

# Publications of Frank Nielsen

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## References

- [1] Gautier Marti, Sébastien Andler, Frank Nielsen, and Philippe Donnat. “Clustering Financial Time Series: How Long is Enough?” In: *arXiv preprint arXiv:1603.04017* (2016).
- [2] Gautier Marti, Frank Nielsen, and Philippe Donnat. “Optimal copula transport for clustering multivariate time series”. In: *2016 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*. IEEE. 2016, pp. 2379–2383.
- [3] Boris Muzellec, Richard Nock, Giorgio Patrini, and Frank Nielsen. “Tsallis Regularized Optimal Transport and Ecological Inference”. In: *arXiv preprint arXiv:1609.04495* (2016).
- [4] Frank Nielsen. “A Glance at High Performance Computing (HPC)”. In: *Introduction to HPC with MPI for Data Science*. Springer International Publishing, 2016, pp. 3–20.
- [5] Frank Nielsen. “Fast Approximate Optimization in High Dimensions with Core-Sets and Fast Dimension Reduction”. In: *Introduction to HPC with MPI for Data Science*. Springer International Publishing, 2016, pp. 231–244.
- [6] Frank Nielsen. “Hierarchical Clustering”. In: *Introduction to HPC with MPI for Data Science*. Springer International Publishing, 2016, pp. 195–211.
- [7] Frank Nielsen. “Image and Information”. In: *arXiv preprint arXiv:1602.01228* (2016).
- [8] Frank Nielsen. *Introduction to HPC with MPI for Data Science*. 2016.
- [9] Frank Nielsen. “Parallel Linear Algebra”. In: *Introduction to HPC with MPI for Data Science*. Springer International Publishing, 2016, pp. 121–145.
- [10] Frank Nielsen. “Partition-Based Clustering with k-Means”. In: *Introduction to HPC with MPI for Data Science*. Springer International Publishing, 2016, pp. 163–193.
- [11] Frank Nielsen. “Supervised Learning: Practice and Theory of Classification with the k-NN Rule”. In: *Introduction to HPC with MPI for Data Science*. Springer International Publishing, 2016, pp. 213–229.
- [12] Frank Nielsen. “The MapReduce Paradigm”. In: *Introduction to HPC with MPI for Data Science*. Springer International Publishing, 2016, pp. 147–160.
- [13] Frank Nielsen. “Topology of Interconnection Networks”. In: *Introduction to HPC with MPI for Data Science*. Springer International Publishing, 2016, pp. 63–97.
- [14] Frank Nielsen, Boris Muzellec, and Richard Nock. “Classification with mixtures of curved mahalanobis metrics”. In: *2016 IEEE International Conference on Image Processing (ICIP)*. IEEE. 2016, pp. 241–245.
- [15] Frank Nielsen and Ke Sun. “Guaranteed bounds on the Kullback-Leibler divergence of univariate mixtures using piecewise log-sum-exp inequalities”. In: *arXiv preprint arXiv:1606.05850* (2016).
- [16] Richard Nock, Raphaël Canyasse, Roksana Boreli, and Frank Nielsen. “k-variates++: more pluses in the k-means++”. In: *arXiv preprint arXiv:1602.01198* (2016).

- [17] Richard Nock, Frank Nielsen, and Shun-ichi Amari. “On conformal divergences and their population minimizers”. In: *IEEE Transactions on Information Theory* 62.1 (2016), 527–538.
- [18] Giorgio Patrini, Frank Nielsen, Richard Nock, and Marcello Carioni. “Loss factorization, weakly supervised learning and label noise robustness”. In: *arXiv preprint arXiv:1602.02450* (2016).
- [19] Olivier Schwander, Frank Nielsen, et al. “Comix: Joint estimation and lightspeed comparison of mixture models”. In: *2016 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*. IEEE. 2016, pp. 2449–2453.
- [20] Ke Sun and Frank Nielsen. “Relative Natural Gradient for Learning Large Complex Models”. In: *arXiv preprint arXiv:1606.06069* (2016).
- [21] Junlin Yao and Frank Nielsen. “SSSC-AM: A UNIFIED FRAMEWORK FOR VIDEO CO-SEGMENTATION BY STRUCTURED SPARSE SUBSPACE CLUSTERING WITH APPEARANCE AND MOTION FEATURES”. In: *2016 IEEE International Conference on Image Processing (ICIP)*. IEEE. 2016, pp. 3957–3961.
- [22] Gautier Marti, Philippe Donnat, Frank Nielsen, and Philippe Very. “HCMapper: An interactive visualization tool to compare partition-based flat clustering extracted from pairs of dendrograms”. In: *arXiv preprint arXiv:1507.08137* (2015).
- [23] Gautier Marti, Frank Nielsen, Philippe Very, and Philippe Donnat. “Clustering Random Walk Time Series”. In: *International Conference on Networked Geometric Science of Information*. Springer International Publishing. 2015, pp. 675–684.
- [24] Gautier Marti, Frank Nielsen, Philippe Very, and Philippe Donnat. “Comment partitionner automatiquement des marches aléatoires ? Avec application à la finance quantitative”. In: *GRETSI*. 2015.
- [25] Gautier Marti, Philippe Very, Philippe Donnat, and Frank Nielsen. “A proposal of a methodological framework with experimental guidelines to investigate clustering stability on financial time series”. In: *arXiv preprint arXiv:1509.05475* (2015).
- [26] Frank Nielsen and Frédéric Barbaresco. *Geometric Science of Information: Second International Conference, GSI 2015, Palaiseau, France, October 28-30, 2015, Proceedings*. 2015.
- [27] Frank Nielsen and Gaëtan Hadjeres. “Approximating Covering and Minimum Enclosing Balls in Hyperbolic Geometry”. In: *International Conference on Networked Geometric Science of Information*. Springer International Publishing. 2015, pp. 586–594.
- [28] Frank Nielsen and Richard Nock. “Total Jensen divergences: definition, properties and clustering”. In: *2015 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*. IEEE. 2015, pp. 2016–2020.
- [29] Richard Nock, Wafa Bel Haj Ali, Roberto D’Ambrosio, Frank Nielsen, and Michel Barlaud. “Gentle nearest neighbors boosting over proper scoring rules”. In: *IEEE transactions on pattern analysis and machine intelligence* 37.1 (2015), 80–93.
- [30] Giorgio Patrini, Frank Nielsen, and Richard Nock. “Bridging weak supervision and privacy aware learning via sufficient statistics”. In: *NIPS 2015, workshop on Learning and privacy with incomplete data and weak supervision*. 2015.
- [31] Christophe Saint-Jean and Frank Nielsen. “Online k-MLE for mixture modeling with exponential families”. In: *International Conference on Networked Geometric Science of Information*. Springer International Publishing. 2015, pp. 340–348.
- [32] Olivier Schwander and Frank Nielsen. “Bag-of-components: an online algorithm for batch learning of mixture models”. In: *International Conference on Networked Geometric Science of Information*. Springer International Publishing. 2015, pp. 387–395.
- [33] Olivier Schwander and Frank Nielsen. “Estimation jointe et en ligne de modèles de mélanges avec les co-mélanges et les sacs de composantes”. In: *GRETSI*. 2015.

