistical Planning and Inference*, 134, 140–157.
- Fang, B. Q. (2005c). The t statistic of the skew elliptical distributions. *Science in China, series A: Mathematics*, 48, 214–221.
- Fang, B. Q. (2006). Sample mean, covariance and t^2 statistic of the skew elliptical model. *Journal of Multivariate Analysis*, 97, 1675–1690.
- Fang, B. Q. (2008). Noncentral matrix quadratic forms of the skew elliptical variables. *Journal of Multivariate Analysis*, 99, 1105–1127.
- Farzane Hashemi, V. A. & Jamalizadeh, A. (2015). An extension of the Birnbaum-Saunders distribution based on skew-normal- t distribution. *J. Statistical Research of Iran*, 12(1), 1–37.

- Fasano, A. & Durante, D. (2022). A class of conjugate priors for multinomial probit models which includes the multivariate normal one. *J. Machine Learning Research*, 23, 1–26.
- Fasano, A., Durante, D., & Zanella, G. (2022). Scalable and accurate variational Bayes for high-dimensional binary regression models. *Biometrika*, 109, 901–919.
- Fasano, A., Rebaudo, G., Durante, D., & Petrone, S. (2019). Exact Kalman filter for binary time series. arXiv:1902.06994v1.
- Fasano, A., Rebaudo, G., Durante, D., & Petrone, S. (2021). A closed-form filter for binary time series. *Statistics and Computing*, 31, 47.
- Fernandes, E., Pacheco, A., & Penha-Gonçalves, C. (2007). Mapping of quantitative trait loci using the skew-normal distribution. *J. Zhejiang University – Science B*, 8(11), 792–801.
- Ferrante, M. R. & Pacei, S. (2017). Small domain estimation of business statistics by using multivariate skew normal models. *Journal of the Royal Statistical Society, series A*, 180, 1057–1088.
- Ferrante, M. R. & Pacei, S. (2019). Small area estimation of entropy inequality measures: a comparison between alternative distribution models. In *Denver, Colorado: JSM2019* (pp. 1642–1651).
- Ferraz, V. R. S. & Moura, F. A. S. (2012). Small area estimation using skew normal models. *Computational Statistics and Data Analysis*, 56(10), 2864–2874.
- Ferreira, C. S. & Arellano-Valle, R. B. (2018). Estimation and diagnostic analysis in skew-generalized-normal regression models. *Journal of Statistical Computation and Simulation*, 88, 1039–1059.
- Ferreira, C. S., Bolfarine, H., & Lachos, V. H. (2022). Linear mixed models based on skew scale mixtures of normal distributions. *Communications in Statistics – Theory & Methods*, 51, 7194–7214. Available online 29 September 2020.
- Ferreira, C. S. & Lachos, V. H. (2016). Nonlinear regression models under skew scale mixtures of normal distributions. *Statistical Methodology*, 33, 131–146.
- Ferreira, C. S., Lachos, V. H., & Bolfarine, H. (2016). Likelihood-based inference for multivariate skew scale mixtures of normal distributions. *AStA Advances in Statistical Analysis*, 100, 421–441.
- Ferreira, J. T. A. S. & Steel, M. F. J. (2004). Bayesian multivariate skewed regression modelling with an application to firm size. In M. G. Genton (Ed.), *Skew-elliptical Distributions and Their Applications: a Journey Beyond Normality* chapter 10, (pp. 175–190). Chapman & Hall/CRC.
- Figiel, Ł. (2014). Effect of the interphase on large deformation behaviour of polymer–clay nanocomposites near the glass transition: 2D RVE computational modelling. *Computational Materials Science*, 84, 244–254. Corrigendum in vol. 89, p. 264.

- Figueiredo, C. C., Bolfarine, H., Sandoval, M. C., & Lima, C. R. O. P. (2010). On the skew-normal calibration model. *Journal of Applied Statistics*, 37(3), 435–451.
- Figueiredo, F. & Gomes, M. I. (2013). The skew-normal distribution in SPC. *RevStat-Stat. J.*, 11(SI), 83–104.
- Figueiredo, F. O. & Gomes, M. I. (2015). The role of asymmetric families of distributions in eliminating risk. In P. C. Kitsos, A. T. Oliveira, A. Rigas, & S. Gulati (Eds.), *Theory and Practice of Risk Assessment: ICRA 5, Tomar, Portugal, 2013* (pp. 267–277). Springer International Publishing.
- Filippini, M. & Greene, W. (2016). Persistent and transient productive inefficiency: a maximum simulated likelihood approach. *J. Productivity Analysis*, 45, 187–196. Available online 26 April 2015.
- Flecher, C., Allard, D., & Naveau, P. (2010). Truncated skew-normal distributions: moments, estimation by weighted moments and application to climatic data. *Metron*, LXVIII, 331–345.
- Flecher, C., Naveau, P., & Allard, D. (2009). Estimating the closed skew-normal distribution parameters using weighted moments. *Statistics & Probability Letters*, 79(19), 1977–1984.
- Framstad, N. C. (2011). Portfolio separation properties of the skew-elliptical distributions, with generalizations. *Statistics & Probability Letters*, 81(12), 1862–1866.
- Franceschini, C. & Loperfido, N. (2010). A skewed GARCH-type model for multivariate financial time series. In M. Corazza & C. Pizzi (Eds.), *Mathematical and Statistical Methods for Actuarial Sciences and Finance* (pp. 143–152). Milan: Springer-Verlag Italia.
- Franceschini, C. & Loperfido, N. (2019). MaxSkew and MultiSkew: two R packages for detecting, measuring and removing multivariate skewness. *Symmetry*, 11(8), 970.
- Franco, S. (2011). La matrice di informazione attesa per la distribuzione normale asimmetrica estesa bidimensionale. Tesi di laurea specialistica, Università degli Studi di Padova. <https://hdl.handle.net/20.500.12608/14418>.
- Frederic, P. (2011). Modeling skew-symmetric distributions using B-spline and penalties. *Journal of Statistical Planning and Inference*, 141(8), 2878–2890.
- Frühwirth-Schnatter, S. & Malsiner-Walli, G. (2019). From here to infinity: sparse finite versus Dirichlet process mixtures in model-based clustering. *Adv. Data Analysis and Classification*, 13, 33–64. Available online 14 August 2018.
- Frühwirth-Schnatter, S. & Pyne, S. (2010). Bayesian inference for finite mixtures of univariate and multivariate skew-normal and skew- t distributions. *Biostatistics*, 11, 317–336.
- Fu, R., Dey, D., & Ranvishanker, N. (2002). Bayesian analysis of compositional time series by using multivariate skew normal distribution. In *ASA Proceedings of the Joint Statistical Meetings* (pp. 1082–1086).: American Statistical Association.

- Fung, T. & Seneta, E. (2010). Tail dependence for two skew t distributions. *Statistics & Probability Letters*, 80(9–10), 784–791.
- Fung, T. & Seneta, E. (2014). Convergence rate to a lower tail dependence coefficient of a skew- t distribution. *Journal of Multivariate Analysis*, 128, 62–72.
- Fung, T. & Seneta, E. (2016). Tail asymptotics for the bivariate skew normal. *Journal of Multivariate Analysis*, 144, 129–138. Available online 02 December 2015.
- Fung, T. & Seneta, E. (2018). Quantile function expansion using regularly varying functions. *Methodology and Computing in Applied Probability*, 20, 1091–1103.
- Furlan, F. (1997). La distribuzione normale asimmetrica: utilizzo pratico e problemi numerici. Tesi di diploma, Facoltà di Scienze Statistiche, Università di Padova, Padova, Italia.
- Galarza, C. E., Matos, L. A., & Lachos, V. H. (2020). Moments of the doubly truncated selection elliptical distributions with emphasis on the unified multivariate skew- t distribution. [arXiv.org:2007.14980](https://arxiv.org/abs/2007.14980).
- Galarza Morales, C. E., Matos, L. A., Dey, D. K., & Lachos, V. H. (2022). On moments of folded and doubly truncated multivariate extended skew-normal distributions. *Journal of Computational and Graphical Statistics*, 31, 455–465.
- Garay, A. M., Lachos, V. H., & Abanto-Valle, C. A. (2011). Nonlinear regression models based on scale mixtures of skew-normal distributions. *J. Korean Stat. Soc.*, 40(1), 115–124.
- Garay, A. M., Lachos, V. H., Labra, F. V., & Ortega, E. M. M. (2014). Statistical diagnostics for nonlinear regression models based on scale mixtures of skew-normal distributions. *Journal of Statistical Computation and Simulation*, 84, 1761–1778. Available online 08 Feb 2013.
- García-Escudero, L., Greselin, F., Mayo-Isacar, A., & McLachlan, G. (2016). Robust estimation of mixtures of skew normal distributions. In M. Pratesi & C. Pena (Eds.), *Proceedings of the 48th Scientific Meeting of the Italian Statistical Society*: Italian Statistical Society.
- Gaucher, B. J. (2013). *Factor analysis for skewed data and skew-normal maximum likelihood factor analysis*. PhD thesis, Texas A&M University.
- Genetti, B. (1993). La distribuzione normale asimmetrica: taluni aspetti relativi alla stima dei parametri. Tesi di laurea, Facoltà di Scienze Statistiche, Università di Padova, Padova, Italia.
- Genton, M. G., Ed. (2004a). *Skew-Elliptical Distributions and Their Applications: a Journey Beyond Normality*. Boca Raton, FL, USA: Chapman & Hall/CRC.
- Genton, M. G. (2004b). Skew-symmetric and generalized skew-elliptical distributions. In M. G. Genton (Ed.), *Skew-elliptical Distributions and Their Applications: a Journey Beyond Normality* chapter 5, (pp. 81–100). Chapman & Hall/CRC.

- Genton, M. G. (2005). Discussion of “the skew-normal”. *Scandinavian Journal of Statistics*, 32, 189–198.
- Genton, M. G., He, L., & Liu, X. (2001). Moments of skew-normal random vectors and their quadratic forms. *Statistics & Probability Letters*, 51, 319–325.
- Genton, M. G. & Hering, A. S. (2017). Comments on: Spatiotemporal models for skewed processes. *Environmetrics*, 28, e2430.
- Genton, M. G. & Loperfido, N. (2005). Generalized skew-elliptical distributions and their quadratic forms. *Annals of the Institute Statistical Mathematics*, 57, 389–401.
- Genton, M. G. & Thompson, K. R. (2003). Skew-elliptical time series with application to flooding risk. In D. R. Brillinger, E. A. Robinson, & F. P. Schoenberg (Eds.), *Time series analysis and applications to geophysical systems*, volume 126 of *IMA Volume in Mathematics and its Applications* (pp. 169–186). Springer Verlag.
- Genton, M. G. & Zhang, H. (2012). Identifiability problems in some non-Gaussian spatial random fields. *Chilean Journal of Statistics*, 3, 173–181.
- Ghaderinezhad, F., Ley, C., & Loperfido, N. (2020). Bayesian inference for skew-symmetric distributions. *Symmetry*, 12, 491.
- Ghalani, M. R. & Zadkarami, M. R. (2021). Investigation of covariance structures in modelling longitudinal ordinal responses with skew normal random effect. *Communications in Statistics – Simulation & Computation*, 50, 254–269. Available online 12 March 2019.
- Ghizzoni, T., Roth, G., & Rudari, R. (2010). Multivariate skew- t approach to the design of accumulation risk scenarios for the flooding hazard. *Adv. Water Resources*, 33(10, Sp. Iss. SI), 1243–1255.
- Ghizzoni, T., Roth, G., & Rudari, R. (2012). Multisite flooding hazard assessment in the Upper Mississippi River. *J. Hydrology*, 412–413(Special issue: wHydrology Conference 2010), 101–113.
- Ghorbanzadeh, D., Jaupi, L., & Durand, P. (2014). A method to simulate the skew normal distribution. *Applied Mathematics*, 5, 2073–2076.
- Ghosh, P., Bayes, C. L., & Lachos, V. H. (2009). A robust Bayesian approach to null intercept measurement error model with application to dental data. *Computational Statistics and Data Analysis*, 53(4), 1066–1079.
- Ghosh, P., Branco, M. D., & Chakraborty, H. (2007). Bivariate random effect model using skew-normal distribution with application to HIV-RNA. *Statistics in Medicine*, 26(6), 1255–1267.
- Gianfreda, A., Scandolo, G., & Bunn, D. W. (2022). Higher moments in the fundamental specification of electricity forward prices. *Quantitative Finance*, 22, 2063–2078.

- Giorgi, E. (2012). Indici non parametrici per famiglie parametriche con particolare riferimento alla t asimmetrica. Tesi di laurea magistrale, Università di Padova. <https://hdl.handle.net/20.500.12608/15593>.
- Giorgi, E. & McNeil, A. J. (2016). On the computation of multivariate scenario sets for the skew- t and generalized hyperbolic families. *Computational Statistics and Data Analysis*, 100(205–220), 205–220. Available online 7 July 2014.
- Godoi, L. G., Branco, M. D., & Ruggeri, F. (2017). Concentration function for the skew-normal and skew- t distributions, with application in robust Bayesian analysis. *Brazilian J. Probab. Stat.*, 31, 373–393.
- Gómez, H. W., Elal-Olivero, D., Salinas, H. S., & Bolfarine, H. (2011). Bimodal extension based on the skew-normal distribution with application to pollen data. *Environmetrics*, 22(1), 50–62. Available online 11 Sep 2009.
- Gómez, H. W., Salinas, H. S., & Bolfarine, H. (2006). Generalized skew-normal model: properties and inference. *Statistics*, 40, 495–505.
- Gómez, H. W., Torres, F. J., & Bolfarine, H. (2007a). Large-sample inference for the epsilon-skew- t distribution. *Communications in Statistics – Theory & Methods*, 36(1), 73–81.
- Gómez, H. W., Varela, H., & Vidal, I. (2013). A new class of skew-symmetric distributions and related families. *Statistics: A Journal of Theoretical and Applied Statistics*, 47(2), 411–421. Available online 30 Jun 2011.
- Gómez, H. W., Venegas, O., & Bolfarine, H. (2007b). Reply to comment on “Skew-symmetric distributions generated by the distribution function of the normal distribution” (2007V18 p661-662). *Environmetrics*, 18(8), 889–890.
- Gómez, H. W., Venegas, O., & Bolfarine, H. (2007c). Skew-symmetric distributions generated by the distribution function of the normal distribution. *Environmetrics*, 18(4), 395–407.
- Gómez-Déniz, E., Arnold, B. C., Sarabia, M., & Gómez, H. W. (2021). Properties and applications of a new family of skew distributions. *Mathematics*, 9, 87.
- Gómez-Déniz, E., Dávila-Cárdenes, N., & Boza-Chirino, J. (2022). Modelling expenditure in tourism using the log-skew normal distribution. *Current Issues in Tourism*, to appear. Available online 11 Aug 2021.
- González-Estrada, E. & Cosmes, W. (2019). Shapiro–Wilk test for skew normal distributions based on data transformations. *Journal of Statistical Computation and Simulation*, 89, 3258–3272.
- González-Estrada, E., Villaseñor, J. A., & Acosta-Pech, R. (2022). Shapiro-Wilk test for multivariate skew-normality. *Computational Statistics*, 37, 1985–2001.
- González-Farías, G., Domínguez-Molina, J. A., & Gupta, A. K. (2004a). Additive properties of skew normal random vectors. *Journal of Statistical Planning and Inference*, 126, 521–534.

