# CHANGHAO TIAN
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## 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**

## PUBLICATIONS

- **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.
- Guo, J., **Tian, C.**, & Xu, B. (2020). Biomaterials based on noncovalent interactions of small molecules. *EXCLI journal*, *19*, 1124.
- 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

**Olfactory Simultaneous Localization and Mapping(O-SLAM): Vision Assisted Robot Gas Source Localization**
Munich, Germany
*Munich Institute of Robotics and Machine Intelligence, Technical University of Munich (Supervisor: Prof. Achim Lilienthal )*  August. 2021 - Current
- 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.

**Biomaterials Based on Noncovalent Interactions of Small Molecules**  Boston, US
*Department of Chemistry, Brandeis University (Supervisor: Prof. Bing Xu)*  June. 2020 – September. 2020
- Conducted a comprehensive review on supramolecular biomaterials that leverage noncovalent interactions, emphasizing their transformative applications in tissue engineering, cancer therapy, drug delivery, and molecular imaging, while underscoring the significance of enzymatic control for precise biomedicine regulation.
- Co-authored "*Biomaterials based on noncovalent interactions of small molecules*".

**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.