- [34] Frank Nielsen. “Generalized Bhattacharyya and Chernoff upper bounds on Bayes error using quasi-arithmetic means”. In: *Pattern Recognition Letters* 42 (2014), 25–34.
- [35] Frank Nielsen. *Geometric Theory of Information*. 2014.
- [36] Frank Nielsen. *Information processing apparatus, information processing method, and computer program*. 2014.
- [37] Frank Nielsen. “On learning statistical mixtures maximizing the complete likelihood”. In: *Bayesian Inference and Maximum Entropy Methods in Science and Engineering (MaxEnt 2014), AIP Conference Proceedings Publishing*. Vol. 1641. 2014, pp. 238–245.
- [38] Frank Nielsen and Richard Nock. “A note on the optimal scalar Bregman k-means clustering with an application to learning best statistical mixtures”. In: *arXiv preprint arXiv:1403.2485* (2014).
- [39] Frank Nielsen and Richard Nock. “Further results on the hyperbolic Voronoi diagrams”. In: *arXiv preprint arXiv:1410.1036* (2014).
- [40] Frank Nielsen and Richard Nock. “Optimal interval clustering: Application to Bregman clustering and statistical mixture learning”. In: *IEEE Signal Processing Letters* 21.10 (2014), 1289–1292.
- [41] Frank Nielsen and Richard Nock. “Visualizing hyperbolic Voronoi diagrams”. In: *Proceedings of the thirtieth annual symposium on Computational geometry*. ACM. 2014, p. 90.
- [42] Frank Nielsen, Richard Nock, and Shun-ichi Amari. “On clustering histograms with k-means by using mixed  $\alpha$ -divergences”. In: *Entropy* 16.6 (2014), 3273–3301.
- [43] Christophe Saint-Jean and Frank Nielsen. “Hartigans method for k-MLE: mixture modeling with Wishart distributions and its application to motion retrieval”. In: *Geometric Theory of Information*. Springer International Publishing, 2014, pp. 301–330.
- [44] Wafa Bel Haj Ali, Richard Nock, Franck Nielsen, and Michel Barlaud. “Fast Newton Nearest Neighbors Boosting For Image Classification”. In: *MLSP-23rd Workshop on Machine Learning for Signal Processing*. IEEE. 2013, p. 6.
- [45] Marc Arnaudon and Frank Nielsen. “On approximating the Riemannian 1-center”. In: *Computational Geometry* 46.1 (2013), 93–104.
- [46] Marc Arnaudon and Frank Nielsen. “On the Smallest Enclosing Riemannian Balls”. In: *Computational Geometry* 46.1 (2013), 93–104.
- [47] Frank Nielsen. “An information-geometric characterization of Chernoff information”. In: *IEEE Signal Processing Letters* 20.3 (2013), 269–272.
- [48] Frank Nielsen. “Cramer-Rao lower bound and information geometry”. In: *arXiv preprint arXiv:1301.3578* (2013).
- [49] Frank Nielsen. “Hypothesis testing, information divergence and computational geometry”. In: *Geometric Science of Information*. Springer Berlin Heidelberg, 2013, pp. 241–248.
- [50] Frank Nielsen. *Image processing apparatus, image processing method, and program*. 2013.
- [51] Frank Nielsen. “Jeffreys centroids: A closed-form expression for positive histograms and a guaranteed tight approximation for frequency histograms”. In: *IEEE Signal Processing Letters* 20.7 (2013), 657–660.
- [52] Frank Nielsen. “Logging safely in public spaces using color PINs”. In: *arXiv preprint arXiv:1304.6499* (2013).
- [53] Frank Nielsen. “On the symmetrical Kullback-Leibler Jeffreys centroids”. In: *arXiv preprint arXiv:1303.7286* (2013).
- [54] Frank Nielsen. “Pattern learning and recognition on statistical manifolds: an information-geometric review”. In: *International Workshop on Similarity-Based Pattern Recognition*. Springer Berlin Heidelberg, 2013, pp. 1–25.