- González-Farías, G., Domínguez-Molina, J. A., & Gupta, A. K. (2004b). The closed skew-normal distribution. In M. G. Genton (Ed.), *Skew-elliptical Distributions and Their Applications: a Journey Beyond Normality* chapter 2, (pp. 25–42). Chapman & Hall/CRC.
- Goria, S. (1999). Uso di generalizzazioni della distribuzione normale nei modelli per serie storiche. Tesi di laurea, Facoltà di Scienze Statistiche, Università di Padova, Padova, Italia.
- Greco, L. (2011). Minimum Hellinger distance based inference for scalar skew-normal and skew- t distributions. *Test*, 20(1), 120–137.
- Grifa, C., De Bonis, A., Langella, A., Mercurio, M., Soricelli, G., & Morra, V. (2013). A Late Roman ceramic production from Pompeii. *J. Archaeol. Science*, 40(2), 810–826.
- Grilli, L. & Rampichini, C. (2010). Selection bias in linear mixed models. *Metron*, LXVIII, 309–329.
- Gualtierotti, A. (2004). A family of (skew-normal) stochastic processes that can model some non-Gaussian random signals in dependent Gaussian noise. In *8th World Multiconference on Systemics, Cybernetics and Informatics (SCI 2004)*, volume VI (pp. 88–94). Orlando, Florida.
- Gualtierotti, A. F. (2005). Skew-normal processes as models for random signals corrupted by Gaussian noise. *Int. J. Pure & Appl. Math.*, 20(1), 109–142.
- Guan, Y., Xie, C., & Zhu, L. (2017). Sufficient dimension reduction with mixture multivariate skew-elliptical distributions. *Statistica Sinica*, 27, 335–355.
- Guerra-Peña, K., García-Batista, Z. E., Depaoli, S., & Garrido, L. E. (2020). Class enumeration false positive in skew- t family of continuous growth mixture models. *PLoS ONE*, 15(4), e0231525.
- Guha, N., Wu, X., Efendiev, Y., Jin, B., & Mallick, B. K. (2015). A variational Bayesian approach for inverse problems with skew- t error distributions. *J. Computational Physics*, 301, 377–393.
- Gui, W. & Guo, L. (2018). Statistical inference for the location and scale parameters of the skew normal distribution. *Indian J. Pure and Applied Mathematics*, 49, 644–650.
- Guirguis, K., Gershunov, A., Cayan, D. R., & Pierce, D. W. (2018). Heat wave probability in the changing climate of the Southwest US. *Climate Dynamics*, 50(9–10), 3853–3864. Available online 18 Sept 2017.
- Guolo, A. (2008). A flexible approach to measurement error correction in case-control studies. *Biometrics*, 64, 1207–1214.
- Gupta, A. K. (2003). Multivariate skew t -distribution. *Statistics*, 37(4), 359–363.
- Gupta, A. K. & Aziz, M. A. (2012). Estimation of parameters of the unified skew normal distribution using the method of weighted moments. *J. Statist. Theory Practice*, 6(3), 402–416.

- Gupta, A. K., Aziz, M. A., & Ning, W. (2013a). On some properties of the unified skew normal distribution. *J. Statist. Theory & Practice*, 7(3), 480–495.
- Gupta, A. K. & Chang, F.-C. (2003). Multivariate skew-symmetric distributions. *Appl. Math. Letters*, 16, 643–646.
- Gupta, A. K., Chang, F. C., & Huang, W.-J. (2002). Some skew-symmetric models. *Random Operators and Stochastic Equations*, 10(2), 133–140.
- Gupta, A. K. & Chen, J. T. (2004). A class of multivariate skew-normal models. *Annals of the Institute Statistical Mathematics*, 56, 305–315.
- Gupta, A. K., Chen, J. T., & Tang, J. (2007). A multivariate two-factor skew model. *Statistics: A Journal of Theoretical and Applied Statistics*, 41(4), 301–309.
- Gupta, A. K. & Chen, T. (2001). Goodness-of-fit tests for the skew-normal distribution. *Communications in Statistics – Simulation & Computation*, 30(4), 907–930.
- Gupta, A. K. & Chen, T. (2003). On the sample characterization criterion for normal distributions. *Journal of Statistical Computation and Simulation*, 73(3), 155–163.
- Gupta, A. K., González-Farías, G., & Domínguez-Molina, J. A. (2004a). A multivariate skew normal distribution. *Journal of Multivariate Analysis*, 89(1), 181–190.
- Gupta, A. K. & Huang, W.-J. (2002). Quadratic forms in skew normal variates. *J. Math. Anal. Appl.*, 273, 558–564.
- Gupta, A. K. & Kollo, T. (2003). Density expansions based on the multivariate skew normal distribution. *Sankhyā*, 65(4), 821–835.
- Gupta, A. K., Nguyen, T. T., & Sanqui, J. A. T. (2004b). Characterization of the skew-normal distribution. *Annals of the Institute Statistical Mathematics*, 56, 351–360.
- Gupta, A. K., Varga, T., & Bodnar, T. (2013b). *Elliptically Contoured Models in Statistics and Portfolio Theory*. Springer, II edition.
- Gupta, R. C. & Balakrishnan, N. (2012). Log-concavity and monotonicity of hazard and reversed hazard functions of univariate and multivariate skew-normal distributions. *Metrika*, 75, 181–191. Available online 18 July 2010.
- Gupta, R. C. & Brown, N. (2001). Reliability studies of the skew-normal distribution and its application to a strength-stress model. *Communications in Statistics – Theory & Methods*, 30(11), 2427–2445.
- Gupta, R. C. & Gupta, R. D. (2004). Generalized skew normal model. *Test*, 13, 501–524.
- Gupta, R. D. & Gupta, R. C. (2008). Analyzing skewed data by power normal model. *Test*, 17, 197–210.
- Gupta, S. S. & Pillai, S. (1965). On linear functions of ordered correlated normal random variables. *Biometrika*, 52(3/4), 367–379.

- Haas, M. (2010). Skew-normal mixture and Markov-switching GARCH processes. *Studies in Nonlinear Dynamics & Econometrics*, 14(4), 1–56.
- Haas, M. (2012). A note on the moments of the skew-normal distribution. *Economics Bull.*, 32(4), 3306–3312.
- Hallin, M. & Ley, C. (2010). *Skew-symmetric distributions and Fisher information — A tale of two densities*. Technical Report 2010/40, ECORE, Fondation Universitaire, 11 Rue d'Egmont, 1000 Bruxelles.
- Hallin, M. & Ley, C. (2012). Skew-symmetric distributions and Fisher information – a tale of two densities. *Bernoulli*, 18, 747–763.
- Hallin, M. & Ley, C. (2014). Skew-symmetric distributions and Fisher information: The double sin of the skew-normal. *Bernoulli*, 20, 1432–1453.
- Hao, S., Yang, J., & Berenguer, C. (2019). Degradation analysis based on an extended inverse Gaussian process model with skew-normal random effects and measurement errors. *Reliability Eng. & System Safety*, 189, 261–270.
- Harrar, S. W. & Gupta, A. K. (2008). On matrix variate skew-normal distributions. *Statistics*, 42(2), 179–184.
- Harvey, C. R., Liechty, J. C., Liechty, M. W., & Müller, P. (2010). Portfolio selection with higher moments. *Quantitative Finance*, 10, 469–485.
- Hasanalipour, P. & Sharafi, M. (2012). A new generalized Balakrishnan skew-normal distribution. *Stat. Papers*, 53, 219–228.
- Hazra, A., Reich, B. J., & Staicu, A. (2020). A multivariate spatial skew- t process for joint modeling of extreme precipitation indexes. *Environmetrics*, 31, e2602. Available online 29 October 2019.
- He, R., Feng, X., Li, S., Pan, F., & Pu, N. (2021). Variational Bayesian filter for nonlinear system with Gaussian-skew t mixture noise,. In *33rd Chinese Control and Decision Conference (CCDC)* (pp. 6191–6198).
- Heckman, J. J. (1976). The common structure of statistical models of truncation, sample selection and limited dependent variables, and a simple estimator for such models. *Ann. Econ. Soc. Meas.*, 5, 475–492.
- Heckman, J. J. (1979). Sample selection bias as a specification error. *Econometrica*, 47, 153–161.
- Heinen, A. & Valdesogo, A. (2022). The Kendall and Spearman rank correlations of the bivariate skew normal distribution. *Scandinavian Journal of Statistics*, 49, 1669–1698.
- Hejblum, B. P., Alkhassim, C., Gottardo, R., Caron, F., & Thiébaud, R. (2019). Sequential Dirichlet process mixtures of multivariate skew t -distributions for model-based clustering of flow cytometry data. *Annals of Applied Statistics*, 13, 638–660.

- Henze, N. (1986). A probabilistic representation of the ‘skew-normal’ distribution. *Scandinavian Journal of Statistics*, 13, 271–275.
- Hering, A. S. & Genton, M. G. (2010). Powering up with space-time wind forecasting. *Journal of the American Statistical Association*, 105(489), 92–104.
- Hernández-Sánchez, E. & Scarpa, B. (2012). A wrapped flexible generalized skew-normal model for a bimodal circular distribution of wind directions. *Chilean Journal of Statistics*, 3, 131–143.
- Ho, H.-J. & Lin, T.-I. (2010). Robust linear mixed models using the skew t distribution with application to schizophrenia data. *Biometrical Journal*, 52, 449–469.
- Ho, H. J., Lin, T. I., Chang, H. H., Haase, S. B., Huang, S., & Pyne, S. (2012a). Parametric modeling of cellular state transitions as measured with flow cytometry. *BMC Bioinformatics*, 13 (Suppl. 5), S5.
- Ho, H. J., Pyne, S., & Lin, T. I. (2012b). Maximum likelihood inference for mixtures of skew student- t -normal distributions through practical EM-type algorithms. *Statistics and Computing*, 22, 287–299.
- Hofer, V., Leitner, J., Lewitschnig, H., & Nowak, T. (2017). Determination of tolerance limits for the reliability of semiconductor devices using longitudinal data. *Quality and Reliability Engineering International*, 33, 2673–2683.
- Hossain, A. (2015). Application of skew-normal distribution for detecting differential expression to microRNA data. *Journal of Applied Statistics*, 42, 477–491. Available online 29 Sep 2014.
- Hossain, A. & Beyene, J. (2015). Application of skew-normal distribution for detecting differential expression to microRNA data. *Journal of Applied Statistics*, 42(3), 477–491. Available online 29 Sep 2014.
- Hosseini, F., Eidsvik, J., & Mohammadzadeh, M. (2011). Approximate Bayesian inference in spatial GLMM with skew normal latent variables. *Computational Statistics and Data Analysis*, 55(4), 1791–1806.
- Hosseini, F. & Karimi, O. (2021). Approximate pairwise likelihood inference in SGLM models with skew normal latent. *J. Computational and Applied Mathematics*, 398, 113692.
- Huang, W.-J. & Chen, Y.-H. (2007). Generalized skew-Cauchy distribution. *Statistics & Probability Letters*, 77(11), 1137–1147.
- Huang, W.-J., Su, N.-C., & Gupta, A. K. (2013a). A study of generalized skew-normal distribution. *Statistics*, 47, 942–953. Available online 28 June 2012.
- Huang, W.-J., Su, N.-C., & Teng, H.-Y. (2019). On some study of skew- t distributions. *Communications in Statistics – Theory & Methods*, 48(19), 4712–4729. Available online 13 May 2014.

- Huang, Y., Chen, J., & Yan, C. (2012). Mixed-effects joint models with skew-normal distribution for HIV dynamic response with missing and mismeasured time-varying covariate. *The International Journal of Biostatistics*, 8(1), 34.
- Huang, Y. & Dagne, G. A. (2012). Simultaneous Bayesian inference for skew-normal semiparametric nonlinear mixed-effects models with covariate measurement errors. *Bayesian Analysis*, 7, 189–210.
- Huang, Y.-X., Dagne, G. A., & Park, J.-G. (2013b). Segmental modeling of changing immunologic response for CD4 data with skewness, missingness and dropout. *Journal of Applied Statistics*, 40(10), 2244–2258.
- Huang, Z., Xu, Z., Ke, X., Wang, W., & Sun, Y. (2017). Remaining useful life prediction for an adaptive skew-wiener process model. *Mechanical Systems and Signal Processing*, 87(part A), 294–306.
- Huiqiong Li, Liucang Wu, T. M. (2017). Variable selection in joint location, scale and skewness models of the skew-normal distribution. *J. Syst. Sci. Complex*, 30, 694–709. Available online 07 December 2016.
- Hürlimann, W. (2013). Multivariate likelihood ratio order for skew-symmetric distributions with a common kernel. *International Scholarly Research Notices*, 2013, ID 614938.
- Hussain, S., Arif, H., Noorullah, M., & Pantelous, A. A. (2023). Pricing American options under Azzalini Ito-McKean skew Brownian motions. *Applied Mathematics and Computation*, 451, 128040.
- Hutson, A. D. (2019). An alternative skew exponential power distribution formulation. *Communications in Statistics – Theory & Methods*, 48, 3005–3024. Available online 22 Nov 2018.
- Hutton, J. L. & Stanghellini, E. (2011). Modelling bounded health scores with censored skew-normal distributions. *Statistics in Medicine*, 30, 368–376.
- Huynh, U., Pal, N., & Nguyen, M. (2021). Regression model under skew-normal error with applications in predicting groundwater arsenic level in the Mekong Delta Region. *Environmental & Ecological Statistics*, 28, 323–353.
- Ismail, S., Sun, W., Nathoo, F. S., Babul, A., Moiseev, A., Beg, M. F., & Virji-Babul, N. (2013). A skew- t space-varying regression model for the spectral analysis of resting state brain activity. *Statistical Methods in Medical Research*, 22, 422–438. Available online 20 May 2012.
- Jain, S., Levine, M., Radivojac, P., & Trosset, M. W. (2019). Identifiability of two-component skew normal mixtures with one known component. *Scandinavian Journal of Statistics*, 46, 955–986.
- Jamali, D., Amiri, M., & Jamalizadeh, A. (2021). Comparison of the multivariate skew-normal random vectors based on the integral stochastic ordering. *Communications in Statistics – Theory & Methods*, 50, 5215–5227. Available online 23 March 2020.

