

Ming-Yu Liu

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

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

- **Nvidia Research** **Santa Clara, CA, USA**
Senior Research Scientist 2016 – now
 - Conducted fundamental and applied research in computer vision and deep learning.
 - Applied fields: virtual reality, artificial intelligence, and autonomous driving
 - **Mitsubishi Electric Research Laboratories (MERL)** **Cambridge, MA, USA**
Principal Research Scientist 2012 – 2016
 - Conducted fundamental and applied research in computer vision and deep learning.
 - Applied fields: autonomous driving, factory automation
 - 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 6 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 9,633,274: Method and system for denoising images using deep Gaussian conditional random field network
 - US 9,558,268: Method for semantically labeling an image of a scene using recursive context propagation
 - 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

- **Deep 360 Pilot: Learning a Deep Agent for Piloting through 360 Sports Videos**
Hou-Ning Hu*, Yen-Chen Lin*, Ming-Yu Liu, Hsien-Tzu Cheng, Stanley Chang, Min Sun
CVPR 2017
- **CASENet: Deep Category-Aware Semantic Edge Detection**
Zhiding Yu, Chen Feng, Ming-Yu Liu, Srikumar Ramalingam
CVPR 2017
- **Tactics of Adversarial Attack on Deep Reinforcement Learning Agents**
Yen-Chen Lin, Zhang-Wei Hong, Yuan-Hong Liao, Meng-Li Shih, Ming-Yu Liu, Min Sun
IJCAI 2017
- **Unsupervised Image-to-Image Translation Networks**
Ming-Yu Liu, Thomas Breuel, and Jan Kautz
arXiv preprint arXiv:1702.01478
- **Attentional Network for Visual Object Detection**
Kota Hara, Ming-Yu Liu, Oncel Tuzel, and Amir-massoud Farahmand
arXiv preprint arXiv:1702.01478
- **Deep Active Learning for Civil Infrastructure Defect Detection and Classification**
Chen Feng, Ming-Yu Liu, Chieh-Chi Kao, and Teng-Yok Lee
International Workshop on Computing in Civil Engineering (IWCCE), 2017
- **Coupled Generative Adversarial Networks**
Ming-Yu Liu, Oncel Tuzel
NIPS 2016
- **R-CNN for Small Object Detection**
Chenyi Chen, Ming-Yu Liu, Oncel Tuzel, Jianxiang Xiao
ACCV 2016
- **Gaussian Conditional Random Field Network for Semantic Segmentation**
Raviteja Vemulapalli, Oncel Tuzel, Ming-Yu Liu, Rama Chellappa
CVPR 2016
- **Deep Gaussian Conditional Random Field Network: A Model-based Deep Network for Denoising**
Raviteja Vemulapalli, Oncel Tuzel, Ming-Yu Liu
CVPR 2016
- **Learning to Remove Multipath Distortions in Time-of-Flight Range Images for a Robotic Arm Setup**
Kilho Son, Ming-Yu Liu, Yuichi 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, Shuoxin Lin, Srikumar Ramalingam, Oncel Tuzel
RSS 2015
- **Recursive Context Propagation Network for Semantic Scene Labeling**
Abhishek Sharma, Oncel Tuzel, Ming-Yu Liu
NIPS 2014
- **Learning to Rankd 3D Features**
Oncel Tuzel, Ming-Yu Liu, Yuichi Taguchi, Arvind Raghunathan
ECCV 2014
- **Joint Geodesic Upsampling of Depth Images**
Ming-Yu Liu, Oncel Tuzel, Yuichi Taguchi
CVPR 2013
- **Cluster Analysis via Maximizing a Submodular Function subject to a Matroid Constraint**
Ming-Yu Liu, Oncel Tuzel, Srikumar Ramalingam, Rama Chellappa
TPAMI 2014

- **Model-Based Vehicle Pose Estimation and Tracking in Videos Using Random Forests**
Michael Hödlmoser, Branislav Micusik, Marc Pollefeys, Ming-Yu Liu, Martin Kampel
3DV 2013
 - **Fast Object Detection and Pose Estimation in Heavy Clutter for Robotic Bin-Picking**
Ming-Yu Liu, Oncel Tuzel, Ashok Veeraraghavan, Yuichi Taguchi, Tim K. Marks, Rama Chellappa
IJRR 2012
 - **Voting-Based Pose Estimation for Robotic Assembly Using a 3D Sensor**
Changhyun Choi, Yuichi Taguchi, Oncel Tuzel, Ming-Yu Liu, Srikumar Ramalingam
ICRA 2012
 - **A Grassmann Manifold-based Domain Adaptation Approach**
Jingjing Zheng, Ming-Yu Liu, Rama Chellappa, P Jonathan Phillips
ICPR 2012
 - **Classification and Pose Estimation of Vehicles in Videos by 3D Modeling**
Michael Hödlmoser, Branislav Micusik, Ming-Yu Liu, Marc Pollefeys, Martin Kampel
3DV 2012
 - **Entropy Rate Superpixel Segmentation**
Ming-Yu Liu, Oncel Tuzel, Srikumar Ramalingam, Rama Chellappa
CVPR 2011
 - **Fast Directional Chamfer Matching**
Ming-Yu Liu, Oncel Tuzel, Ashok Veeraraghavan, Rama Chellappa
CVPR 2010
 - **Pose Estimation in Heavy Clutter using a Multi-Flash Camera**
Ming-Yu Liu, Oncel Tuzel, Ashok Veeraraghavan, Rama Chellappa, Amit Agrawal, Haruhisa 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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Tutorials

- Deep Learning for Vision Guided Language Generation and Image Generation, ACCV 2016
 - Theory and Applications of Generative Adversarial Networks, CVPR 2017
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Programming Skills

Programming Languages: C++, Python, Matlab

Libraries: PyTorch, Caffe, EIGEN, OpenGL, Coin-OR, GUROBI

Opensource Code:

- Coupled generative adversarial network algorithm
- Fast directional chamfer matching algorithm
- Entropy rate superpixel segmentation algorithm
- Joint geodesic depth upsampling algorithm