Haozhe Tian

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Personal Website

Education

- **Beihang University** — Beijing, China
  Bachelor of Engineering — *Sep 2017 - Jun 2021*
  GPA: 3.844/4 | Outstanding Graduate (2021) | China National Scholarship (2017)
  Department: Automation and Electrical Engineering | Specialization: Pattern Recognition
  Courses: *Linear Algebra | Mathematical Analysis | Complex Functions and Integral Transform | Probability and Statistics | Microprocessor and Interface | Principles of Automatic Control | Digital Signal Processing | Nonlinear Control | Pattern Recognition and Intelligent Systems | Visual Measurement and Applications | Introduction to Robotics*

- **Imperial College London** — London, UK
  Master of Science — *Sep 2021 - Sep 2022*
  Communications and Signal Processing
  Courses: *Information Theory | Coding Theory | Digital Image Processing | Computer Vision and Pattern Recognition | Adaptive Signal Processing and Machine Intelligence | Wavelet and Representation Learning | Advanced Communication Theory*

Publications

- **Instrumentation of Surface Plasmon Microscopy: Complete Scheme of Signal Extractions**: Second Author, published on IEEE Transaction on Instrumentation and Measurement, vol. 70, pp. 1-10, 2021
- **Assembly and Error Analysis of Back Focal Plane-typed Apertometer**: Second Author, SPIE, vol. 11717, 2020

Skills

- **English**: GRE General (330+4.0) | TOEFL iBT (115)
- **Languages**: Python | MATLAB (Code Sample) | julia | C/C++ | Verilog HDL
- **Frameworks**: Numpy | PyTorch | Scikit-learn | OpenCV | pandas | Matplotlib
- **Others**: LaTeX | html | CSS

Experience

- **Surface Plasmon Microscopy Based on Object Detection Networks** — Beihang University
  Supervisor: Dr. Bei Zhang (in cooperation with Prof. Michael Somekh) — *May 2020 - Apr 2021*
  - **Instrumentation**: Built an Surface Plasmon Microscopy (SPM) system and acquired surface plasmon (SP) profiles
  - **Object Detection Network**: Trained a Faster R-CNN network for classifying polarization mode and localizing SP profiles (the first time deep-learning was applied to back focal plane SPM, to our best knowledge)
  - **Radius Measurements**: Proposed self-correlation for center identification; Gray-scale statistics for the measurement of SP and aperture's radii
  - **Verification**: Applied the complete algorithm to measure the excitation angle of MgO; bench-marked the model against traditional approaches (based on Hough transform or Fourier correlation analysis; compared the performance of several object detection networks (YOLO, SSD, Faster R-CNN)

- **Epileptic Seizure Detection Based on Graph Neural Network** — Beihang University
  Supervisor: Prof. Yang Li — *Jan 2021 - Jun 2021*
  - **Data Preparation**: Adopted the MIT-CHB data set, analysed the power spectrum density, identified key frequencies, and performed noise removal
  - **Adjacency Matrix**: Constructed the adjacency matrix using spatial and spectral coherence between Electroencephalogram (EEG) electrodes; the spatial coherence was based on geodestic distance; the spetral coherence was based on normalized cross spectral density
  - **Graph Neural Network**: train, validate, and tested the performance of fully connected neural network, shallow GCN, and deep GCN. Comparison was carried out based on several metrics

- **Heart Rate Variability Based on in-ear MPG and PPG** — Imperial College London
  Supervisor: Prof. Danilo Mandic — *Jan 2022 - (ongoing)*
  - **Motion Artefact Removal**: use MPG signal as reference to remove motion artefact in PPG signal (multivariate empirical mode decomposition)
  - **Feature Extraction**: Identify R-peaks and measure RR-Intervals; construct time-domain and frequency domain features reflecting heart-rate variability (HRV)
  - **Stress Classification based on HRV**: use k-means or hierarchical clustering to analyse in-ear measurement efficacy

Activity

- **Student Representative**
  Beihang University Admissions Office
  Led a team of volunteers to organize campus tours and events to help accepted students fit into the Beihang community. Promoted Beihang University to high school students; provided consulting service to 1K+ students and their parents.