- Jamalizadeh, A., Arabpour, A. R., & Balakrishnan, N. (2011). A generalized skew two-piece skew-normal distribution. *Statist. Papers*, 52, 431–446. Available online 19 June 2009.
- Jamalizadeh, A. & Balakrishnan, N. (2008). On order statistics from bivariate skew-normal and skew- t_ν distributions. *Journal of Statistical Planning and Inference*, 138(12), 4187–4197.
- Jamalizadeh, A. & Balakrishnan, N. (2009). Order statistics from trivariate normal and t_ν -distributions in terms of generalized skew-normal and skew- t_ν distributions. *Journal of Statistical Planning and Inference*, 139(11), 3799–3819.
- Jamalizadeh, A. & Balakrishnan, N. (2010). Distributions of order statistics and linear combinations of order statistics from an elliptical distribution as mixtures of unified skew-elliptical distributions. *Journal of Multivariate Analysis*, 101, 1412–1427.
- Jamalizadeh, A., Balakrishnan, N., & Salehi, M. (2010). Order statistics and linear combination of order statistics arising from a bivariate selection normal distribution. *Statistics & Probability Letters*, 80(5–6), 445–451.
- Jamalizadeh, A., Balakrishnan, N., & Sheikhy, A. (2009a). Distributions of ratios of two correlated skew-normal variables and of ratios of two linear functions of order statistics from bivariate normal distribution. *Communications in Statistics – Theory & Methods*, 38(12), 2107–2115.
- Jamalizadeh, A., Behboodian, J., & Balakrishnan, N. (2008). A two-parameter generalized skew-normal distribution. *Statistics & Probability Letters*, 78(13), 1722–1726.
- Jamalizadeh, A., Khosravi, M., & Balakrishnan, N. (2009b). Recurrence relations for distributions of a skew- t and a linear combination of order statistics from a bivariate- t . *Computational Statistics and Data Analysis*, 53(4), 847–852.
- Jamalizadeh, A. & Kundu, D. (2015). A multivariate Birnbaum-Saunders distribution based on the multivariate skew normal distribution. *J. Japan Stat. Soc.*, 45, 1–20.
- Jamalizadeh, A. & Lin, T.-I. (2017). A general class of scale-shape mixtures of skew-normal distributions: properties and estimation. *Computational Statistics*, 32, 451–474. Available online 11 October 2016.
- Jamalizadeh, A., Mahmoodian, H., & Balakrishnan, N. (2009c). Exact distribution of a linear combination of a variable and order statistics from the other two variables of a trivariate elliptical random vector as a mixture of skew-elliptical distributions. *Statist. Methodology*, 6(6), 634–644.
- Jamalizadeh, A., Mehrali, Y., & Balakrishnan, N. (2009d). Recurrence relations for bivariate t and extended skew- t distributions and an application to order statistics from bivariate t . *Computational Statistics and Data Analysis*, 53(12), 4018–4027.
- Jammalamadaka, S. R., Taufer, E., & Terdik, G. H. (2021a). Cumulants of multivariate symmetric and skew symmetric distributions. *Symmetry*, 13, 1383.

- Jammalamadaka, S. R., Taufer, E., & Terdik, G. H. (2021b). On multivariate skewness and kurtosis. *Sankhyā, series A*, 83, 607–644.
- Jamshidi, A. A. & Kirby, M. J. (2010). Skew-radial basis function expansions for empirical modeling. *SIAM Journal on Scientific Computing*, 31(6), 4715–4743.
- Jamshidi Eini, E. & Khaloozadeh, H. (2021a). Tail conditional moment for generalized skew-elliptical distributions. *Journal of Applied Statistics*, 48, 2285–2305.
- Jamshidi Eini, E. & Khaloozadeh, H. (2021b). The tail mean-variance optimal portfolio selection under generalized skew-elliptical distribution. *Insurance: Mathematics and Economics*, 98, 44–50.
- Jamshidi Eini, E. & Khaloozadeh, H. (2022). Tail variance for generalized skew-elliptical distributions. *Communications in Statistics – Theory & Methods*, 51, 519–536.
- Jana, S., Balakrishnan, N., & Hamid, J. S. (2020). Inference in the growth curve model under multivariate skew normal distribution. *Sankhyā, series B*, 82, 344–69.
- Jana, S., Balakrishnan, N., & S.Hamid, J. (2018). Estimation of the parameters of the extended growth curve model under multivariate skew normal distribution. *Journal of Multivariate Analysis*, 166, 111–128.
- Jara, A., Quintana, F., & San Martín, E. (2008). Linear mixed models with skew-elliptical distributions: a Bayesian approach. *Computational Statistics and Data Analysis*, 52(11), 5033–5045.
- Jardón-Álvarez, D., Sanders, K. J., Phyo, P., Baltisberger, J. H., & Grandinetti, P. J. (2018). Cluster formation of network-modifier cations in cesium silicate glasses. *J. Chem. Phys.*, 148, 094502.
- Javier, W. & Gupta, A. K. (2009). Mutual information for certain multivariate distributions. *Far East J. Theor. Stat.*, 29(1), 39–51.
- Jha, S. K. & Singh, N. V. (2023). Skew-normal spatial simultaneous autoregressive model and its implementation. *Sankhyā, series A*, 85, 306–323. Available online 20 April 2021.
- Jiang, S., Li, T., & Liao, X. (2018). Distributional expansions on extremes from skew-normal distribution under power normalization. *Stat. Papers*, 59, 1–20. Available online 09 February 2016.
- Jiménez-Gamero, M. D., Alba-Fernández, M. V., Jodrá, P., & Chalco-Cano, Y. (2015). Testing for the symmetric component in skew distributions. *Math. Methods in the Applied Sciences*, 39(16), 4713–4722. Available online 06 January 2015.
- Jiménez-Gamero, M. D. & Kim, H.-M. (2015). Fast goodness-of-fit tests based on the characteristic function. *Computational Statistics and Data Analysis*, 89, 172–191.
- Jimichi, M., Miyamoto, D., Saka, C., & Nagata, S. (2018). Visualization and statistical modeling of financial big data: log-linear modeling with skew error. SSRN eLibrary, paper 3166440.

- Joe, H. & Li, H. (2019). Tail densities of skew-elliptical distributions. *Journal of Multivariate Analysis*, 171, 421–435.
- Joe, H. & Sang, P. (2016). Multivariate models for dependent clusters of variables with conditional independence given aggregation variables. *Computational Statistics and Data Analysis*, 97, 114–132. Available online 14 December 2015.
- Joe, H., Seshadri, V., & Arnold, B. C. (2012). Multivariate inverse gaussian and skew-normal densities. *Statistics & Probability Letters*, 82, 2244–2251.
- Jones, E., Sagawa, S., Koh, P. W., Kumar, A., & Liang, P. (2020). Selective classification can magnify disparities across groups. [arXiv.org:2010.14134](https://arxiv.org/abs/2010.14134).
- Jradi, S., Parmeter, C. F., & Ruggiero, J. (2019). Quantile estimation of the stochastic frontier model. *Economics Letters*, 182, 15–18.
- Jradi, S. & Ruggiero, J. (2019). Stochastic data envelopment analysis: A quantile regression approach to estimate the production frontier. *Eur. J. Operational Research*, 278, 385–393.
- Jupp, P. E., Regoli, G., & Azzalini, A. (2016). A general setting for symmetric distributions and their relationship to general distributions. *Journal of Multivariate Analysis*, 148, 107–199.
- Käärik, M., Selart, A., & Käärik, E. (2015). On parametrization of multivariate skew-normal distribution. *Communications in Statistics – Theory & Methods*, 44(9), 1869–1885. Available online 09 April 2013.
- Kahrari, F., Arellano-Valle, R. B., Rezaei, M., & Yousefzadeh, F. (2017). Scale mixtures of skew-normal-Cauchy distribution. *Statistics & Probability Letters*, 126, 1–6.
- Kahrari, F., Ferreira, C. S., & Arellano-Valle, R. B. (2019). Skew-normal-Cauchy linear mixed models. *Sankhyā, series B*, 81, 185–202. Available online 19 September 2018.
- Kahrari, F., Rezaei, M., Yousefzadeh, F., & Arellano-Valle, R. B. (2016). On the multivariate skew-normal-Cauchy distribution. *Statistics & Probability Letters*, 117, 80–88.
- Karimi, O. & Mohammadzadeh, M. (2012). Bayesian spatial regression models with closed skew normal correlated errors and missing. *Statist. Papers*, 53, 205–218. Available online on 19 May 2010.
- Karimi, O., Omre, H., & Mohammadzadeh, M. (2010). Bayesian closed-skew Gaussian inversion of seismic AVO data for elastic material properties. *Geophysics*, 75(1), R1–R11.
- Karling, M. J., Genton, M. G., & Meintanis, S. G. (2023). Goodness-of-fit tests for multivariate skewed distributions based on the characteristic function. *Statistics and Computing*, 33, 99.
- Kazemi, I. & Hassanzadeh, F. (2020). Modelling multivariate, overdispersed count data with correlated and non-normal heterogeneity effects. *SORT*, 44, 335–356.

- Khaledi, H. Z. M. J. (2021). A heterogeneous Bayesian regression model for skewed spatial data. *Spatial Statistics*, 46, 100545.
- Kheradmandi, A. & Rasekh, A. (2015). Estimation in skew-normal linear mixed measurement error models. *Journal of Multivariate Analysis*, 136, 1–11. Available online 19 December 2014.
- Kim, B. & Lee, S. (2014). Minimum density power divergence estimator for covariance matrix based on skew t distribution. *Statist. Methods and Appl.*, 23, 565–575.
- Kim, H.-J. (2002). Binary regression with a class of skewed t link models. *Communications in Statistics – Theory & Methods*, 31(10), 1863–1886.
- Kim, H.-J. (2005). On a class of two-piece skew-normal distributions. *Statistics: A Journal of Theoretical and Applied Statistics*, 39(6), 537–553.
- Kim, H.-J. (2008a). A class of flexible weighted distributions for modelling and analyzing non-normal data. *J. Korean Stat. Soc.*, 37, 108–117.
- Kim, H.-J. (2008b). A class of weighted multivariate normal distributions and its properties. *Journal of Multivariate Analysis*, 99(8), 1758–1771.
- Kim, H.-J. (2008c). On perturbed symmetric distributions associated with the truncated bivariate elliptical models. *Communications for Statistical Applications and Methods*, 15(4), 483–496.
- Kim, H.-J. (2015). A best linear threshold classification with scale mixture of skew normal populations. *Computational Statistics*, 30, 1–28.
- Kim, H.-J. & Kim, H.-M. (2015). A class of rectangle-screened multivariate normal distributions and its applications. *Statistics: A Journal of Theoretical and Applied Statistics*, 49(4), 878–899. Available online 20 May 2014.
- Kim, H.-M. (2008d). A note on scale mixtures of skew normal distribution. *Statistics & Probability Letters*, 78(13), 1694–1701. Corrigendum in vol. 83 (2013), p. 1937.
- Kim, H.-M. & Genton, M. G. (2011). Characteristic functions of scale mixtures of multivariate skew-normal distributions. *Journal of Multivariate Analysis*, 102(7), 1105–1117.
- Kim, H.-M., Ha, E., & Mallick, B. K. (2004). Spatial prediction of rainfall using skew-normal processes. In M. G. Genton (Ed.), *Skew-elliptical Distributions and Their Applications: a Journey Beyond Normality* chapter 16, (pp. 279–289). Chapman & Hall/CRC.
- Kim, H.-M. & Kim, C. (2017). Moments of scale mixtures of multivariate skew-normal distributions. *Communications in Statistics – Theory & Methods*, 46, 1117–1126. Available online 29 Feb 2016.
- Kim, H.-M., Maadooliat, M., Arellano-Valle, R. B., & Genton, M. G. (2016). Skewed factor models using selection mechanisms. *Journal of Multivariate Analysis*, 145, 162–177.

- Kim, H.-M. & Mallick, B. K. (2003). Moments of random vectors with skew t distribution and their quadratic forms. *Statistics & Probability Letters*, 63(4), 417–423. Corrigendum in vol. 79 (2009), 2098–9.
- Kim, H.-M. & Mallick, B. K. (2004). A Bayesian prediction using the skew Gaussian distribution. *Journal of Statistical Planning and Inference*, 120(1–2), 85–101.
- Kim, H.-M., Ryu, D., Mallick, B. K., & Genton, M. G. (2014). Mixtures of skewed Kalman filters. *Journal of Multivariate Analysis*, 123, 228–251.
- Kim, H.-M. & Zhao, J. (2018). Multivariate measures of skewness for the scale mixtures of skew-normal distributions. *Comm. Statist. Appl. Meth.*, 25(2), 109–130.
- Kim, S. & Kim, D. (2016). Directional dependence analysis using skew-normal copula-based regression. In W. Wiedermann & A. von Eye (Eds.), *Statistics and Causality: Methods for Applied Empirical Research* chapter 6. J. Wiley & Sons.
- Kim, S. & Kim, H.-M. (2022). Series form of the characteristic functions of scale mixtures of multivariate skew-normal distributions. *Math. Comp. in Simulation*, 198, 172–187.
- Kollo, T., Käärrik, M., & Selart, A. (2018). Asymptotic normality of estimators for parameters of a multivariate skew-normal distribution. *Communications in Statistics – Theory & Methods*, 47(15), 3640–3655. Available online 23 Oct 2017.
- Kollo, T., Käärrik, M., & Selart, A. (2021). Multivariate skew t -distribution: asymptotics for parameter estimators and extension to skew t -copula. *Symmetry*, 13, 1059.
- Kollo, T. & Pettere, G. (2010). Parameter estimation and application of the multivariate skew t -copula. In P. J. et al. (Ed.), *Copula Theory and its Applications* chapter 15, (pp. 289–298). Springer.
- Kollo, T., Pettere, G., & Valge, M. (2015). Tail dependence of skew t -copulas. *Communications in Statistics – Simulation & Computation*. Available online 15 May 2015.
- Kollo, T. & Traat, I. (2001). On the multivariate skew normal distribution. In *Revista de Estatística*, volume II of *Edição Especial* (pp. 231–232). Portugal: Proceedings 23rd European Meeting of Statisticians Instituto Nacional de Estatística.
- Kotz, S. & Vicari, D. (2005). Survey of developments in the theory of continuous skewed distributions. *Metron*, LXIII(2), 225–261.
- Kozubowski, T. J. & Nolan, J. P. (2008). Infinite divisibility of skew Gaussian and Laplace laws. *Statistics & Probability Letters*, 78(6), 654–660.
- Krupskii, P., Huser, R., & Genton, M. G. (2018). Factor copula models for replicated spatial data. *Journal of the American Statistical Association*, 113, 467–479.
- Kubokawa, T., Strawderman, W. E., & Yuasa, R. (2020). Shrinkage estimation of location parameters in a multivariate skew-normal distribution. *Communications in Statistics – Theory & Methods*, 49, 2008–2024. Available online 05 Feb 2019.

- Kumar, C. S. & Anusree, M. R. (2011). On a generalized mixture of standard normal and skew normal distributions. *Statistics & Probability Letters*, 81(1813–1821).
- Kumbhakar, S. C. & Lai, H.-P. (2016). Maximum likelihood estimation of the revenue function system with output-specific technical efficiency. *Economics Letters*, 128, 42–45.
- Kuroki, M. & Cai, Z. (2006). On recovering a population covariance matrix in the presence of selection bias. *Biometrika*, 93(3), 601–611.
- Labra, F. V., Garay, A. M., Lachos, V. H., & Ortega, E. M. M. (2012). Estimation and diagnostics for heteroscedastic nonlinear regression models based on scale mixtures of skew-normal distributions. *Journal of Statistical Planning and Inference*, 142(7), 2149–2165.
- Lachos, V. H., Bandyopadhyay, D., & Garay, A. M. (2011). Heteroscedastic nonlinear regression models based on scale mixtures of skew-normal distributions. *Statistics & Probability Letters*, 81(8), 1208–1217.
- Lachos, V. H., Bolfarine, H., Arellano-Valle, R. B., & Montenegro, L. C. (2007). Likelihood based inference for multivariate skew-normal regression models. *Communications in Statistics – Theory & Methods*, 36(9), 1769–1786.
- Lachos, V. H., Ghosh, P., & Arellano-Valle, R. B. (2010a). Likelihood based inference for skew-normal independent linear mixed models. *Statistica Sinica*, 20, 303–322.
- Lachos, V. H., Labra, F. V., Bolfarine, H., & Ghosh, P. (2010b). Multivariate measurement error models based on scale mixtures of the skew-normal distribution. *Statistics*, 44, 541–556. Available online 28 Oct 2009.
- Lachos, V. H., Moreno, E. J. L., Chen, K., & Cabral, C. R. B. (2017). Finite mixture modeling of censored data using the multivariate Student- t distribution. *Journal of Multivariate Analysis*, 159(151–167).
- Lachos Dávila, V. H., Cabral, C. R. B., & Zeller, C. B. (2018). *Finite Mixture of Skewed Distributions*. SpringerBriefs in Statistics. Springer Nature.
- Lagos Álvarez, B. & Jiménez Gamero, M. D. (2012). A note on bias reduction of maximum likelihood estimates for the scalar skew t distribution. *Journal of Statistical Planning and Inference*, 142(2), 608–612. Available online 8 Sept 2011.
- Lai, H.-P. & Tsay, W.-J. (2016). Maximum simulated likelihood estimation of the panel sample selection model. *Econometric Reviews*.
- Landsman, Z., Makov, U., & Shushi, T. (2013). Tail conditional expectations for generalized skew-elliptical distributions. SSRN eLibrary, paper 2298265.
- Landsman, Z., Makov, U., & Shushi, T. (2017). Extended generalized skew-elliptical distributions and their moments. *sankhya*, 79-A, 76–100. Available online 03 October 2016.

