XIANG FEI

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EDUCATION

The Chinese University of Hong Kong (Shenzhen) — 2020.09 - Present
Bachelor of Engineering, Computer Science and Engineering
Cumulative GPA: 3.773/4.000
Major GPA: 3.886/4.000

University of California, Berkeley — 2023.01 - 2023.05
Visiting students (Spring 2023)
Cumulative GPA: 4.000/4.000
Core Courses: (CS182) Designing, Visualizing and Understanding Deep Neural Networks; (EECS C106B) Robotic Manipulation and Interaction; (CS170) Efficient Algorithms and Intractable Problems

Carnegie Mellon University — 2023.06 - 2023.08
Research Assistant
Robotics Institute Summer Scholars (RISS) Program
Biorobotics Lab, Mentor: Prof. Howie Choset

PAPERS (INCLUDING WORKING PAPERS)

First Author

Power System Fault Diagnosis with Quantum Computing and Efficient Gate Decomposition, Submitted to Nature Communications.

Bag-of-Word-Groups (BoWG): A Robust Loop Closure Module for In-pipe Visual-Laser-Inertial SLAM, Published by Robotics Institute Summer Scholar' Working Papers Journal 2023.

Others

Linear-Layer-Enhanced Quantum Long Short-Term Memory for Carbon Price Forecasting, Published by Quantum Machine Intelligence (JCR Q1).

Carbon Market Risk Estimation Using Quantum Generative Adversarial Network and Amplitude Estimation, Ready to submit.

Carbon Disclosure Effect on Listed Companies under the Net-zero Emission Target: The Case of China, National Outstanding Award of National University Student Energy Economy Academic Creativity Competition (TOP 5 in China).

Simulation Modeling Analysis of Carbon-Electricity Market in the Context of Carbon Neutrality, Submitted to Electric Power Construction.

Carbon Rating Report of China's 100 Overseas Listed Companies, (REPORT) Published at the 2022 Global Forum on Sustainable Development.

RESEARCH EXPERIENCE

<u>**Biorobotics Lab**</u>, Robotics Institute, Carnegie Mellon University — 2023.06 - 2023.08
Mentor: Prof. Howie Choset

Robust Loop Closure Module for In-pipe SLAM — 2023.06 - 2023.08
· Proposed a high-precision and high-recall loop closure module for confined spaces.
· Implemented the proposed Bag-of-Word-Groups module and incorporated it into VLI-SLAM, which is an advanced SLAM method based on VINS-Mono.
· Wrote the paper as the first author.

Energy Internet Lab, School of Science and Engineering, CUHK(SZ)   2021.08 - Present
Mentor: Prof. Junhua Zhao

Quantum Computing Algorithm for Power System Fault Diagnosis   2022.08 - Present
· Solved power system fault diagnosis problem based on quantum approximate optimization algorithm.
· Used Ising model to derive the Hamiltonian of the power system fault diagnosis problem.
· Proposed and proved the symmetric equivalent decomposition of multi-qubit rotation gate.
· Applied the small probability event characteristic in power system faults to the proposed quantum algorithm.
· Wrote the code, conducted the experiments and wrote the whole paper.

Quantum Machine Learning for Carbon Price Forecasting   2022.04 - 2022.09
· Proposed and applied Linear-Layer-Enhanced Quantum Long Short-Term Memory for carbon price forecasting.
· Wrote the code to implement the proposed L-QLSTM and wrote the paper.
· The paper has been accepted by Quantum Machine Intelligence.

Establish a Firm-Level Carbon Emission Database with Computer Vision   2022.05 - 2022.12
· Proposed the idea to use computer vision technique to obtain carbon emission data from the ESG reports in PDF format.
· Designed a pipeline using PP-PicoDet, SLANet and Ultra Lightweight OCR System (PP-OCRv3) to extract table content in ESG reports.
· Wrote the code to implement the web crawlers, table recognition and the OCR system.

The Impact of Carbon Disclosure on Company Financial Performance   2022.01 - Present
· Established a database of 4336 Chinese A-share listed companies' emission disclosure information (boolean variables) from 2017 to 2022 using web crawlers and traditional table recognition technology.
· Established difference-in-differences models to analyze the impact of carbon disclosure behavior on company fundamentals from cumulative and dynamic perspectives.
· Explored the association between company stock market performance, carbon disclosure behavior and the establishment of China's national/regional emission trading systems (ETS).
· Read relevant papers and completed the writing of the paper.

