Zheng (Thomas) Tang

Senior Deep Learning Engineer at NVIDIA · Expert in Computer Vision and Machine Learning

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Summary

Current Senior Deep Learning Engineer at NVIDIA · Previous Applied Scientist at Amazon ('19-'21) · Ph.D. in Electrical & Computer Engineering at UW · 6 filed U.S. patents and 25 publications · Tech Lead of Metropolis Multi-Camera Tracking AI Workflow featured in NVIDIA GTC'24 Keynote by Jensen Huang · Associate Editor of T-CSVT · Organizing Committee Lead of AI City Challenges at CVPR · Winning team's leader at the 2nd AI City Challenge in CVPR'18 · Finalist in 2 Best Student Paper Awards at ICPR'16 · No immigration sponsorship needed

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), dissertation titled "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*

Work Experience

NVIDIA — *Redmond, WA, USA*

Senior Deep Learning Engineer, Metropolis — *May 2021 - PRESENT*

- Led development of a Multi-Camera Tracking AI Workflow featured in the **NVIDIA GTC'24 Keynote** and ranked **2/19** in the 8th AI City Challenge
- Created a 3.2M-image dataset for human-centric tasks and trained a **ReID Transformer**, improving tracking accuracy by **6-20%** on our KPIs
- Organizing the **AI City Challenges** at **CVPR** with the largest indoor synthetic dataset created by **Omniverse**, featured in an **NVIDIA blog**

Amazon — *Seattle, WA, USA*

Applied 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 an architecture that utilized various modalities of sensor data for automated user identification and was filed for a **U.S. patent**
- Invented a mechanism to update identification data in automated user-identification systems that was also 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**
- Proposed evolutionary camera self-calibration from tracking, a finalist of **2 Best Student Paper Awards** at **ICPR'16** (funded by Prism Skylabs)

Professional Services

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

Associate Editor — *Jan. 2021 - PRESENT*

AI City Challenge Workshops at IEEE Conf. Comput. Vis. Pattern Recognit. (CVPR) — *Remote*

Organizing Committee Lead — *Jun. 2020 - PRESENT*

Selected Publications

Journal Articles

The staged knowledge distillation in video classification: Harmonizing student progress by a complementary weakly supervised framework
Chao Wang, Zheng Tang
T-CSVT 34.8 (2024) pp. 6646–6660. 2024

WSSGCN: Wide sub-stage graph convolutional networks
Chao Wang, Zheng Tang, Hailu Xu
Neurocomputing 602 (2024) p. 128273. 2024

Conference Papers

The 8th AI City Challenge
Shuo Wang, David C. Anastasiu, Zheng Tang, Ming-Ching Chang, Yue Yao, Liang Zheng, Mohammed Shaiqur Rahman, Meenakshi S. Arya, Anuj Sharma, Pranamesh Chakraborty, Sanjita Prajapati, Quan Kong, Norimasa Kobori, Munkhjargal Gochoo, Munkh-Erdene Otgonbold, Ganzorig Batnasan, Fady Alnajjar, Ping-Yang Chen, Jun-Wei Hsieh, Xunlei Wu, Sameer Satish Pusegaonkar, Yizhou Wang, Sujit Biswas, Rama Chellappa
Proc. CVPR Workshops, pp. 7261–7272, 2024, Seattle, WA, USA

UAV first-person viewers are radiance field learners
Liqi Yan, Qifan Wang, Junhan Zhao, Qiang Guan, Zheng Tang, Jianhui Zhang, Dongfang Liu
Proc. ECCV (accepted), 2024, Milan, Italy

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 C. Anastasiu, Jenq-Neng Hwang
Proc. CVPR, pp. 8797–8806, 2019, Long Beach, CA, USA

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

Selected Patents

Multi-sensor subject tracking for monitored environments for real-time and near-real-time systems and applications
Zheng Tang, Sujit Biswas, Ganapathy Seshadri Cadungude Aiyer, Shuo Wang, Akshay Agrawal, Sameer Satish Pusegaonkar
U.S. Patent Application No. 18/605,121 (Pending), 2024

Multi-subject multi-camera tracking for high-density environments
Zheng Tang, Sujit Biswas, Ganapathy Seshadri Cadungude Aiyer, Shuo Wang, Akshay Agrawal, Sameer Satish Pusegaonkar
U.S. Patent Application No. 18/618,974 (Pending), 2024

Three-dimensional multi-camera perception systems and applications
Zheng Tang, Yizhou Wang, Orcun Cetintas, Sameer Satish Pusegaonkar, Ganapathy Seshadri Cadungude Aiyer, Shuo Wang, Akshay Agrawal, Sujit Biswas, Tim Meinhardt, Laura Leal-Taixe
U.S. Patent Application No. 18/898,120 (Pending), 2024

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

Updating identification data in automated user-identification systems
Zheng Tang, Lior Zamir, Prithviraj Banerjee, Manoj Aggarwal, Gerard Medioni, Dilip Kumar
U.S. Patent Application No. 17/361,811 (Pending), 2021

Honors & Awards

2022 **T-CSVT Best Associate Editor Award,** IEEE Circuits and Systems Society (CASS) *Remote*
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*
2016 **Finalist in IBM & Intel Best Track 3 Student Paper Awards,** ICPR'16 *Cancún, México*

Skills

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