

# Liang Mi

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## SUMMARY

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I am a Ph.D. candidate at Arizona State University. My research interests lie in the intersection of machine learning and computer vision, particularly in functional mapping and its applications in clustering, embedding learning, domain adaptation, 3D registration, and medical imaging. I am also working on unsupervised depth estimation from monocular color images. I have interned at Bosch and Intuitive Surgical. I am open to a full-time scientist/engineer position focusing on machine learning and computer vision, starting in May 2020.

## EDUCATION

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- **Doctor of Philosophy in Computer Engineering, 4.0/4.0** Aug. 2014 – Present  
*Arizona State University, Tempe, Arizona*
- **Master of Science in Electrical and Computer Engineering, 3.8/4.0** May 2014  
*Worcester Polytechnic Institute, Worcester, Massachusetts*
- **Bachelor of Engineering in Electrical Engineering, 83.3/100** Jul. 2012  
*Harbin Institute of Technology, Harbin, China*

## SKILLS

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- **Languages:** C/C++, Python, Matlab, etc. **Libraries:** Eigen, ITK/VTK, OpenCV/GL, PyTorch, SciPy, etc.

## WORK EXPERIENCE

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- **Research Intern (Visual Sensing)** Summer 2019  
*Bosch, Sunnyvale, California*
  - **Depth Estimation:** Developed a deep self-supervised learning framework for depth map estimation from monocular color images and sparse LiDAR samples.
  - **Metric Learning:** Developed a deep learning model to find a common embedding space of different modalities for cross-modal object recognition.
- **Software Engineering Intern (Imaging and Computer Vision)** Summer 2017  
*Intuitive Surgical, Sunnyvale, California*
  - **3D Reconstruction:** Designed and implemented an algorithm, in C++, for on-line 3D reconstruction.

## RESEARCH PROJECTS

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- **Optimization over Optimal Transportation** Sep. 2018 – Present  
*Geometric Systems Laboratory, Arizona State University*
  - **Regularization:** Designing regularized transportation techniques for domain adaptation, point set registration, and skeleton layout.
  - **Wasserstein Loss:** Developing a differential Wasserstein loss for learning Gaussian mixtures, autoencoders, and generative models.
- **Wasserstein Clustering using Variational Principles (ECCV'18, ICCV'17)** Sep. 2015 – Mar. 2018
  - **Clustering:** Proposed to solve constraint k-means problem with optimal transportation.
  - **Transportation:** Implemented 3D variational optimal transportation for computing Wasserstein distances.
- **Mesh Completion** Jan. 2015 – May 2015  
*3D Scanning Laboratory, Stony Brook University*
  - **ICP:** Used iterative closest point to register parametric face meshes.
- **Virtual Capsule Endoscopy (BodyNets 2013)** Jan. 2013 – Jan. 2014  
*Center for Wireless Information Networking Studies, Worcester Polytechnic Institute*
  - **Simulation:** Created a virtual testbed to simulate capsule endoscopy for validating visual tracking algorithms.
- **Building Detection on Aerial LiDAR Images (IST 2013)** Jan. 2012 – May 2012  
*Institute of Image and Information Processing, Harbin Institute of Technology*
  - **Terran reconstruction:** Implemented a reconstruction algorithm by using the *minimum description length*.
  - **Building detection:** Proposed a two-step detection framework by reconstructing terrain and removing trees.

## TEACHING EXPERIENCE

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- **Teaching Assistant** Aug. 2014 - Present  
*Arizona State University*
  - **Spring 2018:** Database Management (SER 322), Logic Design (SER232)
  - **Fall 2017:** Logic In Computer Science (CSE 259, Instructor of recitation sessions)
  - **Fall 2016:** Data Structures and Algorithms (CSE 310, Instructor of recitation sessions)
  - **Fall 2014:** The Principles of Programming Languages (CSE 110)
- **Grader** May 2013 - May 2014  
*Worcester Polytechnic Institute*
  - **Spring 2012:** Digital Image Processing (CS/ECE 545)
  - **Fall 2011:** Introduction to Wireless Networks (ECE 3308)

## RELATED COURSES

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- **Math:** Conformal Geometry (ASU), Complex Analysis (Coursera)
- **Graphics:** Computer Graphics (ASU, WPI), Geometric Modeling (ASU)
- **Vision:** Digital Image/Video Processing (ASU, WPI), Robotics: Perception (Coursera)
- **Machine/Deep Learning:** Statistical Machine Learning (ASU), Neural Networks for Machine Learning (Coursera)  
Convolutional Neural Networks for Visual Recognition (Stanford Online)

## SOME PROJECTS

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- **Geometry processing:** Implemented *Loop subdivision*, *spherical conformal map*, and *least squares conformal map* with the half-edge structure in C++.
- **Image stitching:** Used OpenCV (C++) to stitch panoramic pictures by matching SIFT features.

## AWARDS

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- **Fellowship:** ASU Graduate College Completion Fellowship 2019-2020, ASU Engineering Graduate Fellowship 2018 - 2020,  
ASU University College Fellowship 2018
- **Travel:** Peter Hall Conference Travel Award 2019, ASU Graduate College Travel Award 2017,  
ASU CIDSE Conference Funding 2017, 2018

## SERVICES

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- **Reviewer:** AAAI '20, CVPR '20, '19, ICCV '19, MICCAI '19, '18, '17

## SELECT PUBLICATIONS

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- **Mi, Liang**, Wen Zhang, and Yalin Wang. "Regularized Wasserstein Means via Variational Transportation" arXiv preprint arXiv:1812.00338. (Preprint)
- Zhang, Wen, **Liang Mi**, Paul Thompson, and Yalin Wang. "A Geometric Framework for Feature Mappings in Multimodal Fusion of Brain Image Data." In proceedings of the Information Processing in Medical Imaging (IPMI), 2019.
- **Mi, Liang**, Wen Zhang, Xianfeng Gu, and Yalin Wang. "Variational Wasserstein Clustering." In Proceedings of the European Conference on Computer Vision (ECCV), pp. 322-337. 2018.
- Singh, Shibani, Anant Srivastava, **Liang Mi**, Richard J. Caselli, Kewei Chen, Dhruvan Goradia, Eric M. Reiman, and Yalin Wang. "Deep-learning-based classification of FDG-PET data for Alzheimer's disease categories." In 13th International Conference on Medical Information Processing and Analysis, vol. 10572, p. 105720J. International Society for Optics and Photonics, 2017.
- **Mi, Liang**, Wen Zhang, Junwei Zhang, Yonghui Fan, Dhruvan Goradia, Kewei Chen, Eric M. Reiman, Xianfeng Gu, and Yalin Wang. "An Optimal Transportation based Univariate Neuroimaging Index." In Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (ICCV), pp. 182-191. 2017.
- Bao, Guanqun, Kaveh Pahlavan, **Liang Mi**, "Hybrid Localization of Micro-robotic Endoscopic Capsule inside Small Intestine by Data Fusion of Vision and RF Sensors", Sensors Journal, IEEE, Volume:PP , Issue: 99, Nov. 2014.
- **Mi, Liang**, Shuang Zhou, Hao Chen, Yishuang Geng, Building Detection in Digital Surface Model, Imaging Systems and Techniques (IST), 2013 IEEE International Conference on, Beijing, China, 22-23 Oct. 2013.