

# YUANDONG TIAN

## RESEARCH INTEREST

Reinforcement Learning, Theory and Practice of Deep Learning, Optimization, Computer Vision.

## WORK EXPERIENCE

Jan.2015-present      **Research Scientist and Manager**  
Facebook Artificial Intelligence Research (FAIR)  
*Research Lead in Reinforcement Learning in Games / Multi-agent.*  
*Distributed reinforcement learning system (ELF).*  
*RL for learning intelligent behaviors of agents.*  
*RL for combinatorial optimization.*  
*Tech Lead of Facebook Go engine.*  
*DarkForestGo (2015): Strong CNN-based Go AI before AlphaGo.*  
*ELF OpenGo (2018): Superhuman and best open source Go AI by 2018.*  
Replication of AlphaZero with 2k GPUs.  
*Theoretical analysis of multilayered ReLU neural networks.*

Sep.2013-Dec.2014      **Robotics Researcher / Software Engineer**  
Vision and Learning Group, Driverless Car Team (Waymo), Google X  
*Real-time object recognition for autonomous driving car.*

## EDUCATION

Sep.2008-Sep.2013      **Ph.D** in Robotics  
Carnegie Mellon University

Sep.2005-Jun.2008      **Master** in Computer Science & Engineering  
Shanghai Jiao Tong University

Sep.2001-Jun.2005      **Bachelor** in Computer Science & Engineering  
Shanghai Jiao Tong University

## AWARDS AND SCHOLARSHIP

Dec.2013      Recipient of ICCV 2013 **Marr Prize Honorable Mentions.**

## PAPER REVIEWS

Reviewers      CVPR, ICCV, ECCV, Eurographics, ICCP, ACM SIGCHI, AAAI  
PAMI, IJCV, TIP, ICML, NeurIPS, ICLR, UAI

Area Chair      AAAI 2020, AISTats 2020

## SKILLS

Software      C/C++, Python, LUA/torch, Matlab

Languages      Mandarin Chinese (Native), English, Japanese

## ARXIV

- [1] Bolei Zhou, **Yuandong Tian**, Sainbayar Sukhbaatar, Arthur Szlam, Rob Fergus, *Simple Baseline for Visual Question Answering*, arXiv, 2016.
- [2] **Yuandong Tian**, *Student Specialization in Deep ReLU Networks With Finite Width and Input Dimension*, arXiv, 2019

[3] Linnan Wang, Saining Xie, Teng Li, Rodrigo Fonseca, **Yuandong Tian**, *Sample-Efficient Neural Architecture Search by Learning Action Space*, arXiv, 2019

## JOURNAL PUBLICATIONS

[1] Jiajun Wu, Tianfan Xue, Joseph J. Lim, **Yuandong Tian**, Joshua B. Tenenbaum, Antonio Torralba, William T. Freeman, *3D Interpreter Networks for Viewer-Centered Wireframe Modeling*, International Journal of Computer Vision (IJCV), Jul. 2015.

[2] **Yuandong Tian**, Srinivasa G. Narasimhan, *Theory and Practice of Hierarchical Data-driven Descent for Optimal Deformation Estimation*, International Journal of Computer Vision (IJCV), Jul. 2015.

[3] **Yuandong Tian**, Srinivasa G. Narasimhan, *Globally Optimal Estimation of Nonrigid Image Distortion*, International Journal of Computer Vision (IJCV), Nov. 2011.

[4] Mohit Gupta, **Yuandong Tian**, Srinivasa G. Narasimhan, Li Zhang, *A Combined Theory of De-focused Illumination and Global Light Transport*, International Journal of Computer Vision (IJCV), Sep. 2011.

## SELECTED CONFERENCE PUBLICATIONS

[1] Alvin Wan, Xiaoliang Dai, Peizhao Zhang, Zijian He, **Yuandong Tian**, Saining Xie, Bichen Wu, Matthew Yu, Tao Xu, Kan Chen, Peter Vajda, Joseph Gonzalez, *FBNetV2: Differentiable Neural Architecture Search for Spatial and Channel Dimensions*, CVPR 2020

[2] Hui Shi, Yang Zhang, Xinyun Chen, **Yuandong Tian**, Jishen Zhao, *Deep Symbolic Superoptimization Without Human Knowledge*, ICLR 2020.

[3] Haonan Yu, Sergey Edunov, **Yuandong Tian**, Ari S Morcos, *Playing the lottery with rewards and multiple languages: lottery tickets in RL and NLP*, ICLR 2020.

[4] Xinyun Chen, **Yuandong Tian**, *Learning to Perform Local Rewriting for Combinatorial Optimization*, NeurIPS 2019.

[5] Ari Morcos, Haonan Yu, Michela Paganini, **Yuandong Tian**, *One ticket to win them all: generalizing lottery ticket initializations across datasets and optimizers*, NeurIPS 2019.

[6] Cheng Fu, Huili Chen, Haolan Liu, Xinyun Chen, **Yuandong Tian**, Farinaz Koushanfar, Jishen Zhao, *Coda: An End-to-End Neural Program Decompiler*, NeurIPS 2019.

[7] Hengyuan Hu\*, Denis Yarats\*, Qucheng Gong, **Yuandong Tian**, Mike Lewis, *Hierarchical Decision Making by Generating and Following Natural Language Instructions*, NeurIPS 2019.

[8] Yi Wu, Yuxin Wu, Aviv Tamar, Stuart Russell, Georgia Gkioxari, **Yuandong Tian**, *Bayesian Relational Memory for Semantic Visual Navigation*, ICCV 2019.

