Shubing Xie

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Education

Leiden University September 2022-August 2024
Leiden The Netherlands *M.S. Physics and Data Science*

Xi'an Jiaotong University (Qunxuesen Honor college, Honor Degree) June 2021
Xi'an China *B.S. Physics*

Coursework:

Data science: Machine Learning, Deep Learning, Reinforcement learning, statistical Learning
Quantum physics: Applied Quantum Algorithm, Quantum theory, statistical Physcis
Sofware skills: Text mining, Advanced data management
Interdisciplinary area: Econophysics, physics of finance, computational Physics

Work Experience

Applied Quantum Algorithm Intern For Image Processing June 2024- Present
Aramco Delft Reseach Center *Supervisor: Marcin Dukalski*

- Utilized Dynamic Time Warping (DTW) to analyze seismograms, extending 1D sequence analysis to 2D image analysis.
- Liteature Review on related annealing based quantum matching, comparing their QUBO formulation and potential application.
- Developed a SIFT-inspired quantum image matching algorithm, selecting the candidates pairs by gradient descriptors and then optimizing them by QUBO .

Reasearch Experience

Quantum Circuit Decompiler – Pattern Recognition of Quantum Circuits Feb 2024- July 2024
Qutech(QML Group from TUDelft) *Supervisor: Sebastian Feld & vedran dunjko*

- Explored methods for quantum circuit decompilation, focusing on QASM to qiskit transformation.
- Developed a proof-of-concept quantum circuit decompiler, capable of pattern recognition for quantum circuits
- Combined Abstract Syntax Tree(AST) and Genetic Algorithm to develop the quantum decompiler, AST is used to represent the python code, and GA plays a role in optimal structure search.

Master Project: Representation Learning for Qunatum States Aug 2023-Jan 2024
AQA(applied Quantum Algorithm) Group in Leiden *Supervisor:Evert Van Nieuwenburg & Jordi Tura*

- combined shadow tomography with a large language model-β-VAE-based transformer
- developed an artificial agent to reconstruct quantum state
- Applied different quantum states(w-state,GHZ-state, and product state) and try to compare them in the aspect of learnability

Skills

Hardcore skills: Quantum information, Machine Learning, Quantitative Analysis,Optimization, Optics

Soft Skills: Critical Thinking, Problem detecting and solving, Work Arrangement for the group, Sustainable Learning

Characteristics Teamwork, Willingness to Learn, Communication, Self-Motivation, Cultural Fit

Languages:

Mandarin Chinese ●●●●●
English ●●●●○

Programming: C/C++, Python, Matlab, , LaTeX
Tools and Frame works: Git/GitHub, Tensorflow, Pytorch, Numpy, Pandas, Qiskit

github.com/XlxlICE *Curriculum vitae*
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Projects(Course)

Future Sales Prediction with Machine Learning | Python | *XGBoost, Random Forest,MLP* Dec 2022

- Predicting daily sales of the last 6 weeks with data from previous 2.5 years, including daily sales, information about competitors, promotion and holiday.
- huge dataset with more than 1M rows. nomalies exist, such as some missing values.
- we choose 3 methods to predict the sales. Randomforest (Bagging). XGboost (Boosting). MLP(Artificial Neural network)

Playing Game with Deep Reinforcement Learning | python | *pytorch,Gym policy-based RL* May 2023

- Implemented the policy-based, deep-RL REINFORCE AND Actor-Crtic Algorithms tp play a ball-catch game
- Applied Bootstrapping and baseline substraction to reduce variance

Computational Physics Projects | python | *Verlet Algorithm, Monte Carlo Integration* May 2023

- simulated the time evolution of Argon atoms in three different phases(gas, liquid and solid). calculated their energy, pressure, and pair correlation as a function of distance between pairs. simulated the molecular Dynamics. The initial condition for the position of atoms is a FCC cube.
- Utilized Monte Carlo methods to simulate the 2D Ising model, analyzing thermalization, critical phenomena, and phase transitions, and assessing the impact of an external magnetic field on system parameters such as energy and magnetization.

Optimization for a Quantum Control | Julia | *PINN(physics Informed Neural Networks)* May 2023

- Implemented a neural network-based method to optimize quantum gate controls, reducing noise effects without assuming noise statistics, enhancing quantum computing reliability and flexibility across different hardware.
- Gained expertise in neural network parametrization, quantum computing applications, and advanced problem-solving in noise reduction strategies.

Sentiment Analysis in Twitter | python | *Text mining, sentiment analysis* Dec 2023

- Conducted sentiment analysis on English-language Twitter data, evaluating three neural network models: DistilBERT, XLNet, and RoBERTa, against informal text challenges such as slang and emoticons.
- The data processing for sentiment analysis involved importing tweet datasets into pandas DataFrames, encoding sentiment labels numerically, and employing model-specific tokenizers for text data preprocessing to prepare for neural network training and evaluation.
- The classifiers are evaluated by a comprehensive assessment metric:accuracy, average precision, average recall, and average F1 score

Other Experience

Participant , College Students' Entrepreneurship Competition Sep 2020 - Oct 2020
conducted the research project with the topic of Study on Quantum Storage Based on Rubidium atoms

Members of De Leidsche Flesch Oct 2022 -now
Volunteered in organizing student activities like food bar and some regular workshops

Voluteeners in Haijiao community Sep 2022 - now
assisted Dutch individuals in learning Mandarin and sharing the richness of Chinese culture with them

Hobbies

Sports : I am an avid football fan, with a keen interest in following the UEFA Champions League and the top five European leagues. Attending live matches is a passion of mine, offering a thrilling experience that I deeply cherish.

Travel : As a dedicated traveler with a passion for history, I find great joy in tracing the steps of historical figures.

Multimedia : My interests also extend to video games and music, having been engaged with a wide array of video games from a young age. I play the guitar and have a particular fondness for jazz music, which resonates with my appreciation for its complexity and expressive depth.