Serial Journal Publications

- Peter C. Doerschuk, Donald E. Gustafson, and Alan S. Willsky, "Upper Extremity Limb Function Discrimination Using EMG Signal Analysis," *IEEE Transactions on Biomedical Engineering*, vol. BME-30, no. 1, pp. 18–29, January 1983. https://doi.org/10.1109/TBME.1983.325162.
- Peter C. Doerschuk, Robert R. Tenney, and Alan S. Willsky, "Modeling Electrocardiograms Using Interacting Markov Chains," *International Journal of Systems Science*, vol. 21, no. 2, pp. 257–283, 1990. https://doi.org/10.1080/00207729008910361.
- Peter C. Doerschuk, Robert R. Tenney, and Alan S. Willsky, "Event Based Estimation of Interacting Markov Chains with Applications to Electrocardiogram Analysis," *International Journal of Systems Science*, vol. 21, no. 2, pp. 285–304, 1990. https://doi.org/10.1080/00207729008910362.
- 4. Peter C. Doerschuk, "Bayesian Signal Reconstruction, Markov Random Fields, and X-ray Crystallography," *Journal of the Optical Society of America Series A*, vol. 8, no. 8, pp. 1207–1221, August 1991. https://doi.org/10.1364/JOSAA.8.001207.
- Peter C. Doerschuk, "Adaptive Bayesian Signal Reconstruction with A Priori Model Implementation and Synthetic Examples for X-ray Crystallography," *Journal of the Optical Society of America Series A*, vol. 8, no. 8, pp. 1222–1232, August 1991. https://doi.org/10.1364/JOSAA.8. 001222.
- Peter C. Doerschuk, "Bayesian Reconstruction of Signals Invariant Under a Space Group Symmetry From Fourier Transform Magnitudes," *IEEE Transactions on Image Processing*, vol. 3, no. 4, pp. 438–449, July 1994. https://doi.org/10.1109/83.298397.
- Shan Lu, Peter C. Doerschuk, George R. Wodicka, "Parametric Phase-Delay Estimation of Sound Transmitted Through Intact Human Lung," *Medical & Biological Engineering & Computing*, vol. 33, no. 3, pp. 293–298, May 1995. https://doi.org/10.1007/BF02510502.
- Chi-hsin Wu, Peter C. Doerschuk, "Cluster Approximations for the Deterministic Computation of Bayesian Estimators Based on Markov Random Fields," *IEEE Transactions on Pattern Analysis* and Machine Intelligence, vol. 17, no. 3, pp. 275–293, March 1995. https://doi.org/10.1109/ 34.368192.
- Chi-hsin Wu, Peter C. Doerschuk, "Tree Approximations to Markov Random Fields," *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 17, no. 4, pp. 391–402, April 1995. https://doi.org/10.1109/34.385979.
- Samir Patel, Shan Lu, Peter C. Doerschuk, George R. Wodicka, "Sonic Phase Delay from Trachae to Chest Wall: Spatial and Inhaled Gas Dependence," *Medical & Biological Engineering & Computing*, vol. 33, no. 4, pp. 571–574, July 1995. https://doi.org/10.1007/BF02522516.
- Yibin Zheng, Peter C. Doerschuk, "Symbolic Symmetry Verification for Harmonic Functions Invariant Under Polyhedral Symmetries," *Computers in Physics*, vol. 9, no. 4, pp. 433–437, July/August 1995. https://doi.org/10.1063/1.168544.
- Chi-hsin Wu, Peter C. Doerschuk, "Texture-based Segmentation Using Markov Random Field Models and Approximate Bayesian Estimators Based on Trees," *Journal of Mathematical Imaging* and Vision, vol. 5, no. 4, pp. 277–286, December 1995 (Invited). https://doi.org/10.1007/ BF01250284.
- Peter C. Doerschuk, "Cramer-Rao Bounds for Discrete-Time Nonlinear Filtering Problems," *IEEE Transactions on Automatic Control*, vol. 40, no. 8, pp. 1465–1469, August 1995. https://doi.org/10.1109/9.402242.