- [55] Frank Nielsen. “Perspective click-and-drag area selections in pictures.” In: *MVA*. 2013, pp. 29–32.
- [56] Frank Nielsen and Frédéric Barbaresco. *Geometric Science of Information: First International Conference, GSI 2013, Paris, France, August 28-30, 2013, Proceedings*. 2013.
- [57] Frank Nielsen and Rajendra Bhatia. *Matrix information geometry*. 2013.
- [58] Frank Nielsen, Meizhu Liu, and Baba C Vemuri. “Jensen divergence-based means of SPD matrices”. In: *Matrix Information Geometry*. Springer Berlin Heidelberg, 2013, pp. 111–122.
- [59] Frank Nielsen and Richard Nock. “Consensus Region Merging for Image Segmentation”. In: *2013 2nd IAPR Asian Conference on Pattern Recognition*. IEEE. 2013, pp. 325–329.
- [60] Frank Nielsen and Richard Nock. “On the chi square and higher-order chi distances for approximating f-divergences”. In: *arXiv preprint arXiv:1309.3029* (2013).
- [61] Frank Nielsen and Richard Nock. “Total Jensen divergences: Definition, Properties and k-Means++ Clustering”. In: *arXiv preprint arXiv:1309.7109* (2013).
- [62] Frank Nielsen, Richard Nock, and Shun-ichi Amari. “Sided, symmetrized and mixed  $\alpha$ -clustering”. In: *Entropy* 20 (2013), 2.
- [63] Richard Nock, Brice Magdalou, Eric Briys, and Frank Nielsen. “Mining matrix data with Bregman matrix divergences for portfolio selection”. In: *Matrix Information Geometry*. Springer Berlin Heidelberg, 2013, pp. 373–402.
- [64] Richard Nock and Frank Nielsen. “Information-geometric lenses for multiple foci+ contexts interfaces”. In: *SIGGRAPH Asia 2013 Technical Briefs*. ACM. 2013, p. 18.
- [65] Richard Nock, Frank Nielsen, and Eric Briys. “Non-linear book manifolds: learning from associations the dynamic geometry of digital libraries”. In: *Proceedings of the 13th ACM/IEEE-CS joint conference on Digital libraries*. ACM. 2013, pp. 313–322.
- [66] Paolo Piro, Michel Barlaud, Richard Nock, and Frank Nielsen. “K-NN boosting prototype learning for object classification”. In: *Analysis, Retrieval and Delivery of Multimedia Content*. Springer New York, 2013, pp. 37–53.
- [67] Paolo Piro, Richard Nock, Wafa Bel Haj Ali, Frank Nielsen, and Michel Barlaud. “Boosting k-nearest neighbors classification”. In: *Advanced Topics in Computer Vision*. Springer London, 2013, pp. 341–375.
- [68] Christophe Saint-Jean and Frank Nielsen. “A new implementation of k-MLE for mixture modeling of Wishart distributions”. In: *Geometric Science of Information*. Springer Berlin Heidelberg, 2013, pp. 249–256.
- [69] Olivier Schwander and Frank Nielsen. “Fast learning of Gamma mixture models with k-MLE”. In: *International Workshop on Similarity-Based Pattern Recognition*. Springer Berlin Heidelberg. 2013, pp. 235–249.
- [70] Olivier Schwander and Frank Nielsen. “Learning mixtures by simplifying kernel density estimators”. In: *Matrix Information Geometry*. Springer Berlin Heidelberg, 2013, pp. 403–426.
- [71] Miklós Abért and Gabor Elek. “Hyperfinite actions on countable sets and probability measure spaces”. In: *Dynamical systems and group actions* 116 (2012).
- [72] Marc Arnaudon and Frank Nielsen. “Medians and means in Finsler geometry”. In: *LMS Journal of Computation and Mathematics* 15 (2012), 23–37.
- [73] Roberto D’Ambrosio, Wafa Bel Haj Ali, Richard Nock, Paolo Soda, Frank Nielsen, and Michel Barlaud. “Biomedical images classification by universal nearest neighbours classifier using posterior probability”. In: *International Workshop on Machine Learning in Medical Imaging*. Springer Berlin Heidelberg. 2012, pp. 119–127.

- [74] Roberto D'Ambrosio, Richard Nock, Wafa Bel Haj Ali, Frank Nielsen, and Michel Barlaud. “Boosting nearest neighbors for the efficient estimation of posteriors”. In: *Joint European Conference on Machine Learning and Knowledge Discovery in Databases*. Springer Berlin Heidelberg, 2012, pp. 314–329.
- [75] Meizhu Liu, Baba C Vemuri, Shun-ichi Amari, and Frank Nielsen. “Shape retrieval using hierarchical total Bregman soft clustering”. In: *IEEE transactions on pattern analysis and machine intelligence* 34.12 (2012), 2407–2419.
- [76] Frank Nielsen. “A glance at information-geometric signal processing”. In: (2012).
- [77] Frank Nielsen. “August 2012”. In: (2012).
- [78] Frank Nielsen. “Closed-form information-theoretic divergences for statistical mixtures”. In: *Pattern Recognition (ICPR), 2012 21st International Conference on*. IEEE, 2012, pp. 1723–1726.
- [79] Frank Nielsen. *Information processing device and information processing method, image processing device and image processing method, and computer program*. 2012.
- [80] Frank Nielsen. “k-MLE: A fast algorithm for learning statistical mixture models”. In: *2012 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*. IEEE, 2012, pp. 869–872.
- [81] Frank Nielsen. “Perspective dragging: quick area selection in photos”. In: *SIGGRAPH Asia 2012 Posters*. ACM, 2012, p. 18.
- [82] Frank Nielsen and Yuichi Hasegawa. *Image processing apparatus, image processing method, and computer program*. 2012.
- [83] Frank Nielsen, Meizhu Liu, Xiaojing Ye, and Baba C Vemuri. “Jensen divergence based SPD matrix means and applications”. In: *Pattern Recognition (ICPR), 2012 21st International Conference on*. IEEE, 2012, pp. 2841–2844.
- [84] Frank Nielsen and Richard Nock. “The hyperbolic voronoi diagram in arbitrary dimension”. In: *arXiv preprint arXiv:1210.8234* (2012).
- [85] Richard Nock, Paolo Piro, Frank Nielsen, Wafa Bel Haj Ali, and Michel Barlaud. “Boosting k-NN for categorization of natural scenes”. In: *International journal of computer vision* 100.3 (2012), 294–314.
- [86] Paolo Piro, Richard Nock, Frank Nielsen, and Michel Barlaud. “Leveraging k-NN for generic classification boosting”. In: *Neurocomputing* 80 (2012), 3–9.
- [87] Olivier Schwander and Frank Nielsen. “Model centroids for the simplification of kernel density estimators”. In: *2012 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*. IEEE, 2012, pp. 737–740.
- [88] Olivier Schwander, Aurélien J Schutz, Frank Nielsen, and Yannick Berthoumieu. “k-MLE for mixtures of generalized Gaussians”. In: *Pattern Recognition (ICPR), 2012 21st International Conference on*. IEEE, 2012, pp. 2825–2828.
- [89] Thomas Houit and Frank Nielsen. “Video stippling”. In: *International Conference on Advanced Concepts for Intelligent Vision Systems*. Springer Berlin Heidelberg, 2011, pp. 384–395.
- [90] Frank Nielsen. “Chernoff information of exponential families”. In: *arXiv preprint arXiv:1102.2684* (2011).
- [91] Frank Nielsen. *Image processing apparatus, image processing method and computer program*. 2011.
- [92] Frank Nielsen and Sylvain Boltz. “The burbea-rao and bhattacharyya centroids”. In: *IEEE Transactions on Information Theory* 57.8 (2011), 5455–5466.
- [93] Frank Nielsen and Richard Nock. “A closed-form expression for the Sharma–Mittal entropy of exponential families”. In: *Journal of Physics A: Mathematical and Theoretical* 45.3 (2011), 032003.
- [94] Frank Nielsen and Richard Nock. “On Rényi and Tsallis entropies and divergences for exponential families”. In: *arXiv preprint arXiv:1105.3259* (2011).

