Yuhan Mao

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RESEARCH INTERESTS

I am interested in using machine learning techniques to understand human being. Research areas such as computational neuroscience, natural language understanding and generation are what I am willing to dive into. I am also keen on explorations in reinforcement learning.

EDUCATION

UNIVERSITY COLLEGE LONDON London, UK
MSc Data Science and Machine Learning *Sep 2019 – Sep 2020*

- **Academic:** Distinction
- **Curriculum:** Machine Learning, Deep Learning, Reinforcement Learning, Graphical Models, Statistical Data Science, Numerical Optimization, Statistical Natural Language Processing

BEIJING INSTITUTE OF TECHNOLOGY Beijing, China
Bachelor of Engineering in Automation *Sep 2015 – Jun 2019*

- **Academic:** 90.1/100
- **Curriculum:** Linear Algebra, Probability and Mathematical Statistics, Mathematical Analysis, Computer Technology and Program, Practice on Program with C Language, Pattern Recognition, Functions of Complex Variables and Integral Transformation, Signals and Systems, Mathematical Logic and CPU, Automatic Control Theory and etc.

PUBLICATION

- M. Yuhan, "A Novel Collaborative Filtering Algorithm Based on Trust," 2018 Eighth International Conference on Instrumentation & Measurement, Computer, Communication and Control (IMCCC), Harbin, China, 2018.

RESEARCH EXPERIENCE

Decoding from the Human Ventral Stream Using Deep Convolutional Networks London, UK
Love Lab, University College London, Supervisor: Prof. Bradley C. Love *Feb 2020 – Sep 2020*

- Aimed at exploring the **relationships between the hierarchical structure of human visual system and convolutional neural networks**
  - Bold5000 dataset is used to represent the human brain activities, since fMRI signals of Bold5000 are processed vectors that can represent brain activities of different regions after viewing a subset of pictures from ImageNet
  - VGG-16 is selected as the convolutional neural network to investigate, since it achieves good results in ImageNet competitions
- Used a projection layer to link the fMRI voxels of each brain region to each layer of VGG-16, trained the projection layer and compared the decoding results of different combination of brain region and VGG layer
- Added **Gaussian noise** to the data, and using some other techniques like **spatial regularization** to augment the dataset and improve the results

Named Entity Recognition for Chinese Electronic Medical Records Beijing, China
School of Automation, Beijing Institute of Technology, Supervisor: Prof. Yuan Li *Mar 2019 – Jun 2019*

- Processed the original Chinese Electronic Medical Records dataset into the format suitable for training and testing the models
- Used machine learning methods, including **Conditional Random Field (CRF)**, as well as **Bi-LSTM** based models and other more complex models (**Bi-LSTM+CNN+CRF**) to predict the type of named entities and compared between different models and parameters to optimize the models
- Gathered results of different training models and finished a systematic thesis that discussed the effect of different models on the named entity recognition task based on Chinese Electronic Medical Records.

Chinese Question Answering on DuReader with Pre-trained Contextualized Word Vector London, UK
Course Project of Statistical Natural Language Processing, UCL, Lecturer: Prof. Sebastian Riedel *Feb 2020 – Mar 2020*

- **Gathered and Pre-processed the Chinese-English and Chinese-Japanese parallel corpus**, using attention-based **neural machine translation model to train the corpus and extract the contextualized vectors** (CoVe)

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from the encoder

- Used **R-Net, Match-LSTM and Bi-DAF to evaluate the results of different Chinese-English and Chinese-Japanese CoVe vectors**, compared the results of the three models and tuned the models for better results.

Thesis Classification System Based on Naïve Bayesian Model Beijing, China

Course Project of Pattern Recognition, Beijing Institute of Technology, Lecturer: Prof. Qi Gao *Apr 2018 – Jun 2018*

- Adapted theories in Natural Language Processing to design and implement the thesis classification system with Python and Scikit-Learn
- Gained a better understanding of basic algorithms in machine learning including Naïve Bayes, K-means, etc.

WORK EXPERIENCE

Shenzhen Institute of Advanced Technology, Chinses Academy of Sciences Shenzhen, China

Position: Machine Learning Engineer at Material Center *Oct 2020 – present*

- Apply machine learning methods to predict the properties of different materials
- Use machine learning methods to assist the design and exploration of new materials.

INTERNSHIP EXPERIENCE

Institute of Computing Technology, Chinese Academy of Sciences Beijing, China

Position: Machine Learning Intern at High Performance Computer Research Center *Sep 2018 – Nov 2018*

- Participated in image segmentation projects based on neural networks
- Learned about the Linux system and docker technology used in application
- Developed skills to apply deep learning frameworks to solve practical tasks.

WISESOFT CO., LTD Chengdu, China

Position: Machine Learning Intern at Face Recognition Department *July 2018 – Aug 2018*

- Used deep learning methods like convolution neural networks to develop face recognition and learned basic concepts of recurrent neural network.
- Had a systematic study about machine learning and deep learning, including the applications of PyTorch and Tensorflow.

SKILLS

Programming Skills:

- Languages: Python, C/C++, Julia, Matlab
- Machine Learning APIs: PyTorch, Keras, Tensorflow, Scikit-Learn and etc.

Languages: Mandarin, English

HONORS AND AWARDS

- **First-class Scholarship for Academic Excellence** (GPA ranked Top 1 in major), School of Automation, Beijing Institute of Technology, 2019
- **First-class Prize in China National College Students English Competition**, 2017
- **Second-class Prize in English Speech Contest, Beijing Institute of Technology**, 2017
- **Honorable Mention in COMAP's Mathematical Contest in Modeling / Interdisciplinary Contest in Modeling (MCM/ICM)**, 2017

ACTIVITIES

Student Union, Beijing Institute of Technology *Oct 2015 – Mar 2016*

- Member of Department of Art of Student Union, in charge of the organization of artistic activities.

Academic Guidance Center, Beijing Institute of Technology *Oct 2015 – Jun 2016*

- Member of Department Office, in charge of the arrangements of academic tutorial appointments.

Hi-World Youth Community *Apr 2017 – Jun 2017*

- English-Chinese translator, in charge of translating the propagating information concerning international communication activities that help youngsters build up stronger leaderships and academic abilities.