Wenxuan Zhang

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EDUCATION

M.A. in Applied Mathematics, University of Pennsylvania *08/2019 – present, Philadelphia*

- **Cumulative GPA**: 3.88/4
- **Coursework**: Advanced Analysis, Algebra, Advanced Probability, Modern Convex Optimization, Machine Learning Theory

B.S. in Mathematics and Applied Mathematics, Beijing Normal University *09/2015 – 06/2019, Beijing*

- **Cumulative GPA**: 90.5/100, **Major GPA**: 93.9/100, **Liyun (top students) College**
- **Coursework**: Mathematical Analysis, Advanced Algebra, Probability Theory, Mathematical Statistics, Mathematical Modeling, Deep Learning, Theory and Methods of Optimization, Data Structure

Summer School, College of William & Mary *07/2017, Williamsberg*

- **Coursework**: Computer Problem Solving

RESEARCH EXPERIENCE

Non-stationary Lifelong Learning of Compositional Structures

Advised by Prof. Eric Eaton *09/2020 - present, Philadelphia*

- Aim to apply the lifelong compositional learning to the non-stationary setting by finding a proper way to update compositional representation. Analyzed the non-stationarity of the data and the catastrophic forgetting of the original algorithm on this data.
- Use beta-mixing to describe the data, and use Non-stationary Markov Decision Process to fit the model. Verify the model consistency and convergence

Hand Gesture Recognition based on Depth Image, First Honor Graduation Thesis

Advised by Prof. Ming Bai *01/2019 - 05/2019, Beijing*

- Proposed a feature point detection method adapting to a specific scene based on depth information, and built a real time hand gesture recognition system using Kinect 2.0 and MATLAB, which can achieve an average accuracy of 92% in a complicated background.
- Conducted field research and applied the system to eyesight check process.

Activity Recognition Research and Application based on Deep Learning, Found by Beijing Government

Advised by Prof. Fusheng Yu *05/2017 - 05/2018, Beijing*

- Built a pre-processing system using Open CV to extract main contents, which solved the problem of scattered contents.
- Separated abnormal human actions from normal human actions using pre-trained Inception v3 as feature extraction and LSTM as classifier. Implemented the system on the KTH Action dataset and achieved an average accuracy of 85% on overall six classes of the actions, and an average accuracy of 98% on four specific actions.

PROJECT EXPERIENCE

Image Processing using Fourier Transform and Neural Network

Advised by Prof. Mark Liberman *03/2020 - 05/2020, Philadelphia*

- Researched on the Fourier Transform, Wavelet Transform and other traditional methods for scene classification problem, and built a model using Fourier Transform as feature extraction and ANN as classifier.
- Solved the dimension explosion problem for the traditional feature extraction by PCA method.

Applications on Stochastic Block Model and Markov Chain Monte Carlo based on Recovery Method

Advised by Prof. Robin Pemantle *10/2019 - 12/2019, Philadelphia*

- Researched on the stochastic block model for community detection problem as well as its recovery algorithms based on both traditional modular maximization methods and Bayesian methods.
- Constructed a stochastic block model of the American football games network among Division IA colleges, analyzed the network theoretically, and introduced an improved Markov Chain Monte Carlo method to solve the community detection problem.

WORKING EXPERIENCE

RED (Xingyin Information Technology (Shanghai) Co., Ltd)

Machine Learning Engineer *08/2020 -10/2020, Beijing*

- Built a speaker verification model for video review using x-vector method based on Kaldi and Pytorch. This model has been trained on more than 8000 speakers' dataset and achieved 90% precision and 96% recall, and it can process 1800 hours' single day video data in less than 6 hours.
- Self-trailed a CNN based on Spleeter framework to eliminate background music for 16kHz, mono, wav format audio data, which was used in pre-processing procedure.

SKILLS

Programming Skills: Python (pytorch, tensorflow), MATLAB, Shell, C language

Languages: English (fluent), Chinese (native)

AWARDS & LEADERSHIP

Meritorious Winner, COMAP's Mathematical Contest in Modeling (MCM) *2018*

First Class of Jingshi Scholarship *2018*

First Prize, Contemporary Undergraduate Mathematical Contest in Modeling *2017*