

## EDUCATION

<b>University of Florida</b>	May 2021- May 2025 (expected)
◇ Ph.D. in Electrical Engineering, Concentration: Deep learning GPA: 4/4	
<b>University of Michigan Ann Arbor</b>	Aug 2019-Dec 2020
◇ Master in Biomedical Engineering, Concentration: Neural Engineering & Imaging	GPA: 3.83/4
<b>University of Nottingham Ningbo China</b>	Sep 2015-Jun 2019
◇ BEng Hons in Electrical and Electronic Engineering	First Class (GPA: 3.92/4, top 10%)

## SKILLS

- ◇ **Software Skills:** Proficient in Python (NumPy, pandas, PyTorch, scikit-learn, Keras, etc), Java, C/C++, MATLAB, R, Linux
- ◇ **Computational Skills:** Deep Learning, Machin Learning, Baysian Statistics
- ◇ **Hardware Skills:** Arduino, PIC, VLSI

## RESEARCH EXPERIENCE

<b>Saxena Lab for Neural Control</b>	<i>Electrical Engineering, UF</i>
PhD student, Supervisor: Shreya Saxena	May 2021 – Present

### Neural Decoding From High-dimensional Data

- ◇ Decode the behavior using RNN models and transfer learning from the neural activity in the form of widefield calcium imaging

### Behavioral Modeling From High-dimensional Video Data Across Subjects & Social Behavior

- ◇ Model the high dimensional data by interpretable latent using Cauchy-Schwarz divergence regularized partitioned subspace variational autoencoder. Apply state space models to analysis the latent space across subjects
- ◇ Extract the feature from high dimensional video data using SOTA Unet-VAE structure.
- ◇ Apply SOTA computer vision methods to model different behaviors.

### Human motion

- ◇ Model the human motion using the LSTM-CNN-VAE(seq-VAE) model to capture the time relations between the frames

### Guan's Lab

Graduate Research Assistant, Supervisor: Yuanfang Guan

*Department of BioInformatics, UMich*

May 2020 – May 2021

### Time Series Data Prediction Using Machine Learning

- ◇ Preprocess the time series data, fill the missing value and add an annotation term to indicates the existing of feature
- ◇ Apply the data to machine learning model (LightGBM) and analysis the feature importance using SHAP

### Protein Secondary Structure Prediction Based on Spectrum Information by Deep Learning

- ◇ Built a sum frequency generation (SFG) spectra library for selected protein with homogenous less than 10%
- ◇ Combined the SFG spectra information and the primary sequence information to predict the protein secondary structure using two inputs convolutional neural network in Python
- ◇ The accuracy of prediction was 92% which was 10% higher than the traditional Psipred package

### Pal's Lab

Graduate Researcher, Supervisor: Denish Pal

*Department of Anesthesiology, UMich*

Sep 2019 - May 2020

### EEG Signal Processing for Determining the Effect of Sleep Deprivation on Brain Connectivity

- ◇ Selected EEG signals with inconspicuous defects and applied Power Spectral Density (PSD) to those signals with frequency range from 0.5 to 175 Hz based on short time Fourier transform using MATLAB

- ◇ The PSD results were plotted on histogram graph to demonstrate the brain connectivity for comparison

## Chengbo Wang's Lab

Department of Electrical and Electronic Engineering, UNNC

Undergraduate Researcher, Supervisor: Chengbo Wang

Sep 2017 - May 2019

## Sleep Quality Monitoring & Application Development

- ◇ Monitor and preprocess the EEG, EMG, PPG signals using FFT, WDT, etc.
- ◇ Bluetooth for communication between the hardware and the phone.
- ◇ Android application development using java; Database development using MySQL.