- [95] Frank Nielsen and Richard Nock. “Skew jensen-bregman voronoi diagrams”. In: *Transactions on Computational Science XIV*. Springer Berlin Heidelberg, 2011, pp. 102–128.
- [96] Richard Nock, Brice Magdalou, Eric Briys, and Frank Nielsen. “On tracking portfolios with certainty equivalents on a generalization of markowitz model: the fool, the wise and the adaptive”. In: *Proceedings of the 28th International Conference on Machine Learning (ICML-11)*. 2011, pp. 73–80.
- [97] Olivier Schwander and Frank Nielsen. “Non-flat clustering with alpha-divergences”. In: *2011 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*. IEEE. 2011, pp. 2100–2103.
- [98] Olivier Schwander and Frank Nielsen. “PyMEFA framework for exponential families in Python”. In: *2011 IEEE Statistical Signal Processing Workshop (SSP)*. IEEE. 2011, pp. 669–672.
- [99] Olivier Schwander and Frank Nielsen. “Simplification de modèles de mélange issus destimateur par noyau”. In: *Gretsi*. Vol. 2011. 2011, p. 150.
- [100] Baba C Vemuri, Meizhu Liu, Shun-Ichi Amari, and Frank Nielsen. “Total Bregman divergence and its applications to DTI analysis”. In: *IEEE Transactions on medical imaging* 30.2 (2011), 475–483.
- [101] Caroline Ventura, Fred Célimene, Richard Nock, and Frank Nielsen. “Predicting and interpreting business failures with supervised information geometric algorithms”. In: *Biannual International Conference on Business, Banking and Finance*. UWI. 2011.
- [102] Jean-Daniel Boissonnat, Frank Nielsen, and Richard Nock. “Bregman voronoi diagrams”. In: *Discrete & Computational Geometry* 44.2 (2010), 281–307.
- [103] Sylvain Boltz and Frank Nielsen. “Randomized motion estimation”. In: *2010 IEEE International Conference on Image Processing*. IEEE. 2010, pp. 781–784.
- [104] Sylvain Boltz, Frank Nielsen, and Stefano Soatto. “Earth mover distance on superpixels”. In: *2010 IEEE International Conference on Image Processing*. IEEE. 2010, pp. 4597–4600.
- [105] Sylvain Boltz, Frank Nielsen, and Stefano Soatto. “Texture regimes for entropy-based multiscale image analysis”. In: *European Conference on Computer Vision*. Springer Berlin Heidelberg. 2010, pp. 692–705.
- [106] Vincent Garcia, Eric Debreuve, Frank Nielsen, and Michel Barlaud. “K-nearest neighbor search: Fast GPU-based implementations and application to high-dimensional feature matching”. In: *2010 IEEE International Conference on Image Processing*. IEEE. 2010, pp. 3757–3760.
- [107] Vincent Garcia and Frank Nielsen. “Simplification and hierarchical representations of mixtures of exponential families”. In: *Signal Processing* 90.12 (2010), 3197–3212.
- [108] Vincent Garcia, Frank Nielsen, and Richard Nock. “Hierarchical Gaussian Mixture Model.” In: *ICASSP*. 2010, pp. 4070–4073.
- [109] Meizhu Liu, Baba C Vemuri, Shun-Ichi Amari, and Frank Nielsen. “Total bregman divergence and its applications to shape retrieval”. In: *Computer Vision and Pattern Recognition (CVPR), 2010 IEEE Conference on*. IEEE. 2010, pp. 3463–3468.
- [110] Frank Nielsen. “A family of statistical symmetric divergences based on Jensen’s inequality”. In: *arXiv preprint arXiv:1009.4004* (2010).
- [111] Frank Nielsen. *Legendre transformation and information geometry*. 2010.
- [112] Frank Nielsen. “Limits from lHôpital rule: Shannon entropy as limit cases of Rényi and Tsallis entropies”. In: (2010).
- [113] Frank Nielsen and Sylvain Boltz. “Persistence of features for robust image matching”. In: (2010).
- [114] Frank Nielsen, Sylvain Boltz, and Olivier Schwander. “Bhattacharyya clustering with applications to mixture simplifications”. In: *Pattern Recognition (ICPR), 2010 20th International Conference on*. IEEE. 2010, pp. 1437–1440.

