Rex Tin Long Fung

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Education

University of Michigan
Doctor of Philosophy in Biomedical Engineering *August 2022 – Present*

- **GPA:** 3.62/4
- **Relevant Coursework:**
  - BME 516: Medical Imaging Systems
  - EECS 551: Matrix Methods for Signal Processing, Data Analysis, and Machine Learning
  - EECS 559: Optimization Methods in Signal Processing and Machine Learning

Bachelor of Science in Neuroscience, Minor in Electrical Engineering *August 2018 – May 2022*

- **GPA:** 3.78/4
- **Relevant Coursework:**
  - Engineering: Digital Signal Processing, Signals and Systems
  - Neurobiology: Sensory Neurons, Principles of Cellular and Molecular Neuroscience
  - Psychology: Behavioral Neuroscience, Cognitive Psychology, Neuroimaging (fMRI)

Research Experience

Department of Biomedical Engineering, University of Michigan
Graduate Student Research Assistant *August 2022 – Present*

- Current project: Pseudorandom 3D-EPI sampling and locally low-rank regularized image reconstruction for high resolution fMRI
- Tested, edited, commented, and documented Matlab code from a collaborator at MGH for acquiring and reconstructing high-resolution T1-weighted images. Details here: https://github.com/HarmonizedMRI/MP-RAGE/tree/develop. This is part of the larger Harmonized
- MRI project for improving reproducibility in MRI research.Took some patch extraction and rank analysis code for gut images from a collaborator here at UM and applied it to brain images. Extended the patch extraction operator to handle 3D data although rigorous testing has yet to be done.
- Implemented fundamental model-based image reconstruction methods using both Matlab and Python, laying the foundation for using techniques from modern image reconstruction literature.

Department of Molecular, Cellular, and Developmental Biology, University of Michigan
Undergraduate Research Assistant *July 2020 – March 2022*

- Identified new population of neurons responsible for cool sensation by collecting and analyzing behavior and histology data from over 20 mice

- Wrote a MATLAB script to semiautomate auditory brainstem response (ABR) analysis, reducing processing time by over 80%
- Presented a scientific article with another undergraduate research assistant to the lab journal club every semester

Student Organizations (Undergraduate)

Michigan Neuroprosthetics
Mission: To restore upper limb mobility in pediatric amputees (1 in 2,540 in the US) by designing affordable (<$200) myoelectric arms as an alternative to traditional ones that cost around $20,000

Software Co-lead *July 2021 – Present*
- Enabled individual velocity control of 5 fingers by leading a team of over 20 students to develop EMG classifiers and functions for mapping EMG signal to servo velocity
- Designed new mode selection scheme by adapting a voice recognition module to the existing setup, allowing arm user to rapidly switch between 4 modes via voice commands

Electrical Team Member *September 2020 – Present*
- Cowrote arm assembly guide by documenting 25+ pages of instructions for procuring and soldering custom PCBs
- Evaluated performance of various muscle activity sensors by analyzing responsiveness and signal to noise ratios

Publications

- Peltier S., Egan M., **Fung R.**, Chen Q., Zaitsev M., Nielsen JF. Harmonization of an SMS-EPI fMRI protocol using Pulseq: sequence implementation and ABCD QC metrics. *OHBM* 2024.
- He Y., **Fung R**., Nielsen JF. High-Accuracy Ultra-Short Inner-Volume Saturation Pulse for 3D Steady-State Imaging. *ISMRM* 2024.
- Horwitz L R., Hor C C., Lee H., Shen F Y., Pai E., **Fung T L R.**, Walker L., Cai D., Duan B D. Identification of a Spinal Circuit that transmits Innocuous Cool Sensations. *bioRxiv* 2022..

Honors and Awards

University of Michigan
Neuroscience Summer Research Fellowship *April 2021*
- A one-time $1000 fellowship for students doing research in a neuroscience faculty lab

James B. Angell Scholar *March 2021*
- Awarded to students who achieve an "A" record (all grades of A+, A, or A-) for two or more consecutive terms

University Honors *Every term from May 2019 – May 2021*
- Awarded to students who earned a GPA of 3.5 or higher during a term

Informal Education & Professional Development

Coursera

Matrix Algebra for Engineers *August 2021*

- **Description:** Concise coverage of the matrices and linear algebra that an engineer should know
- **Professor:** Jeffrey R. Chasnov from the Hong Kong University of Science and Technology

Python for Everybody Specialization *June 2019 – Present*

- **Description:** Five-course specialization on writing Python programs to gather, clean, analyze, and visualize data. Currently on the fourth course
- **Professor:** Charles R. Severance from the University of Michigan

Udemy

User Experience Design Essentials - Adobe XD UI UX Design *January 2021*

- **Description:** Use Adobe XD to get a job in UI design, UX design, and web design
- **Instructor:** Daniel W. Scott

Skills

- Programming: Python, MATLAB, Julia
- Content creation: Filming, Video editing
- Recreational: Volleyball, Badminton, Drums