- Yibin Zheng, Peter C. Doerschuk, John E. Johnson, "Determination of Three-dimensional Lowresolution Viral Structure from Solution X-ray Scattering Data," *Biophysical Journal*, vol. 69, no. 2, pp. 619–639, August 1995. https://doi.org/10.1016/S0006-3495(95)79939-8.
- Shan Lu, Peter C. Doerschuk, "Nonlinear Modeling and Processing of Speech Based on Sums of AM-FM Formant Models," *IEEE Transactions on Signal Processing*, vol. 44, no. 4, pp. 773–782, April 1996. https://doi.org/10.1109/78.492530.

- Yibin Zheng, Peter C. Doerschuk, "Explicit Orthonormal Fixed Bases for Spaces of Functions that are Totally Symmetric Under the Rotational Symmetries of a Platonic Solid," Acta Crystallographica, vol. A52, pp. 221–235, 1996. https://doi.org/10.1107/S0108767395012888.
- Wai Ying Kan, James V. Krogmeier, Peter C. Doerschuk, "Model-Based Vehicle Tracking from Image Sequences with an Application to Road Surveillance," *Optical Engineering*, vol. 35, no. 6, pp. 1723–1729, June 1996. https://doi.org/10.1117/1.600747.
- Yibin Zheng, Peter C. Doerschuk, "Iterative Reconstruction of 3-D Objects From Averaged Fourier Transform Magnitude: Solution and Fiber X-ray Scattering Problems," *Journal of the Optical Society of America Series A*, vol. 13, no. 7, pp. 1483–1494, July 1996. https://doi.org/ 10.1364/JOSAA.13.001483.
- Shan Lu, Peter C. Doerschuk, "Performance Bounds for Nonlinear Filters," *IEEE Transactions on Aerospace and Electronic Systems*, vol. 33, no. 1, pp. 316–318, January 1997. https://doi.org/10.1109/7.570795.
- Yibin Zheng, Peter C. Doerschuk, "3-D Image Reconstruction from Averaged Fourier Transform Magnitude by Parameter Estimation," *IEEE Transactions on Image Processing*, vol. 7, no. 11, pp. 1561–1570, November 1998. https://doi.org/10.1109/83.725363.
- Ann E. Rundell, Raymond A. DeCarlo, Harm HogenEsch, Peter C. Doerschuk, "The humoral immune response to *Haemophilus influenzae* Type b: A mathematical model based on T-zone and germinal center B-cell dynamics," *J. Theoretical Biology*, vol. 194, pp. 341–381, 1998. https: //doi.org/10.1006/jtbi.1998.0751.
- Yibin Zheng, Peter C. Doerschuk, and John E. Johnson, "Symmetry-constrained 3D interpolation of viral x-ray crystallography data," *IEEE Transactions on Signal Processing*, vol. 48, no. 1, pp. 214–222, January 2000. https://doi.org/10.1109/78.815491.
- Wan-Chieh Pai and Peter C. Doerschuk, "Statistical AM-FM models, extended Kalman filter demodulation, Cramer-Rao bounds, and speech analysis," *IEEE Transactions on Signal Processing*, vol. 48, no. 8, pp. 2300–2313, August 2000. https://doi.org/10.1109/78.852011.
- Yibin Zheng and Peter C. Doerschuk, "Explicit computation of orthonormal symmetrized harmonics with application to the identity representation of the icosahedral group," SIAM Journal on Mathematical Analysis, vol. 32, no. 3, pp. 538–554, 2000. https://doi.org/10.1137/ S0036141098341770.
- Peter C. Doerschuk and John E. Johnson, "Ab initio reconstruction and experimental design for cryo electron microscopy," *IEEE Transactions on Information Theory*, vol. 46, no. 5, pp. 1714– 1729, August 2000. https://doi.org/10.1109/18.857786.
- Yuh-Chin Chang, Srinivas R. Kadaba, Peter C. Doerschuk, Saul B. Gelfand, "Image restoration using recursive Markov random field models driven by Cauchy distributed noise," *IEEE Signal Processing Letters*, vol. 8, no. 3, pp. 65–66, March 2001. https://doi.org/10.1109/97.905941.