## MRI image processing and reconstruction

## WORK EXPERIENCE

### Research Associate @ UMICH, Public Health Guan's Lab

Jan 2020- May 2021

### Grader of BIOMEDE 241 @UMICH, BME

Sep 2020- Dec 2020

### Novartis China

Jun 2018- Aug 2018

R&D Center Data Assistant

- ◇ Compiled and entered all data from experiment into internal systems accurately and consistently with emphasis on timeliness and quality
- ◇ Updated and distributed periodic reports or spreadsheets, established and updated unit folders/e-rooms to ensure accurate records were maintained

### Grader of Signal Processing and Control @UNNC, EEE

May 2018

## HONORS

- ◇ Excellent Student Cadre Fall 2018
- ◇ Undergraduate student summer research grant Summer 2018
- ◇ College funded overseas summer school @ University of Nijmegen Summer 2017

## PUBLICATIONS

- ◇ Yi D.\*, Zhang X.\*, Saxena S., Behdad S. (2023) Unsupervised Human Activity Recognition Learning for Disassembly Tasks (IEEE Transactions on Industrial Informatics)
- ◇ Yi D., Musall S., Churchland A., Padilla-Coreano N., Saxena S., (2022) Disentangled multi-subject and social behavioral representations through a constrained subspace variational autoencoder (CS-VAE), available at bioRxiv: <https://www.biorxiv.org/content/10.1101/2022.09.01.506091v1> (to appear at elife)
- ◇ Yi D. and Saxena S. (2023) "Neural Correlations across Mice during Spontaneous and Task-Related Behaviors", submitted to 11th International IEEE EMBS Conference on Neural Engineering.
- ◇ Yi D. and Saxena S. (2022) "Modeling the behavior of multiple subjects using a Cauchy-Schwarz regularized Partitioned Subspace Variational AutoEncoder (CS-PS-VAE)," 2022 44th Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC) , pp. 497-503, doi: 10.1109/EMBC48229.2022.9871466.
- ◇ Yi D.\*, Zhang H.\*, Guan Y., (2021) *Timesias: A machine learning pipeline for predicting outcomes from time-series clinical records* (STAR protocols 2 (3), 100639)
- ◇ Berryman D., Barrett J., Liu C., Maugee C., Waldbaum J., Yi D., Xing H., Yokoi F., Saxena S., Li Y., (2023) *Motor deficit and lack of overt dystonia in Dlx conditional Dyt1 knockout mice* (Behavioural Brain

Research)

- ◇ Zhang H., Wang Z., Nan Y., Zagidullin B., **Yi D.**, Tang J., Guan Y. (2023) *Harmonizing across datasets to improve the transferability of drug combination prediction* (Communications Biology)
- ◇ Guan Y., Wang X., Chen X., **Yi D.**, Chen L., Jiang X., (2021) *Assessment of the timeliness and robustness for predicting adule sepsis* (Iscience 24 (2), 102106)
- ◇ An X., Chen X., **Yi D.**, Li H., Guan Y., Representation of molecules for drug response prediction, Briefings in Bioinformatics, Volume 23, Issue 1, January 2022, bbab393, <https://doi.org/10.1093/bib/bbab393>
- ◇ Guan Y., Li H., **Yi D.**, Zhang D., Yin X., Li K., Zhang P., (2021) *A survival model generalized to regression learning algorithms* (Nature Computational Science, 1-8)
- ◇ Eksi R., **Yi D.**, Li H., Godfrey B., Lisa R. Mathew, Guan Y., *Micro-dissection and integration of long and short reads to create a robust catalog of kidney compartment-specific isoforms* (PLOS Computational biology)
- ◇ Qin Y., **Yi D.**, Chen X., Guan.Y, (2021) *Deep Learning Identifies Erroneous Microarray-based, Gene-level Conclusions in Literature* (NAR Genomics and Bioinformatics)
- ◇ Mu H., Meng J., Zhang L., **Yi D.**, Zhao D., *Weighted Symbol Flipping Decoding for Non-binary LDPC Codes Based on Iteration Stopping Criterion*, 2018 37th Chinese Control Conference (CCC), 2018, pp. 8447-8452, doi: 10.23919/ChiCC.2018.8483599.

\* : These authors contributed equally