- [115] Frank Nielsen and Richard Nock. “Entropies and cross-entropies of exponential families”. In: *2010 IEEE International Conference on Image Processing*. IEEE. 2010, pp. 3621–3624.
- [116] Frank Nielsen and Richard Nock. “Hyperbolic Voronoi diagrams made easy”. In: *Computational Science and Its Applications (ICCSA), 2010 International Conference on*. IEEE. 2010, pp. 74–80.
- [117] Frank Nielsen and Richard Nock. “Jensen-Bregman Voronoi diagrams and centroidal tessellations”. In: *Voronoi Diagrams in Science and Engineering (ISVD), 2010 International Symposium on*. IEEE. 2010, pp. 56–65.
- [118] Frank Nielsen and Shigeru Owada. *Image processing apparatus and image processing method*. 2010.
- [119] Frank Nielsen and Olivier Schwander. “Géométrie post-Euclidienne pour les moteurs de recherche multimédia”. In: (2010).
- [120] Paolo Piro, Richard Nock, Frank Nielsen, and Michel Barlaud. “Leveraging K-nn for generic classification boosting”. In: *2010 IEEE International Workshop on Machine Learning for Signal Processing*. IEEE. 2010, pp. 142–147.
- [121] Paolo Piro, Richard Nock, Frank Nielsen, and Michel Barlaud. “Boosting Bayesian MAP Classification”. In: *Pattern Recognition (ICPR), 2010 20th International Conference on*. IEEE. 2010, pp. 661–665.
- [122] Paolo Piro, Richard Nock, Frank Nielsen, and Michel Barlaud. “Boosting k-NN for categorization of natural scenes”. In: *arXiv preprint arXiv:1001.1221* (2010).
- [123] Paolo Piro, Richard Nock, Frank Nielsen, and Michel Barlaud. “Multi-class Leveraged  $\kappa$ -NN for Image Classification”. In: *Asian Conference on Computer Vision*. Springer Berlin Heidelberg. 2010, pp. 67–81.
- [124] Olivier Schwander and Frank Nielsen. “Reranking with Contextual Dissimilarity Measures from Representational Bregman k-Means.” In: *VISAPP (1)*. 2010, pp. 118–123.
- [125] Vincent Garcia and Frank Nielsen. “Searching high-dimensional neighbours: Cpu-based tailored data-structures versus gpu-based brute-force method”. In: *International Conference on Computer Vision/Computer Graphics Collaboration Techniques and Applications*. Springer Berlin Heidelberg. 2009, pp. 425–436.
- [126] Vincent Garcia, Frank Nielsen, and Richard Nock. “Levels of details for gaussian mixture models”. In: *Asian Conference on Computer Vision*. Springer Berlin Heidelberg. 2009, pp. 514–525.
- [127] David Hutchison, Madhu Sudan, Demetri Terzopoulos, Gerhard Weikum, C Pandu Rangan, Doug Tygar, Takeo Kanade, Bernhard Steffen, Oscar Nierstrasz, Frank Nielsen, et al. “Emerging Trends in Visual Computing: LIX Fall Colloquium, ETVC 2008, Palaiseau, France, November 18-20, 2008. Revised Invited Papers”. In: *Lecture Notes in Computer Science* (2009).
- [128] Frank Nielsen. *A concise and practical introduction to programming algorithms in Java*. 2009.
- [129] Frank Nielsen. “Abstracts of the LIX Fall Colloquium 2008: Emerging Trends in Visual Computing”. In: *Emerging Trends in Visual Computing*. Springer Berlin Heidelberg, 2009, pp. 1–12.
- [130] Frank Nielsen. “Computational information geometry: Pursuing the meaning of distances”. In: *Open Systems Science* (2009).
- [131] Frank Nielsen. “Conditional Structures and Loops”. In: *A Concise and Practical Introduction to Programming Algorithms in Java*. Springer London, 2009, pp. 1–25.
- [132] Frank Nielsen. *Emerging Trends in Visual Computing: LIX Fall Colloquium, ETVC 2008, Palaiseau, France, November 18-20, 2008, Revised Selected and Invited Papers*. 2009.
- [133] Frank Nielsen. “Functions and Recursive Functions”. In: *A Concise and Practical Introduction to Programming Algorithms in Java*. Springer London, 2009, pp. 1–25.
- [134] Frank Nielsen. “List of journal publications”. In: (2009).

- [135] Frank Nielsen. “Object-Oriented Data-Structures”. In: *A Concise and Practical Introduction to Programming Algorithms in Java*. Springer London, 2009, pp. 1–22.
- [136] Frank Nielsen. “Searching and Sorting”. In: *A Concise and Practical Introduction to Programming Algorithms in Java*. Springer London, 2009, pp. 1–17.
- [137] Frank Nielsen. “Technical opinion Steering self-learning distance algorithms”. In: *Communications of the ACM* 52.11 (2009), 150–152.
- [138] Frank Nielsen and Vincent Garcia. “Statistical exponential families: A digest with flash cards”. In: *arXiv preprint arXiv:0911.4863* (2009).
- [139] Frank Nielsen, Vincent Garcia, and Richard Nock. “Simplifying Gaussian mixture models via entropic quantization”. In: *Signal Processing Conference, 2009 17th European*. IEEE. 2009, pp. 2012–2016.
- [140] Frank Nielsen and R Nock. “Emerging trends in visual computing”. In: *Lecture Notes in Computer Science* 6 (2009).
- [141] Frank Nielsen and Richard Nock. “Approximating smallest enclosing balls with applications to machine learning”. In: *International Journal of Computational Geometry & Applications* 19.05 (2009), 389–414.
- [142] Frank Nielsen and Richard Nock. “Clustering multivariate normal distributions”. In: *Emerging Trends in Visual Computing*. Springer Berlin Heidelberg, 2009, pp. 164–174.
- [143] Frank Nielsen and Richard Nock. “Sided and symmetrized Bregman centroids”. In: *IEEE transactions on Information Theory* 55.6 (2009), 2882–2904.
- [144] Frank Nielsen and Richard Nock. “The dual Voronoi diagrams with respect to representational Bregman divergences”. In: *Voronoi Diagrams, 2009. ISVD’09. Sixth International Symposium on*. IEEE. 2009, pp. 71–78.
- [145] Frank Nielsen, Paolo Piro, and Michel Barlaud. “Bregman vantage point trees for efficient nearest neighbor queries”. In: *2009 IEEE International Conference on Multimedia and Expo*. IEEE. 2009, pp. 878–881.
- [146] Frank Nielsen, Paolo Piro, and Michel Barlaud. “Tailored Bregman ball trees for effective nearest neighbors”. In: *Proceedings of the 25th European Workshop on Computational Geometry (EuroCG)*. 2009, pp. 29–32.
- [147] Frank Nielsen and Aurélien Sérandour. “Accuracy of distance metric learning algorithms”. In: *Proceedings of the 2nd Workshop on Data Mining using Matrices and Tensors*. ACM. 2009, p. 1.
- [148] Frank Nielsen and Kosuke Suzuki. *Image processing apparatus and image processing method for non-planar image, storage medium, and computer program*. 2009.
- [149] Richard Nock, Brice Magdalou, Nicolas Sanz, Eric Briys, Fred Celimene, and Frank Nielsen. “Information geometries and microeconomic theories”. In: *arXiv preprint arXiv:0901.2586* (2009).
- [150] Richard Nock and Frank Nielsen. “Bregman divergences and surrogates for learning”. In: *IEEE Transactions on Pattern Analysis and Machine Intelligence* 31.11 (2009), 2048–2059.
- [151] Richard Nock and Frank Nielsen. “Intrinsic geometries in learning”. In: *Emerging Trends in Visual Computing*. Springer Berlin Heidelberg, 2009, pp. 175–215.
- [152] Richard Nock and Frank Nielsen. “On the efficient minimization of classification calibrated surrogates”. In: *Advances in neural information processing systems*. 2009, pp. 1201–1208.
- [153] Richard Nock, Pascal Vaillant, Claudia Henry, and Frank Nielsen. “Soft memberships for spectral clustering, with application to permeable language distinction”. In: *Pattern Recognition* 42.1 (2009), 43–53.
- [154] Natalia Polouliakh, Richard Nock, Frank Nielsen, and Hiroaki Kitano. “G-protein coupled receptor signaling architecture of mammalian immune cells”. In: *PLoS One* 4.1 (2009), e4189.

