Zheng (Thomas) Tang

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

11431 Willows Rd #200, Redmond, WA 98052, USA

(+1) 206-669-5590 | tangzhengthomas@gmail.com | zhengthomastang.github.io | zhengthomastang | zhengthomastang

Summary

Current Senior Data Science Engineer at NVIDIA · Previous Applied Scientist at Amazon ('19-'21) · Ph.D. in Electrical & Computer Engineering at UW · 4 filed U.S. patents and 19 publications · Associate Editor of T-CSVT · Organizing Committee Member of AI City Challenge Workshops in CVPR · Internship at NVIDIA with 2 papers accepted to CVPR'19 and ICCV'19 · Winning team's leader at the 2nd AI City Challenge Workshop in CVPR'18 · Finalist of 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 Data Science Engineer, Metropolis *May 2021 - PRESENT*

- Developed the Multi-Camera Tracking app of **Metropolis Microservices** that ranked at 3/46 in the AI City Challenge, featured in NVIDIA GTC
- Integrated ReID and action recognition networks into the **TAO Toolkit** and built end-to-end video analytics apps on the **Triton Inference Server**
- Organizing the **AI City Challenge Workshops** in conjunction with **CVPR** that have attracted 1,000+ participating teams across 40+ countries

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 Member *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 (2023). 2023

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 7th AI City Challenge
Milind Naphade, Shuo Wang, David C. Anastasiu, Zheng Tang, Ming-Ching Chang, Yue Yao, Liang Zheng, Mohammed Shaiqur Rahman, Meenakshi S. Arya, Anuj Sharma, Qi Feng, Vitaly Ablavsky, Stan Sclaroff, Pranamesh Chakraborty, Sanjita Prajapati, Alice Li, Shangru Li, Krishna Kunadharaju, Shenxin Jiang, Rama Chellappa
Proc. CVPR Workshops, pp. 5537–5547, 2023, Vancouver, BC, Canada

Training with product digital twins for AutoRetail Checkout
Yue Yao, Xinyu Tian, Zheng Tang, Sujit Biswas, Huan Lei, Tom Gedeon, Liang Zheng
arXiv:2308.09708 (submitted to AAAI 2024), 2023

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

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

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

Cloud-Native System for Multi-Target Multi-Camera Tracking Using Hierarchical Clustering and Hungarian Matching
Zheng Tang, Sujit Biswas, Ganapathy Seshadri Cadungude Aiyer, Shuo Wang, Akshay Agrawal, Sameer Satish Pusegaonkar
U.S. Patent Application No. 63/539,325 (Pending), 2023

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

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

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*
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++ (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)