[9] **Yuandong Tian**, Jerry Ma\*, Qucheng Gong\*, Shubho Sengupta\*, Zhuoyuan Chen, James Pinkerton, C. Lawrence Zitnick, *ELF OpenGo: An Analysis and Open Reimplementation of AlphaZero*, ICML 2019 (**Long oral**).

[10] Bichen Wu, Xiaoliang Dai, Peizhao Zhang, Yanghan Wang, Fei Sun, Yiming Wu, **Yuandong Tian**, Peter Vajda, Yangqing Jia, Kurt Keutzer: *FBNet: Hardware-Aware Efficient ConvNet Design via Differentiable Neural Architecture Search*, CVPR 2019.

[11] Yuping Luo, Harry Huazhe Xu, Yuanzhi Li, **Yuandong Tian**, Trevor Darrell, Tengyu Ma: *Algorithmic Framework for Model-based Deep Reinforcement Learning with Theoretical Guarantees*,

ICLR 2019.

[12] Tianmin Shu, **Yuandong Tian**: *M<sup>3</sup>RL: Mind-aware Multi-agent Management Reinforcement Learning*, ICLR 2019.

[13] Simon S. Du, Jason D. Lee, **Yuandong Tian**, Barnabas Poczos, Aarti Singh, *Gradient Descent Learns One-hidden-layer CNN: Don't be Afraid of Spurious Local Minima*, ICML 2018.

[14] Simon S. Du, Jason D. Lee, **Yuandong Tian**, *When is a Convolutional Filter Easy to Learn?* ICLR 2018.

[15] **Yuandong Tian**, Qucheng Gong, Wenling Shang, Yuxin Wu, C. Lawrence Zitnick, *ELF: An Extensive, Lightweight and Flexible Research Platform for Real-time Strategy Games*, NIPS 2017 (**Oral**).

[16] **Yuandong Tian**, *An Analytical Formula of Population Gradient for two-layered ReLU network and its Applications in Convergence and Critical Point Analysis*, ICML 2018.

[17] Yan Zhu, **Yuandong Tian**, Dimitris Mexatas, Piotr Dollar, *Semantic Amodal Segmentation*, CVPR 2017.

[18] Yuxin Wu, **Yuandong Tian**, *Training Agent for First-Person Shooter Game with Actor-Critic Curriculum Learning*, ICLR 2017.

[19] Jiajun Wu, Tianfan Xue, Joseph J. Lim, **Yuandong Tian**, Joshua B. Tenenbaum, Antonio Torralba, William T. Freeman, *Single Image 3D Interpreter Network*, ECCV 2016 (Oral presentation).

[20] **Yuandong Tian**, Yan Zhu, *Better Computer Go Player with Neural Network and Long-term Prediction*, ICLR 2016.

[21] **Yuandong Tian**, Srinivasa G. Narasimhan: *Hierarchical Data-Driven Descent for Efficient Optimal Deformation Estimation*, ICCV 2013 (**Marr Prize Honorable Mentions**).

[22] Nan Li, **Yuandong Tian**, William W. Cohen, Ken Koedinger: *Integrating Perceptual Learning with External World Knowledge in a Simulated Student*, Proceedings of the 16th International Conference on Artificial Intelligence in Education, 2013.

[23] **Yuandong Tian**, C. Lawrence Zitnick, Srinivasa G. Narasimhan: *Exploring the Spatial Hierarchy of Mixture Models for Human Pose Estimation*, ECCV 2012

[24] **Yuandong Tian**, Jun Zhu: *Learning from Crowds in the Presence of Schools of Thought*, SIGKDD 2012.

[25] **Yuandong Tian**, Srinivasa G. Narasimhan, Alan J. Vannevel: *Depth from Optical Turbulence*, CVPR 2012.

[26] **Yuandong Tian**, Srinivasa G. Narasimhan: *Rectification and 3D reconstruction of Curved Document Images*, CVPR 2011, (**Oral Presentation**), 3.5% acceptance).

[27] Dong Huang, **Yuandong Tian**, Fernando De la Torre, *Local Isomorphism to Solve the Pre-image Problem in Kernel Methods*, CVPR 2011.

[28] **Yuandong Tian**, Srinivasa G. Narasimhan: *A Globally Optimal Data-Driven Approach for Image Distortion Estimation*, CVPR 2010, (**Oral Presentation**, 4% acceptance).

[29] **Yuandong Tian**, Srinivasa G. Narasimhan: *Seeing through water: Image restoration using*

*model-based tracking*, ICCV 2009.

[30] Mohit Gupta, **Yuandong Tian**, Srinivasa G. Narasimhan, Li Zhang: *(De)Focusing on Global Light Transport for Active Scene Recovery*, CVPR 2009, (**Oral Presentation**, 3.5% acceptance).

[31] Shifeng Chen, **Yuandong Tian**, Fang Wen, Ying-Qing Xu, Xiaoou Tang: *Easytoon: an easy and quick tool to personalize a cartoon storyboard using family photo album*, ACM Multimedia 2008.

[32] **Yuandong Tian**, Wei Liu, Rong Xiao, Fang Wen, Xiaoou Tang: *A Face Annotation Framework with Partial Clustering and Interactive Labeling*, CVPR 2007.

[33] Jingyu Cui, FangWen, Rong Xiao, **Yuandong Tian**, Xiaoou Tang: *EasyAlbum: An Interactive Photo Annotation System Based on Face Clustering and Re-ranking*, ACM SIGCHI 2007.

[34] Rong Xiao, Wu-Jun Li, **Yuandong Tian**, Xiaoou Tang: *Joint Boosting Feature Selection for Robust Face Recognition*, CVPR 2006.