

# Lilla Zöllei

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**PROFESSIONAL OBJECTIVE** Research-oriented academic position in the field of medical image analysis where close collaboration with a hospital or a medical university is a priority. Preference is given to statistical and information theoretic approaches.

**EDUCATION**

- ◇ **EECS, Massachusetts Institute of Technology**, Cambridge, MA.  
Ph.D. in Computer Science, September 2001 - January 2006.  
Thesis: *Unified Information Theoretic Framework for Pair- and Group-wise Registration of Medical Images*  
Advisors: Prof. E. Grimson, Prof. W.M. Wells
- ◇ **EECS, Massachusetts Institute of Technology**, Cambridge, MA.  
MS in Computer Science, September 1999 - August 2001.  
Thesis: *2D-3D Rigid-Body Registration of X-Ray Fluoroscopy and CT Images*  
Advisors: Prof. E. Grimson, Prof. W.M. Wells
- ◇ **Mount Holyoke College**, South Hadley, MA.  
BA in Computer Science and Mathematics (summa cum laude), September 1995 - May 1999.  
Thesis: *Place Recognition Using Color Region Analysis*  
Advisor: Prof. C. Fennema

**WORK AND RESEARCH EXPERIENCE**

- ◇ **Research Fellow**, Martinos Center, Massachusetts General Hospital December 2006 - present  
Incorporating diffusion weighted image information into surface-based inter-subject registration of brain acquisitions.
- ◇ **Postdoctoral Researcher**, MAS, Ecole Central de Paris (December 2005- December 2006)  
Analysis and classification of Diffusion Tensor MRI acquisitions of skeletal muscle and cardiac image registration.
- ◇ **Lecturer**, MAS, Ecole Central de Paris (Spring 2006)  
Course: *Image Processing : Basics, Challenges and Perspectives*.
- ◇ **Research Assistant**, Computer Science and Artificial Intelligence Laboratory, Massachusetts Institute of Technology (September 1999- December 2005)  
Investigated multi-modal alignment of 3D-3D and 2D-3D medical images and created a unified information theoretic framework for the registration problem.
- ◇ **Teaching Assistant**, Massachusetts Institute of Technology (January - May 2003)  
Course: *Biomedical Signal and Image Processing* (graduate level course).  
Lectured, created lab projects, corrected homeworks, monitored lab hours and held office hours.

- ◇ **Visiting Research Fellow**, Project Odyssee, INRIA, Sophia Antipolis, France  
(June - August 2002)  
Investigated the problem of identifying physiological noise in functional Magnetic Resonance (fMRI) data sets.
- ◇ **Software Consultant**, Visualization Technology, Inc. Lawrence, MA (June - August 2000)  
Investigated the problem of 3D-3D rigid-body registration of CT and MR data sets. Integrated algorithm into existing commercial software package.
- ◇ **Software Design Engineer**, Small Business Group, Microsoft Co. Redmond, WA  
(June - August 1999)  
Designed, wrote and tested a COM addin to hook a Contact Manager application to Outlook. Examined TAPI, Win32, ATL and COM technologies to develop modules for initiating outgoing and monitoring incoming phone calls.
- ◇ **Honours Student**, Computer Science Department, Mount Holyoke College, South Hadley, MA (September 1998 - May 1999)  
Investigated the *Where am I?* problem in Computer Vision. Studies involved color perception and classification, reflectance analysis and camera calibration.
- ◇ **Software Developer**, Service Research Laboratory, GTE Laboratories, Waltham, MA (June - August 1998)  
Designed software applications for a Web-based telecommunications ordering system. Contacted the product's main client regarding design issues. Participated in designing the object model for the project. Evaluated recently developed application servers and software solutions.
- ◇ **Research Fellow**, Computer Science Department, Smith College, Northampton, MA (September 1997 - June 1998)  
Created an interactive research tool for use in Computational Geometry studies. Wrote applications and applets in Java, translated programs from C to Java, and did research in the field of Computational Geometry.

- PUBLICATIONS L. Zöllei: *2D-3D Rigid-Body Registration of X-Ray Fluoroscopy and CT Images*, Masters Thesis, MIT AI Lab, August 2001.
- L. Zöllei, E. Grimson, A. Norbash, W. Wells: *2D-3D Rigid Registration of X-Ray Fluoroscopy and CT Images Using Mutual Information and Sparsely Sampled Histogram Estimators*, IEEE CVPR, 2001.
- A. Yezzi, L. Zöllei, T. Kapur: *A Variational Framework for Joint Segmentation and Registration*, IEEE CVPR - MMBIA, 2001.
- A. Yezzi, L. Zöllei, T. Kapur: *A Variational Framework for Integrating Segmentation and Registration Through Active Contours*, Medical Image Analysis, Volume 7, Issue 2, June 2003, pp. 171-185.
- L. Zöllei, J. Fisher, W.M. Wells III: *A Unified Statistical and Information Theoretic Framework for Multimodal Image Registration*, Information Processing in Medical Imaging (IPMI) 2003, LNCS 2732, pp. 366-377.
- L. Zöllei, L. Panych, E. Grimson, W.M. Wells III: *Exploratory Identification of Cardiac Noise in fMRI Images*, MICCAI 2003, Montreal, Canada, LNCS 2878, pp. 475-483.
- L. Zöllei, J. Fisher, W.M. Wells III: *A Unified Statistical and Information Theoretic Framework for Multimodal Image Registration*, AI Memo #AIM-2004-011.
- L. Zöllei, J. Fisher, W.M. Wells III: *An Introduction to Statistical Methods of Medical Image Registration*, Mathematical Models in Computer Vision: The Handbook, Springer (2005).
- L. Zöllei et al.: *Efficient Population Registration of 3D Data*, (Best Paper Award) Computer Vision for Biomedical Image Applications, ICCV 2005.

