Yinan (Tom) Xuan

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My research interests lie at the intersection of ubiquitous computing and personal tracking. I am interested in enabling what I refer to as **unconscious interaction**, where users' natural behaviors can implicitly facilitate **seamless** and **personalized** usage of computational system. I am trying to achieve this goal by leveraging both machine learning and my hardware and software prototyping skills.

Education

University of California, San Diego — La Jolla, CA
Ph.D. in Electrical & Computer Engineering — *July 2020 – Present*
Expected Graduation: June 2024

M.S. in Biological Science — *Sept. 2017 – June 2020*
Thesis Topic: Drosophila Gut Imaging Data Collection and Analysis

B.S. in Physiology & Neuroscience — *Sept. 2013 – June 2017*
Minor: Cognitive Science — *Honors: MAGNA CUM LAUDE (GPA 3.89/4.00)*

Experience

Graduate Student Researcher — Oct. 2019 – Present
University of California, San Diego — *La Jolla, CA*
Electrical and Computer Engineering Department, Jacobs School of Engineering
Ubiquitous Data & Computing Lab — *Advisor: Edward Wang*

- Designed and implemented SpecTracle, a vision-based wearable facial tracking system, which consists of fisheye lens cameras controlled by Raspberry Pi and an image based neural network model. (Under review)
- Implemented a prototype of a Unity based exercising game on Vuzix AR glasses w/ IMU signals

Graduate Student Researcher — April 2018 – June 2020
University of California, San Diego — *La Jolla, CA*
Section of Neurobiology, Division of Biological Science
Wang Lab — *Advisor: Jing Wang*

- Designed and implemented an olfaction VR device as a novel instrument to observe odor guided behaviors in *Drosophila*
- Designed, implemented and deployed an image processing software to facilitate bio-imaging data analysis pipeline to profile *Drosophila* intestinal cells' response to different nutrients
- Designed, implemented and deployed an automated solenoid valve control system for perfusion experiments that can independently control up to 22 valves
- Collaborated in building and testing a customized three-photon fluorescent imaging microscope
- Built a feedback controlled temperature based anesthetic platform to facilitate surgery process on *Drosophila*

Undergraduate Student Researcher — Jan 2014 – June 2017
University of California, San Diego — *La Jolla, CA*
Division of Otolaryngology–Head and Neck Surgery, Department of Surgery
Ongkeko Lab — *Advisor: Weg Ongkeko*

- Studied the role of long non-coding RNAs in head and neck squamous cell cancer
- Designed and conducted in vitro experiments for various projects

Research Internship — June 2016 – Aug. 2016
AskGene Pharmaceutical Inc. — *Camarillo, CA*

- Collaborated in cell line development selecting clone cells with the highest titer
- Purified recombinant antibodies using Protein-A Affinity Chromatography

Software Technical Skills

Languages: Python, Matlab JavaScript, HTML/CSS, C#, Java, C++, SQL (MySQL)
Supervised Machine Learning: Neural Networks, SVM
Unsupervised Machine Learning: hierarchical clustering, k-means clustering, DBSCAN, Gaussian Mixture Model
Data Analysis: dimension reduction (PCA, t-SNE, UMAP), signal processing, computer vision / image processing
Mobile Development: iOS (Swift), Android (JAVA)
Frameworks: Bootstrap, React, Node.js
Developer Tools: PyCharm, Unity, Git, Google Cloud Platform
Libraries: OpenCV, pandas, NumPy, PyTorch, SciPy, scikit-learn, Matplotlib, seaborn, TensorFlow

Hardware Technical Skills

- PCB design
- Prototype w/ microcontroller
- Prototype w/ Raspberry Pi
- Free-space Optics
- Compressed gas cylinder handling

Bio-related Technical Skills

- Mice/*Drosophila* handling
- Cell culture
- RNA extraction
- qRT-PCR
- Transfection

Publications

1. Vicky Yu, Mehran Rahimy, Avinaash Korrapati, Yinan Xuan, Angela E. Zou, Aswini R. Krishnan, Tzuhan Tsui, Joseph A. Aguilera, Sunil Advani, Laura E. Crotty Alexander, Kevin T. Brumund, Jessica Wang-Rodriguez, and Weg M. Ongkeko. Electronic cigarettes induce DNA strand breaks and cell death independently of nicotine in cell lines. *Oral Oncology*, 52:58–65, January 2016.
2. Angela E. Zou, Jonjei Ku, Thomas K. Honda, Vicky Yu, Selena Z. Kuo, Hao Zheng, Yinan Xuan, Maarouf A. Saad, Andrew Hinton, Kevin T. Brumund, Jonathan H. Lin, Jessica Wang-Rodriguez, and Weg M. Ongkeko. Transcriptome sequencing uncovers novel long noncoding and small nucleolar RNAs dysregulated in head and neck squamous cell carcinoma. *RNA*, 21(6):1122–1134, April 2015.
3. Angela E. Zou, Hao Zheng, Maarouf A. Saad, Mehran Rahimy, Jonjei Ku, Selena Z. Kuo, Thomas K. Honda, Jessica Wang-Rodriguez, Yinan Xuan, Avinaash Korrapati, Vicky Yu, Pranav Singh, Jennifer R. Grandis, Charles C. King, Scott M. Lippman, Xiao Qi Wang, Andrew Hinton, and Weg M. Ongkeko. The non-coding landscape of head and neck squamous cell carcinoma. *Oncotarget*, 7(32):51211–51222, June 2016.

Teaching Experience

- 2018 Fall - UCSD BIPN 100 Human Physiology I

Membership & Honors

- Member of Phi Beta Kappa Honor Society
- Member of Muir College's Senior Honors Caledonian Society