- Lee, A. B. & Konigsberg, L. W. (2018). Univariate and linear composite asymmetry statistics for the “pair-matching” of bone antimeres. *J. Forensic Sciences*, 63, 1796–1801.
- Lee, D. & Sinha, S. (2020). Identifiability and bias reduction in the skew-probit model for a binary response. *Journal of Statistical Computation and Simulation*. Available online 14 March 2019.
- Lee, M. S. Y. & Skinner, A. (2011). Testing fossil calibrations for vertebrate molecular trees. *Zoologica Scripta*, 40(5), 538–543.
- Lee, S., Genton, M. G., & Arellano-Valle, R. B. (2010). Perturbation of numerical confidential data via skew- t distributions. *Management Science*, 56(2), 318–333.
- Lee, S. & McLachlan, G. J. (2014a). Finite mixtures of multivariate skew t -distributions: some recent and new results. *Statistics and Computing*, 24(2), 181–202. Available online 20 October 2012.
- Lee, S. X., Leemaqz, K. L., & McLachlan, G. J. (2018). A block EM algorithm for multivariate skew normal and skew t -mixture models. *IEEE Neural Networks and Learning Systems*, 29, 5581–5591.
- Lee, S. X. & McLachlan, G. J. (2013a). Model-based clustering and classification with non-normal mixture distributions. *Stat. Methods & Application*, 22, 427–454.
- Lee, S. X. & McLachlan, G. J. (2013b). On mixtures of skew normal and skew t -distributions. *Advances in Data Analysis and Classification*, 7, 241–266.
- Lee, S. X. & McLachlan, G. J. (2014b). Maximum likelihood estimation for finite mixtures of canonical fundamental skew t -distributions: the unification of the unrestricted and restricted skew t -mixture models. [arXiv.org:1401.8182](https://arxiv.org/abs/1401.8182).
- Lee, S. X. & McLachlan, G. J. (2016). Finite mixtures of canonical fundamental skew t -distributions. *Statistics and Computing*, 26, 573–596. Available online 28 February 2015.
- Lee, S. X. & McLachlan, G. J. (2018). EMMIXcskew: an R package for the fitting of a mixture of canonical fundamental skew t -distributions. *Journal of Statistical Software*, 83(3).
- Lee, S. X. & McLachlan, G. J. (2018). Risk measures based on multivariate skew normal and skew t -mixtures models. In J. Alcock & S. Satchell (Eds.), *Asymmetric Dependence in Finance* chapter 7, (pp. 152–168). J. Wiley & Sons.
- Lee, S. X. & McLachlan, G. J. (2021). On formulations of skew factor models: Skew factors and/or skew errors. *Statistics & Probability Letters*, 168, 108935. Available online 18 September 2020.
- Lee, S. X. & McLachlan, G. J. (2022). An overview of skew distributions in model-based clustering. *Journal of Multivariate Analysis*, 188, 104853. Available online 13 October 2021.

- Ley, C. (2014). Skew distributions. In *Wiley StatsRef: Statistics Reference Online*. J. Wiley & Sons.
- Ley, C. (2021). When the score function is the identity function – a tale of characterizations of the normal distribution. *Econometrics and Statistics*, to appear. Available online 19 November 2020.
- Ley, C. & Paindaveine, D. (2009). *On the singularity of multivariate skew-symmetric models*. Technical Report 2009–017, ECARES, European Centre for Advanced Research in Economics and Statistics, Université Libre de Bruxelles.
- Ley, C. & Paindaveine, D. (2010a). Multivariate skewing mechanisms: A unified perspective based on the transformation approach. *Statistics & Probability Letters*, 80(23–24), 1685–1694.
- Ley, C. & Paindaveine, D. (2010b). On Fisher information matrices and profile log-likelihood functions in generalized skew-elliptical models. *Metron*, LXVIII, 235–250.
- Ley, C. & Paindaveine, D. (2010c). On the singularity of multivariate skew-symmetric models. *Journal of Multivariate Analysis*, 101(6), 1434–1444.
- Ley, C. & Verdebout, T. (2017). Skew-rotationally-symmetric distributions and related efficient inferential procedures. *Journal of Multivariate Analysis*, 159, 67–81.
- Li, B., Tian, W., & Wang, T. (2018). Remarks for the singular multivariate skew-normal distribution and its quadratic forms. *Statistics & Probability Letters*, 137(105–112).
- Li, C.-I., Su, N.-C., Su, P.-F., & Shyr, Y. (2014). The design of \bar{X} and r control charts for skew normal distributed data. *Communications in Statistics – Theory & Methods*, 43(23), 4908–4924.
- Li, D. & Tong, H. (2020). On an absolute autoregressive model and skew symmetric distributions. *Statistica*, 80, 177–198.
- Li, E., Zhang, D., & Davidian, M. (2004). Conditional estimation for generalized linear models when covariates are subject-specific parameters in a mixed model for longitudinal measurements. *Biometrics*, 60, 1–7.
- Li, H. & Wu, L. (2014). Joint modelling of location and scale parameters of the skew-normal distribution. *Applied Mathematics—A Journal of Chinese Universities*, 29(3), 265–272.
- Li, M., Staicu, A.-M., & Bondell, H. D. (2015). Incorporating covariates in skewed functional data models. *Biostatistics*. Available online 19 December 2014.
- Li, X., Wu, Z., Chakravarthy, V. D., & Wu, Z. (2011). A low-complexity approximation to lognormal sum distributions via transformed log skew normal distribution. *IEEE Trans. Vehicular Technol.*, 60, 4040–4045.
- Li, Y. & Sun, Y. (2020). A multi-site stochastic weather generator for high-frequency precipitation using censored skew-symmetric distribution. *Spatial Statistics*, 100474.

- Li, Y. & Sun, Y. (2021). Multi-site high-frequency stochastic precipitation generator using censored skew-symmetric distributions. *Spatial Statistics*, 41, 100474.
- Liao, X., Peng, Z., Nadarajah, S., & Wang, X. (2014). Rates of convergence of extremes from skew-normal samples. *Statistics & Probability Letters*, 84, 40–47.
- Lien, D. & Wang, Y. (2015). Effects of skewness and kurtosis on production and hedging decisions: a skewed t distribution approach. *European J. Finance*, 21(13–14), 1132–1143. Available online 6 March 2012.
- Lin, G. D. & Stoyanov, J. (2009). The logarithmic skew-normal distributions are moment-indeterminate. *Journal of Applied Probability*, 46, 909–916.
- Lin, J.-G., Xie, F.-C., & Wei, B.-C. (2009a). Statistical diagnostics for skew- t -normal nonlinear models. *Communications in Statistics – Theory & Methods*, (pp. 2096–2110).
- Lin, T. I. (2009). Maximum likelihood estimation for multivariate skew normal mixture models. *Journal of Multivariate Analysis*, 100(2), 257–265.
- Lin, T.-I. (2010). Robust mixture modeling using multivariate skew t distributions. *Statistics and Computing*, 20, 343–356.
- Lin, T.-I., Ho, H. J., & Chen, C. L. (2009b). Analysis of multivariate skew normal models with incomplete data. *Journal of Multivariate Analysis*, 100, 2337–2351.
- Lin, T.-I., Ho, H. J., & Lee, C.-R. (2014). Flexible mixture modelling using the multivariate skew- t -normal distribution. *Statistics and Computing*, 24, 531–546. Available online 27 February 2013.
- Lin, T. I. & Lee, J. C. (2008). Estimation and prediction in linear mixed models with skew-normal random effects for longitudinal data. *Statistics in Medicine*, 27(9), 1490–1507. Available online 20 August 2007.
- Lin, T. I., Lee, J. C., & Hsieh, W. J. (2007a). Robust mixture modeling using the skew t distribution. *Statistics and Computing*, 17(2), 81–92.
- Lin, T. I., Lee, J. C., & Yen, S. Y. (2007b). Finite mixture modelling using the skew normal distribution. *Statistica Sinica*, 17, 909–927.
- Lin, T.-I. & Lin, T.-C. (2011). Robust statistical modelling using the multivariate skew t distribution with complete and incomplete data. *Statistical Modelling*, 11, 253–277.
- Lin, T.-I. & Lun Wang, W. (2013). Multivariate skew-normal at linear mixed models for multi-outcome longitudinal data. *Statistical Modelling*, 13(3), 199–221.
- Lin, T.-I., McLachlan, G. J., & Lee, S. X. (2016). Extending mixtures of factor models using the restricted multivariate skew-normal distribution. *Journal of Multivariate Analysis*, 143, 398–413.
- Lin, T.-I., Wu, P. H., McLachlan, G. J., & Lee, S. X. (2015). A robust factor analysis model using the restricted skew- t distribution. *TEST*, 24(3), 510–531. Available online 07 Dec 2014.

- Linero, A. R. & Daniels, M. J. (2015). A flexible Bayesian approach to monotone missing data in longitudinal studies with nonignorable missingness with application to an acute schizophrenia clinical trial. *Journal of the American Statistical Association*, 110(509), 45–55. Available online 15 Oct 2014.
- Liseo, B. (1990). La classe delle densità normali sghembe: aspetti inferenziali da un punto di vista bayesiano. *Statistica*, L, 59–70.
- Liseo, B. (2004). Skew-elliptical distributions in Bayesian inference. In M. G. Genton (Ed.), *Skew-elliptical Distributions and Their Applications: a Journey Beyond Normality* chapter 9, (pp. 153–171). Chapman & Hall/CRC.
- Liseo, B. & Loperfido, N. (2001). Bayesian analysis of the skew-normal distribution. In *Revista de Estatística*, volume II of *Edição Especial* (pp. 253–255). Portugal: Proceedings 23rd European Meeting of Statisticians Instituto Nacional de Estatística.
- Liseo, B. & Loperfido, N. (2003a). A Bayesian interpretation of the multivariate skew-normal distribution. *Statistics & Probability Letters*, 61, 395–401.
- Liseo, B. & Loperfido, N. (2003b). Integrated likelihood inference for the shape parameter of the multivariate skew-normal distribution. In *Proceedings of the 2003 Meeting of the Italian Statistical Society*.
- Liseo, B. & Loperfido, N. (2006). A note on reference priors for the scalar skew-normal distribution. *Journal of Statistical Planning and Inference*, 136(2), 373–389.
- Liseo, B. & Parisi, A. (2013). Bayesian inference for the multivariate skew-normal model: A population Monte Carlo approach. *Computational Statistics and Data Analysis*, 63, 125–138.
- Lisi, F. (2007). Testing asymmetry in financial time series. *Quantitative Finance*, 7, 687–696.
- Liu, J. & Dey, D. K. (2004). Skew-elliptical distributions. In M. G. Genton (Ed.), *Skew-elliptical Distributions and Their Applications: a Journey Beyond Normality* chapter 3, (pp. 43–64). Chapman & Hall/CRC.
- Liu, J. & Dey, D. K. (2008). Skew random effects in multilevel binomial models. *Statistical Modelling*, 8(3), 221–241.
- Liu, M. & Lin, T.-I. (2014). A skew-normal mixture regression model. *Educational and Psychological Measurement*, 74(1), 139–162. Available online 01 August 2013.
- Liu, M. & Lin, T. I. (2015). Skew-normal factor analysis models with incomplete data. *Journal of Applied Statistics*, 42(4), 789–805. Available online 02 December 2014.
- Liu, W.-H. (2014). Optimal hedge ratio estimation and hedge effectiveness with multivariate skew distributions. *Applied Economics*, 46(12), 1420–1435.
- Liu, Y., Mao, G., Leiva, V., Liu, S., & Tapia, A. (2020). Diagnostic analytics for an autoregressive model under the skew-normal distribution. *Mathematics*, 8, 5.

- Lombardi, M. J. & Calzolari, G. (2008). Indirect estimation of α -stable distributions and processes. *Econometrics Journal*, 11(1), 193–208.
- Loperfido, N. (2001). Quadratic forms of skew-normal random vectors. *Statistics & Probability Letters*, 54, 381–387.
- Loperfido, N. (2002). Statistical implications of selectively reported inferential results. *Statistics & Probability Letters*, 56(1), 13–22.
- Loperfido, N. (2008a). Modelling maxima of longitudinal contralateral observations. *Test*, 17(2), 370–380.
- Loperfido, N. (2008b). A note on skew-elliptical distributions and linear functions of order statistics. *Statistics & Probability Letters*, 78(18), 3184–3186.
- Loperfido, N. (2010). Canonical transformations of skew-normal variates. *Test*, 19(1), 146–165.
- Loperfido, N. & Guttorp, P. (2008). Network bias in air quality monitoring design. *Environmetrics*, 19(661–671).
- Loperfido, N., Navarro, J., Ruiz, J. M., & Sandoval, C. J. (2007). Some relationships between skew-normal distributions and order statistics from exchangeable normal random vectors. *Communications in Statistics – Theory & Methods*, 36(9), 1719–1733.
- Loperfido, N. M. R. (2004). Generalized skew-normal distributions. In M. G. Genton (Ed.), *Skew-elliptical Distributions and Their Applications: a Journey Beyond Normality* chapter 4, (pp. 65–80). Chapman & Hall/CRC.
- Loschi, R. H., Queiroz, M. M. D., & Silva, R. W. C. (2016). Shannon entropy and kullback–leibler divergence in multivariate log fundamental skew-normal and related distributions. *Canadian Journal of Statistics*, 44, 219–237.
- Louzada, F., Ara, A., & Fernandes, G. (2017). The bivariate alpha-skew-normal distribution. *Communications in Statistics – Theory & Methods*, 46, 7147–7156.
- Lu, C., Zhang, Y., & Ge, Q. (2021a). Kalman filter based on multiple scaled multivariate skew normal variance mean mixture distributions with application to target tracking. *IEEE Transactions on Circuits and Systems–II: Express Briefs*, 68, 802–806.
- Lu, C., Zhang, Y., Liu, H., & Lu, F. (2021b). A new robust filter for nonlinear system based on multiple scaled multivariate skew- t distribution. In *2021 IEEE International Conference on Unmanned Systems (ICUS)* (pp. 21–25).
- Lu, D., Xu, H., & Niu, Y. (2019). A new general asymptotic formula for the Mills’ ratio of the skew-generalized normal distribution. *J. Math. Analysis and Appl.*, 480, 123378.
- Lysenko, N., Roy, P., & Waeber, R. (2009). Multivariate extremes of generalized skew-normal distributions. *Statistics & Probability Letters*, 79(4), 525–533.
- Ma, Y. & Genton, M. G. (2004). Flexible class of skew-symmetric distributions. *Scandinavian Journal of Statistics*, 31, 459–468.