- [155] Natalia Polouliakh, Richard Nock, Frank Nielsen, and Hiroaki Kitano. *Gene clustering program, gene clustering method, and gene cluster analyzing device*. 2009.
- [156] Frank Nielsen. *Image processing apparatus and image processing method, storage medium and computer program*. 2008.
- [157] Frank Nielsen, Alexis André, and Shigeru Tajima. “Real-time spherical videos from a fast rotating camera”. In: *International Conference Image Analysis and Recognition*. Springer Berlin Heidelberg, 2008, pp. 326–335.
- [158] Frank Nielsen and Richard Nock. “Bregman sided and symmetrized centroids”. In: *Pattern Recognition, 2008. ICPR 2008. 19th International Conference on*. IEEE, 2008, pp. 1–4.
- [159] Frank Nielsen and Richard Nock. “On the smallest enclosing information disk”. In: *Information Processing Letters* 105.3 (2008), 93–97.
- [160] Frank Nielsen and Richard Nock. “Quantum Voronoi diagrams and Holevo channel capacity for 1-qubit quantum states”. In: *2008 IEEE International Symposium on Information Theory*. IEEE, 2008, pp. 96–100.
- [161] Frank Nielsen and Richard Nock. “The entropic centers of multivariate normal distributions”. In: *Collection of Abstracts* (2008), 221.
- [162] Richard Nock and Frank Nielsen. “On the efficient minimization of convex surrogates in supervised learning”. In: *Pattern Recognition, 2008. ICPR 2008. 19th International Conference on*. IEEE, 2008, pp. 1–4.
- [163] Richard Nock, Nicolas Sanz, Fred Celimene, and Frank Nielsen. “Staring at economic aggregators through information lenses”. In: *arXiv preprint arXiv:0801.0390* (2008).
- [164] Richard Nock, Pascal Vaillant, Frank Nielsen, and Claudia Henry. “Soft uncoupling of markov chains for permeable language distinction: A new algorithm”. In: *arXiv preprint arXiv:0810.1261* (2008).
- [165] Shigeru Owada, Frank Nielsen, Takeo Igarashi, Ryo Haraguchi, and Kazuo Nakazawa. “Projection plane processing for sketch-based volume segmentation”. In: *2008 5th IEEE International Symposium on Biomedical Imaging: From Nano to Macro*. IEEE, 2008, pp. 117–120.
- [166] Jean-Daniel Boissonnat, Frank Nielsen, and Richard Nock. “Bregman voronoi diagrams: Properties, algorithms and applications”. PhD thesis. INRIA, 2007.
- [167] Claudia Henry, Richard Nock, and Frank Nielsen. “Real Boosting a la Carte with an Application to Boosting Oblique Decision Tree.” In: *IJCAI*. 2007, pp. 842–847.
- [168] Kazuhiro Hoshino, Frank Nielsen, and Toshihiro Nishimura. “Noise reduction in CMOS image sensors for high quality imaging: the autocorrelation function filter on burst image sequences”. In: *The International Congress for global Science and Technology*. 2007, p. 21.
- [169] F Neilsen, JD Boissonnat, and R Nock. *Bregman voronoi diagrams: properties, algorithms and applications*. 2007.
- [170] Frank Nielsen. “The digital chameleon principle: computing invisibility by rendering transparency”. In: *IEEE computer graphics and applications* 27.1 (2007), 90–96.
- [171] Frank Nielsen, Jean-Daniel Boissonnat, and Richard Nock. “On bregman voronoi diagrams”. In: *Proceedings of the eighteenth annual ACM-SIAM symposium on Discrete algorithms*. Society for Industrial and Applied Mathematics, 2007, pp. 746–755.
- [172] Frank Nielsen, Jean-Daniel Boissonnat, and Richard Nock. “Visualizing bregman voronoi diagrams”. In: *Proceedings of the twenty-third annual symposium on Computational geometry*. ACM, 2007, pp. 121–122.
- [173] Frank Nielsen and Richard Nock. “Fast Graph Segmentation Based on Statistical Aggregation Phenomena.” In: *MVA*. 2007, pp. 150–153.

