# Zheng (Thomas) Tang

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

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## Summary

Senior Deep Learning Engineer at NVIDIA · Former Applied Scientist at Amazon ('19–'21) · Ph.D. in Electrical & Computer Engineering from UW · Holder of 9 U.S. patents & author of 25 publications · Tech Lead of Metropolis Multi-Camera Tracking AI Workflow, integrated into the Mega Omniverse Blueprint and showcased in CES'25 & GTC'25 keynotes · Senior Area Editor for IEEE T-CSVT · Organizing Committee Lead for AI City Challenges at CVPR · Led winning team of the 2nd AI City Challenge at CVPR'18 · Finalist for two 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), 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*

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

- Led the development of a real-time location system (**RTLS**) for spatial AI agents, leveraging Sparse4D 3D perception and GNN-based tracking
- Integrated RTLS in **Mega Omniverse Blueprint**, with digital twin demos (warehouse & Foxconn factory) showcased at CES'25 & GTC'25 keynotes
- Proposed **MCBLT** 3D perception framework with NVIDIA Research, achieving state-of-the-art on both synthetic and real-world benchmarks
- Led organization of the **AI City Challenges** at CVPR & ICCV, releasing Omniverse-generated 3D perception data in NVIDIA's Hugging Face

**Amazon** — *Seattle, WA*

Applied Scientist, Amazon One — *Jul. 2019 - May 2021*

- Part of the core research team that built and launched **Amazon One**, a palm-based identity service for payment, entry, and more
- Invented a multi-modal sensor architecture and adaptive update schema for automated authentication systems with **two U.S. patents** filed

**NVIDIA** — *Santa Clara, CA*

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

- Created **CityFlow**, a large-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*

Research Assistant — *Jun. 2015 - Jun. 2018*

- Built clustering-based vehicle tracking and camera self-calibration, winning **Track 1** of the **2nd AI City Challenge Workshop** at **CVPR'18**
- Developed multi-camera tracking using visual and semantic features, winning **Track 3** of the **2nd AI City Challenge Workshop** at **CVPR'18**
- Proposed evolutionary camera self-calibration from tracking, a finalist for **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*

Senior Area Editor — *Jan. 2025 - 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 9th AI City Challenge
Zheng Tang, Shuo Wang, David C. Anastasiu, Ming-Ching Chang, Anuj Sharma, Quan Kong, Norimasa Kobori, Munkhjargal Gochoo, Ganzorig Batnasan, Munkh-Erdene Otgonbold, Fady Alnajjar, Jun-Wei Hsieh, Tomasz Kornuta, Xiaolong Li, Yilin Zhao, Han Zhang, Subhashree Radhakrishnan, Arihant Jain, Ratnesh Kumar, Vidya N. Murali, Yuxing Wang, Sameer Satish Pusegaonkar, Yizhou Wang, Sujit Biswas, Xunlei Wu, Zhedong Zheng, Pranamesh Chakraborty, Rama Chellappa
*Proc. ICCV Workshops*, 2025, Honolulu, HA, USA

Radiance field learners as UAV first-person viewers
Liqi Yan, Qifan Wang, Junhan Zhao, Qiang Guan, Zheng Tang, Jianhui Zhang, Dongfang Liu
*Proc. ECCV*, 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

Determining camera placement for optimized scene coverage using light transport simulation
Shenxin Jiang, Yuxing Wang, Shangru Li, Haoquan Liang, Tongwei Dai, Zheng Tang
U.S. Patent Application No. 19/080,481 (Pending), 2025

3D multi-sensor perception and object tracking
Yizhou Wang, Sameer Satish Pusegaonkar, Vishal Kumar, Yuxing Wang Chetan Sethi, Ganapathy Seshadri Cadungude Aiyer, Alice Li, Yun He, Kartikay Thakkar, Zheng Tang, Swapnil Rathi, Bhushan Rupde, Sujit Biswas
U.S. Patent Application No. 19/079,809 (Pending), 2025

Subject re-identification using semantic attribute recognition
Sameer Satish Pusegaonkar, Zheng Tang, Yizhou Wang, Sujit Biswas, Yuxing Wang
U.S. Patent Application No. 18/960,754 (Pending), 2024

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

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

# 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)