

Jonas August

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Employment

Project Scientist at Medical Robotics Technology Center, Robotics Institute, Carnegie Mellon University, Pittsburgh, Sept. 2003–Present.

Postdoctoral fellow at Medical Robotics Technology Center, Robotics Institute, Carnegie Mellon University, Pittsburgh, Oct. 2001–Sept. 2003.

Education

Ph.D. at Yale University in electrical engineering, thesis entitled *The Curve Indicator Random Field*, supervised by Prof. Steven W. Zucker, 2001.

M.Phil at Yale University, 1999.

M.Sc. at Yale University, 1999.

M.Eng. at McGill University (Montréal, Canada) in electrical engineering, Dean's honour list, thesis entitled *From Contour Fragment Grouping to Shape Decomposition*, 1996.

B.Eng. at McGill University in honours program in electrical engineering, 1993.

Funding

Project Scientist with Takeo Kanade (PI), National Science Foundation, "Scalable Algorithms for Regularized Tomography via Decoupling," 2003-2006.

Co-PI with George Stetten (PI) and Yanxi Liu (co-PI), National Library of Medicine, "Methods in Medical Image Analysis: An ITK-Based Course with Deliverable Algorithms," 2002-2003.

Patents Pending

Jonas August, "Image Smoothing with Decoupled Regularization," US-2003-0219152-A1, Nov. 27, 2003.

Jonas August, "Volterra filters for enhancement of contours in images," August 8, 2003.

Jonas August, "Biased curve indicator random field filters for enhancement of contours in images," US 2003/0118246 A1, June 26, 2003.

Journal Papers and Book Chapters

Jonas August and Steven W. Zucker, "Sketches with Curvature: The Curve Indicator Random Field and Markov Processes", *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 25(4):387–400, 2003.

Jonas August and Steven W. Zucker, "The Curve Indicator Random Field: Curve Organization via Edge Correlation", Chapter. 15, pp. 265–287, in *Perceptual Organization in Artificial Vision Systems*, Boyer and Sarkar, Eds., Kluwer Academic, Boston, 2000.

Eric Saund, Jonas August, Joachim Buhmann, Daniel Crevier, Greet Frederix, Danny Roobaert, "Learning and Perceptual Organization," Chapter. 3, pp. 29–32, in *Perceptual Organization in Artificial Vision Systems*, Boyer and Sarkar, Eds., Kluwer Academic, Boston, 2000.

Jonas August, Kaleem Siddiqi, Steven W. Zucker, "Ligature Instabilities and the Perceptual Organization of Shape," *Computer Vision and Image Understanding*, 76(3): 231–243, 1999.

Jonas August, Kaleem Siddiqi, Steven W. Zucker, "Contour Fragment Grouping and Shared, Simple Occluders," *Computer Vision and Image Understanding*, 76(2): 146–162, 1999.

Conference Papers and Talks

Goksel Dedeoglu, Takeo Kanade, and Jonas August, "High-Zoom Video Hallucination by Exploiting Spatio-Temporal Regularities," *Computer Vision and Pattern Recognition (CVPR)*, 2004 (submitted).

Jonas August and Takeo Kanade, "Scalable Regularized Tomography without Repeated Projections," 5th Workshop on Parallel and Distributed Scientific and Engineering Computing (PDSEC-04) at 18th International Parallel and Distributed Processing Symposium (IPDPS-04), Santa Fe, April, 2004 (accepted).

Jonas August, "Weakly-Supervised Segmentation of Non-Gaussian Images via Histogram Adaptation," *Medical Image Computing and Computer-Assisted Intervention (MICCAI)*, Montreal, 2003.

Fredrik Kahl and Jonas August, "Multiview Reconstruction of Space Curves," *International Conference on Computer Vision*, Nice, 2003.

Damion Shelton, George Stetten, Jonas August, and Yanxi Liu (presented by Shelton), "A Semester Course in ITK," *Meeting of the NLM Insight Toolkit Consortium*, Philadelphia, PA, Feb 6, 2003.

Jonas August, "Decoupling the Equations of Regularized Tomography," in *Proceedings, 2002 IEEE International Symposium on Biomedical Imaging*, Washington, D.C., July 7–10, 2002.

Jonas August, "Volterra Filtering of Noisy Images of Curves," in *Proceedings, European Conference on Computer Vision*, Copenhagen, May 2002, pp. 604–620.

Jonas August and Steven W. Zucker, "A Stochastic Curvature Process for the Curve Indicator Random Field: Euler Spirals, Filtering, and Asymmetric Regularization," in *Energy Minimization Methods for Computer Vision and Pattern Recognition*, Nice, France, 2001.

Jonas August and Steven W. Zucker, "A Generative Model for Image Contours: A Completely-Characterized Non-Gaussian Joint Distribution," for *Statistical and Computational Theories of Vision*, at *International Conference in Computer Vision*, 2001.

Jonas August and Steven W. Zucker, "A Field Model for Contour Organization and Partial Differential Equations," for *Workshop on Perceptual Organization in Computer Vision*, at *International Conference in Computer Vision*, 2001.

