

Liang Mi

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SUMMARY

I am a computer vision research engineer at Apple. I am part of the camera algorithms team developing new features and enhancements for the next generations of iOS devices. Before joining Apple, I completed my Ph.D study at Arizona State University where I developed several mathematical models for solving machine learning and computer vision problems, specifically matching distributional data in the Euclidean space and its applications to clustering, domain adaptation, and point-set registration.

EDUCATION

- **Doctor of Philosophy, Computer Engineering, 4.0/4.0** 2020
Arizona State University, Tempe, Arizona
Thesis: Transportation Techniques for Geometric Clustering
- **Master of Science, Electrical and Computer Engineering, 3.8/4.0** 2014
Worcester Polytechnic Institute, Worcester, Massachusetts
- **Bachelor of Engineering, Electrical Engineering, 83.3/100** 2012
Harbin Institute of Technology, Harbin, China

PROGRAMMING SKILLS

- **Languages:** C/C++/Obj-C, Python, Matlab, Swift **Libraries:** Eigen, Metal, OpenCV/GL, PyTorch, etc.

WORK EXPERIENCE

- **Imaging and Computer Vision Research Engineer** May 2020 - present
Apple, Cupertino, California
 - **Camera algorithms:** Developing camera algorithms based on image processing, 3D geometry, and machine learning techniques.
- **Visual Sensing Intern** Jan - Aug, 2019
Bosch, Sunnyvale, California
 - **Depth Estimation:** Developed a deep self-supervised learning framework with PyTorch 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)** May - Aug, 2017
Intuitive Surgical, Sunnyvale, California
 - **3D Reconstruction:** Designed and implemented an algorithm, in C++, for on-line 3D reconstruction.
- **Software Engineering Intern** Mar - Aug, 2014
Aware, Bedford, Massachusetts
 - **Gaussian downsampling:** Wrote a C/C++ library for image downsampling by Gaussian filtering.

RESEARCH WORK AT ASU

- **Clustering via Variational Optimal Transport** 2015 – 2020
Geometric Systems Laboratory, Arizona State University
 - **Unbalanced Variational Transport:** Developing theories and algorithms for optimal transportation for unbalanced measures. [Under submission]
 - **Multi-marginal Optimal Transport:** Developing theories and algorithms for optimal transportation between multiple distributional data. [Under submission]
 - **Regularized Transportation:** Developed regularized transportation techniques for domain adaptation, point set registration, and skeleton layout. [AAAI'20]
 - **Clustering:** Proposed to solve constraint k-means problem with optimal transportation. [ECCV '18]
 - **Transportation:** Implemented variational optimal transportation for indexing 3D shapes. [ICCV '17]

AWARDS

- **Fellowships:** ASU Graduate College Completion Fellowship '20,'19,
ASU Engineering Graduate Fellowship '20,'19,'18,
ASU University College Fellowship '18
- **Travel Awards:** AAAI Scholarship '20
NeurIPS Travel Award '19
Peter Hall Conference Travel Award '19,
ASU CIDSE Conference Funding '19, '18, '17
ASU Graduate College Travel Award '19, '17

SELECT PUBLICATIONS

- **Mi, Liang**, Azadeh Sheikholeslami, and Jos Bento. "A family of pairwise multi-marginal optimal transports that define a generalized metric." *Machine Learning* 112, no. 1 (2023): 353-384.
- **Mi, Liang**, Zhang, W., & Wang, Y. (2020). Regularized Wasserstein Means for Aligning Distributional Data. *Proceedings of the AAAI Conference on Artificial Intelligence*, 34(04), 5166-5173.
- Tu, Yanshuai*, **Mi, Liang***, Wen Zhang, Haomeng Zhang, Junwei Zhang, Yonghui Fan, Dhruvan Goradia et al. "Computing Univariate Neurodegenerative Biomarkers with Volumetric Optimal Transportation: A Pilot Study." *Neuroinformatics* (2020).
- 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 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**, and others. "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.
- Pahlavan, Kaveh, Yishuang Geng, David R. Cave, Guanqun Bao, **Mi, Liang**, Emmanuel Agu, Andrew Karellas, Kamran Sayrafian, and Vahid Tarokh. "A novel cyber physical system for 3-D imaging of the small intestine in vivo." *IEEE Access* 3 (2015): 2730-2742.
- 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.*
- Bao, Guanqun, **Mi, Liang**, and Kaveh Pahlavan. "A video aided RF localization technique for the wireless capsule endoscope (WCE) inside small intestine." In *Proceedings of the 8th International Conference on Body Area Networks*, pp. 55-61. 2013.
- Bao, Guanqun, **Mi, Liang**, and Kaveh Pahlavan. "Emulation on motion tracking of endoscopic capsule inside small intestine." In *Proceedings of the International Conference on Bioinformatics & Computational Biology (BIOCOMP)*, p. 1. The Steering Committee of The World Congress in Computer Science, Computer Engineering and Applied Computing (WorldComp), 2013.
- Zhou, Shuang, **Mi, Liang**, Hao Chen, and Yishuang Geng. "Building detection in Digital surface model." In *2013 IEEE International Conference on Imaging Systems and Techniques (IST)*, pp. 194-199. IEEE, 2013.

REVIEWING

I have been invited to review submissions for several conferences on machine learning and computer vision.

- AAAI Conference on Artificial Intelligence (AAAI) '20, '21
International Conference on Medical Image Computing & Computer Assisted Intervention (MICCAI) '18 – '21
European/International Conference on Computer Vision (ECCV/ICCV) '19 – '21
International Conference on Machine Learning (ICML) '20 – '23
Neural Information Processing Systems (NeurIPS) '20 – '23
Computer Vision and Patter Recognition (CVPR) '19 – '23