Haozhe Tian

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Personal Website

Education

- **Beihang University** — Beijing, China
  Bachelor of Engineering GPA: 3.844/4 — *Sep 2017 - Jun 2021*
  China National Scholarship (0.2%) | Twice Outstanding Student List (5%) | Outstanding Graduate (10%)
  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**: , B. Zhang, H. Tian, T. Xiao and J. Zhang, in IEEE Transactions on Instrumentation and Measurement, vol. 70, pp. 1-10, 2021, Art no. 7003710, doi: 10.1109/TIM.2021.3072137.
- **Assembly and Error Analysis of Back Focal Plane-typed Apertometer**: , C. Zhang, H. Tian, and B. Zhang, Proc. SPIE 11717, 24th National Laser Conference & Fifteenth National Conference on Laser Technology and Optoelectronics, 117171Y (2 December 2020); https://doi.org/10.1117/12.2587151

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 EEG channels; the spatial coherence was based on geodesic distance; the spectral 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

Activities

- **Student Representative** Promoted Beihang University to 1K+ high-school students and their parents.
- **Vice Minister of College Union** In charge of visual design (logos and posters for college events) of Shoue College, Beihang. Extensively used Adobe Premier, Lightroom, and Photoshop.