- Ma, Y., Genton, M. G., & Davidian, M. (2004). Linear mixed effects models with flexible generalized skew-elliptical random effects. In M. G. Genton (Ed.), *Skew-elliptical Distributions and Their Applications: a Journey Beyond Normality* chapter 20, (pp. 339–358). Chapman & Hall/CRC.
- Ma, Y., Genton, M. G., & Tsiatis, A. A. (2005). Locally efficient semiparametric estimators for generalized skew-elliptical distributions. *Journal of the American Statistical Association*, 100, 980–989.
- Ma, Y. & Hart, J. (2007). Constrained local likelihood estimators for semiparametric skew-normal distributions. *Biometrika*, 94, 119–134.
- Ma, Y., Kim, M., & Genton, M. G. (2013). Semiparametric efficient and robust estimation of an unknown symmetric population under arbitrary sample selection bias. *Journal of the American Statistical Association*, 108(503), 1090–1104.
- Ma, Z., Tian, W., Li, B., & Wang, T. (2018). The decomposition of quadratic forms under skew normal settings. In V. Kreinovich, S. Sriboonchitta, & N. Chakpitak (Eds.), *TES2018: Predictive Econometrics and Big Data*, volume 753 of *Studies in Computational Intelligence* (pp. 222–232).: Thailand Econometric Society Springer. Available online 02 December 2017.
- Maghami, M. M., Bahrami, M., & Sajadi, F. A. (2020). On bias reduction estimators of skew-normal and skew- t distributions. *Journal of Applied Statistics*, 47(3030–3052).
- Mahmoudian, B. (2017). A skewed and heavy-tailed latent random field model for spatial extremes. *Journal of Computational and Graphical Statistics*, 26, 658–670.
- Mahmoudian, B. (2018). On the existence of some skew-Gaussian random field models. *Statistics & Probability Letters*, 127, 331–335.
- Maleki, M., Wraith, D., & Arellano-Valle, R. B. (2019a). A flexible class of parametric distributions for Bayesian linear mixed models. *TEST*. Available online 20 June 2018.
- Maleki, M., Wraith, D., & Arellano-Valle, R. B. (2019b). Robust finite mixture modeling of multivariate unrestricted skew-normal generalized hyperbolic distributions. *Statistics and Computing*, 29, 415–428. Available online 19 May 2018.
- Mameli, V. (2015). The Kumaraswamy skew-normal distribution. *Statistics & Probability Letters*, 104, 75–81.
- Mameli, V. & Musio, M. (2013). A generalization of the skew-normal distribution: the Beta skew-normal. *Communications in Statistics – Theory & Methods*, 42(12), 2229–2244.
- Mameli, V. & Musio, M. (2016). Some new results on the Beta skew-normal distribution. In G. Allewa & A. Giommi (Eds.), *Topics in Theoretical and Applied Statistics*, Studies in Theoretical and Applied Statistics. Springer.
- Mameli, V., Musio, M., Sauleau, E., & Biggeri, A. (2012). Large sample confidence intervals for the skewness parameter of the skew-normal distribution based on Fisher’s transformation. *Journal of Applied Statistics*, 39(8), 1693–1702.

- Marchenko, Y. V. & Genton, M. G. (2010a). Multivariate log-skew-elliptical distributions with applications to precipitation data. *Environmetrics*, 21(3-4, Sp. Iss. SI), 318–340.
- Marchenko, Y. V. & Genton, M. G. (2010b). A suite of commands for fitting the skew-normal and skew- t models. *The Stata Journal*, 10(4), 507–539.
- Marchenko, Y. V. & Genton, M. G. (2012). A Heckman selection- t model. *Journal of the American Statistical Association*, 107, 304–317.
- Márquez-Urbina, J. U. & González-Farías, G. (2022). A flexible special case of the CSN for spatial modeling and prediction. *Spatial Statistics*, 47, 100556.
- Martin, R. D., Uthaisaad, C., & Xia, D. Z. (2020). Skew- t expected information matrix evaluation and use for standard error calculations. *The R Journal*, 12, 188–205.
- Martínez, E. H., Varela, H., Gómez, H. W., & Bolfarine, H. (2008). A note on the likelihood and moments of the skew-normal distribution. *SORT*, 32(1), 57–66.
- Martínez-Flórez, G., Arnold, B. C., Bolfarine, H., & Gómez, H. W. (2013). The multivariate alpha-power model. *Journal of Statistical Planning and Inference*, 143(7), 1244–1255.
- Martínez-Flórez, G., Barrera-Causil, C., & Marmolejo-Ramos, F. (2020a). The exponential-centred skew-normal distribution. *Symmetry*, 12(7), 1140.
- Martínez-Flórez, G., Bolfarine, H., & Gómez, H. W. (2014). Skew-normal alpha-power model. *Statistics*, 48, 1414–1428. Corrigendum: vol. 52 (2018), 950–953.
- Martínez-Flórez, G., Leiva, V., Gómez-Déniz, E., & Marchant, C. (2020b). A family of skew-normal distributions for modeling proportions and rates with zeros/ones excess. *Symmetry*, 12, e1439.
- Martins, A. B. T., Janeiro, V., Guedes, T. A., Rossi, R. M., & Andrade Gonçalves, A. C. (2014). Modeling asymmetric compositional data. *Acta Scientiarum. Technology*, 36(2).
- Mastrantonio, G., Gelfand, A. E., & Jona Lasinio, G. (2016). The wrapped skew Gaussian process for analyzing spatio-temporal data. *Stochastic Environmental Research and Risk Assessment*, 30(8), 2231–2242. Available online 28 September 2015.
- Mateu-Figueras, G. (2003). *Models de distribució sobre el símplex*. PhD thesis, Universitat Politècnica de Catalunya, Barcelona.
- Mateu-Figueras, G., Barceló-Vidal, C., & Pawlowsky-Glahn, V. (1998). Modelling compositional data with multivariate skew-normal distributions. In A. Buccianti, G. Nardi, & R. Potenza (Eds.), *Proceedings of the IAMG'98. The Fourth Annual Conference of the International Association for Mathematical Geology*, volume II (pp. 532–537). Napoli: De Frede Editore.
- Mateu-Figueras, G. & Pawlowsky-Glahn, V. (2007). The skew-normal distribution on the simplex. *Communications in Statistics – Theory & Methods*, 36(9), 1787–1802.

- Mateu-Figueras, G., Pawlowsky-Glahn, V., & Barceló-Vidal, C. (2005). Additive logistic skew-normal on the simplex. *Stochastic Environmental Research and Risk Assessment*, 19(3), 205–214.
- Mateu-Figueras, G., Puig, P., & Pewsey, A. (2007). Goodness-of-fit tests for the skew-normal distribution when the parameters are estimated from the data. *Communications in Statistics – Theory & Methods*, 36(9), 1735–1755.
- Matthews, J. N. S. & Badi, N. H. (2015). Inconsistent treatment estimates from misspecified logistic regression analyses of randomized trials. *Statistics in Medicine*, 34(19), 2681–2694.
- Mattos, T. d. & da Silva Ferreira, C. (2016). The mean-shift outlier model under skew normal distribution. *Communications in Statistics – Simulation & Computation*, 45, 1905–1917. Available online 23 June 2014.
- Mattos, T. d., M.Garay, A., & Lachos, V. H. (2018). Likelihood-based inference for censored linear regression models with scale mixtures of skew-normal distributions. *Journal of Applied Statistics*, 45, 2039–2066. Available online 02 Dec 2017.
- Mayston, D. J. (2015). Analysing the effectiveness of public service producers with endogenous resourcing. *J. Productivity Analysis*, 44(1), 115–126.
- Mazzuco, S. & Scarpa, B. (2015). Fitting age-specific fertility rates by a flexible generalized skew normal probability density function. *Journal of the Royal Statistical Society, series A*. Available online 15 April 2014.
- Mazzuco, S., Scarpa, B., & Zanotto, L. (2018). A mortality model based on a mixture distribution function. *Population Studies*, 72, 191–200.
- McKean, J. W. & Kloke, J. D. (2014). Efficient and adaptive rank-based fits for linear models with skew-normal errors. *J. Stat. Distributions and Applications*, 1(18).
- McLachlan, G. & Lee, S. X. (2013). EMMIXuskew: An R package for fitting mixtures of multivariate skew t distributions via the EM algorithm. *Journal of Statistical Software*, 55(12).
- McLachlan, G. J. & Lee, S. X. (2016). Comment on “On nomenclature, and the relative merits of two formulations of skew distributions” by A. Azzalini, R. Browne, M. Genton, and P. McNicholas. *Statistics & Probability Letters*, 210, 1–5.
- Meintanis, S. G. (2007). A Kolmogorov-Smirnov type test for skew normal distributions based on the empirical moment generating function. *Journal of Statistical Planning and Inference*, 137(8), 2681–2688.
- Meintanis, S. G. & Hlávka, Z. (2010). Goodness-of-fit tests for bivariate and multivariate skew-normal distributions. *Scandinavian Journal of Statistics*, 37(4), 701–714.
- Meng, H., Li, X. R., & Jilkov, V. P. (2019). Nonlinear state estimation using skew-symmetric representation of distributions. In *2019 22th International Conference on Information Fusion, Ottawa, Canada* (pp. 1–8).: IEEE.

- Meucci, A. (2006a). Beyond Black-Litterman in practice. *Risk Magazine*, 19(9), 114–119.
- Meucci, A. (2006b). Beyond Black-Litterman: views on non-normal markets. *Risk Magazine*, 19(2), 87–92.
- Michaelis, P., Klein, N., & Kneib, T. (2018). Bayesian multivariate distributional regression with skewed responses and skewed random effects. *Journal of Computational and Graphical Statistics*, 27, 602–611.
- Minozzo, M. & Bagnato, L. (2021). A unified skew-normal geostatistical factor model. *Environmetrics*, 32, e2672.
- Minozzo, M. & Ferracuti, L. (2012). On the existence of some skew-normal stationary processes. *Chilean Journal of Statistics*, 3, 159–172.
- Mobasserfar, Y., Adibnazari, S., & Shariyat, M. (2022). Skew-normal log-volatility model of road surface profile. *Mechanical Systems and Signal Processing*, 177, 109236.
- Molenaar, D., Dolan, C. V., & de Boeck, P. (2012). The heteroscedastic graded response model with a skewed latent trait: Testing statistical and substantive hypotheses related to skewed item category functions. *Psychometrika*, 77, 455–478.
- Mondal, S., Arellano-Valle, R. B., & Genton, M. G. (2023a). A multivariate modified skew-normal distribution. *Stat. Papers*, to appear.
- Mondal, S., Arellano-Valle, R. B., & Genton, M. G. (2023b). A multivariate modified skew-normal distribution. *Stat. Papers*, to appear. Available online 13 February 2023.
- Montanari, A. (2020). A conversation with Adelchi Azzalini and Narayanaswamy Balakrishnan. *Statistica*, 80, 131–143.
- Montanari, A. & Viroli, C. (2010). A skew-normal factor model for the analysis of student satisfaction towards university courses. *Journal of Applied Statistics*, 37, 473–487.
- Montenegro, C. & Branco, M. (2016). Bayesian state-space approach to biomass dynamic models with skewed and heavy-tailed error distributions. *Fisheries Research*, 181, 48–62.
- Montenegro, L. C., Lachos, V. H., & Bolfarine, H. (2009). Local influence analysis for skew-normal linear mixed models. *Communications in Statistics – Theory & Methods*, 38(4), 484–496.
- Monti, A. C. (2003). A note on the estimation of the skew normal and the skew exponential power distributions. *Metron*, XLI(2), 205–219.
- Monti, A. C. & Fucci, R. (2014). Sub-model identification in the context of flexible distributions obtained by perturbation of symmetric densities. *Chilean Journal of Statistics*, 5(1), 3–18.

- Morales, V. H. & Panza, C. A. (2022). Control charts for monitoring the mean of skew-normal samples. *Symmetry*, 14, 2302.
- Morán-Vásquez, R. A., Cataño Salazar, D. H., & Nagar, D. K. (2022a). Some results on the truncated multivariate skew-normal distribution. *Symmetry*, 14, 970.
- Moran-Vasquez, R. A., Giraldo-Melo, A. D., & Mazo-Lopera, M. A. (2023). Quantile estimation using the log-skew-normal linear regression model with application to children's weight data. *Mathematics*, 11, 3736.
- Morán-Vásquez, R. A., Zarrazola, E., & Nagar, D. K. (2022b). Some statistical aspects of the truncated multivariate skew- t distribution. *Mathematics*, 10, 2793.
- Morris, S. A., Reich, B. J., Thibaud, E., & Cooley, D. (2017). A space-time skew- t model for threshold exceedances. *Biometrics*, 73, 749–758.
- Moser, A., Clough-Gorr, K., & Zwahlen, M. (2015). Modeling absolute differences in life expectancy with a censored skew-normal regression approach. *PeerJ*, 3, e1162. Available online 06 August 2015.
- Moura, F. A. S., Neves, A. F., & Silva, D. B. d. N. S. (2017). Small area models for skewed brazilian business survey data. *Journal of the Royal Statistical Society, series A*, 180(4), 1039–1055.
- Mukhopadhyay, S. & Vidakovic, B. (1995). Efficiency of linear Bayes rules for a normal mean: skewed prior class. *Journal of the Royal Statistical Society, series D (The Statistician)*, 44, 389–397.
- Mulero, J., Sordo, M. A., de Souza, M. C., & Suárez-Llorens, A. (2017). Two stochastic dominance criteria based on tail comparisons. *Applied Stochastic Models in Business and Industry*. Available online 19 June 2017.
- Müller, P., José A. del Peral-Rosado, R. P., & Seco-Granados, G. (2016). Statistical trilateration with skew- t distributed errors in LTE networks. *IEEE Trans. Wireless Communications*, 15(10), 7114–7127.
- Müller, P. & Piché, R. (2015). Statistical trilateration with skew- t errors. In *2015 International Conference on Localization and GNSS (ICL-GNSS), Gothenburg, Sweden* (pp. 1–6).: IEEE.
- Muthén, B. & Asparouhov, T. (2015). Growth mixture modeling with non-normal distributions. *Statistics in Medicine*, 34, 1041–1058. Available online 11 December 2014.
- Na, J. (2014). Saddlepoint approximation to the linear combination based on multivariate skew-normal distribution. *Korean Journal of Applied Statistics*, 27(5), 809–818.
- Nadarajah, S. (2007). Comment on “Skew-symmetric distributions generated by the distribution function of the normal distribution” (2007v18 p.395-407). *EnvironMetrics*, 18(6), 661–662.
- Nadarajah, S. (2009). The skew logistic distribution. *Adv. Stat. Analysis*, 93(2), 187–203. Available online 19 February 2009.

