Zheng (Thomas) Tang

Applied Scientist, Metropolis at NVIDIA · Expert in Computer Vision and Machine Learning

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Summary

Current Applied Scientist, Metropolis at NVIDIA · Previous Research Scientist, Amazon One at Amazon (2019 - 2021) · Ph.D. in Electrical & Computer Engineering at the University of Washington · 9-month internship at NVIDIA with 2 papers accepted to CVPR'19 and ICCV'19 · 2 filed U.S. patents and 16 publications · Associate Editor of T-CSVT · Member of the Organizing Committee for the AI City Challenge Workshops in CVPR · Leader of the winning team at the 2nd AI City Challenge Workshop in CVPR'18 · Finalist of 2 Best Student Paper Awards at ICPR'16

Education

University of Washington (UW) *Seattle, WA, USA*

Ph.D. in Electrical & Computer Engineering *Sep. 2014 - Jun. 2019*

- Advised by Prof. Jenq-Neng Hwang (IEEE Fellow) at the Information Processing Lab
- Dissertation topic: Robust Video Object Tracking via Camera Self-Calibration

University of Washington (UW) *Seattle, WA, USA*

M.S. in Electrical Engineering *Sep. 2014 - Mar. 2016*

- GPA: 3.83/4.0

Queen Mary University of London (QMUL) *London, UK*

B.S. in Telecommunications Engineering with Management (Joint Programme) *Sep. 2010 - Jun. 2014*

- First Class Honours

Beijing University of Posts and Telecommunications (BUPT) *Beijing, China*

B.S. in Telecommunications Engineering with Management (Joint Programme) *Sep. 2010 - Jun. 2014*

- GPA: 88.73/100

Work Experience

NVIDIA *Redmond, WA, USA*

Applied Scientist, Metropolis *May 2021 - PRESENT*

- Researching in pose estimation and action recognition for pedestrians and vehicles to be deployed to traffic video analytics in smart cities
- Organizing the **AI City Challenge Workshops** in conjunction with **CVPR** that have attracted 1,000+ participating teams across 40+ countries

Amazon *Seattle, WA, USA*

Research Scientist, Amazon One *Jul. 2019 - May 2021*

- Worked on the research team that developed and launched **Amazon One**, an identity service using people's palm for payment, entry and more
- Invented a novel way to utilize various modalities of sensor data for automated user identification that was filed for a **U.S. patent**

NVIDIA *Santa Clara, CA, USA*

Intelligent Video Analytics Intern *Jun. 2018 - Mar. 2019*

- Created **CityFlow**, a city-scale benchmark for multi-target multi-camera (MTMC) vehicle tracking and ReID, accepted to **CVPR'19 (Oral)**
- Proposed **PAMTRI**, a pose-aware multi-task network for vehicle ReID using highly randomized synthetic data, accepted to **ICCV'19**

University of Washington *Seattle, WA, USA*

Research Assistant *Jun. 2015 - Jun. 2018*

- Built clustering-based vehicle tracking and camera self-calibration that won in **Track 1** of the **2nd AI City Challenge Workshop** in **CVPR'18**
- Developed multi-camera tracking from visual and semantic features that won in **Track 3** of the **2nd AI City Challenge Workshop** in **CVPR'18**
- Created a 3D human pose estimator to enable overlaying AR for medical simulation under 6-DoF camera motion (funded by ArchieMD Inc.)
- Proposed evolutionary camera self-calibration from tracking, a finalist of **2 Best Student Paper Awards** at **ICPR'16** (funded by Prism Skylabs)
- Invented adaptive segmentation and tracking with top accuracy (**74.82%**) on the **NLPR_MCT** benchmark (funded by Madrona Venture Group)

Professional Service

IEEE Transactions on Circuits and Systems for Video Technology (T-CSVT) *Remote*

Associate Editor *Jan. 2021 - PRESENT*

- Promptly assigned papers for review and offered decisions that helped reduce decision-making time by **52.5 days** compared to 2019
- Provided active feedback to the editors on the innovation, coverage and quality of papers that supported the impact factor of **4.133**

Selected Publications

Journal Articles

MOANA: An online learned adaptive appearance model for robust multiple object tracking in 3D
Zheng Tang, Jenq-Neng Hwang
IEEE Access 7.1 (2019) pp. 31934–31945. 2019