- Zhye Yin, Yili Zheng, and Peter C. Doerschuk, "An ab initio algorithm for low-resolution 3-D reconstructions from cryoelectron microscopy images," *Journal of Structural Biology*, vol. 133, no. 2/3, pp. 132–142, February/March 2001. https://doi.org/10.1006/jsbi.2001.4356.
- Po-Han Chen, Yuh-Chin Chang, Luh-Maan Chang, Peter C. Doerschuk "Application of Multiresolution Pattern Classification to Steel Bridge Coating Assessment," J. Computing in Civil Engineering., vol. 16, no. 4, pp. 244–251, October 2002. https://doi.org/10.1061/(ASCE) 0887-3801(2002)16:4(244).
- Zhye Yin, Yili Zheng, Peter C. Doerschuk, Padmaja Natarajan, and John E. Johnson, "A statistical approach to computer processing of cryo electron microscope images: virion classification and 3-D reconstruction," J. Structural Biology, vol. 144, pp. 24–50, 2003. https://doi.org/10.1016/j.jsb.2003.09.023.
- 30. Zhye Yin, Peter C. Doerschuk, and Saul B. Gelfand, "Model calculations for joint pattern recognition and signal reconstruction in cryo electron microscopy," *Communications in Information* and Systems, vol. 4, no. 1, pp. 73–88, 2004. https://doi.org/10.4310/CIS.2004.v4.n1.a4. Special Issue in honor of the 70th birthday of Professor Sanjoy K. Mitter.

(P. C. Doerschuk)

- 31. Tianwei Lin, Wilfried Schildkamp, Keith Brister, Peter C. Doerschuk, Maddury Somayazulu, Ho-kwang Mao, and John E. Johnson, "The mechanism of high pressure induced ordering in a macromolecular crystal," Acta Crystallographica D, vol. D61, Part 6, pp. 737–743, 2005. https: //doi.org/10.1107/S0907444905000053.
- 32. Junghoon Lee, Peter C. Doerschuk, and John E. Johnson, "Exact Reduced-Complexity Maximum Likelihood Reconstruction of Multiple 3-D Objects from Unlabeled Unoriented 2-D Projections and Electron Microscopy of Viruses", *IEEE Transactions on Image Processing*, 16(12):2865–2878, 2007. https://doi.org/10.1109/TIP.2007.908298.
- Jae-Joon Han, Peter C. Doerschuk, Saul B. Gelfand, and Sean J. O'Connor, "Models and signal processing for an implanted ethanol bio-sensor", *IEEE Transactions on Biomedical Engineering*, 55(2):603-613, 2008. https://doi.org/10.1109/TBME.2007.912652.
- Martin H. Plawecki, Jae-Joon Han, Peter C. Doerschuk, Vijay Ramchandani, and Sean J. O'Connor, "Physiologically-based pharmacokinetic (PBPK) models for ethanol", *IEEE Transactions on Biomedical Engineering*, 55(12):2691–2700, 2008. https://doi.org/10.1109/TBME.2008.919132.
- 35. Yili Zheng and Peter C. Doerschuk, "A Parallel Software Toolkit for Statistical 3-D Virus Reconstructions from Cryo Electron Microscopy Images Using Computer Clusters with Multi-core Shared-Memory Nodes", *IEEE International Parallel & Distributed Processing Symposium 2008* (*IEEE IPDPS'08*), 11 pages, Miami, FL, April 14–18, 2008.
- Seunghee Lee, Peter C. Doerschuk, and John E. Johnson, "Reciprocal space representation of helical objects and their projection images for helices constructed from motifs without spherical symmetry", *Ultramicroscopy*, 109:253-263, 2009. https://doi.org/10.1016/j.ultramic. 2008.10.014.
