

DZUNG L. PHAM

CONTACT INFORMATION

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GENERAL INFORMATION

Date of birth: May 29, 1971
Place of birth: Washington, D.C.
Research interests: Image processing and computer vision with application to biomedical imaging.

EDUCATION

B.S. *Summa Cum Laude* May 1993, Electrical Engineering, The George Washington University.
M.S.E. May 1995, Electrical Engineering, The Johns Hopkins University.
Course work emphasized image processing, medical imaging, and statistical estimation theory.
Ph.D. June 1999, Electrical Engineering, The Johns Hopkins University.
Dissertation title: *Statistical Estimation and Pattern Recognition Methods for Robust Segmentation of Magnetic Resonance Images*
Research advisor: Dr. Jerry L. Prince

EMPLOYMENT

Research Assistant, Naval Medical Research Institute, Bethesda MD, 1988–89 (summer).
Performed high pressure liquid chromatography experiments for purification of protein antigens.
Computer Programmer, Applied Physics Laboratory, Laurel MD, 1990–93.
Designed and programmed a menu-driven image processing software package. Ported target tracking simulation software from APL to C for PC, Unix, and VMS systems.
Teaching Assistant, The Johns Hopkins University, Baltimore MD, 1993–1996.
Taught classes in circuit analysis and electronic design. Graded classes in computer architecture and communications networks.
Research Assistant, The Johns Hopkins University, Baltimore MD, 1994–present.
Performed research in image segmentation, image interpolation, and pulse sequence optimization of magnetic resonance (MR) images of the brain.
Pre-doctoral Fellow, National Institute on Aging, Baltimore MD, 1996–1999.
Performed neuroimaging research for the Baltimore Longitudinal Study on Aging involving the development of methods for quantification of tissue volumes in MR images and statistical parametric mapping (SPM) analysis of positron emission tomography (PET) images.
Consultant, Confirma, Inc., Kirkland, WA, 1999–2000.
Implemented and tested image processing algorithms for cancer staging and monitoring using multichannel MR images.
Consultant, FastVDO, Inc., Columbia, MD, 1998–2000.
Configured Windows and Linux-based server and client machines for video streaming applications.

Course Instructor, Johns Hopkins University, Baltimore MD, Spring 2001.

Co-instructor for *Medical Image Processing*.

Research Fellow, National Institute on Aging, Baltimore MD, 1999–present.

Current projects focus on developing and implementing image processing algorithms for investigating structural and functional longitudinal changes in the brain.

HONORS AND AWARDS

Inducted into Tau Beta Pi Honor Society, 1990.

Inducted into Eta Kappa Nu Honor Society, 1990 (President of Theta Iota Chapter 1992–93).

Engineering High Honor Full–Tuition Scholarship, The George Washington University, 1989–93.

Outstanding Academic Achievement Citation, The George Washington University, 1991,93.

Alfred M. Freudenthal Prize for Academic Excellence awarded to the top graduating student in Electrical Engineering, The George Washington University, 1993.

Pre-doctoral Intramural Research Training Award (Pre-IRTA), National Institute on Aging, 1996–1999.

Fellows Award for Research Excellence (FARE), National Institutes of Health, 1996.

Nathan W. Shock Poster Presentation Award, National Institute on Aging, 1998.

Staff Recognition Award, National Institute on Aging, 2002.

PROFESSIONAL ACTIVITIES

Battery Systems Team Leader, The George Washington University Solar Car Racing Team. Finished fourth nationally, ninth internationally, 1992–93.

Graduate Student Faculty Representative, The Johns Hopkins University Department of Electrical and Computer Engineering, 1995.

Student Member of Institute of Electrical and Electronics Engineers (IEEE) Signal Processing Society, 1995–1998.

Student Volunteer for International Conference on Image Processing, Washington, D.C. 1995.

Member of the Johns Hopkins University Image Analysis Group, 1995–1999 (Coordinator 1998).

Member of the Johns Hopkins University Brain Mapping Group, 1997–present.

Presenter at the National Institute on Aging Annual Retreat, 1997–2002.

Member of the Center for Imaging Science (<http://www.cis.jhu.edu>), 1998–present.

Member of the Computer-Integrated Surgical Systems and Technology Engineering Research Center (<http://cisstweb.cs.jhu.edu>), 1998–2000.

Journal Referee for *IEEE Transactions on Biomedical Engineering*, and *International Journal of Pattern Recognition and Artificial Intelligence*, 1998.

Student Member of the IEEE Engineering in Medicine and Biology Society, 1999.

Invited Collaboration, Minneapolis VA Medical Center, PET Center, 1999.

Invited Speaker, University of Iowa, Department of Biomedical Engineering, 1999.

Invited Speaker, National Institutes of Health, Diagnostic Radiology Department, 1999.

Journal Referee for *Computer Vision and Image Understanding*, 1999.

Member of IEEE Signal Processing Society, 2000–present.

Invited Collaboration, National Institutes of Health, Laboratory of Diagnostic Radiology Research, 2000.

