

# Ming-Yu Liu

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**Objectives:** Seeking a research scientist position in an industrial artificial intelligence research lab or product development department

**Research interest:** Computer vision, deep unsupervised learning, deep reinforcement learning

**Expertise:** Computer vision, deep learning, and machine learning

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## Education

- **University of Maryland College Park, Maryland** **College Park, MD, USA**  
*Electrical and Computer Engineering, Ph.D.* 2006 – 2012  
Dissertation: Discrete optimization methods for segmentation and matching  
Adviser: Rama Chellappa
  - **National Chiao Tung University** **Hsinchu, Taiwan**  
*Electrical Engineering, B.A.* 1999 – 2003
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## Professional Experiences

- **Mitsubishi Electric Research Laboratories (MERL)** **Cambridge, MA, USA**  
*Principal Research Scientist* 2012 – present
    - Conducted fundamental and applied research in computer vision and deep learning.
    - Applied fields: autonomous driving, factory automation, social infrastructure monitoring, and satellite image analysis
    - Computer vision expertise: object detection, semantic segmentation and labeling, pose estimation, image classification, domain adaptation, depth super-resolution
    - Deep learning expertise: deep convolutional neural nets, deep generative adversarial nets, attention mechanism and recurrent neural nets, recursive context propagation nets
    - Published 10 high impact scientific papers
    - Earned 5 US patents
    - Product launched: MELFA-3D vision system
  - **Intel** **Taipei, Taiwan**  
*Software Engineering Intern* 2005 – 2006  
Intel X-Scale ARM-based embedded system software development for smart TV applications
  - **Army** **Taiwan**  
*Paratrooper Platoon Leader, Military Rank: Second Lieutenant* 2003 – 2005
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## Earned Patents

- US 8,428,363: Method for segmenting images using superpixels and entropy rate clustering
  - US 8,983,177: Method for increasing resolutions of depth images
  - US 8,908,913: Voting-based pose estimation for 3D sensors
  - US 9,195,904: Method for detecting objects in stereo images
  - US 9,280,827: Method for determining object poses using Weighted Features
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## Awards

- Best paper honorable mention by Robotics: Science and System Conference RSS, 2015
  - R&D 100 Award by R&D magazine, 2014
  - University of Maryland College Park, Fellowship, 2011
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## Publications

- **Coupled Generative Adversarial Networks**  
Ming-Yu Liu, O. Tuzel, arXiv:1606.07536
- **Gaussian Conditional Random Field Network for Semantic Segmentation**  
R. Vemulapalli, O. Tuzel, Ming-Yu Liu, R. Chellappa, CVPR 2016
- **Deep Gaussian Conditional Random Field Network: A Model-based Deep Network for Denoising**  
R. Vemulapalli, O. Tuzel, Ming-Yu Liu, CVPR 2016
- **Learning to Remove Multipath Distortions in Time-of-Flight Range Images for a Robotic Arm Setup**  
K. Son, Ming-Yu Liu, Y. Taguchi, ICRA 2016
- **Unsupervised Network Pretraining via Encoding Human Design**  
Ming-Yu Liu, Arun Mallya, Oncel Tuzel, Xi Chen, WACV 2016
- **Layered Interpretation of Street View Images**  
Ming-Yu Liu, S. Lin, S. Ramalingam, O. Tuzel, RSS 2015 (Best paper honorable mention)
- **Recursive Context Propagation Network for Semantic Scene Labeling**  
A. Sharma, O. Tuzel, Ming-Yu Liu, NIPS 2014
- **Learning to Rankd 3D Features**  
O. Tuzel, Ming-Yu Liu, Y. Taguchi, A. Raghunathan, ECCV 2014
- **Joint Geodesic Upsampling of Depth Images**  
Ming-Yu Liu, O. Tuzel, Y. Taguchi, CVPR 2013
- **Cluster Analysis via Maximizing a Submodular Function subject to a Matroid Constraint**  
Ming-Yu Liu, O. Tuzel, S. Ramalingam, R. Chellappa, TPAMI 2014
- **Model-Based Vehicle Pose Estimation and Tracking in Videos Using Random Forests**  
M. Hödlmoser, B. Micusik, M. Pollefeys, Ming-Yu Liu, M. Kampel, 3DV 2013
- **Fast Object Detection and Pose Estimation in Heavy Clutter for Robotic Bin-Picking**  
Ming-Yu Liu, O. Tuzel, A. Veeraraghavan, Y. Taguchi, T. Marks, R. Chellappa, IJRR 2012
- **Voting-Based Pose Estimation for Robotic Assembly Using a 3D Sensor**  
C. Choi, Y. Taguchi, O. Tuzel, Ming-Yu Liu, S. Ramalingam, ICRA 2012
- **A Grassmann Manifold-based Domain Adaptation Approach**  
J. Zheng, Ming-Yu Liu, R. Chellappa, P. Phillips, ICPR 2012
- **Classification and Pose Estimation of Vehicles in Videos by 3D Modeling**  
M. Hödlmoser, B. Micusik, Ming-Yu Liu, M. Pollefeys, M. Kampel, 3DV 2012
- **Entropy Rate Superpixel Segmentation**  
Ming-Yu Liu, O. Tuzel, S. Ramalingam, R. Chellappa, CVPR 2011
- **Fast Directional Chamfer Matching**  
Ming-Yu Liu, O. Tuzel, A. Veeraraghavan, R. Chellappa, CVPR 2010
- **Pose Estimation in Heavy Clutter using a Multi-Flash Camera**  
Ming-Yu Liu, O. Tuzel, A. Veeraraghavan, R. Chellappa, A. Agrawal, H. Okuda, ICRA 2010

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## Services

- **Reviewer:** IEEE TIP, IEEE SPL, CVIU
- **Technical committee:** CVPR, ICCV, ECCV, NIPS, ICRA, AAAI

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## Programming Skills

**Programming Languages:** C++, Python, Matlab

**Libraries:** Caffe, OpenCV, EIGEN, OpenGL, Coin-OR, GUROBI

**Opensource Code:**

- Fast directional chamfer matching algorithm
- Entropy rate superpixel segmentation algorithm
- Joint geodesic depth upsampling algorithm

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## References

- Upon request
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