Nan Li

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Education

University of Zurich (UZH) *Zurich, Switzerland*

MSc in Computer Science (Major in Artificial Intelligence) Sep. 2022 - Oct. 2024

- Master thesis: Interpretable Machine Learning Algorithm for Drunk Driving Detection
- Master project: Explainability method for Recommender Systems
- Related courses: Probabilistic Artificial Intelligence(ETHz), Introduction to Machine Learning(ETHz), Deep Learning, Planning and Decision Making for Autonomous Robots(ETHz), Foundations of Data Science, Advanced Topics in Artificial Intelligence, Systems for Data Science

Beihang University (BUAA) *Beijing, China*

BEng in Software Engineering Sep. 2016 - Jun. 2021

- GPA: 87/100 (Top 20%)
- Thesis: Project Review Assistant System Based on BlockChain
- Related courses: Algorithm Analysis and Program, Mathematical Analysis, Foundation and application of intelligent computer, Data Structures, Compiler Theory, Operating System and Linux Kernel Practice

Projects

Visual-Assisted Workflow for Locomotion Learning *Zurich*

AI Center Projects in Machine Learning Research - ETHz Mar. 2024 - Present

- **Description:** This project focuses on the investigation into appropriate metrics and visualization techniques to steer the quadrupedal locomotion learning process interactively. This action will be an important step towards a more transparent learning system.
- **Main Work:** Conduct in-depth research on the Dynamics Explorer system and other relevant visualization techniques. Integrate state-of-the-art quadrupedal locomotion learning algorithms, leveraging platforms such as Isaac Gym and RaiSim for simulation and experimentation.

Interpretable Machine Learning Algorithm for Drunk Driving Detection *Zurich*

Bosch IoT Lab | ETH Zurich | University of St. Gallen Oct. 2023 - Present

- **Description:** Developed interpretable machine learning algorithms to detect drunk driving using a multi-sensor dataset, focusing on creating accurate models for effective interpretation. Explored various approaches for multivariate time-series classification and used them on driving data.
- **Dataset:** Utilized a unique real-world dataset collected from real vehicles, including vehicle CAN bus data, eye tracking data, gas sensor data, vital sensor data, and in-vehicle radar data.
- **Responsibilities:** Led the development and training of interpretable time-series classification models, employing techniques such as logistic regression, convolutional neural networks, recurrent neural networks, etc. Investigated methods for generating comprehensive explanations for model predictions.

An AI player for 3D Pinball Space Cadet *Zurich*

Independent Project Sep. 2023 - Present

- **Description:** Developed an AI player for the classic Windows game '3D Pinball Space Cadet', capable of learning from gameplay to achieve high scores. Utilized a combination of Computer Vision, Reinforcement Learning, and Genetic Algorithm.
- **Vision:** Use OpenCV to recognize the pinball's coordinates, speed vector, score, and state in each frame during gameplay.
- **Reinforcement Learning:** Trained the AI during gameplay to optimize its performance and achieve higher scores using data gathered from the Vision component.
- **Genetic Algorithm:** Implemented a genetic algorithm to generate the best-performing players after each game round, employing crossover (averaging parameters) and mutation (adding random noise) to generate the next players.

GPT-Generated Text Detection *Zurich*

Essentials in Text and Speech Processing - UZH Sep. 2023 - Oct. 2023

- **Description:** Developed a system to differentiate between paragraphs written by humans and those generated by Chat-GPT.
- **Main Work:** Utilized datasets comprising articles from Wikipedia and text generated by GPT-3 and GPT-3.5 using the same articles' starting sentences as prompts. Achieved high accuracy (>0.8) across all models.

Explainability Method for Recommender Systems *Zurich*

Dynamic and Distributed Information Systems Group - UZH Feb. 2023 - Sep. 2023

- **Description:** Conducted research and implemented explanation methods for recommender systems' outputs, along with quantitative metrics to evaluate these explainers.
- **Main Work:** Extended the Python package *Cornac* by integrating additional recommender models, explanation methods, and evaluation metrics. Developed a comprehensive pipeline to facilitate the entire workflow. Authored a Wiki for usage guidelines and produced a detailed report spanning over 100 pages.
- **Responsibilities:** Specialized in matrix factorization-based recommender models, explanation methods, and the evaluation of these methods.

Influence Maximization in Twitter Network *Zurich*

Network Science - UZH Sep. 2022 - Dec.2022

- **Description:** Conducted research on identifying a small subset of the most influential users in the Twitter network and evaluated the performance of various algorithms.
- **Main Work:** Utilized a dataset sampled from the Twitter follower network in 2012. Modeled the diffusion process to propagate information by adapting four well-established diffusion models. Analyzed the outcomes of three Information Maximization algorithms.
- **Responsibilities:** Researched and developed the Independent Cascade Model and Decreasing Cascade Model. Designed and implemented a naive greedy algorithm to maximize information influence.

On-Campus Works

Practical Tutor *Zurich*

Lecture: Foundations of Data Science (Graduate Level) Sep. 2023 - Present

As a tutor for the course, I was tasked with grading practical assignments and written exams, collaborating with fellow tutors, and providing comprehensive support by addressing student inquiries.

Teaching Assistant *Beijing*

Lecture: Compiler Theory (Undergraduate Level) Sep. 2020 - Jan. 2021

As a Teaching Assistant, I played a key role in grading assignments and provided essential skeleton code support for programming projects.

Leader of Teaching Assistant *Beijing*

Lecture: Object-Oriented Programming (Java) (Undergraduate Level) Feb. 2020 - Jun. 2020

As the Lead Teaching Assistant for the course, I spearheaded the coordination of TA activities, overseeing the development of assignments for regular exercises, major projects, and final exams. Additionally, I collaborated with the professor in facilitating online course operations.

Teaching Assistant *Beijing*

Lecture: Algorithm Analysis and Design (Undergraduate Level) Sep. 2019 - Jan. 2020

As a Teaching Assistant, I taught bi-weekly tutorial sessions. Additionally, I took on the responsibility of crafting and evaluating programming exercises and final exam questions, and invigilation for them.

Awards and Honors

Jun. 2021	**Honor Certificate**: Outstanding Graduate of Beihang University	*Beijing*
2020, 2019, 2018	**Scholarship**: Excellent Scholarship for Academic Performance(3 times)	*Beijing*
2019, 2018	**Scholarship**: Excellent Scholarship for Social Work(2 times)	*Beijing*
2019, 2017	**Honor Certificate**: Merit Student(2 times)	*Beijing*
Jan. 2019	**Scholarship**: Lee Kum Kee Innovation Scholarship	*Beijing*

Skills

Programming Languages	Python, Java, C++, C, JavaScript, TypeScript, SQL, Kotlin, Golang, Matlab, LaTeX
Framework and Software	Git, Pytorch, Tensorflow, MySQL, MongoDB, React, Vue, Spring Boot
Languages	Chinese(Native), English(C1)