CHANGHAO TIAN

+65 84246559 | e: changhao001@e.ntu.edu.sg Personal Website: Link

EDUCATION

Technical University of Munich Munich, Germany
Visiting PhD Student in Intelligent System July .2024-October. 2024
Nanyang Technological University Singapore
Doctoral Candidate in Materials Science and Engineering August .2021-September. 2025

- Jointly supervised by Singapore Agency for Science, Technology and Research
- Award: **A*Star Merit Award (AMA), Singapore International Graduate Award (SINGA)**

Nanjing University Nanjing, China
Bachelor of Science (Physics) September. 2017 – June. 2021

- Award: **People's Scholarship Science and Technology Innovation Award**

SELECTED PUBLICATIONS *FULL LIST*

- **Tian, C**, An, N, Et al. *Deep Learning Based Topography Aware Gas Source Localization with Mobile Robot*. *International Conference on Robotics and Automation (ICRA 2025).* Under Review
- ***Tian, C.**, Zhang, J., Gu, J., Li, W., & Cao, Y. (2022). Light controlled biomaterials for regulating cell migration and differentiation. Smart Materials in Medicine, 3, 209-216.*
- Wang, Z., Wang, Z., Li, J., **Tian, C.**, & Wang, Y. (2020). Active colloidal molecules assembled via selective and directional bonds. *Nature communications*, *11*(1), 2670.
- Wang, Z., Wang, Z., Li, J., Cheung, S. T. H., **Tian, C.**, Kim, S. H., ... & Wang, Y. (2019). Active patchy colloids with shape-tunable dynamics. *Journal of the American Chemical Society*, *141*(37), 14853-14863.

CONFERENCE PRESENTATIONS

- ***Tian, C.***, "Detecting and Predicting Gas Sources Using a Multi-Sensor Robot," International Conference on Robotics and Automation (ICRA), London, May 27- June 3, 2023.

RESEARCH EXPERIENCE

Area Gas Concentration Reconstruction from Ultra-sparse Observation with Physics-informed Neuron Network
School of Material Science and Engineering, NTU (Supervisor: Prof. Xiaodong Chen) August. 2024 - Current

- Developing a physics-informed model, reconstructing area gas distribution with limited sensor observation.
- Did CFD for pre-training dataset and fine-tuned the model with data from low-speed wind tunnel.

Deep Learning Based Topography Aware Gas Source Localization with Mobile Robot Munich, Germany
Munich Institute of Robotics and Machine Intelligence, Technical University of Munich (Supervisor: Prof. Achim Lilienthal) July. 2024 – October 2024

- Lead the design of a robot integrating visual, LIDAR, and gas sensors, leveraging reinforcement and transfer learning for multisensory data fusion.
- Train the system to pinpoint gas leak sources and autonomously plan efficient navigation routes.

DeepVNO: Dynamic Smart Gas Sensor Array Singapore
School of Material Science and Engineering, NTU (Supervisor: Prof. Xiaodong Chen) August. 2021 - Current

- Developed an innovative MOX sensor array system, whose operational parameters are governed by a sophisticated neural network model, allowing for nuanced interactions with diverse environmental factors.
- Achieved significant advancements in rapid and precise detection of gas mixture components.

Novel Synthetic and Dynamic Analysis of Customized Janus Nano Particle Hongkong, China
Complex Soft Materials Laboratory, HKU (Supervisor: Prof. Yufeng Wang) August. 2019 – November. 2019

- Co-authored "*Active colloidal molecules assembled via selective and directional bonds*", where I introduced a novel cluster-encapsulation-dewetting method for the synthesis of Janus nanoparticles, enabling customization of particle size and potential application for similar particle synthesis.
- Co-authored "*Active patchy colloids with shape-tunable dynamics*", where I developed a computer vision program for tracking and analyzing the behavior of particles, especially under the influence of electric fields.

Development of Nano-hydrogel Particles with Specific Property Nanjing, China
Institute of Biophysics, Nanjing University (Supervisor: Prof. Yi Cao) December. 2018 – June. 2021

- Contributed to "*Light controlled biomaterials for regulating cell migration and differentiation*" by pioneering the design of self-assembled proteins for synthesizing hydrogels with unique internal tension structures.
- Established a robust protein system and innovated a self-assembled ParMRC mechanism driven by ATP within the hydrogel, enhancing its capability for sustained and repeatable drug delivery.

WORK EXPERIENCE

Intern Industry Researcher Beijing, China (Remote)
CAS Star Venture Capital January. 2024 – April. 2024

- Investigate potential investment opportunity and write report.