- Nadarajah, S. & Kotz, S. (2003). Skewed distributions generated by the normal kernel. *Statistics & Probability Letters*, 65(3), 269–77.
- Nadarajah, S. & Kotz, S. (2006). Skew distributions generated from different families. *Acta Appl. Math.*, 91, 1–37.
- Nadarajah, S. & Kotz, S. (2007). Skew models I. *Acta Appl. Math.*, 98, 1–28.
- Nadarajah, S. & Li, R. (2017). The exact density of the sum of independent skew normal random variables. *J. Computational and Applied Mathematics*, 311, 1–10.
- Nagaraja, H. N. (1982). A note on linear functions of ordered correlated normal random variables. *Biometrika*, 69, 284–285.
- Najari, N., Asl, M. Q. V., & Jalilian, A. (2021). Neyman-Scott process with skew-normal clusters. *Communications in Statistics – Theory & Methods*. Available online 10 Sep 2020.
- Nathoo, F. S. (2010). Space–time regression modeling of tree growth using the skew- t distribution. *Environmetrics*, 21, 817–833.
- Navarro, J. & Arevalillo, J. M. (2023). On connections between skewed, weighted and distorted distributions: applications to model extreme value distributions. *Test*.
- Naveau, P. & Allard, D. (2008). Modeling skewness in spatial data analysis without data transformation. In O. Leuangthong & C. V. Deutsch (Eds.), *Geostatistics Banff 2004*, volume 14 of *Quantitative Geology and Geostatistics* (pp. 929–937). Springer Netherlands.
- Naveau, P., Genton, M. G., & Ammann, C. (2004). Time series analysis with a skewed Kalman filter. In M. G. Genton (Ed.), *Skew-elliptical distributions and their applications: a journey beyond normality* chapter 15, (pp. 259–278). Chapman & Hall/CRC.
- Naveau, P., Genton, M. G., & Shen, X. (2005). A skewed Kalman filter. *Journal of Multivariate Analysis*, 94, 382–400.
- Negeri, Z. F. & Beyene, J. (2020). Skew-normal random-effects model for meta-analysis of diagnostic test accuracy (DTA) studies. *Biometrical J.*, 62, 1223–1244.
- Nekoukhou, V. & Alamatsaz, M. (2012). A family of skew-symmetric-Laplace distributions. *Statistical Papers*, 53, 685–696. Available online 22 Feb 2011.
- Nekoukhou, V., Alamatsaz, M. H., & Aghajani, A. H. (2013). A flexible skew-generalized normal distribution. *Communications in Statistics – Theory & Methods*, 42(13), 2324–2334.
- Nelson, L. S. (1964). The sum of values from a normal and a truncated normal distribution. *Technometrics*, 6, 469–471.
- Nematollahi, N., Farnoosh, R., & Rahnamaei, Z. (2016). Location-scale mixture of skew-elliptical distributions: Looking at the robust modeling. *Statistical Methodology*, 32, 131–146.

- Ning, W. (2015). Probabilistic representations of matrix variate skew normal models. *Random Operators and Stochastic Equations*, 23, 21–29.
- Ning, W. & Gupta, A. K. (2012). Matrix variate extended skew normal distributions. *Random Operators and Stochastic Equations*, 20, 299–310.
- Ning, W. & Ngunkeng, G. (2013). An empirical likelihood ratio based goodness-of-fit test for skew normality. *Statistical Methods & Applications*, 22(2), 209–226.
- Noma, H., Nagashima, K., Kato, S., Teramukai, S., & Furukawa, T. A. (2022). Meta-analysis using flexible random-effects distribution models. *J. Epidemiology*, to appear, JE20200376.
- Nurminen, H., Ardeshiri, T., Piché, R., & Gustafsson, F. (2015). Robust inference for state-space models with skewed measurement noise. *IEEE Signal Processing Letters*, 22(11), 1898–1902.
- Nurminen, H., Ardeshiri, T., Piché, R., & Gustafsson, F. (2018). Skew- t filter and smoother with improved covariance matrix approximation. *IEEE Transactions on Signal Processing*, 66, 5618–5633.
- Ogundimu, E. O. & Hutton, J. L. (2015). On the extended two-parameter generalized skew-normal distribution. *Statistics & Probability Letters*, 100, 142–148.
- Ogundimu, E. O. & Hutton, J. L. (2016). A sample selection model with skew-normal distribution. *Scandinavian Journal of Statistics*, 43, 172–190.
- O’Hagan, A. & Leonard, T. (1976). Bayes estimation subject to uncertainty about parameter constraints. *Biometrika*, 63, 201–202.
- Opheim, T. & Roy, A. (2021). Score tests for intercept and slope parameters of doubly multivariate linear models with skew-normal errors. *J. Stat. Theory Pract.*, 15, 30.
- Ormerod, J. T. (2011). Skew-normal variational approximations for Bayesian inference. Available from <http://www.maths.usyd.edu.au/u/jormerod/> on 2016-01-24.
- Otiniano, C. E. G., Rathie, P. N., & Ozelim, L. C. S. M. (2015). On the identifiability of finite mixture of skew-normal and skew- t distributions. *Statistics & Probability Letters*, 106, 103–108.
- Pacillo, S. (2012). Selection of conditional independence graph models when the distribution is extended skew normal. *Chilean Journal of Statistics*, 3, 183–194.
- Padoan, S. A. (2011). Multivariate extreme models based on underlying skew- t and skew-normal distributions. *Journal of Multivariate Analysis*, 102(5), 977–991. Corrigendum in vol. 143 (2016), 503.
- Pagan, R. (1992). Algoritmi per la generazione di numeri pseudo-casuali dalla distribuzione normale asimmetrica. Tesi di laurea, Facoltà di Scienze Statistiche, Università di Padova, Padova, Italia.

- Panagiotelis, A. & Smith, M. (2008). Bayesian density forecasting of intraday electricity prices using multivariate skew t distributions. *International Journal of Forecasting*, 24(4), 710–727.
- Panagiotelis, A. & Smith, M. (2010). Bayesian skew selection for multivariate models. *Computational Statistics and Data Analysis*, 54(7), 1824–1839.
- Parisi, A. & Liseo, B. (2018). Objective Bayesian analysis for the multivariate skew- t model. *Stat. Methods & Applications*, 27, 277–295. Available online 25 September 2017.
- Peng, C.-Y. (2008). The first negative moment in the sense of the Cauchy principal value. *Statistics & Probability Letters*, 78(13), 1765–1774.
- Peng, C.-Y. & Tseng, S.-T. (2013). Statistical lifetime inference with skew-Wiener linear degradation models. *IEEE Trans. Reliab.*, 62, 338–350.
- Pereira, M. A. A. & Russo, C. M. (2019). Nonlinear mixed-effects models with scale mixture of skew-normal distributions. *Journal of Applied Statistics*, 46, 1602–1620. Available online 14 Dec 2018.
- Pérez Rodríguez, P. & Villaseñor Alva, J. A. (2010). On testing the skew normal hypothesis. *Journal of Statistical Planning and Inference*, 140(11), 3148–3159.
- Pewsey, A. (2000a). Problems of inference for Azzalini's skew-normal distribution. *Journal of Applied Statistics*, 27, 859–870.
- Pewsey, A. (2000b). The wrapped skew-normal distribution on the circle. *Communications in Statistics – Theory & Methods*, 29(11), 2459–2472.
- Pewsey, A. (2003). The characteristic functions of the skew-normal and wrapped skew-normal distributions. In *XXVII Congreso Nacional de Estadística e Investigación Operativa* (pp. 4383–4386). Lleida (España): SEIO.
- Pewsey, A. (2004). Some observations on a simple means of generating skew distributions. In N. Balakrishnan, E. Castillo, & J. M. Sarabia (Eds.), *International Conference on Distribution Theory, Order statistics and Inference in Honor of Barry C. Arnold* University of Cantabria, Spain.
- Pewsey, A. (2005). The large-sample distribution of the most fundamental of statistical summaries. *Journal of Statistical Planning and Inference*, 134, 434–444.
- Pewsey, A. (2006a). Modelling asymmetrically distributed circular data using the wrapped skew-normal distribution. *Environmental & Ecological Statistics*, 13, 257–269.
- Pewsey, A. (2006b). Some observations on a simple means of generating skew distributions. In N. Balakrishnan, E. Castillo, & J. M. Sarabia (Eds.), *Advances in Distribution Theory, Order Statistics and Inference* (pp. 75–84). Boston, Massachusetts: Birkhäuser.

- Pewsey, A. & Aguilar Zuil, L. (2003). The operating characteristics of Pewsey's large-sample test for an underlying wrapped normal distribution within the wrapped skew-normal class. In *XXVII Congreso Nacional de Estadística e Investigación Operativa* (pp. 1656–1659). Lleida (España): SEIO.
- Pietrobon, E. (2003). Modelli ARCH, GARCH e SV con componenti di errore aventi distribuzione t asimmetrica. Tesi di laurea, Facoltà di Scienze Statistiche, Università di Padova, Padova, Italia.
- Pigeon, M., Antonio, K., & Denuit, M. (2013). Individual loss reserving with the multivariate skew normal framework. *ASTIN Bull.*, 43, 399–428.
- Pigeon, M., Henry de Frahan, B., & Denuit, M. (2014). Evaluation of the EU proposed farm income stabilisation tool by skew normal linear mixed models. *Eur. Actuar. J.*, 4, 383–409.
- Pitt, I. L. (2010a). *Economic Analysis of Music Copyright: Income, Media and Performances*. Springer Science & Business Media.
- Pitt, I. L. (2010b). Superstar effects on royalty income in a performing rights organization. *J. Cultural Econ.*, 34, 219–236.
- Possolo, A., Merktas, C., & Bodnar, O. (2019). Asymmetrical uncertainties. *Metrologia*, 56, 045009.
- Potgieter, C. J. (2020). Density deconvolution for generalized skew-symmetric distributions. *J. Stat. Distrib. Appl.*, 7, 2.
- Potgieter, C. J. & Genton, M. G. (2013). Characteristic function-based semiparametric inference for skew-symmetric models. *Scandinavian Journal of Statistics*, 40(3), 471–490. Available online 26 Dec 2012.
- Pourahmadi, M. (2007). Skew-normal ARMA models with nonlinear heteroscedastic predictors. *Communications in Statistics – Theory & Methods*, 36(9), 1803–1819.
- Prataviera, F., Batista, A. M., Libardi, P. L., Cordeiro, G. M., & Ortega, E. M. M. (2022). Joint regression modeling of location and scale parameters of the skew t distribution with application in soil chemistry data. *Journal of Applied Statistics*, 49, 195–213.
- Prates, M., Lachos, V., & Cabral, C. (2021). *The R package mixsmsn: Fitting finite mixture of scale mixture of skew-normal distributions (version 1.1-9)*. <https://cran.r-project.org/package=mixsmsn>.
- Prates, M. O., Cabral, C. R. B., & Lachos, V. H. (2013). mixsmsn: fitting finite mixture of scale mixture of skew-normal distributions. *J. Statistical Software*, 54(12).
- Prates, M. O., Dey, D. K., & Lachos, V. H. (2012). A dengue fever study in the state of Rio de Janeiro with the use of generalized skew-normal/independent spatial fields. *Chilean Journal of Statistics*, 3, 145–157.
- Pronello, N., Ignaccolo, R., Ippoliti, L., & Fontanella, S. (2023). Penalized model-based clustering of complex functional data. *Statistics and Computing*, 22, 122.

- Pu, T., Balakrishnan, N., & Yin, C. (2021). An identity for expectations and characteristic function of matrix variate skew-normal distribution with applications to associated stochastic orderings. *arXiv.org*:2103.05197.
- Punathumparambath, B. (2012). The multivariate asymmetric slash Laplace distribution and its applications. *Statistica*, 72, 235–249.
- Pyne, S., Hu, X., Wang, K., Rossin, E., Lin, T.-I., Maier, L. M., Baecher-Alland, C., McLachlan, G. J., Tamayo, P., Hafler, D. A., De Jagera, P. L., & Mesirov, J. P. (2009). Automated high-dimensional flow cytometric data analysis. *PNAS*, 106(21), 8519–8524.
- Qi, X., Li, H., Tian, W., & Yang, Y. (2022). Confidence interval, prediction interval and tolerance interval for the skew normal distribution: a pivotal approach. *Symmetry*, 14, 5.
- Quiroga, A. M. (1992). *Studies of the polychoric correlation and other correlation measures for ordinal variables*. PhD thesis, Uppsala, Sweden.
- Ramprasath, S., Vijaykumar, M., & Vasudevan, V. (2016). A skew-normal canonical model for statistical static timing analysis. *IEEE Trans. on VLSI Systems*, 24(6), 2359–2368. Available online 08 December 2015.
- Rasekhi, M., Chinipardaz, R., & Alavi, S. M. R. (2015). A flexible generalization of the skew normal distribution based on a weighted normal distribution. *Stat. Methods & Appl.* Available online 27 Septemeber 2015.
- Rasekhi, M., Hamedani, G. G., & Chinipardaz, R. (2017). A flexible extension of skew generalized normal distribution. *Metron*, 75(1), 87–107.
- Rasouli, A. & Monfared, F. D. (2013). On order statistics from a 4-variate normal distribution. *Pakistan Journal of Statistics*, 29, 83–97.
- Razzaghi, M. (2014). A hierarchical model for the skew-normal distribution with application in developmental neurotoxicology. *Communications in Statistics – Theory & Methods*, 43(8), 1859–1872.
- Renda, A., Gibson, B. K., Mouhcine, M., Ibata, R. A., Kawata, D., & Brook, C. F. C. B. (2005). The stellar halo metallicity–luminosity relationship for spiral galaxie. *Monthly Notices R. Astron. Soc.*, 363(1), L16–L20.
- Rezaei, A., Yousefzadeh, F., & Arellano-Valle, R. B. (2020). Scale and shape mixtures of matrix variate extended skew normal distributions. *Journal of Multivariate Analysis*, 179, 104649.
- Rezaie, J. & Eidsvik, J. (2014). Kalman filter variants in the closed skew normal setting. *Computational Statistics and Data Analysis*, 75, 1–14.
- Rezaie, J. & Eidsvik, J. (2016). A skewed unscented Kalman filter. *Int. J. Control*, 89(12), 2572–2583.

- Rezaie, J., Eidsvik, J., & Mukerji, T. (2014). Value of information analysis and Bayesian inversion for closed skew-normal distributions: Applications to seismic amplitude variation with offset data. *Geophysics*, 79(4), R151–R163.
- Ribereau, P., Masiello, E., & Naveau, P. (2016). Skew generalized extreme value distribution: Probability-weighted moments estimation and application to block maxima procedure. *Communications in Statistics – Theory & Methods*, 45, 5037–5052. Available online 16 December 2015.
- Richter, W.-D. & Venz, J. (2014). Geometric representations of multivariate skewed elliptically contoured distributions. *Chilean Journal of Statistics*, 5(2), 71–90.
- Rimstad, K. & Omre, H. (2014). Generalized Gaussian random fields using hidden selections. arXiv:1402.1144.
- Rimstad, K. & Omre, H. (2014). Skew-Gaussian random fields. *Spatial Statistics*, 10, 43–62.
- Roberts, C. (1966). A correlation model useful in the study of twins. *Journal of the American Statistical Association*, 61, 1184–1190.
- Rocha, G. M. A., Loschi, R. H., & Arellano-Valle, R. B. (2013). Inference in flexible families of distributions with normal kernel. *Statistics*, 47(6), 1184–1206.
- Rozeqar, R., Nematollahi, A., & Jamalizadeh, A. (2016). Properties and inference for a new class of skew- t distributions. *Communications in Statistics – Theory & Methods*, 45(9), 3217–3237. Available online 12 Dec 2014.
- Rubio, F. J. & Genton, M. G. (2016). Bayesian linear regression with skew-symmetric error distributions with applications to survival analysis. *Statistics in Medicine*, 35, 2441–2454.
- Rubio, F. J. & Liseo, B. (2014). On the independence Jeffreys prior for skew-symmetric models. *Statistics & Probability Letters*, 85, 91–97.
- Rue, H., Martino, S., & Chopin, N. (2009). Approximate Bayesian inference for latent Gaussian models by using integrated nested Laplace approximations. *Journal of the Royal Statistical Society, series B*, 71, 319–392.
- Rukhin, A. L. (2004). Limiting distributions in sequential occupancy problem. *Sequential Analysis*, 23(1), 141–158.
- Sahu, K., Dey, D. K., & Branco, M. D. (2003). A new class of multivariate skew distributions with applications to Bayesian regression models. *Canadian Journal of Statistics*, 31(2), 129–150. Corrigendum in vol. 37 (2009) , 301–302.
- Sahu, S. K. & Dey, D. K. (2004). On a Bayesian multivariate survival model with a skewed frailty. In M. G. Genton (Ed.), *Skew-elliptical Distributions and Their Applications: a Journey Beyond Normality* chapter 19, (pp. 321–338). Chapman & Hall/CRC.