Member of IEEE Engineering in Medicine and Biology Society, 2001–present.

Invited Speaker, University of Virginia, Department of Electrical Engineering, 2001.

Invited Speaker, National University of Singapore, Department of Electrical Engineering, 2001.

Invited Speaker, Nanyang Technological University, Department of Electrical Engineering, 2001.

Journal Referee for *IEEE Transactions on Medical Imaging*, *IEEE Transactions on Nuclear Science*, *Pattern Recognition Letters*, and *Image and Vision Computing*, 2000.

Invited Collaboration, Johns Hopkins University, Division of Nuclear Medicine, 2001.

Journal Referee for *Journal of Electronic Imaging*, *Image Vision and Computing*, *Journal of Information Fusion*, *Pattern Recognition Letters* and *IEEE Transactions on Medical Imaging*, 2001.

Invited Speaker, Center for Imaging Science, Johns Hopkins University, 2002.

Grant Application Referee for the Health Research Board, Dublin, Ireland, 2002.

PUBLICATIONS

Journal Articles & Book Chapters

1. J.L. Prince, Q. Tan, D. Pham, "Optimization of MR Pulse Sequences for Bayesian Image Segmentation", *Medical Physics*, 22(10):1651-1656, Oct. 1995.
2. D.L. Pham, J.L. Prince, A.P. Dagher, C. Xu, "An Automated Technique for Statistical Characterization of Brain Tissues in Magnetic Resonance Imaging," *International Journal of Pattern Recognition and Artificial Intelligence*, 11(8):1189-1211, 1997.
3. A.F. Goldszal, C. Davatzikos, D.L. Pham, M.X.H. Yan, R.N. Bryan, S.M. Resnick, "An Image Processing System for Qualitative and Quantitative Volumetric Analysis of Brain Images," *Journal of Computer Assisted Tomography*, 22(5):827-837, 1998.
4. D.L. Pham, J.L. Prince, "An Adaptive Fuzzy C-Means Algorithm for Image Segmentation in the Presence of Image Inhomogeneities," *Pattern Recognition Letters*, 20(1):57-68, 1999.
5. C. Xu, D.L. Pham, M.E. Etemad, D.N. Yu, J.L. Prince, "Reconstruction of the Human Cerebral Cortex from Magnetic Resonance Images," *IEEE Transactions on Medical Imaging*, 18(5):467-480, 1999.
6. D.L. Pham, J.L. Prince, "Adaptive Fuzzy Segmentation of Magnetic Resonance Images," *IEEE Transactions on Medical Imaging*, 18(9):737-752, 1999.
7. D.L. Pham, C. Xu, J.L. Prince, "Current Methods in Medical Image Segmentation," in *Annual Review of Biomedical Engineering*, M.L. Yarmush (ed.), vol. 2, pp 315-337, Annual Reviews, Palo Alto, CA, 2000.
8. C. Xu, D.L. Pham, J.L. Prince, "Image Segmentation using Deformable models," in *Handbook of Medical Imaging Volume 2, Medical Image Processing and Analysis*, M. Sonka and J.M. Fitzpatrick (eds.), pp. 129-174, SPIE Press, Bellingham, WA, 2000.
9. A.F. Goldszal, D.L. Pham, "Volumetric Segmentation of Magnetic Resonance Images of the Brain," in *Handbook of Medical Imaging*, I. Bankman (ed.), pp. 185-194, Academic Press, San Diego, CA, 2000.
10. D.L. Pham, "Spatial Models for Fuzzy Clustering," *Computer Vision and Image Understanding*, 84(2):285-297, 2001.
11. R. Leigh, J. Ostuni, D.L. Pham, B.K. Lewis, T. Howard, H. McFarland, J.A. Frank, "Comparison of Various MRI Pulse Sequences in Estimating Cerebral Atrophy in MS and Normal Patients with Intensity Based Segmentation," to appear in *Multiple Sclerosis*.

Conference Articles

1. D.L. Pham, J.L. Prince, A.P. Dagher, "Estimation of Joint Probability Density Functions in Magnetic Resonance Imaging", *Proceedings of The Ninth Image and Multidimensional Signal Processing Workshop (IMDSP96)*, pp. 148-149, in Belize City, Belize, Mar. 3-6, 1996.
2. C. Xu, D.L. Pham, J.L. Prince, "Finding the Brain Cortex using Fuzzy Segmentation, Isosurfaces, and Deformable Surface Models," *Proceedings of Information Processing in Medical Imaging (IPMI97)*, pp. 399-404, in Poultney, VT, June 9-13, 1997.
3. D.L. Pham, J.L. Prince, "An Adaptive Fuzzy C-Means Algorithm for Image Segmentation in the Presence