L. Zöllei: *A Unified Information Theoretic Framework for Pair- and Group-wise Registration of Medical Images*, Ph.D. thesis, MIT; MIT-CSAIL TR-2006-005

L. Zöllei et al.: *Multi-modal Image Registration Using Dirichlet-encoded Prior Information*, WBIR 2006.

L. Zöllei, M.Jenkinson, S.Timoner, W.M. Wells III: *A marginalized MAP approach and EM optimization for pair-wise registration*, Information Processing in Medical Imaging (IPMI) 2007, LNCS 4584, pp. 662-674.

G.M. Postelnicu, L. Zöllei, R. Desikan, B. Fischl: *Geometry Driven Volumetric Registration*, Information Processing in Medical Imaging (IPMI) 2007, LNCS 4584, pp. 675-686.

A. Mewes, L. Zöllei, P. Hüppi, H. Als, G. McAnulty, T. E. Inder, W. M. Wells III, S.K. Warfield: *Displacement of Brain Regions in Preterm Infants with Non-Synostotic Dolichocephaly Investigated by MRI*, NeuroImage 36 (2007) pp. 1074-1085.

L. Zöllei, M. Shenton, W.M. Wells III, K.Pohl: *The Impact of Atlas Formation Methods on Atlas-Guided Brain Segmentation*, Statistical Registration: Pair-wise and Group-wise Alignment and Atlas Formation workshop at MICCAI 2007, Brisbane, Australia, Nov 2007.

INVITED  
TALKS

- ◇ **Computer Science and Artificial Intelligence Laboratory, Massachusetts Institute of Technology**; *Combined Volumetric and Surface Registration*, Biomedical Imaging and Analysis; December 7, 2007.
- ◇ **Department of Electrical and Computer Engineering, University of Iowa**; *Efficient Group-wise Registration of Volumetric Data Sets*, Research Seminar; January 21, 2007.
- ◇ **EPFL, Lausanne, Switzerland**; *Efficient Population Registration of 3D Data*, Research Seminar; May 1, 2006.
- ◇ **Service Hospitalier Frederic Joliot, Orsay, France**; *Group-wise Registration of Medical Image Volumes*, Research Seminar; December 19, 2005.
- ◇ **Stochastic Systems Group, CSAIL, MIT**; *Unified Information Theoretic Framework for Pair-and Group-wise Registration of Medical Image*, Student Seminar; Nov 16, 2005.
- ◇ **Image Processing and Analysis Group, Yale University**; *Efficient population registration of 3D Data*; June 20, 2005.
- ◇ **Siemens Corporate Research, Princeton, NJ**; *Efficient population registration of 3D data*; Scientific Seminar Series, Aug 2, 2005.
- ◇ **Medical University of Szeged, Oncology Department, Szeged, Hungary**; *Medical Image Registration in Practice*; Aug 4, 2004.

SERVICE

- ◇ **Reviewer for IEEE Transactions on Medical Imaging, NeuroImage, IEEE Transactions on Image Processing, IEEE Transactions on Biomedical Engineering, Pattern Recognition Letters, Computer Vision and Image Understanding, International Conference on Pattern Recognition, European Conference on Computer Vision and Computer Vision and Pattern Recognition.**
- ◇ **Co-organizer and host of AI Student Seminar, 2001-02**
- ◇ **Co-organizer and host of CSAIL Student Seminar, 2003-04.**
- ◇ **Co-organizer of the speclaised workshop *Statistical Registration: Pair-wise and Group-wise Alignment and Atlas Formation* at the 10th International Conference on Medical Image Computing and Computer Assisted Intervention in 2007 (<http://www.nmr.mgh.harvard.edu/martinos/training/nonlocal/miccai07-workshop/>)**

AWARDS AND  
FELLOWSHIPS

- ◇ **Chateaubriand Fellowship (12-month-long postdoctoral position) by the Embassy of France in the United States, 2005.**

- ◇ Best Paper Award: Computer Vision for Biomedical Image Applications, ICCV 2005.
- ◇ Department Head Special Recognition Award, EECS, MIT; June, 2003.
- ◇ Phi Beta Kappa membership, 1999.
- ◇ Outstanding Undergraduate Award, Computing Research Association, Honorable Mention, 1999.
- ◇ Microsoft Women's Technical Scholarship (one year full tuition and summer internship), 1998-99.
- ◇ Achievement Award, GTE Laboratories, July 1998.

COMPUTER SKILLS AND LANGUAGES

- ◇ C/C++, Java, Matlab, HTML, LISP, Perl
- ◇ Operating Systems: Windows, Unix, Linux, Macintosh.
- ◇ Hungarian, English, French, Spanish.

PERSONAL

- ◇ **Citizenship:** Hungarian

REFERENCE

- Prof. Eric Grimson, MIT (welg@csail.mit.edu)
- Prof. William Wells, BWH, HMS (sw@bwh.harvard.edu)
- Prof. Bruce Fischl, MGH (fischl@mgh.harvard.edu)
- Prof. Nikos Paragios, ECP (nikos.paragios@ecp.fr)
- Prof. Alan Willsky, MIT (willsky@mit.edu)