- Said, K. K., Basalamaha, D., Ning, W., & Gupta, A. (2018a). The kumaraswamy skew- t distribution and its related properties. *Communications in Statistics – Simulation & Computation*, 47, 2409–2423. Available online 29 June 2017.
- Said, K. K., Ning, W., & Tian, Y. (2017). Likelihood procedure for testing changes in skew normal model with applications to stock returns. *Communications in Statistics – Simulation & Computation*, 46, 6790–6802. Available online 03 Sep 2016.
- Said, K. K., Ning, W., & Tian, Y. (2018b). Detecting changes in linear regression models with skew normal errors. *Random Operators and Stochastic Equations*, 26.
- Said, K. K., Ning, W., & Tian, Y. (2019). Modified information criterion for testing changes in skew normal model. *Brazilian J. Probab. Stat.*, 33, 280–300.
- Sakhabakhsh, L., Farnoosh, R., Fallah, A., & Behzadi, M. (2022). A semiparametric approach for modeling partially linear autoregressive model with skew normal innovations. *Adv. Math. Physics*, 2022, 7863474.
- Salehi, M. & Azzalini, A. (2018). On application of Kotz distribution and some of its extensions. *Metron*, 76, 177–201.
- Salehi, M. & Doostparast, M. (2015). Expressions for moments of order statistics and records from the skew-normal distribution in terms of multivariate normal orthant probabilities. *Stat. Methods & Appl.*, 25, 547–568.
- Salehi, M., Jamalizadeh, A., & Doostparast, M. (2014). A generalized skew two-piece skew-elliptical distribution. *Statistical Papers*, 55, 409–429.
- Salinas, H. S., Arellano-Valle, R. B., & Gómez, H. W. (2007). The extended skew-exponential power distribution and its derivation. *Communications in Statistics – Theory & Methods*, 36(9), 1673–1689.
- Salinas, H. S., Gómez, H. W., Martínez-Flórez, G., & Bolfarine, H. (2018). Skew-normal alpha-power model [statistics 48(2014) 1414–1428]. *Statistics*, 52(4), 950–953.
- Salvan, A. (1986). Test localmente più potenti tra gli invarianti per la verifica dell'ipotesi di normalità. In *Atti della XXXIII Riunione Scientifica della Società Italiana di Statistica*, volume II (pp. 173–179). Bari: Cacucci.
- Sánchez, R. (2020). Granular dynamics and gravity. *Soft Matter*, 16, 9253–9261.
- Sartori, N. (2006). Bias prevention of maximum likelihood estimates for scalar skew normal and skew t distributions. *Journal of Statistical Planning and Inference*, 136, 4259–4275.
- Schmidt, A. M., Gonçalves, K. C. M., & Velozo, P. L. (2017). Spatiotemporal models for skewed processes. *Environmetrics*, 28(6), e2411. Available online 15 September 2016.
- Schmidt, R. & Kneib, T. (2023). Multivariate distributional stochastic frontier models. *Computational Statistics and Data Analysis*, 187, 107796.

- Schumacher, F. L., Lachos, V. H., & Matos, L. A. (2021a). Scale mixture of skew-normal linear mixed models with within-subject serial dependence. *Statistics in Medicine*, 40, 1790–1810.
- Schumacher, F. L., Matos, L. A., & Lachos, V. H. (2021b). *The R package skewlmm: Scale Mixture of Skew-Normal Linear Mixed Models (version 0.2.3)*. <https://cran.r-project.org/package=skewlmm>.
- Seijas-Macías, A., Oliveira, A., Oliveira, T. A., & Leiva, V. (2020). Approximating the distribution of the product of two normally distributed random variables. *Symmetry*, 12, 1201.
- Semmelmayr, F., Reeder, M. F., & Seymour, R. (2019). Statistical modeling of electronically scanned pressure transducer sensor noise uncertainty probability density functions. In *AIAA SciTech Forum (AIAA 2019-0670)*: American Institute of Aeronautics and Astronautics.
- Shafiei, S. & Doostparast, M. (2014). Balakrishnan skew- t distribution and associated statistical characteristics. *Communications in Statistics – Theory & Methods*. Available online 25 Apr 2014.
- Shafiei, S., Safarpour, A., Jamalizadeh, A., & Tizhoosh, H. R. (2020). Class-agnostic weighted normalization of staining in histopathology images using a spatially constrained mixture model. *IEEE Transactions on Medical Imaging*, 39, 3355–3366.
- Sharafi, M. & Behboodian, J. (2008). The Balakrishnan skew-normal density. *Statistical Papers*, 49(4), 769–778.
- Sharafi, M. & Nematollahi, A. R. (2016). AR(1) model with skew-normal innovations. *Metrika*, 79(8), 1011–1029.
- Sharafi, M., Sajjadnia, Z., & Behboodian, J. (2017). A new generalization of alpha-skew-normal distribution. *Communications in Statistics – Theory & Methods*, 46, 6098–6111. Available online 17 June 2016.
- Shemetov, V. V. (2022). Some financial problems in the light of EMM results: asset pricing and efficient portfolio allocation. *Management Studies*, 10, 294–324.
- Shun, Z., Gordon Lan, K. K., & Soo, Y. (2008). Interim treatment selection using the normal approximation approach in clinical trials. *Statistics in Medicine*, 27, 597–618.
- Shushi, T. (2016). A proof for the conjecture of characteristic function of the generalized skew-elliptical distributions. *Statistics & Probability Letters*, 119, 301–304.
- Shushi, T. (2017). Skew-elliptical distributions with applications in risk theory. *Eur. Actuar. J.*, 7, 277–296.
- Shushi, T. (2019). Explicit formulas for the cumulants and the vector-valued odd moments of the multivariate linearly skewed elliptical distributions. *Communications in Statistics – Theory & Methods*. Available online 14 Nov 2018.

- Simola, U., Dumusque, X., & Cisewski-Kehe, J. (2019). Measuring precise radial velocities and cross-correlation function line-profile variations using a skew normal density. *Astronomy & Astrophysics*, 622, A131.
- Smeed, D. A., McCarthy, G., Cunningham, S. A., Frajka-Williams, E., Rayner, D., Johns, W., Meinen, C., Baringer, M., Moat, B., Duchez, A., & Bryden, H. (2014). Observed decline of the Atlantic meridional overturning circulation 2004–2012. *Ocean Science*, 10(1), 29–38.
- Smith, M. S., Gan, Q., & Kohn, R. J. (2012). Modelling dependence using skew t copulas: Bayesian inference and applications. *J. Appl. Econometrics*, 27, 500–522.
- Soriani, N. (2007). La distribuzione t asimmetrica: analisi discriminante e regioni di tolleranza. Tesi di laurea, Facoltà di Scienze Statistiche, Università di Padova.
- Squarcina, M. G. (2006). Analisi di misurazioni su campioni d'acqua prelevati dai pozzi dell'isola di Vulcano. Tesi di laurea specialistica, Facoltà di Scienze Statistiche, Università di Padova, Padova, Italia.
- Stanghellini, E. & Wermuth, N. (2005). On the identification of path analysis models with one hidden variable. *Biometrika*, 92, 337–350.
- Stein, M. L. (2021). Parametric models for distributions when interest is in extremes with an application to daily temperature. *Extremes*, 24, 293–323. Available online 09 June 2020.
- Stingo, F. C., Stanghellini, E., & Capobianco, R. (2011). On the estimation of a binary response model in a selected population. *Journal of Statistical Planning and Inference*, 141(10), 3293–3303.
- Sukhavasi, R. T. & Hassibi, B. (2009). The Kalman like particle filter: optimal estimation with quantized innovations/measurements. arXiv:0909.0996.
- Sulentic, J. W., Del Olmo, A., Marziani, P., Martinez-Carballo, M., D'Onofrio M., Dultzin, D., Perea, J., Martinez-Aldama, M., Negrete, C. A., Stirpe, G., M., & Zamfir, S. (2017). What does CIV λ 1549 tell us about the physical driver of the Eigenvector quasar sequence? *Astronomy & Astrophysics*, 608, A122.
- Sun, Y., Hering, A. S., & Browning, J. M. (2017). Robust bivariate error detection in skewed data with application to historical radiosonde winds. *Environmetrics*, 28, e2431.
- Suriya, K., Sudtasan, T., Wang, T., Lerma, O., & Kreinovich, V. (2015). A natural simple model of scientists' strength leads to skew-normal distribution. *International Journal of Intelligent Technologies and Applied Statistics*, 8(2), 153–158.
- Tadayon, V. & Khaledi, M. J. (2015). Bayesian analysis of skew Gaussian spatial models based on censored data. *Communications in Statistics – Simulation & Computation*, 44(9), 2431–2441. Available online 23 May 2014.

- Tagle, F., Castruccio, S., Crippa, P., & Genton, M. G. (2019). A non-Gaussian spatio-temporal model for daily wind speeds based on a multi-variate skew- t distribution. *Journal of Time Series Analysis*, 40, 312–326. Available online 03 December 2018.
- Tagle, F., Castruccio, S., & Genton, M. G. (2020a). A hierarchical bi-resolution spatial skew- t model. *Spatial Statistics*, 35, 100398. Available online 9 December 2019.
- Tagle, F., Genton, M. G., Yip, A., Mostamandi, S., Stenchikov, G., & Castruccio, S. (2020b). A high-resolution bilevel skew- t stochastic generator for assessing Saudi Arabia's wind energy resources (with discussion). *Environmetrics*, 31, e2628.
- Tamandi, M. & Jamalizadeh, A. (2020). Finite mixture modeling using shape mixtures of the skew scale mixtures of normal distributions. *Communications in Statistics – Simulation & Computation*, 49, 3345–3366. Available online 21 Jan 2019.
- Tancredi, A. (2002). *Accounting for heavy tails in stochastic frontier models*. Working paper 2002.16, Dipartimento di Scienze Statistiche, Università di Padova, Padova, Italia.
- Tang, A.-M. & Tang, N.-S. (2015). Semiparametric Bayesian inference on skew-normal joint modeling of multivariate longitudinal and survival data. *Statistics in Medicine*, 34, 824–843. Available online 18 November 2014.
- Tang, A.-M., Tang, N.-S., & Zhu, H. (2017). Influence analysis for skew-normal semi-parametric joint models of multivariate longitudinal and multivariate survival data. *Statistics in Medicine*, 36, 1476–1490.
- Tang, Y. (2020). A monotone data augmentation algorithm for longitudinal data analysis via multivariate skew- t , skew-normal or t distributions. *Stat. Methods Med. Res.*, 29, 1542–1562. Available online 07 August 2019.
- Taniguchi, M., Petkovic, A., Kase, T., DiCiccio, T., & Monti, A. C. (2015). Robust portfolio estimation under skew-normal return processes. *European J. Finance*, 21(13-14), 1091–1112. Available online 6 Feb 2012.
- Tarpey, T. & Loperfido, N. (2015). Self-consistency and a generalized principal subspace theorem. *Journal of Multivariate Analysis*, 133, 27–37.
- Tchumtchoua, S. & Dey, D. K. (2007). Bayesian estimation of stochastic frontier models with multivariate skew t error terms. *Communications in Statistics – Theory & Methods*, 36(5), 907–916.
- Teimouri, M. (2021). EM algorithm for mixture of skew-normal distributions fitted to grouped data. *Journal of Applied Statistics*, 48, 1154–1179. Available online 05 May 2020.
- Terdik, G. (2021). Multivariate skew distributions. In *Multivariate Statistical Methods: Going Beyond the Linear*, Frontiers in Probability and the Statistical Sciences chapter 5, (pp. 241–311). Springer.

- Thompson, K. R. & Shen, Y. (2004). Coastal flooding and the multivariate skew- t distribution. In M. G. Genton (Ed.), *Skew-elliptical Distributions and Their Applications: a Journey Beyond Normality* chapter 14, (pp. 243–258). Chapman & Hall/CRC.
- Tian, W. & Wang, T. (2016). Quadratic forms of refined skew normal models based on stochastic representation. *Random Operators and Stochastic Equations*, 24(4), 225–234.
- Tomaya, L. C. & de Castro, M. (2018). A heteroscedastic measurement error model based on skew and heavy-tailed distributions with known error variances. *Journal of Statistical Computation and Simulation*, 88, 2185–2200.
- Toosi, R., Akhaee, M. A., & Dehaqani, M. A. (2021). An automatic spike sorting algorithm based on adaptive spike detection and a mixture of skew- t distributions. *Scientific Reports*, 11, 13925.
- Tovar-Falón, R., Bolfarine, H., & Martínez-Flórez, G. (2020). The asymmetric alpha-power skew- t distribution. *Symmetry*, 12(1), 82.
- Tsai, C.-C. & Lin, C.-T. (2015). Lifetime inference for highly reliable products based on skew-normal accelerated destructive degradation test model. *IEEE Trans. Reliability*, 64(4), 1340–1355.
- Tsai, T.-R. (2007). Skew normal distribution and the design of control charts for averages. *Int. J. Rel. Qual. Saf. Eng.*, 14(1), 49–63.
- Tsay, W.-J., Huang, C. J., Fu, T.-T., & Ho, I.-L. (2013). A simple closed-form approximation for the cumulative distribution function of the composite error of stochastic frontier models. *J. Productivity Analysis*, 39, 259–269.
- Tsukuma, H. & Kubokawa, T. (2020). Estimation of a covariance matrix in multivariate skew-normal distribution. *Communications in Statistics – Theory & Methods*, 49, 1174–1200. Available online 10 Feb 2019.
- Tuaç, Y., Güney, Y., & Arslan, O. (2020). Parameter estimation of regression model with AR(p) error terms based on skew distributions with EM algorithm. *Soft Computing*, 24, 3309–3330. Available online 03 June 2019.
- Umbach, D. (2006). Some moment relationships for skew-symmetric distributions. *Statistics & Probability Letters*, 76(5), 507–512.
- Umbach, D. (2007). The effect of the skewing distribution on skew-symmetric families. *Soochow Journal of Mathematics*, 33, 657–668.
- Umbach, D. (2008). Some moment relationships for multivariate skew-symmetric distributions. *Statistics & Probability Letters*, 78(12), 1619–1623.
- Umbach, D. & Jammalamadaka, S. R. (2009). Building asymmetry into circular distributions. *Statistics & Probability Letters*, 79(5), 659–663.
- Umbach, D. & Jammalamadaka, S. R. (2010). Some moment properties of skew-symmetric circular distributions. *Metron*, LXVIII, 265–273.

