Tony (Tongyun) Yang

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EDUCATION

PhD MSCA Doctoral Networks - 6th Sense — **July 2025 – Present**
IMDEA Networks — Madrid, Spain
Joint communication and sensing in 6G networks: This project develops energy-efficient, privacy-preserving RF sensing systems that convert wireless signals (e.g., Wi-Fi, 5G/6G) into actionable insights for human and obstacle detection without requiring cameras or wearables. It focuses on:

- **Neuromorphic computing** combining spiking neural networks and neuromorphic RF receivers for low-power, event-driven signal processing, enabling simultaneous channel estimation, target detection, and micro-motion analysis with drastically reduced energy consumption.
- **Cross-modal, context-aware fusion** combining RF with vision, LiDAR, and inertial sensors to enhance robustness and semantic richness, using RF as a low-power sentinel that selectively activates complementary sensors to balance sensing capability with privacy.
- **Human-centered applications** in smart environments, healthcare, and accessibility, emphasizing real-world deployment and social acceptance.

MSc Computer & Embedded Systems Engineering — **September 2022 – October 2024**
TU Delft — Delft, The Netherlands

BSc (cum laude) Electrical Engineering & Mechatronics — **September 2017 – July 2021**
Shanghai Maritime University & Abroad in NL — China & The Netherlands

EXPERIENCE

AI Research Engineer — **January 2025 – June 2025**
TU Delft Imaging Physics Department — Delft, The Netherlands
Investigated weight redundancy in nnU-Net using unstructured pruning, followed by structured pruning to enhance efficiency. Demonstrated that nnU-Net can be structurally pruned to 99% sparsity with minimal performance degradation, leading to a 6× improvement in training efficiency and gains in inference speed.

Research Assistant — **June 2023 – October 2024**
TU Delft Embedded Systems Department — Delft, The Netherlands
Constructed the first large-scale public dataset for emotion recognition based solely on eye-tracking in immersive environments, covering seven discrete emotions. Developed an efficient and scalable recognition method, with results accepted for publication in IMWUT/UbiComp'25.
Additionally, explored the use of self-supervised learning for human activity recognition using eye-tracking data, achieving 85% classification accuracy across six distinct activity classes.

Support Engineer — **December 2020 – July 2021**
NXP Semiconductors N.V. — Nijmegen, The Netherlands
Developed an automated test bench system for UJA116X CAN chip family, integrating comprehensive diagnostic protocols to enable efficient defect analysis and ensure robust performance verification.

PUBLICATIONS

Yang, T.*, Regmi, B.*, Du, L., Bulling, A., Zhang, X., & Lan, G. (2025). Through the Eyes of Emotion: A Multi-faceted Eye Tracking Dataset for Emotion Recognition in Virtual Reality. In *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT), 9(3), 1-41. ACM, New York, NY, USA.*

Zhao, Y., Kellman, P., Xue, H., Yang, T., Zhang, Y., Han, Y., Simonetti, O., & Tao, Q. (2025). Reverse Imaging for Wide-spectrum Generalization of Cardiac MRI Segmentation. In International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI), 15962, 555-565. Springer Nature Switzerland.

Yang, T., Zhao, Y., & Tao, Q. (2025). Pruning nnU-Net with Minimal Performance Loss. In *Medical Imaging with Deep Learning (MIDL), Short Papers.*

TEACHING

Teaching Assistant & Mentor — **September 2023 – January 2025**
TU Delft — Delft, The Netherlands

- ET 4310 Supercomputing for Big Data (2024/2025 Q1) /TA
- CESE 4030 Embedded Systems Lab (2023/24 Q3) / TA
- CESE 4000 Software Fundamentals (2023/24 Q1) / TA
- CESE 4010 Advanced Computing Systems (2023/24 Q1) / TA
- CESE MSc Programme Student Mentor (2023/24)

PROJECTS

Medical Image Generation with Stable Diffusion — **October 2024**
Engineered a specialized Stable Diffusion model incorporating anatomy-compliant synthesis, leveraging the M&Ms-2 Dataset to generate high-fidelity medical images

AWS Big Data Application — **December 2023**
Developed a global evacuation plan making application on AWS Platform utilizing Apache Kafka, Spark, Hadoop and OpenStreetMap, for flooded areas based on real-time sea-level.

Acoustic Localization — **May 2023**
Developed an Android application with AI model deployed for precise indoor location detection using acoustic signals. Achieving 98% accuracy across 16 distinct locations with only approximately 100 training samples each. Introduced a novel technique for reducing the amount of training data.

Quadcopter Drone — **March 2023**
Developed the control and communication unit for a drone in Rust.

SKILLS & INTERESTS

Languages
Mandarin (Native), English (Working proficiency), Spanish (Intermediate)

Technical
Python, PyTorch, MATLAB, LaTeX, Git, Docker, Signal processing, ML, neural network pruning, wireless sensing, eye tracking.

Interests
Research interests include human-centered innovation at the intersection of AI, embedded systems, and wearable technology, with a focus on real-world impact and social good.
Personal interests include running with a half marathon personal best of 1:43:53 at NN CPC Loop Den Haag, bodybuilding through regular strength training, as well as cooking, hiking, and tennis.