- 37. Cory J. Prust, Peter C. Doerschuk, Gabriel C. Lander, and John E. Johnson, "Ab initio maximum likelihood reconstruction from cryo electron microscopy images of an infectious virion of the tailed bacteriophage P22 and maximum likelihood versions of Fourier Shell Correlation appropriate for measuring resolution of spherical or cylindrical objects", J. Structural Biology, 167:185–199, 2009. https://doi.org/10.1016/j.jsb.2009.04.013.
- Chi-yu Fu, Kang Wang, Jason Lanman, Reza Khayat, Mark J. Young, Grant J. Jensen, Peter C. Doerschuk, and John E. Johnson, "In Vivo Assembly of an Archaeal Virus Studied with Whole Cell Electron Cryotomography", *Structure*, 18(12):1579–1586, 8 December 2010. https: //doi.org/10.1016/j.str.2010.10.005.
- Kang Wang and Chi-yu Fu and Reza Khayat and Peter C. Doerschuk and John E. Johnson, "In vivo virus structures: Simultaneous classification, resolution enhancement, and noise reduction in whole-cell electron tomography", J. Structural Biology, 174(3):425-433, 2011. https://doi.org/10.1016/j.jsb.2011.03.003.
- Seunghee Lee and Peter C. Doerschuk and John E. Johnson, "Multi-class maximum likelihood symmetry determination and motif reconstruction of 3-D helical objects from projection images for electron microscopy", *IEEE Transactions on Image Processing*, 20(7):1962–1976, July 2011. https://doi.org/10.1109/TIP.2011.2107329.
- Martin H. Plawecki, Ulrich S. Zimmermann, Victor Vitvitskiy, Peter C. Doerschuk, David W. Crabb, Sean J. O'Connor, "Alcohol Exposure Rate Control through Physiologically-Based Pharmacokinetic Modeling", *Alcoholism: Clinical and Experimental Research*. 36(6):1042–1049, June 2012. https://doi.org/10.1111/j.1530-0277.2011.01706.x.
- Yili Zheng, Qiu Wang, and Peter C. Doerschuk, "Three-dimensional reconstruction of the statistics of heterogeneous objects from a collection of one projection image of each object", *Journal of the Optical Society of America Series A*, vol. 29, no. 5, pp. 959–970, May 2012. https://doi.org/ 10.1364/JOSAA.29.000959.
- 43. Thom P. Santisakultarm, Nathan R. Cornelius, Nozomi Nishimura, Andrew I. Schafer, Richard T. Silver, Peter C. Doerschuk, William L. Olbricht, and Chris B. Schaffer, "In Vivo Two-photon Excited Fluorescence Microscopy Reveals Cardiac- and Respiration-Dependent Pulsatile Blood

Flow in Cortical Blood Vessels in Mice", Am J Physiol Heart Circ Physiol, vol. 302, pp. H1367–H1377, 2012. https://doi.org/10.1152/ajpheart.00417.2011.

- Qiu Wang, Tsutomu Matsui, Tatiana Domitrovic, Yili Zheng, Peter C. Doerschuk, John E. Johnson, "Dynamics in cryo EM reconstructions visualized with maximum-likelihood derived variance maps", J. Structural Biology, 181(3):195-206, 2013. https://doi.org/10.1016/j.jsb.2012. 11.005.
- Tatiana Domitrovic, Navid Movahed, Brian Bothner, Tsutomu Matsui, Qiu Wang, Peter Doerschuk, John E. Johnson "Virus Assembly and Maturation: Auto-regulation Through Allosteric Molecular Switches", J. Molecular Biology 425(9):1488–1496, 13 May, 2013. https://doi.org/10.1016/j.jmb.2013.02.021.
- 46. Jinghua Tang, Bradley M. Kearney, Qiu Wang, Peter C. Doerschuk, Timothy S. Baker, and John E. Johnson, "Dynamic and geometric analyses of *Nudaurelia capensis* ω virus maturation reveal the energy landscape of particle transitions", *J. Molecular Recognition*, vol. 27, number 4, pp. 230-237, 10 February 2014. https://doi.org/10.1002/jmr.2354.
