

Haozhe Tian

haozhe.tian21@imperial.ac.uk | haozhetian.netlify.app


 LinkedIn |  Github |  Google Scholar

SW7 2AZ, London, United Kingdom

EDUCATION

- **Imperial College London** Oct 2023 - Oct 2027
PhD, Dyson School of Design Engineering London, UK
 - Awarded a full scholarship by UKRI and Dyson School of Design Engineering
- **Imperial College London** Oct 2021 - Oct 2022
MSc, Department of Electrical and Electronic Engineering London, UK
 - Grade: Distinction | The Ivor Tupper Prize For Excellence in Signal Processing, Broadcast, and Video Technology (1 in the cohort)
- **Beihang University** Sep 2017 - Jun 2021
BEng, School of Automation Science and Electrical Engineering Beijing, China
 - GPA: 3.84/4 | China National Scholarship (0.2%) | three times on the outstanding student list (5%) | Outstanding Graduate (10%)

WORK

- **Research Assistant**  Jan 2023 - Aug 2023
Hong Kong Polytechnic University Hong Kong SAR, China
 - Developed a graph poisoning method that systematically injects a small number of malicious nodes, significantly enhancing graph link inference attack performance.
- **Teaching Assistant** Jun 2024 - ongoing
Imperial College London London, UK
 - Taught *Optimisation, Statistics, and Machine Learning* to MEng and MSc students.
 - Developed tutorial sheets to reinforce core concepts, delivered 3-hour weekly tutorials and provided individual guidance during office hours.

PUBLICATIONS

- [1] **Haozhe Tian**, Homayoun Hamedmoghadam, Robert Shorten, Pietro Ferraro. Reinforcement Learning with Adaptive Regularization for Safe Control of Critical Systems. *Advances in Neural Information Processing Systems (NeurIPS)*. 2024.
- [2] **Haozhe Tian**, Haibo Hu, Qingqing Ye. CGP: Centroid-guided Graph Poisoning for Link Inference Attacks in Graph Neural Networks. *IEEE International Conference on Big Data (BigData)*. 2023.
- [3] **Haozhe Tian**, Edoardo Occhipinti, Amir Nassibi, Danilo P. Mandic. Hearables: Heart Rate Variability from Ear Electrocardiogram and Ear Photoplethysmogram (Ear-ECG and Ear-PPG). In *45th Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC) (oral presentation)*. 2023.
- [4] Bei Zhang, **Haozhe Tian**, Tianyu Xiao, Jing Zhang. Instrumentation of surface plasmon microscopy: complete scheme of signal extractions. *IEEE Transactions on Instrumentation and Measurement*. 2021.
- [5] **Haozhe Tian**, Qiyu Rao, Nina Moutonnet, Pietro Ferraro, Danilo P. Mandic. Reinforcement Learning Driven Sequential Matched Filtering for R-Peak Detection in Ear-ECG. *Under review*. 2025.

SKILLS

- **Qualifications:** GRE General (330+4.0) | TOEFL iBT (115)
- **Programming Languages:** Python | MATLAB | Julia
- **Python:** PyTorch | OpenAI Gym | NumPy | Scikit-learn | OpenCV | pandas | Matplotlib
- **Others:** LaTeX | html | CSS | git

PROJECTS

• Reinforcement Learning for Safety-Critical Applications

Oct 2023 - ongoing

Topics: Reinforcement Learning (RL), Model Predictive Control (MPC), Convex Optimization

- Awarded the I-X Moonshot Seed Fund (awarded to 6 projects annually at Imperial College London).
- Developed and open-sourced three safety-critical control environments (two for blood glucose control and one for chemical reactors) in the OpenAI Gym style [🔗].
- Proposed a "focus" module that achieves safe RL training through adaptive integration of MPC.
- Analytically quantified the worst-case policy performance and provided convergence proof for the trained policy.
- Validated the algorithm in simulations based on real patient data.

• Link Inference Attacks in Graph Neural Networks

Jan 2023 - Aug 2023

Topic: Graph Neural Network (GNN), Graph Attention Networks (GAT)

- Formalized a novel graph link inference attack scenario involving malicious nodes.
- Designed a link inference attack method leveraging malicious nodes to extract sensitive links.
- Achieved F1-scores of > 0.9 using only 1% malicious nodes in benchmark graph datasets.

• The Analysis of Noisy Ear ECG and PPG Signals

Jan 2022 - Aug 2022

Topics: Matched Filter, Hilbert Transform, Machine Learning

- Contributed to the development of a wearable ear sensor for bio-signal measurements (ECG and PPG).
- Created a method for heartbeat detection using a Matched Filter with auto-generated templates.
- Applied signal processing techniques to extract features from real-world signals, enabling physical state classification using machine learning.

• Epileptic Seizure Detection Using Graph Neural Networks

Jan 2021 - Jun 2021

Topics: Graph Neural Network (GNN), Signal Processing

- Conducted spectral analysis and statistical tests to identify key EEG frequency bands.
- Developed graph-based representations of EEG channels using spatial and spectral coherence.
- Empirically compared the performance of fully connected neural networks, shallow GNNs, and deep GNNs.

• Surface Plasmon Microscopy Based on Object Detection Networks

May 2020 - Apr 2021

Topics: Object Detection, Signal Processing, Optics

- Built an optical system for acquiring surface plasmon (SP) profiles.
- Trained a Faster R-CNN network for localizing SP profiles and classifying polarization states.
- Introduced self-correlation for location rectification and gray-scale statistical methods for aperture radius measurement.