- Uthaisaad, C. & Martin, R. D. (2018). The Azzalini skew- t information matrix evaluation and use for standard error calculations. Social Science Electronic Publishing, <https://ssrn.com/abstract=3258025>. Available online 30 September 2018.
- Van Oost, K., Van Muysen, W., Govers, G., Heckrath, G., Quine, T. A., & J., P. (2003). Simulation of the redistribution of soil by tillage on complex topographies. *European Journal of Soil Science*, 54(1), 63–76.
- Vernic, R. (2005). On the multivariate skew-normal distribution and its scale mixtures. *An. Șt. Univ. Ovidius Constanța*, 13(2), 83–96.
- Vernic, R. (2006). Multivariate skew-normal distributions with applications in insurance. *Insurance: Mathematics and Economics*, 38, 413–426.
- Vidal, I., Iglesias, P., Branco, M. D., & Arellano-Valle, R. B. (2006). Bayesian sensitivity analysis and model comparison for skew elliptical models. *Journal of Statistical Planning and Inference*, 136(10), 3435–3457.
- Vilca, F., Balakrishnan, N., & Zeller, C. B. (2014). Multivariate skew-normal generalized hyperbolic distribution and its properties. *Journal of Multivariate Analysis*, 128, 73–85.
- Vilca-Labra, F. & Leiva-Sánchez, V. (2006). A new fatigue life model based on the family of skew-elliptical distributions. *Communications in Statistics – Theory & Methods*, 35(2), 229–244.
- Vlainic, M., Ficker, O., Mlynar, J., Macusova, E., & the COMPASS Tokamak Team (2019). Experimental runaway electron current estimation in COMPASS Tokamak. *Atoms*, 7(1), 12.
- von Krosigk, B., Chen, M., Hans, S., Junghans, A. R., Kögler, T., Kraus, C., Kuckert, L., Liu, X., Nolte, R., O’Keefe, H. M., Tseung, H. W. C., Wilson, J. R., Wright, A., Yeh, M., & Zuber, K. (2016). Measurement of α -particle quenching in LAB based scintillator in independent small-scale experiments. *The European Physical Journal C*, 76(3), 109.
- Vrbik, I. & McNicholas, P. (2012). Analytic calculations for the EM algorithm for multivariate skew t -mixture model. *Statistics & Probability Letters*, 82, 1169–1174.
- Vrbik, I. & McNicholas, P. D. (2014). Parsimonious skew mixture models for model-based clustering and classification. *Computational Statistics and Data Analysis*, 71, 196–210. Available online 11 July 2013.
- Wahed, A. S. & Ali, M. M. (2001). The skew-logistic distribution. *Journal of Statistical Research*, 35(2), 71–80.
- Waldman, D. M. (1982). A stationary point for the stochastic frontier likelihood. *J. Econometrics*, 18, 275–279.
- Wallace, M. L., Buysse, D. J., Germain, A., Hall, M. H., & Iyengar, S. (2018). Variable selection for skewed model-based clustering: application to the identification of novel sleep phenotypes. *Journal of the American Statistical Association*, 113, 95–110. Available on line 26 June 2017.

- Walls, W. D. (2005). Modeling heavy tails and skewness in film returns. *Appl. Financial Econ.*, 15(17), 1181–1188.
- Walther, U. (2014). Diversification of higher moments in stock portfolios – an empirical investigation. *J. Applied Operational Research*, 6(4), 255–263.
- Wang, J., Boyer, J., & Genton, M. G. (2004a). A note on an equivalence between chi-square and generalized skew-normal distributions. *Statistics & Probability Letters*, 66, 395–398.
- Wang, J., Boyer, J., & Genton, M. G. (2004b). A skew-symmetric representation of multivariate distributions. *Statistica Sinica*, 14, 1259–1270.
- Wang, J. & Genton, M. G. (2006). The multivariate skew-slash distribution. *Journal of Statistical Planning and Inference*, 136, 209–220.
- Wang, K., Arellano-Valle, R. B., Azzalini, A., & Genton, M. G. (2023). On the non-identifiability of unified skew-normal distributions. *Stat*, 12, e597.
- Wang, K., Ng, S. K., & McLachlan, G. (2009a). Multivariate skew t mixture models: applications to fluorescence-activated cell sorting data. In *Proceedings of Digital Image Computing: Techniques and Applications (DICTA) 2009* (pp. 526–531).: IEEE Computer Society.
- Wang, S., Zimmerman, D. L., & Breheny, P. (2020). Sparsity-regularized skewness estimation for the multivariate skew normal and multivariate skew- t distributions. *Journal of Multivariate Analysis*, 179, 104639.
- Wang, T., Li, B., & Gupta, A. K. (2009b). Distribution of quadratic forms under skew normal settings. *Journal of Multivariate Analysis*, 100, 533–545.
- Wang, W.-L., Castro, L. M., Chang, Y.-T., & Lin, T.-I. (2018a). Mixtures of restricted skew- t factor analyzers with common factor loadings. *Adv. Data Analysis and Classification*.
- Wang, W.-L., Jamalizadeh, A., & Lin, T.-I. (2018b). Finite mixtures of multivariate scale-shape mixtures of skew-normal distributions. *Stat. Papers*, 61, 2643–2670. Available online 13 December 2018.
- Wang, W.-L. & Lin, T.-I. (2015). Robust model-based clustering via mixtures of skew- t distributions with missing information. *Advances in Data Analysis and Classification*, 9(4), 423–445.
- Wang, X., Balakrishnan, N., & Guo, B. (2016). Residual life estimation based on a generalized Wiener process with skew-normal random effects. *Communications in Statistics – Simulation & Computation*, 45, 2158–2181. Available online 02 Jun 2016.
- Wei, Z., Conlon, E. M., & Wang, T. (2021a). Asymmetric dependence in the stochastic frontier model using skew normal copula. *Int. J. Approximate Reasoning*, 128, 56–68.
- Wei, Z. & Kim, D. (2018). On multivariate asymmetric dependence using multivariate skew-normal copula-based regression. *Int. J. Approximate Reasoning*, 92, 376 – 391.

- Wei, Z., Kim, S., Choi, B., & Kim, D. (2019). Multivariate skew normal copula for asymmetric dependence: estimation and application. *Int. J. Information Tech. & Decision Making*, 18, 365–387.
- Wei, Z., Kim, S., & Kim, D. (2016). Multivariate skew normal copula for non-exchangeable dependence. *Procedia Computer Science*, 91, 141 – 150.
- Wei, Z., Zhu, X., & Wang, T. (2021b). The extended skew-normal-based stochastic frontier model with a solution to ‘wrong skewness’ problem. *Statistics: A Journal of Theoretical and Applied Statistics*, 55, 1387–1406.
- Weinstein, M. A. (1964). The sum of values from a normal and a truncated normal distribution. *Technometrics*, 6, 104–105.
- Wheat, P., Stead, A. D., & Greene, W. H. (2019). Robust stochastic frontier analysis: a Student’s t -half normal model with application to highway maintenance costs in England. *J. Productivity Analysis*, 51, 21–38.
- Wilkinson, R. D., Steiper, M. E., Soligo, C., Martin, R. D., Yang, Z., & Tavaré, S. (2011). Dating primate divergences through an integrated analysis of palaeontological and molecular data. *Systematic Biology*, 60, 16–31. Available online 04 November 2010.
- Wu, L., Meng, Q., & Velazquez, J. C. (2015). The role of multivariate skew-Student density in the estimation of stock market crashes. *European J. Finance*, 21(13–14), 1144–1160. Available online 06 Mar 2012.
- Wu, L., Tian, G.-L., Zhang, Y.-Q., & Ma, T. (2017). Variable selection in joint location, scale and skewness models with a skew- t -normal distribution. *Statistics and Its Interface*, 10, 217–227. Available online 31 October 2016.
- Wu, L.-C. (2014). Variable selection in joint location and scale models of the skew- t -normal distribution. *Communications in Statistics – Simulation & Computation*, 43(4), 615–630. Available online 18 Sep 2013.
- Wu, L.-C., Zhang, Z.-Z., & Xu, D.-K. (2013). Variable selection in joint location and scale models of the skew-normal distribution. *Journal of Statistical Computation and Simulation*, 83, 1266–1278. Available online 01 February 2012.
- Wu, Z., Li, X., Husnay, R., Chakravarthy, V., Wang, B., & Wu, Z. (2009). Novel highly accurate log skew normal approximation method to lognormal sum distributions. In *Wireless Communications and Networking Conference, WCNC 2009*: IEEE.
- Xie, F.-C., Lin, J.-G., & Wei, B.-C. (2009a). Diagnostics for skew-normal nonlinear regression models with AR(1) errors. *Computational Statistics and Data Analysis*, 53(12), 4403–4416.
- Xie, F.-C., Wei, B.-C., & Lin, J.-G. (2009b). Homogeneity diagnostics for skew-normal nonlinear regression models. *Statistics & Probability Letters*, 79(6), 821–827.
- Xu, S., Hu, Y., Dong, X., Fang, J., Zhang, X., & Hou, A. (2022). Solar panel scale inversion with higher-order statistical moments of echo laser pulse waveform. *Optical Engineering*, 61, 1–14.

- Yadegari, I., Gerami, A., & Khaledi, M. J. (2008). A generalization of the Balakrishnan skew-normal distribution. *Statistics & Probability Letters*, 78(10), 1165–1167.
- Yalçinkaya, A., Şenoğlu, B., & Yolcu, U. (2018). Maximum likelihood estimation for the parameters of skew normal distribution using genetic algorithm. *Swarm and Evolutionary Computation*, 38, 127–138.
- Yalçinkaya, A., Yolcu, U., & Şenoğlu, B. (2021). Maximum likelihood and maximum product of spacings estimations for the parameters of skew-normal distribution under doubly type II censoring using genetic algorithm. *Expert Systems with Applications*, 168, 114407. Available online 13 December 2020.
- Yan, C., Chen, R., & Huang, Y. (2016). Mixed-effects models with skewed distributions for time-varying decay rate in HIV dynamics. *Communications in Statistics – Theory & Methods*, 45, 737–757. Available online 30 Oct 2015.
- Ye, R., Wang, T., & Gupta, A. K. (2014). Distribution of matrix quadratic forms under skew-normal settings. *Journal of Multivariate Analysis*, 131, 229–239.
- Yilmaz, S., Emre Cek, M., & Acar Savaci, F. (2018). Stochastic bifurcation in generalized Chua’s circuit driven by skew-normal distributed noise. *Fluctuation and Noise Letters*, 17(4), 1830002.
- Yoshida, T. (2018). Maximum likelihood estimation of skew- t copulas with its applications to stock returns. *Journal of Statistical Computation and Simulation*, 88(13), 2489–2506.
- Young, P. D., Harvill, J. L., & Young, D. M. (2016). A derivation of the multivariate singular skew-normal density function. *Statistics & Probability Letters*, 117, 40–45.
- Young, P. D., Kahle, D. J., & Young, D. M. (2017). On the independence of singular multivariate skew-normal sub-vectors. *Statistics & Probability Letters*, 122, 58–62.
- Yu, B., O’Malley, A. J., & Ghosh, P. (2014). Linear mixed models for multiple outcomes using extended multivariate skew- t distributions. *Stat Interface*, 7, 101–111.
- Zakaria, R., Metcalfe, A., Piantadosi, J., Boland, J., & Howlett, P. (2010). Using the skew- t copula to model bivariate rainfall distribution. *ANZIAM J.*, 51, C231–C246.
- Zanotto, L. (2012). Indici di curtosi per la distribuzione normale asimmetrica multivariata. Tesi di laurea magistrale, Facoltà di Scienze Statistiche, Università di Padova, Padova, Italia. <https://hdl.handle.net/20.500.12608/16391>.
- Zanotto, L. (2017). *A mixture model to distinguish mortality components*. PhD thesis, Department of Statistical Sciences, University of Padua.
- Zanotto, L., Canudas-Romo, V., & Mazzucco, S. (2021). A mixture-function mortality model: illustration of the evolution of premature mortality. *Eur. J. Population*, 37, 1–27. Available online 20 March 2020.

- Zareifard, H. & Jafari Khaledi, M. (2013). Non-Gaussian modeling of spatial data using scale mixing of a unified skew Gaussian process. *Journal of Multivariate Analysis*, 114, 16–28.
- Zareifard, H., Rue, H., Khaledi, M. J., & Lindgren, F. (2016). A skew Gaussian decomposable graphical model. *Journal of Multivariate Analysis*, 145, 58–72. Available online 28 August 2015.
- Zarrin, P., Maleki, M., Khodadai, Z., & Arellano-Valle, R. B. (2019). Time series models based on the unrestricted skew-normal process. *Journal of Statistical Computation and Simulation*, 89, 38–51. Available online 15 October 2018.
- Zeller, C. B., Cabral, C. R. B., & Lachos, V. H. (2016). Robust mixture regression modeling based on scale mixtures of skew-normal distributions. *Test*, 25, 375–396. Available online 19 July 2015.
- Zeng, L., Neogi, S., & Zhou, Q. (2014). Robust Phase I monitoring of profile data with application in low-E glass manufacturing processes. *J. Manufacturing Systems*, 33(4), 508–521.
- Zeng, X., Ju, Y., & Wu, L. (2023). Variable selection in finite mixture of median regression models using skew-normal distribution. *Statistical Theory and Related Fields*, 7, 30–48. Available online 06 August 2022.
- Zhang, H. & El-Shaarawi, A. (2010). On spatial skew-Gaussian processes and applications. *Environmetrics*, 21, 33–47. Available online 17 March 2009.
- Zhang, Z., Arellano-Valle, R. B., Genton, M. G., & Huser, R. (2023). Tractable Bayes of skew-elliptical linkmodels for correlated binary data. *Biometrics*, 79, 1788–1800. Available online 11 August 2022.
- Zheng, C. L. & Huang, D. D. (2011). The dynamics of VaRs with skew t distribution for A300 index in China. *Appl. Mechan. Materials*, 135–136, 1051–1056.
- Zheng, S., Knisley, J., & Wang, K. (2016). Moments and quadratic forms of matrix variate skew normal distributions. *Communications in Statistics – Theory & Methods*, 45(3), 794–803. Available online 01 April 2015.
- Zheng, S., Knisley, J., & Zhang, C. (2013a). Moments of matrix variate skew elliptically contoured distributions. *Advances and Applications in Statistics*, 36(1), 13–27.
- Zheng, S., Zhang, C., & Knisley, J. (2013b). Stochastic representations of the matrix variate skew elliptically contoured distributions. *Advances and Applications in Statistics*, 33(2), 83–98.
- Zhou, J. & Wang, X. (2008). Accurate closed-form approximation for pricing Asian and basket options. *Appl. Stoch. Model. Bus. Ind.*, 24(4), 343–358.
- Zhou, R. & Palomar, D. P. (2019). Accelerating the multivariate SKEW T parameter estimation. In *IEEE 8th International Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP)* (pp. 251–255).

- Zhou, T. & He, X. (2008). Three-step estimation in linear mixed models with skew- t distributions. *Journal of Statistical Planning and Inference*, 138(6), 1542–1555.
- Zhu, S.-P. & He, X.-J. (2018). A new closed-form formula for pricing European options under a skew Brownian motion. *European J. Finance*, 24, 1063–1074. Available online 15 June 2017.
- Zhu, X., Li, B., Wu, M., & Wang, T. (2018). Plausibility regions on parameters of the skew normal distribution based on inferential models. In V. Kreinovich, S. Sriboonchitta, & N. Chakpitak (Eds.), *TES2018: Predictive Econometrics and Big Data*, volume 753 of *Studies in Computational Intelligence* (pp. 287–302).: Thailand Econometric Society Springer. Available online 02 December 2017.
- Zhu, X., Ma, Z., Wang, T., & Teetranont, T. (2017). Plausibility regions on the skewness parameter of skew normal distributions based on inferential models. In V. Kreinovich, S. Sriboonchitta, & V.-N. Huynh (Eds.), *Robustness in Econometrics*, volume 692 of *Studies in Computational Intelligence* (pp. 267–286). Springer Internat. Publ.
- Zhu, X., Wei, Z., Wang, T., Choy, S. T. B., & Ma, Z. (2023). An expectation conditional maximization algorithm for the skew-normal based stochastic frontier model. *Computational Statistics*, to appear, to appear. Available online 02 May 2023.