ESTHER: Joint camera self-calibration and automatic radial distortion correction from tracking of walking humans
Zheng Tang, Yen-Shuo Lin, Kuan-Hui Lee, Jenq-Neng Hwang
IEEE Access 7.1 (2019) pp. 10754–10766. 2019

Online-learning-based human tracking across non-overlapping cameras
Young-Gun Lee, Zheng Tang, Jenq-Neng Hwang
T-CSVT 28.10 (2018) pp. 2870–2883. 2018

Conference Papers

The 5th AI City Challenge
Milind Naphade, Shuo Wang, David C. Anastasiu, Zheng Tang, Ming-Ching Chang, Xiaodong Yang, Yue Yao, Liang Zheng, Pranamesh Chakraborty, Christian E. Lopez, Anuj Sharma, Qi Feng, Vitaly Ablavsky, Stan Sclaroff
Proc. CVPR Workshops, pp. 4263–4273, 2021, Virtual

PAMTRI: Pose-aware multi-task learning for vehicle re-identification using highly randomized synthetic data
Zheng Tang, Milind Naphade, Stan Birchfield, Jonathan Tremblay, William Hodge, Ratnesh Kumar, Shuo Wang, Xiaodong Yang
Proc. ICCV, pp. 211–220, 2019, Seoul, Korea

CityFlow: A city-scale benchmark for multi-target multi-camera vehicle tracking and re-identification
Zheng Tang, Milind Naphade, Ming-Yu Liu, Xiaodong Yang, Stan Birchfield, Shuo Wang, Ratnesh Kumar, David Anastasiu, Jenq-Neng Hwang
Proc. CVPR, pp. 8797–8806, 2019, Long Beach, CA, USA

Joint multi-view people tracking and pose estimation for 3D scene reconstruction
Zheng Tang, Renshu Gu, Jenq-Neng Hwang
Proc. ICME, pp. 1–6, 2018, San Diego, CA, USA

Single-camera and inter-camera vehicle tracking and 3D speed estimation based on fusion of visual and semantic features
Zheng Tang, Gaoang Wang, Hao Xiao, Aotian Zheng, Jenq-Neng Hwang
Proc. CVPR Workshops, pp. 108–115, 2018, Salt Lake City, UT, USA

Multiple-kernel adaptive segmentation and tracking (MAST) for robust object tracking
Zheng Tang, Jenq-Neng Hwang, Yen-Shuo Lin, Jen-Hui Chuang
Proc. ICASSP, pp. 1115–1119, 2016, Shanghai, China

Camera self-calibration from tracking of moving persons
Zheng Tang, Yen-Shuo Lin, Kuan-Hui Lee, Jenq-Neng Hwang, Jen-Hui Chuang, Zhijun Fang
Proc. ICPR, pp. 260–265, 2016, Cancún, México

Patents

Utilizing Sensor Data for Automated User Identification
Zheng Tang, Prithviraj Banerjee, Manoj Aggarwal, Gerard Medioni
U.S. Patent Application No. 17/209,845 (Pending), 2021

Neural Network System for Object Identification
Zheng Tang, Stan Birchfield, William Hodge, Ratnesh Kumar, Milind Naphade, Jonathan Tremblay, Shuo Wang, Xiaodong Yang
U.S. Patent Application No. 16/442,375 (Pending), 2019

Honors & Awards

2019	**People's Choice Award**, Code for the Kingdom (C4TK) Hackathon	*Seattle, WA, USA*
2018	**Winner of Track 1 (Traffic Flow Analysis)**, 2nd AI City Challenge Workshop in CVPR'18	*Salt Lake City, UT, USA*
2018	**Winner of Track 3 (Multi-camera Vehicle Detection & ReID)**, 2nd AI City Challenge Workshop in CVPR'18	*Salt Lake City, UT, USA*
2017	**Winner of Track 2 (AI City Applications)**, 1st AI City Challenge Workshop in SmartWorld'17	*San Francisco, CA, USA*
2016	**Finalist IBM Best Track 3 Student Paper Award**, ICPR'16	*Cancún, México*
2016	**Finalist Intel Best Track 3 Student Paper Award**, ICPR'16	*Cancún, México*

Skills

Programming	Python (expert), C/C++ (expert), Java (proficient), JavaScript (proficient), MATLAB (expert), LaTeX(expert)
Frameworks & Tools	PyTorch (expert), TensorFlow (expert), Git (expert), Docker (proficient), CUDA (proficient), React (proficient)
Languages	English (proficient), Mandarin (native), Cantonese (native), Spanish (elementary)