- [174] Frank Nielsen and Richard Nock. “On the centroids of symmetrized bregman divergences”. In: *arXiv preprint arXiv:0711.3242* (2007).
- [175] Richard Nock and Frank Nielsen. “A Real generalization of discrete AdaBoost”. In: *Artificial Intelligence* 171.1 (2007), 25–41.
- [176] Richard Nock and Frank Nielsen. “Self-improved gaps almost everywhere for the agnostic approximation of monomials”. In: *Theoretical computer science* 377.1 (2007), 139–150.
- [177] Shigeru Owada, Frank Nielsen, Kazuo Nakazawa, and Takeo Igarashi. “A sketching interface for modeling the internal structures of 3D shapes”. In: *ACM SIGGRAPH 2007 courses*. ACM. 2007, p. 38.
- [178] Shigeru Owada, Makoto Okabe, Takeo Igarashi, Frank Nielsen, and Norimichi Tsumura. “Customized Slider Bars for Adjusting Multi-dimension Parameter Sets.” In: *Smart Graphics*. 2007, pp. 230–232.
- [179] Frank Nielsen and Richard Nock. “On approximating the smallest enclosing Bregman balls”. In: *Proceedings of the twenty-second annual symposium on Computational geometry*. ACM. 2006, pp. 485–486.
- [180] Frank Nielsen, Shigeru Owada, and Yuichi Hasegawa. “Autoframing: A Recommendation System for Detecting Undesirable Elements and Cropping Automatically Photos.” In: *ICME*. 2006, pp. 417–420.
- [181] Frank Nielsen and Noriyuki Yamashita. “Clairvoyance: A fast and robust precision mosaicing system for gigapixel images”. In: *IECON 2006-32nd Annual Conference on IEEE Industrial Electronics*. IEEE. 2006, pp. 3471–3476.
- [182] Richard Nock and Frank Nielsen. “A real generalization of discrete adaboost”. In: *FRONTIERS IN ARTIFICIAL INTELLIGENCE AND APPLICATIONS* 141 (2006), 509.
- [183] Richard Nock and Frank Nielsen. “On weighting clustering”. In: *IEEE transactions on pattern analysis and machine intelligence* 28.8 (2006), 1223–1235.
- [184] Shigeru Owada, Frank Nielsen, and Takeo Igarashi. “Copy-paste synthesis of 3d geometry with repetitive patterns”. In: *International Symposium on Smart Graphics*. Springer Berlin Heidelberg. 2006, pp. 184–193.
- [185] Shigeru Owada, Frank Nielsen, Takeo Igarashi, TAKEO IGARASHI, and TAKEO IGARASHI. “An Extension and Application of the Volume Catcher System”. In: *Information Processing Society of Japan (IPSJ)* (2006), 55–58.
- [186] Paul Agron, Leo Bachmair, and Frank Nielsen. “A visual interactive framework for formal derivation”. In: *International Conference on Computational Science*. Springer Berlin Heidelberg. 2005, pp. 1019–1026.
- [187] Frank Nielsen. “Surround video: a multihead camera approach”. In: *The visual computer* 21.1-2 (2005), 92–103.
- [188] Frank Nielsen. *Visual Computing: Geometry, Graphics, and Vision*. 2005.
- [189] Frank Nielsen and Richard Nock. “A fast deterministic smallest enclosing disk approximation algorithm”. In: *Information Processing Letters* 93.6 (2005), 263–268.
- [190] Frank Nielsen and Richard Nock. “ClickRemoval: interactive pinpoint image object removal”. In: *Proceedings of the 13th annual ACM international conference on Multimedia*. ACM. 2005, pp. 315–318.
- [191] Frank Nielsen and Richard Nock. “Interactive pinpoint image object removal”. In: *2005 IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR’05)*. Vol. 2. IEEE. 2005, 1191–vol.
- [192] Frank Nielsen and Richard Nock. “Interactive point-and-click segmentation for object removal in digital images”. In: *International Workshop on Human-Computer Interaction*. Springer Berlin Heidelberg. 2005, pp. 131–140.

- [193] Richard Nock and Frank Nielsen. “Fitting the smallest enclosing Bregman ball”. In: *European Conference on Machine Learning*. Springer Berlin Heidelberg. 2005, pp. 649–656.
- [194] Richard Nock and Frank Nielsen. “Semi-supervised statistical region refinement for color image segmentation”. In: *Pattern Recognition* 38.6 (2005), 835–846.
- [195] Shigeru Owada, Frank Nielsen, and Takeo Igarashi. “Volume catcher”. In: *Proceedings of the 2005 symposium on Interactive 3D graphics and games*. ACM. 2005, pp. 111–116.
- [196] Frank Nielsen and Richard Nock. “Approximating smallest enclosing balls”. In: *International Conference on Computational Science and Its Applications*. Springer Berlin Heidelberg. 2004, pp. 147–157.
- [197] Frank Nielsen and Richard Nock. “Approximating smallest enclosing disks.” In: *CCCG*. 2004, pp. 124–127.
- [198] Richard Nock and Frank Nielsen. “An Abstract Weighting Framework for Clustering Algorithms.” In: *SDM*. 2004, pp. 200–209.
- [199] Richard Nock and Frank Nielsen. “Grouping with bias revisited”. In: *IEEE Computer Society Conference on Computer Vision and Pattern Recognition*. Vol. 2. IEEE Computer Society; 1999. 2004, pp. II–460.
- [200] Richard Nock and Frank Nielsen. “Improving clustering algorithms through constrained convex optimization”. In: *Pattern Recognition, 2004. ICPR 2004. Proceedings of the 17th International Conference on*. Vol. 4. IEEE. 2004, pp. 557–560.
- [201] Richard Nock and Frank Nielsen. “On domain-partitioning induction criteria: worst-case bounds for the worst-case based”. In: *Theoretical Computer Science* 321.2 (2004), 371–382.
- [202] Richard Nock and Frank Nielsen. “Statistical region merging”. In: *IEEE Transactions on pattern analysis and machine intelligence* 26.11 (2004), 1452–1458.
- [203] Shigeru Owada, Frank Nielsen, Makoto Okabe, and Takeo Igarashi. “Volumetric illustration: designing 3D models with internal textures”. In: *ACM Transactions on Graphics (TOG)* 23.3 (2004), 322–328.
- [204] Kim Binsted, Franck Nielsen, and Claudio Pinhanez. *Method and apparatus for image projection, and apparatus controlling image projection*. 2003.
- [205] Matthew J Katz, Frank Nielsen, and Michael Segal. “Maintenance of a piercing set for intervals with applications”. In: *Algorithmica* 36.1 (2003), 59–73.
- [206] Frank Nielsen. *Picture processing method and apparatus*. 2003.
- [207] Frank Nielsen. “Plenoptic path and its applications”. In: *Image Processing, 2003. IICIP 2003. Proceedings. 2003 International Conference on*. Vol. 1. IEEE. 2003, pp. I–793.
- [208] Frank Nielsen and Richard Nock. “On region merging: The statistical soundness of fast sorting, with applications”. In: *Computer Vision and Pattern Recognition, 2003. Proceedings. 2003 IEEE Computer Society Conference on*. Vol. 2. IEEE. 2003, pp. II–19.
- [209] Shigeru Owada, Yoshihisa Shinagawa, and Frank Nielsen. “Enumeration of contour correspondence”. In: *International Journal of Image and Graphics* 3.04 (2003), 609–627.
- [210] Frank Nielsen. “High resolution full spherical videos”. In: *Information Technology: Coding and Computing, 2002. Proceedings. International Conference on*. IEEE. 2002, pp. 260–267.
- [211] Frank Nielsen. “Sony Computer Science Laboratories”. In: (2002).
- [212] Tatsuo Yotsukura, Shigeo Morishima, Frank Nielsen, Kim Binsted, and Claudio Pinhanez. “HyperMask—projecting a talking head onto a real object”. In: *The Visual Computer* 18.2 (2002), 111–120.
- [213] Patrice Calégari, Frédéric Guidec, Pierre Kuonen, and Frank Nielsen. “Combinatorial optimization algorithms for radio network planning”. In: *Theoretical Computer Science* 263.1 (2001), 235–245.

