XIANGJING (SIMON) SHEN

xiangjing.shen.utokyo@gmail.com

RELEVANT WORK EXPERIENCE

Project Academic Specialist   February 2021 – March 2022

IRCN, The University of Tokyo, Japan
Performance: Project in process.
Main work: We collected the movie natural task and rest-state fMRI data. Then we combined the movie data and spontaneous thought data to build the encoding and decoding model between the depression and healthy population. Finally, we hope we can classify the disorder and healthy people.

Machine Learning Engineer   December 2018 – April 2020

Ping An Technology (Shenzhen) Co., Ltd. Shanghai Branch, China
Performance: The participating KYM project has become the company's most profitable star project of the year, and has participated in important machine learning and other work.
Main work: Predicted the ratio of the fund's stock holdings each day, mined the fund manager's face factor and constructed user portraits, and conducted financial research report entity recognition and sentiment analysis.

Data Mining Engineer   July 2017 – May 2018

Shanghai Qianchen Network Technology Co., Ltd., China
Performance: The team won the company's best team of the year, and the risk control credit model built by itself became the long-term credit model used by the company.
Main work: Used various types of user information to analyze and derive numerous features, established a specific user scoring model through logistic regression, formulated relevant risk control strategies and performed group clustering on user groups.

EDUCATION

B.S. in Thermal and Power Engineering   September 2010 – June 2014

Nanjing Institute of Technology, China
Overall GPA: 83/100 Rank: 11/42
Undergraduate thesis: Based on the related theories of engineering thermophysics, oriented to energy conversion and power system.
Advanced Mathematics B I (95/100)
Advanced Mathematics B II (82/100)
Probability and Maths-physics Sta.A (91/100)
Linear Algebra (84/100)

HONORS, AWARDS & SCHOLARSHIPS

02/2018   2017 Best Team Award, Shanghai Qianchen Network Technology Co., Ltd. Team: Risk Control Decision Business Center

10/2012   Second Class Scholarship, Nanjing Institute of Technology (Top 10%)

10/2012	Summer social practice advanced individual, Nanjing Institute of Technology (Top 5%)
10/2012	Outstanding Student Leader Award, Nanjing Institute of Technology (Top 5%)
04/2012	First Class Scholarship, Nanjing Institute of Technology (Top 5%)
04/2011	Second Class Scholarship, Nanjing Institute of Technology (Top 10%)
11/2008	Jiangsu Province High School Mathematical Olympiad, Highest score (1/2400+)
11/2005	Jiangsu Province Junior High School Mathematical Olympiad, Highest score (1/1000+)

RESEARCH INTERESTS

I intend to pursue research in information systems and continue to pursue an industry position in related fields. I am very interested in large language models (LLMs), especially those focused on the brain-inspired machine, which enhances the applications of content-based search engines in the real world.

Also, I am very interested in these questions. (*The research proposals inspire these questions as well.*):

(a). From the cognition perspective, we explore the differences in memories between the large language model (LLM) and the human brain. LLMs tend to memorize more (e.g., Carlini et al. 2023, Mckenzie et al. 2023), consuming more energy.

(b). How does language in modern humans co-evolve with our thinking and reasoning capacities (e.g., Fedorenko et al. 2024), which will enhance the application of transfer learning in language and vision? In addition, we know that Chinese is hieroglyphics. If the language and vision share a similar representation (e.g., Popham et al. 2021), we can also solve the limitation of useful prompting data in other languages by the English LLMs.

(C). For the internal states of our humanity, different people have different experiences for the same sentences. People learn language from continuous signals in the broader context of physically interacting with the environment and engaging in social interactions (e.g., Tuckute et al. 2024). Therefore, we should make the LLMs represent more functional linguistic competence (e.g., Mahowald et al. 2024). Then, the embedding distance (semantic representation) from word A to word B in LLMs for different people will be different in the real world.

RESEARCH EXPERIENCE

CAI LAB, IRCN, THE UNIVERSITY OF TOKYO, JAPAN
Project 1: The role of dynamic neural functional coupling in spontaneous thought

Supervisor: Prof. Mingbo Cai   *February 2021 – Present*
Role: Machine Learning Engineer
- Understood the spontaneous thought and project background.
- Discussed the experiment design and movie task.
- Obtained the Forrest Gump fMRI data and used the movie dialog and script to predict a linear model to evaluate the baseline model.
- Improved the performance by extracting more semantic information and reducing the autocorrection of fMRI noise with a run based on the share response model(SRM) and connectivity-share response model(CSRM).

PING AN TECHNOLOGY (SHENZHEN) CO., LTD. SHANGHAI BRANCH, CHINA
Project 1: A Discrete-Time State Observer Approach to Discovering Portfolio Holdings

Supervisor: Dr. Keren Yang   *February 2019 – May 2019*
Role: Machine Learning Engineer
- Understood the principle of the Kalman filter, mathematical formula.

