Miaomiao Zhang

Contact Information	Computer Science and Artificial Intelligence Lab Massachusetts Institute of Technology 32 Vassar Street, 32-D475A Cambridge, MA 02139 USA	<i>Cell:</i> (801) 232-3679 <i>E-mail:</i> miao86@mit.edu		
Research Interests	Image Analysis, Machine Learning and Statistical Modeling, Computer Vision			
Education	Massachusetts Institute of Technology, Cambridge, MA11/2015 -Postdoctoral Associate, Electrical Engineering and Computer Science11/2015 -			
	University of Utah , Salt Lake City, UT Ph.D. in Computing, School of Computing	08/2010 - 10/2015		
	East China Normal University , Shanghai, China M.S. in Computer Science	09/2008 - 07/2010		
	Henan Normal University, Henan, China B.S. in Computer Science	09/2004 - 07/2008		
Selected Honors	• Young Scientist Award (a.k.a. Best Paper Award), Medical Image Computing and Computer Assisted Intervention (MICCAI) 2014			
	• Student Travel Award, MICCAI	2014		
	• Travel Grant Support, 23rd Information Processing in Medical Imaging (IPMI) 2013			
	• Travel Grant Award, Women in Machine Learning (WIML) 2013			
	• Travel Grant Award, CRA-W Grad Cohort Workshop 2012			
	• Student Teaching Award, Henan, China	2008		
	• National Scholarship (1 out of 164), China	2006, 2007		
Research Experience	Massachusetts Institute of Technology, Cambridge, MA 11/2015 - Postdoctoral Associate , Advisor: Dr. Polina Golland Currently focus on deriving theoretical problems of low-dimensional statistical shape analysis for imaging data; conducting research in sparse image registration for undersampled pathology images.			
	University of Utah, Salt Lake City, UT 05/2012 - 10/2015 Graduate Research Assistant, Advisor: Dr. P. Thomas Fletcher			

	• Developed an entire Bayesian framework for statistical shape and high-dimensional nonlinear data and its applications to Brain Magne onance Imaging and Alzheimer's disease	lysis of tic Res-		
	• Proposed efficient Bayesian inference algorithms of sampling on manifolds			
	• Defined a novel finite-dimensional representation of diffeomorphisms in a discrete space, which has never been done in the literature			
	• Mentored students in Bayesian multiatlas building, clustering mode diffeomorphic registration.	els, and		
	East China Normal University, Shanghai, China 09/2008 - 0 Graduate Research Assistant, Advisor: Dr. Guixu Zhang	07/2010		
	• Presented a new model for a single color image dehazing and denois	sing		
	• Improved the speed and accuracy of traditional image segmentation methods by using fuzzy clustering analysis			
	• Numerically derived the variational formulation of level set methodesigned a new optimization strategy for searching a better optima.	ods and		
INVITED TALKS Presentations	• Finite-Dimensional Lie Algebras for Fast Diffeomorphic Image Regist IPMI, June 2015, Isle of Skye, UK	tration,		
	• Fast Diffeomorphic Image Registration, East China Normal University, May 2015, Shanghai, China			
	• Bayesian Analysis of Diffeomorphic Shape Variability, MIT, April 2015, Cambridge, USA			
	• Probabilistic Principal Geodesic Analysis, East China Normal University, January 2014, Shanghai, China			
	• Bayesian Estimation of Regularization and Atlas Building in Diffeon Image Registration, IPMI, June 2013, California, USA	norphic		
Professional Activities	Journal Reviews			
	• Medical Image Analysis	2015		
	• Computer Vision and Image Understanding	2015		
	• Journal of Zhejiang University Science	2014		
	Conference Reviews			
	• MICCAI	2015		
	Book Chapter Reviews			
	• Riemannian Volume, Springer	2015		