Jonas August and Steven W. Zucker, "The Moments of the Curve Indicator Random Field," *Proceedings of the 2000 Conference on Information Sciences and Systems*, Vol. 1, pp. WP5-19–WP5-24, Princeton, NJ, March 2000.

Jonas August, Allen Tannenbaum, Steven W. Zucker, "On the Evolution of the Skeleton," *Proceedings of the International Conference on Computer Vision*, Corfu, Greece, September 1999.

Jonas August and Steven W. Zucker, "Organizing Curve Elements with an Indicator Random Field on the (Unit) Tangent Bundle," *US National Science Foundation and IEEE Computer Society Workshop on Perceptual Organization in Computer Vision*, Corfu, Greece, September 1999.

Jonas August, Kaleem Siddiqi, and Steven W. Zucker, "Ligature Instabilities in the Perceptual Organization of Shape," *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*, Fort Collins, Colorado, June 1999.

Jonas August, Kaleem Siddiqi, and Steven W. Zucker, "Duality in Perceptual Organization: Grouping vs. Shape Decomposition," *IEEE Computer Society Workshop on Perceptual Organization in Computer Vision*, Santa Barbara, California, June 1998.

Jonas August, Kaleem Siddiqi, and Steven W. Zucker, "Fragment Grouping via the Principle of Perceptual Organization," *Proceedings of the International Conference on Pattern Recognition*, at Vienna in September 1996.

Invited Talks

"Sketch Inference and Decoupled Tomography," Robotics Institute Seminar, Carnegie Mellon University, March 7, 2003.

"Sketch Inference as a Theory of Visual Contour Computation," *Image Analysis and Understanding Data from Scientific Experiments*, Los Alamos National Labs, December 9, 2002.

"From Uncertain Boundaries to Stabilized Skeletons: The Curve Indicator Random Field and Shape Evolution for Generic Object Recognition," Computer Science Dept., Princeton University, May 2001.

"Fragment Grouping via the Principle of Perceptual Occlusion," *Second NEC Vision Workshop*, Princeton, NJ, June 1996.

Other Public Talks

"From Uncertain Geometry to Reliable Visual Contour Computation," Graduate Student Seminar Series, Electrical and Computer Engineering, Yale University, April 2001.

"On the Evolution of the Skeleton," Vision Lunch at Center for Computational Vision and Control, Yale University, October 1999.

"Geometry of Perceptual Grouping," Graduate Student Seminar Series on Nonlinear Phenomena, Yale University, September 1998.

“Fragment Grouping via the Principle of Perceptual Organization,” Graduate Student Seminar Series for Computer and Electrical Engineering, Yale University, Spring 1997.

“From Curves to Creatures: Shape Description for Object Recognition,” Seminar for Advanced Topics in Control, McGill University, April 1995.

Teaching Experience

Methods in Image Analysis (16-725 at Carnegie Mellon, BioE 2630 at U. Pitt.), Spring 2003 and Spring 2004. I was co-instructor (with George Stetten and Yanxi Liu) and lectured on probability, Bayes decision theory, Markov random fields, contour inference, level set methods, and tomography.

Computer Vision and Biological Perception at Yale University, Spring 1999 and Spring 1998. As teaching assistant, I lectured several times in addition to both creating and grading the final exam and homework assignments.

C Data Structures, Yale University, in Spring 1997. Tutoring and grading.

Undergraduate mathematics, physics, and engineering tutor, McGill University, 1992.

Mentoring

Graduate Students: Goksel Dedeoglu, Pragyam Mishra, Lin Cheng, Sanjiv Kumar

Research Programmer: Luiza Solomon

Academic Committee Membership

Member of Ph.D. Committee for Goksel Dedeoglu, graduate student in Robotics at Carnegie Mellon University, 2003–Present.

Reviews and Editing

Written for these journals:

International Journal of Computer Vision, Neural Computation, IEEE Pattern Analysis and Machine Intelligence, Pattern Recognition Letters

Written for these conferences:

European Conference on Computer Vision, Conference on Computer Vision and Pattern Recognition, Conference on Computer Vision and Image Processing, International Conference on Computer Vision

Edited chapters in:

Gregory S. Chirikjian and Alexander B. Kyatkin, *Engineering Applications for Noncommutative Harmonic Analysis*, CRC, 2000.

Awards

Thomas Edison Scholarship, Yale University, 1996.

Natural Sciences and Engineering Research Council of Canada (NSERC) Award for Postgraduate Studies, 1993-1995.

Canada Scholarship, 1989-1993.

McConnell Entrance Award, McGill University, 1989.

Technical Skills

Mathematics: Probability, statistical inference, stochastic processes, Markov random fields, differential geometry, partial differential equations, linear algebra, system theory, optimization.

Scientific computation, including numerical methods of linear & nonlinear PDEs.

Parallel computation: Cluster design and installation, OSCAR cluster management, Condor job management, PetSC numerical library, C MPI, Matlab MPI.

Python, C, Matlab, Mathematica, GNU/Linux, IRIX, SunOS, Windows.

GNU/Linux system administration, configuration, installation, and basic networking (1993-present).

Robot programming (Zebra Zero).

Languages

English (native), French (basic)

February 22, 2004