

# Haozhe Tian

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[Personal Website](#)

## EDUCATION

- Beihang University** Beijing, China  
*Bachelor of Engineering* GPA: 3.84/4 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* avg. mark: 78 Sep 2021 - Nov 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 from Ear ECG and PPG** Imperial College London  
*Supervisor: Prof. Danilo Mandic* Jan 2022 - (ongoing)
  - Protocol Design:** Designed an interactive recording MATLAB app
  - Feature Extraction:** Used matched filter and Hilbert transform to identify ECG R-peaks; estimated time- and frequency-domain heart rate variability features; estimated breathing rate and blood oxygen saturation from PPG; estimated blood pressure using pulse arrival time
  - Classification:** classified physical states using random forest, support vector machine, and naive Bayes classifier; compared the significance of different features

## 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 Shouei College, Beihang. Extensively used Adobe Premier, Lightroom, and Photoshop.