Haoming Yang

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EDUCATION

Duke University **Durham, North Carolina**

- ***Master of Science*** *in Statistics* Expected Graduation: Dec 2022

University of Illinois at Urbana-Champaign | Highest Honor **Urbana, Illinois**

- ***Bachelor of Science*** *in Engineering Physics &* ***Bachelor of Science*** *in Statistics* Graduation: May 2021

RESEARCH EXPERIENCE

Brain Connectome Inference with Deep Learning **Durham, North Carolina**

Advised by Prof. David Dunson Current

- Design the **St**ructural **a**nd **F**unctional **G**raph **Au**t**o**-**E**ncoder (Staf-GATE), a latent graph based neural network method for generating structural (physical neuron connections) and functional brain network (correlation of neuron activations) jointly. Staf-GATE achieved state-of-the-art result (SOTA).
- Propose a perturbation-based interpretation algorithm to leverage Staf-GATE for interpretable inference. Found important structural subnetworks for generating realistic functional network in general. Studied structural subnetworks differences for subpopulation groups such as high/low cognitive scores, male/female.

Mean-field Stochastic Differential Equation Estimation **Durham, North Carolina**

Advised by Prof. Vahid Tarokh Current

- Develop 3 different deep learning architectures to estimate the parameters of complex mean-field stochastic processes and generate realistic paths under the mean-field assumption.
- Apply the methods to brain electroencephalogram (EEG) data to generate synthetic EEG recording and study the mean field synchronization in brain activity.
- Analyzing models convergence and error bounds.

UIUC IRisk Lab, NLP Risk Management Group **Urbana, Illinois**

Advised by Prof. Zhiyu Quan Sept. 2020 - Sept. 2021

- Fine-tuned XL-Net pretrained model for fuzzy sentiment analysis with an 85% accuracy
- Built a multi-class unsupervised classification model from business textual data scrapped from various website. The classification pipeline includes topic modeling, keyword weighting, and word embeddings to classify business industry for improving efficiency and credibility during insurance pricing. Model accuracy is 70%, which is comparable to current supervised model.
- Advised peers on coding, technical problems, and creative ideas implementation.

UIUC High Energy Physics Group **Urbana, Illinois**

Advised By Prof. Liang Yang Mar. 2019 - Mar. 2020

- Simulated Double Beta Decay (bb2n), Neutrinoless Double Beta Decay (bb0n), and Gamma Rays using CERN Root and extracted trajectory and energy Data with C++ script. Constructed an algorithm to identify centers of closely distributed clusters and extracted single-sited events from multi-sited events.
- Designed a Convolution Neural Network (CNN) to differentiate particle decays with similar single-sited event trajectory (Mainly Gamma rays and Double Beta Decay) using TensorFlow.
- Developed a novel 3D projection technique to project trajectory into 2D and improved model accuracy by 15%.

CONFERENCE & TALKS

- 56th Actuarial Research Conference. Topic: Natural language processing application in actuarial science: interpretable language models

SKILLS

- **Coding Languages**: Proficient with Python, R, SQL; Familiar with C++, Java.
- **Techniques**: Familiar with Pytorch, Tensor-Flow, Sklearn, Pandas and other data analysis packages with Python. Familiar with Statistical learning algorithm and deep learning algorithm.
- **Languages**: Chinese (Native), English (Fluent), French (Intermediate)