- 47. Nathan R. Cornelius, Nozomi Nishimura, Minah Suh, Theodore H. Schwartz, and Peter C. Doerschuk, "A mathematical model relating cortical oxygenated and deoxygenated hemoglobin flows and volumes to neural activity", *Journal of Neural Engineering*, 12(4):046013, August 2015. https://doi.org/10.1088/1741-2560/12/4/046013.
- Sam Tilsen, Pascal Spincemaille, Bo Xu, Peter Doerschuk, Wen-Ming Luh, Elana Feldman, Yi Wang, "Anticipatory Posturing of the Vocal Tract Reveals Dissociation of Speech Movement Plans from Linguistic Units", *PLOS One*, 11(1):e0146813, 2016. https://doi.org/10.1371/journal. pone.0146813.
- Yunye Gong, David Veesler, Peter C. Doerschuk, John E. Johnson, "Effect of the viral protease on the dynamics of bacteriophage HK97 maturation intermediates characterized by variance analysis of cryo EM particle ensembles", *Journal of Structural Biology* 193(3):188–195, March 2016. https://doi.org/10.1016/j.jsb.2015.12.012.
- 50. Peter C. Doerschuk, Yunye Gong, Nan Xu, Tatiana Domitrovic, and John E. Johnson, "Virus particle dynamics derived from CryoEM studies", *Current Opinion in Virology* 18:57–63, June 2016. https://doi.org/10.1016/j.coviro.2016.02.011.
- 51. Kang Wang, Chi-yu Fu, Carlos E. Catalano, Peter E. Prevelige, Peter C. Doerschuk, and John E. Johnson, "Detecting asymmetry in the presence of symmetry with maximum likelihood three-dimensional reconstructions of viruses from electron microscope images", *IET Image Processing* 10(8):624–629, 2016. https://doi.org/10.1049/iet-ipr.2015.0737.
- 52. Tejapratap Bollu, Nathan R. Cornelius, John Sunwoo, Nozomi Nishimura, Chris B. Schaffer and Peter C. Doerschuk, "Experimentally constrained circuit model of cortical arteriole networks for understanding flow redistribution due to occlusion and neural activation", J. Cerebral Blood Flow and Metabolism 38(1):38-44, 2017. https://doi.org/10.1177/0271678X17741086.
- 53. Nan Xu, R. Nathan Spreng, and Peter C. Doerschuk, "Initial Validation for the Estimation of Resting-State fMRI Effective Connectivity by a Generalization of the Correlation Approach", *Frontiers in Neuroscience* 11, Article 271, 2017. https://doi.org/10.3389/fnins.2017.00271.
- 54. Nan Xu, David Veesler, Peter C. Doerschuk, John E. Johnson, "Allosteric effects in bacteriophage HK97 procapsids revealed directly from covariance analysis of cryo EM data", Journal of Structural Biology 202(2):129–141, May 2018. https://doi.org/10.1016/j.jsb.2017.12.013.
- 55. Kai Ma, Yunye Gong, Tangi Aubert, Melik Z. Turker, Teresa Kao, Peter C. Doerschuk, Ulrich Wiesner, "Self-assembly of highly symmetrical, ultrasmall inorganic cages directed by surfactant micelles", *Nature* 558:577–580, 28 June, 2018. https://doi.org/10.1038/s41586-018-0221-0.
- 56. Yunye Gong, Srikrishna Karanam, Ziyan Wu, Kuan-Chuan Peng, Jan Ernst, Peter C. Doerschuk, "Learning Compositional Visual Concepts With Mutual Consistency", 2018 IEEE Conference on Computer Vision and Pattern Recognition (CVPR) pages 8659-8668, 2018. http://openaccess. thecvf.com/content_cvpr_2018/html/Gong_Learning_Compositional_Visual_CVPR_2018_paper. html.

(P. C. Doerschuk)

57. Nan Xu, Peter C. Doerschuk, "Reconstruction of stochastic 3-D signals with symmetric statistics from 2-D projection images motivated by cryo-electron microscopy", *IEEE Transactions on Image Processing*, 28(11):5479–5494, 2019. https://doi.org/10.1109/TIP.2019.2915631.