- Mastered the application of this mathematical model in the predicting the proportion of financial fund holdings, as well as model assumptions and parameter selection.
- Obtained the financial data required by this model, wrote data processing and main program code and debugged parameters.
- Formulated some parameters such as the number of changes in the top ten positions to analyze the effectiveness of the model of numerous funds, and selected typical funds for display.
- Added quarterly reports of funds to make full use of data on the original basis.

Project 2: Convolutional Neural Networks for Sentence Classification

Supervisor: Dr. Keren Yang   *July 2019 – October 2019*

Role: Independent Machine Learning Engineer

- Formulated business factors and corresponding pairs of keywords, and matched key short sentences through keyword rules.
- Chose quantitative short sentences and labeled positive, neutral, and negative sentiment tendencies of short sentences into three categories.
- Trained the TextCNN/Bert model, adjusted the parameters, and optimized the model through data enhancement and error analysis. (The accuracy rate is 82%/89%.)
- Combined the data pre-processing code and model code and went online to achieve the process of predicting numerous fund manager factors and factor scores.

SHANGHAI QIANCHEN NETWORK TECHNOLOGY CO., LTD., CHINA

Project 1: A Credit Score Card Model Based on Logistic Regression

Supervisor: Chief Risk Officer(CRO). Yu Chen   *February 2018 – May 2018*

Role: Independent Data Mining Engineer

- Analyzed and derived various types of user credit information features.
- Filtered features by business interpretability and the correlation between each feature X_i and the target value Y.
- The overlapping features are discarded through the correlation between the feature X_i and the feature X_j combined with the service interpretability.
- Used logistic regression to model and select features to build the model, and used stepwise regression to see the training set and validation set to verify the AUC results to remove variables.
- Tested the temporal validity of the model and put the final optimized model online.

NANJING INSTITUTE OF TECHNOLOGY, CHINA

Project 1: Analysis and Research on Thermal Economics of 600MW Unit Thermal System

PI: Aiping Chen   *January 2014 – May 2014*

Role: Experiment designer

- Calculated the thermal economy of 600MW units by conventional method.
- Calculated the absolute internal efficiency of a thermal power plant using the equivalent heat drop method.
- Calculated and analyzed the 600MW unit auxiliary system using an equivalent heat drop method.
- Calculated and analyzed the 600MW unit's main thermal equipment using the equivalent heat drop method.
- Selected the best plan to improve the thermal economy of the unit, integrate the comprehensive investment and efficiency, and maximize the benefits.

ONLINE RESEARCH, COURSES & CERTIFICATE

RESEARCH

STANFORD UNIVERSITY COHEN LAB, USA

Large-scale Data Reveal WEIRDness Trajectory In Psychological Research History, 112 hours

Supervisor: Dr. Geoffrey L. Cohen   *April 2020*

Role: Research Assistant

- Accepted and confirmed the main purpose and main work of the research project.
- Structured the information in the data related to the WEIRD (Western, educated, industrialized, rich, and democratic societies) field in the data in the paper, and found the problem.
- Corrected the collected data and completed the final result.

COURSES

HUNG-YI LEE

Deep Learning for Human Language Processing, 32 hours(Online)

Lecturer: Hung-yi Lee   *April 2021 – June2021*

- Mastered the basic concepts of speech and text, then we can know how to develop models between them and do the classification tasks.
- Understood the different kinds of speech recognition model structures including CTC, RNN-T, and HMM.
- Acquired how to do a Voice Conversion task using the Feature Disentangle, CycleGAN and StarGAN methods, do a Speech Separation task using the Deeping Clustering, PIT and TasNet, and do a Speech Synthesis using a Tacotron model.

Deep Reinforcement Learning, 10 hours(Online)

Lecturer: Hung-yi Lee   *February 2021 – February 2021*

- Learned the definition of reinforcement learning and how to estimate it using the Monto-Carlo based approach and the Temporal-difference approach.
- Accomplished the Q-learning, Proximal Policy Optimization, Double DQN, Continuous Actions, Sparse Reward and Inverse reinforcement learning.

CERTIFICATE

NEUROMATCH ACADEMY

Completion of the interactive track and the course project, 120hours

Supervisor: Ning Mei   *July 2020*

- Learned modeling, machine learning, dimensionality reduction, Bayesian statistics, linear systems, optimal control, reinforcement learning, real neurons, dynamic networks, network causality, and deep learning.
- Researched the differences in individual motivational behavior. There are risk-seeking people in gambling activities, while others show extreme avoidance.

SKILLS (NIH proficiency scales: N-Novice, I-Intermediate, A-Advanced)

Language   English – Moderate; Mandarin - Native

Technical   Computer Science – Linux[A], GitHub[A]

Data analysis – Python[A], SQL[A]

Machine learning – NLP[A], Pytorch[A]

Statistical mathematics – Bayesian[I], LR[A], SVM[I], DT[A], HMM[A], CRF[I], RNN[I], CNN[A], Word2vec[A], ELMO[I], BERT[A], GPT[A]