Peng (Irene) Zheng

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EDUCATION

University of California, Berkeley Aug 2022 - Aug 2023
Master of Analytics, GPA: 3.93/4.0

University of Liverpool Sep 2020 - July 2022
Bachelor of Computer Science, GPA: 3.95/4.0

Xi'an Jiaotong-Liverpool University Sep 2018 - June 2020
Bachelor of Computer Science, Academic Excellence Award (**top 5%**)

RESEARCH EXPERIENCES

Name Disambiguation using Siamese Neural Networks May 2023 - Present
Supervisor: Prof. Lee Fleming | University of California, Berkeley *Berkeley, CA*

- Proposed a **Siamese Neural Network** clustering model with **triplet loss** for inventor disambiguation in the **PASTATS** dataset, incorporating text and meta-information.
- Preprocessed text features using **BERT** and trained them separately from meta-information features using two streams of fully connected layers and an aggregation layer.
- Assigned indices to different clusters based on the **cosine similarity** between the feature vectors.

Extensions of Qmix, a Multi-Agent Reinforcement Learning Algorithm Oct 2021 - Jun 2022
Supervisor: Prof. Bei Peng | Honours Year Project at University of Liverpool *Liverpool, UK*

- Proposed **Deep Recurrent Dueling Q-networks (DRDQN)**, a novel agent network architecture for deep MARL in a centralized training with decentralized execution paradigm, based on dueling networks.
- Evaluated DRDQN on cooperative multi-agent tasks (e.g., predator-prey and coordinated navigation), outperforming the baseline algorithm by **38.9%** with **faster convergence**.

Time-varying Matrix Projective Synchronization July 2021 - Oct 2021
Supervisor: Prof. Guoguang Wen | Beijing Jiaotong University *Beijing, China*

- Derived and provided a rigorous proof fixed-time adaptive time-varying matrix projective synchronization (ATVMPS) criteria for time-delayed discrete-time chaotic systems (DDCSs) with different dimensions.
- Demonstrated the effectiveness of theoretical results through numerical simulations of time-delayed DDCSs with different dimensions via Matlab-Simulink

Unsupervised Image-to-Image Translation via Self-Attention GANs June 2020 - Sep 2021
Supervisor: Prof. Chao Peng | East China Normal University *Shanghai, China*

- Proposed an novel unsupervised image-to-image translation framework based on the **Conditional Self-Attention Generative Adversarial Network (CSAGAN)** through a novel discriminator structure, attention module, and normalization function, with improved image quality and computational efficiency.
- Evaluated CSAGAN on unpaired datasets, showcasing a remarkable improvement of **22%** over the second best method as measured by Frechet Inception Distance (**FID**) and Kernel Inception Distance (**KID**).

PUBLICATIONS

- Shuo Gao, Guoguang Wen, Xiaoqin Zhai, and **Peng Zheng**, "Finite-/Fixed-time Bipartite Consensus for First-order Multi-agent Systems via Impulsive Control", Applied Mathematics and Computation, vol. 442, p. 127740, 2023.

- **Peng Zheng**, Xiaozhen Guo, Guoguang Wen, "Fixed-time Adaptive Time-varying Matrix Projective Synchronization of Time-delayed Chaotic Systems with Different Dimensions", Computer Modeling in Engineering & Sciences, vol. 131, no. 3, pp. 1451–1463, 2022.
- Rui Yang, Chao Peng, Chenchao Wang, Mengdan Wang, Yao Chen, **Peng Zheng**, Neal N. Xiong, "CSAGAN: Channel and Spatial Attention-Guided Generative Adversarial Networks for Unsupervised Image-to-Image Translation", 2021 IEEE International Conference on Systems, Man, and Cybernetics (SMC), Melbourne, Australia, pp. 3258-3265, 2021.

ACADEMIC PROJECTS

Deep Reinforcement Learning Framework for Portfolio Optimization Feb 2023 - May 2023
Instructor: Prof. Zeyu Zheng | INDENG231 *Berkeley, CA*

Developed a Reinforcement Learning (RL) framework for portfolio optimization based on deep Q-networks (**DQNs**). The framework achieved a significant improvement of **118%** in performance (**positive return**) compared to baseline algorithms and Monte Carlo simulation, while enhancing stability.

Personalized Investment Recommendation Systems: PortfolioPro Feb 2023 - May 2023
Instructor: Prof. Daniel Pirutinsky | INDENG243 *Berkeley, CA*

Developed a personalized investment recommendation system for individual investors, leveraging their personalized information and predicted **risk-aversion** scores to generate well-diversified portfolios across various market capitalization categories, including **equities**, **bond ETFs**, and **U.S. T-bills**.

Note Sharing and Document Library Platform: Xuni Feb 2023 - May 2023
Instructor: Prof. Michele Zito | COMP208 *Liverpool, UK*

Developed front-end, back-end, database for an online documentation library using **HTML**, **CSS**, **JavaScript**, **Bootstrap**, **PHP** and **MongoDB** with a basic text summarizing function included.

WORK EXPERIENCES

Software Engineer Intern May 2023 - Present
GamePlay Inc. *San Francisco, United States*

- Implemented website functionalities, such as Automatic Search and sports field visualization on Google Maps, following the **Model-View-Controller (MVC)** architecture using **ASP.NET Core**.
- Connected web application to **pgAdmin4** database for efficient data integration and retrieval.
- Debugged app loading and login functions in GamePlay app and incorporated new website functionalities into the app, leveraging **Expo** and **React**.

Course Reader March 2023 - May 2023
INDENG235 | University of California, Berkeley *Berkeley, United States*

- Designed lab materials on Neural Networks, **Deep Learning**, and **Reinforcement Learning**.
- Graded lab exercises, assignments, and exams, providing constructive feedback to students.
- Assisted TA during lab sessions, supporting students with debugging and inquiries.

SKILLS

Programming Languages
Python | SQL | Java | C | C++ | C# | HTML | JavaScript
Software Tools
ASP.NET | pgAdmin4 | MySQL | JUnit | MATLAB | AMPL | Unity
Libraries
Scientific Computing (NumPy, SciPy) | Machine Learning (Scikit-Learn, PyTorch, Keras, TensorFlow, Pandas) | Visualization (Matplotlib, Seaborn) | Data Mining (Scrapy)