- PUBLICATIONS [1] FLETCHER, P. T., AND **Zhang, M.** Probabilistic geodesic models for regression and dimensionality reduction on riemannian manifolds. In *Riemannian Computing in Computer Vision*. Springer, 2015.
 - [2] GAO, Y., Zhang, M., FLETCHER, P. T., AND GERIG, G. Image registration and segmentation in longitudinal MRI using temporal appearance modeling. In *International Symposium on Biomedical Imaging - ISBI 2016* (accepted). Springer, 2016.
 - [3] HROMATKA, M., Zhang, M., FLEISHMAN, G. M., GUTMAN, B., JAHAN-SHAD, N., THOMPSON, P., AND FLETCHER, P. T. A hierarchical bayesian model for multi-site diffeomorphic image atlases. In *Medical Image Computing and Computer-Assisted Intervention-MICCAI 2015.* Springer, 2015.
 - [4] **Zhang, M.**, AND FLETCHER, P. T. Probabilistic principal geodesic analysis. In Advances in Neural Information Processing Systems (2013).
 - [5] Zhang, M., AND FLETCHER, P. T. Bayesian principal geodesic analysis in diffeomorphic image registration. In *Medical Image Computing and Computer-Assisted Intervention-MICCAI 2014*. Springer, 2014.
 - [6] Zhang, M., AND FLETCHER, P. T. Bayesian principal geodesic analysis for estimating intrinsic diffeomorphic image variability. *Medical Image Analysis* (2015).
 - [7] Zhang, M., AND FLETCHER, P. T. Bayesian statistical shape analysis on the manifold of diffeomorphisms. In *Riemannian Volume*. Springer, In progress, 2015.
 - [8] Zhang, M., AND FLETCHER, P. T. Bayesian statistical shape analysis on the manifold of diffeomorphisms. In *Riemannian Volume (under review)*. Springer, 2015.
 - [9] Zhang, M., AND FLETCHER, P. T. Fast geodesic shooting via lowdimensional Lie algebras. International Journal of Computer Vision (under review) (2015).
 - [10] Zhang, M., AND FLETCHER, P. T. Finite-dimensional Lie algebras for fast diffeomorphic image registration. In *Information Processing in Medical Imaging* (2015).
 - [11] Zhang, M., SHAO, H., AND FLETCHER, P. T. A mixture model for automatic diffeomorphic multi-atlas building. In *MICCAI Workshop - BAMBI* (2015).
 - [12] Zhang, M., SINGH, N., AND FLETCHER, P. T. Bayesian estimation of regularization and atlas building in diffeomorphic image registration. In *Information Processing in Medical Imaging* (2013), Springer.

Teaching Experience	• Teaching Assistant, Image Processing, University of Utah	Fall 2010
	• International Teaching Assistant Workshop, University of U	tah 08/2010
	• Teaching Assistant, Linear Algebra, ECNU	Fall 2009
	• Lecturer, Introduction to Computer Programming, HNU	Spring 2008
Software Releases	 FLASH This is a free C++ library of a fast diffeomrophic image registration algorithm. Distributed via: https://bitbucket.org/FlashC/flashc Role: Developer Manifold Statistics This is a free C++ library for general computations and statistics on Riemannian manifolds. Distributed via: https://bitbucket.org/vakra/manifoldstatistics Role: Team member, my main contribution is the probabilistic principal geodesic analysis package 	
References	Dr. Polina Golland Professor in Electrical Engineering and Computer Science Computer Science and Artificial Intelligence Lab Massachusetts Institute of Technology	
	<i>E-mail:</i> pointa@csail.mit.edu Dr. P. Thomas Fletcher Associate Professor in Computer Science Scientific Computing and Imaging Institute University of Utah <i>E-mail:</i> fletcher@sci.utah.edu	
	Dr. Laurent Younes Professor in Department of Applied Mathematics and Statistics Center for Imaging Science Johns Hopkins University <i>E-mail:</i> laurent.younes@jhu.edu	
	Dr. Sarang Joshi Professor in BioEngineering Scientific Computing and Imaging Institute University of Utah <i>E-mail:</i> sjoshi@sci.utah.edu	