- of Intensity Inhomogeneities,” *Proceedings of SPIE Medical Imaging 1998: Image Processing*, pp. 555–563, in San Diego, CA, Feb. 21-27, 1998.
4. C. Xu, D.L. Pham, J.L. Prince, M.E. Etemad, D. Yu, “Reconstruction of the Central Layer of the Human Cerebral Cortex from MR images,” *Proceedings of the First International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI98)*, pp. 399-404, in Cambridge, MA, Oct. 11-13, 1998.
 5. D.L. Pham, J.L. Prince, “Partial Volume Estimation and the Fuzzy C-Means Algorithm,” *Proceedings of the 1998 International Conference on Image Processing (ICIP98)*, vol. III: 819-822, in Chicago, IL, Oct. 4-7, 1998.
 6. D.L. Pham, J.L. Prince, “A Generalized EM algorithm for Robust Segmentation of Magnetic Resonance Images,” *Proceedings of the 33rd Annual Conference on Information Sciences and Systems*, pp. 558-563, in Baltimore, MD, March 17-19, 1999.
 7. D.L. Pham, J.L. Prince, “An Adaptive Fuzzy Segmentation Algorithm for Three-Dimensional Magnetic Resonance Images,” *Proceedings of the XVIIth Conference on Information Processing in Medical Imaging (IPMI99)*, pp. 140-153, in Visegrad, Hungary, June 28-July 2, 1999.
 8. M.E. Rettmann, C. Xu, D.L. Pham, J.L. Prince, “Automated Segmentation of Sulcal Regions,” *Proceedings of the Second International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI99)*, pp. 158-167, in Cambridge, England, Sept. 19-22, 1999.
 9. D.L. Pham, J.L. Prince, “Unsupervised Partial Volume Estimation in Single-Channel Image Data”, *Proceedings of the IEEE Workshop on Mathematical Methods in Biomedical Image Analysis*, pp. 170-177, in Hilton Head, SC, June 11-12, 2000.
 10. D.L. Pham, “Edge-Adaptive Clustering for Unsupervised Image Segmentation”, *Proceedings of the 2000 International Conference on Image Processing*, vol. I: 816-819, in Vancouver, Canada, September 10-13, 2000.
 11. D.L. Pham, “Robust Fuzzy Segmentation of Magnetic Resonance Images,” *Proceedings of the Fourteenth IEEE Symposium on Computer-Based Medical Systems (CBMS2001)*, pp. 127-131, in Bethesda, MD, July 26-27, 2001.
 12. D.L. Pham, X. Han, M.E. Rettmann, C. Xu, D. Tosun, S.M. Resnick, J.L. Prince, “New Approaches for Measuring Changes in the Cortical Surface Using an Automatic Reconstruction Algorithm,” presented at SPIE Medical Imaging 2002, in San Diego, CA, Feb. 23-28, 2002.
 13. D.L. Pham, “Fuzzy Clustering with Spatial Constraints,” to be presented at IEEE 2002 International Conference on Image Processing (ICIP2002), in Rochester, NY, Sept. 22-25, 2002.
 14. S. Yu, D.L. Pham, D. Shen, E.H. Herskovitz, S.M. Resnick, C. Davatzikos, “Automatic Segmentation of White Matter Lesions in T1-weighted Brain MR Images,” to be presented at 2002 IEEE International Symposium on Biomedical Imaging (ISBI2002), in Washington, DC, July 7-10, 2002.

Abstracts

1. C. Xu, D.L. Pham, J.L. Prince, M. Etemad, D. Yu, “Reconstruction of the Human Cortical Surface from MR Images,” *Fourth International Conference on Functional Mapping of the Human Brain (HBM)*, Montreal, Canada, June 7-12, published in *NeuroImage*, 7(4):715,1998.
2. C. Xu, M. Etemad, D. Yu, D.L. Pham, J.L. Prince, “A Spherical Map for Cortical Geometry,” *Fourth International Conference on Functional Mapping of the Human Brain (HBM)*, Montreal, Canada, June 7-12, published in *Neuroimage*, 7(4):734, 1998.
3. M.E. Etemad, C. Xu, D.L. Pham, D. Yu, J.L. Prince, “On Automated Segmentation of Buried Gyri,” *Fifth International Conference on Functional Mapping of the Human Brain* Dusseldorf, Germany, June 22-26, published in *Neuroimage* 9(6), Part 2, page S143, 1999.
4. M.E. Rettmann, X. Han, D.L. Pham. J.L. Prince, “Geodesics for Sulcal Segmentation and Depth Measure-

ments,” *Sixth International Conference on Functional Mapping of the Human Brain (HBM)*, San Antonio, TX published in *Neuroimage* 11(5), Part 2, page S667, 2000.

5. S.M. Resnick, D.L. Pham, C. Davatzikos, M.A. Kraut, “Sex Differences in Regional Cerebral Blood Flow: Clinical Implications for Alzheimer’s Disease,” to be presented at the 8th International Conference on Alzheimer’s Disease and Related Disorders, in Stockholm, Sweden, July 20-25, 2002.
6. J. Varga, D.L. Pham, Y. Wang, K. Huang, and Z. Szabo, “Comparison of MRI brain segmentation methods for the partial volume correction of coregistered PET,” to be presented at the European Association of Nuclear Medicine Congress (EANM), in Vienna, Austria, August 31 - September 4, 2002.

REFERENCES

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