- [214] MJ Katz, F Nielsen, and M Segal. “Maintenance of, a piercing set for intervals with applications”. In: *ALGORITHM AND COMPUTATION, PROCEEDINGS 1969* (2001), 552–563.
- [215] S Morishima, T Yotsukura, F Nielsen, K Binsted, and C Pinhanez. “Hyper Mask-Projecting Virtual Face onto a Moving Real Object”. In: *Proc. of Eurographics’ 01*. Citeseer. 2001.
- [216] Frank Nielsen. “On point covers of c-oriented polygons”. In: *Theoretical computer science* 263.1 (2001), 17–29.
- [217] Frank Nielsen and Nicolas de Mauroy. “On the precision of textures”. In: *IEICE TRANSACTIONS on Information and Systems* 84.12 (2001), 1684–1689.
- [218] Tatsuo Yotsukura, Frank Nielsen, Kim Binsted, Nobuji Tetsutani, Ryouhei Nakatsu, and Shigeo Morishima. “Hypermask: Reactive talking head for storytelling”. In: *IEICE Transactions on Information and Systems* (2001), 36–45.
- [219] , Kim Binsted, Frank Nielsen, Claudio Pinhanez,, and. “HYPER MASK: 3 ”. In: *16 NICOGRAPH/MULTIMEDIA* (2000), 43–50.
- [220] Kim Binsted, F Nielsen, Shigeo Morishima, and T Misawa. “Danger hamster 2000”. In: *ACM SIGGRAPH Conference Abstracts and Applications*. ACM, New York. 2000, p. 81.
- [221] Alon Efrat, Matthew J Katz, Frank Nielsen, and Micha Sharir. “Dynamic data structures for fat objects and their applications”. In: *Computational Geometry* 15.4 (2000), 215–227.
- [222] Matthew J Katz, Frank Nielsen, and Michael Segal. “Maintenance of a piercing set for intervals with applications”. In: *International Symposium on Algorithms and Computation*. Springer Berlin Heidelberg. 2000, pp. 552–563.
- [223] Shigeo Morishima, Tatsuo Yotsukura, Kim Binsted, Frank Nielsen, and Claudio Pinhanez. “Hyper-Mask: talking head projected onto real objects”. In: *Proc. of Multimedia Modeling (MMM’00)*. 2000, pp. 403–412.
- [224] Frank Nielsen. “Fast stabbing of boxes in high dimensions”. In: *Theoretical Computer Science* 246.1-2 (2000), 53–72.
- [225] Frank Nielsen. “Randomized adaptive algorithms for mosaicing systems”. In: *IEICE TRANSACTIONS on Information and Systems* 83.7 (2000), 1386–1394.
- [226] Matthew J Katz, Frank Nielsen, and Michael Segal. “Computing Minimum Cut Sets for Circular-Arc Graphs— a New Approach”. In: (1999).
- [227] Frank Nielsen. *Storage system for compact disks*. 1999.
- [228] Claudio Pinhanez, Frank Nielsen, and Kim Binsted. “Projecting computer graphics on moving surfaces: a simple calibration and tracking method”. In: (1999).
- [229] Frank Nielsen. “Grouping and querying: A paradigm to get output-sensitive algorithms”. In: *Japanese Conference on Discrete and Computational Geometry*. Springer Berlin Heidelberg. 1998, pp. 250–257.
- [230] Patrice Calégari, Frédéric Guidec, Pierre Kuonen, and Franck Nielsen. “Combinatorial Optimization Algorithms for Radio Network Planning”. In: *CCCS’97*. 1997, 10–pages.
- [231] Alon Efrat, Matthew Katz, Franck Nielsen, and Micha Sharir. “Dynamic data structures for fat objects and their applications”. In: *Algorithms and Data Structures* (1997), 297–306.
- [232] Matthew J Katz and Franck Nielsen. “On piercing sets of objects”. In: *Proceedings of the twelfth annual symposium on Computational geometry*. ACM. 1996, pp. 113–121.
- [233] Franck Nielsen. “Fast stabbing of boxes in high dimensions”. In: (1996).
- [234] Franck Nielsen. “Output-sensitive peeling of convex and maximal layers”. In: *Information processing letters* 59.5 (1996), 255–259.
- [235] Frank Nielsen. “Algorithmes géométriques adaptatifs”. PhD thesis. Université Nice Sophia Antipolis, 1996.

- [236] Franck Nielsen, Mariette Yvinec, et al. “An output-sensitive convex hull algorithm for planar objects”. In: (1995).
- [237] Franck Nielsen and Peter Kornerup. “Algorithms On Continued And Multicontinued Fractions”. PhD thesis. Citeseer, 1993.

Frank NIELSEN. Sony Computer Science Laboratories Inc (Sony CSL). Verified email at acm.org - Homepage. DeepBach: a Steerable Model for Bach Chorales Generation. G Hadjeres, F Pachet, F Nielsen. arXiv preprint, 2016. 188. 2016. K-nearest neighbor search: Fast GPU-based implementations and application to high-dimensional feature matching. V Garcia, E Debreuve, F Nielsen, M Barlaud. 2010 IEEE International Conference on Image Processing, 3757-3760, 2010. 171. 2010. Sided and symmetrized Bregman centroids. F Nielsen, R Nock. IEEE transactions on Information Theory 55 (6), 2882-2904, 2009. 170. 2009. Statistical exponential families: A digest with flash cards. F Nielsen, V Garcia. arXiv preprint arXiv:0909.3539v1 [cs.LG], 2009. We introduce and study the Hilbert geometry induced by the Siegel disk, an open bounded convex set of complex matrices. This Hilbert geometry naturally yields a generalization of the Klein disk model of hyperbolic geometry, which we term the Siegel-Klein model to differentiate it with the usual Siegel upper plane and Siegel disk domains. Frank Nielsen. The informational energy of Onicescu is a positive quantity that measures the amount of uncertainty of a random variable like Shannon's entropy. In this note, we report closed-form formula for Onicescu's informational energy and correlation coefficient when the densities belong to an exponential family.