Shenzhen Institute of Artificial Intelligence and Robotics for Society (AIRS)   2021.08 - 2022.09
Mentor: Prof. Junhua Zhao

Carbon Rating Report of China's 100 Overseas Listed Companies   2021.08 - 2022.06
· Participated in the design of the carbon score calculation method.
· Participated in the selection of metrics that can measure corporate carbon scores.
· Collected and analyzed the energy disclosure data of China's 100 Overseas Listed Companies.
· The research report published at the 2022 Global Forum on Sustainable Development.

Simulation Modeling Analysis of Carbon-Electricity Market   2022.07-2022.09
· Read relevant papers and completed the writing of the whole paper.
· Revise the paper according to the review comments.

INTERNSHIP EXPERIENCE

Energy Internet Lab, SSE, CUHK(SZ)   2021.08 - Present
Undergraduate Research Assistant
· Research on quantum computing, power system, smart grid, deep learning, carbon market.

Winning Health Technology Group Co.,Ltd.   2022.07 - 2022.09
Algorithm Engineer (Computer Vision)
· Responsible for monocular endoscope 3D reconstruction project.
· Implement 3D reconstruction of gastrointestinal tract based on supervised CNN, Structure from Motion and Marching Cubes Method.
· Participated in the production of the company's science and technology festival promotional video.

Shenzhen Teabreak Network Technology Co., Ltd.   2020.12 - 2022.3
Leader of the back-end development department

· Deeply involved in the development of more than 5 products.
· Led the cooperation of the entrepreneurial team of China University of Political Science and Law.
· Undertook the Halloween promotion activities of JD.com, Inc. in CUHK(SZ).
· The entrepreneurial team with the highest score for the school's incubation base 2021.

COMPETITION EXPERIENCE

2023 National University Student Energy Economy Academic Creativity Competition
· National Outstanding Award of Graduate Group (Top 10 in China)   2023.05

2022 National University Student Energy Economy Academic Creativity Competition
· National Outstanding Award of Undergraduate Group (Top 5 in China)   2022.05

2022 CCF "Sinan Cup" Quantum Computing Programming Competition
· National Second Prize (Top 18 in China)   2022.08

2022 Mathematical Contest in Modeling
· Meritorious Winner (Top 7% of the world)   2022.05

HONORS & AWARDS

2022-2023 Dean's List Honor of School of Data Science	2023.09
2021-2022 Academic Performance Scholarship of The Chinese University of Hong Kong, Shenzhen	2022.12
Undergraduate Research Award of The Chinese University of Hong Kong, Shenzhen	2022.11
2021-2022 Dean's List Honor of School of Data Science	2022.09
Received the offer to the 2022 Summer Program at Pembroke College, University of Cambridge	2022.01
2020-2021 Master's List Award of Muse College	2021.11
2020-2021 Dean's List Honor of School of Data Science	2021.09
Bowen Scholarship of The Chinese University of Hong Kong, Shenzhen	2020.09

EXTRACURRICULAR ACTIVITIES

Teaching Assistant of the Discrete Mathematics Course
· Take tutorial courses for students.
· Make out homework questions for students and grade them.
· Answer questions for students during my office hours.

Peer Advisor of the School of Data Science
· Organize orientation activities.
· Organize freshmen to communicate with professors.
· Advice for freshmen's study and life.

Member of the Chinese University of Hong Kong (Shenzhen) Basketball Team
· Participated in the second level of the Chinese University Basketball League.
· Several friendly matches with Shenzhen Technology University, Shenzhen Polytechnic, and Shenzhen Sports School.

INTERESTS, LANGUAGES, SKILLS

Previous Fields of Research:
· Simultaneous Localization and Mapping (SLAM), Quantum Computing, Computer Vision, Deep Learning, Power System, Carbon Market
Languages:
· English (GRE 325+4), Mandarin (native)
Skills:
· ROS, Python, Pytorch, C++, C, Matlab, Django, MySQL, Linux, Git, CUDA, Latex, Microsoft Office