Jiaheng Cui

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[My LinkedIn Page](#) | [My Personal Website](#) | [My GitHub Page](#)

EDUCATION

University of Georgia   **Athens, GA, USA**
PhD in Electrical and Computer Engineering, College of Engineering   Jun. 2023 – Present
- **PhD Advisor:** Dr. Yiping Zhao, Dr. Xianyan Chen

Northeastern University   **Boston, MA, USA**
Master in Artificial Intelligence, Khoury College of Computer Sciences   Sept. 2021 – May. 2023
- **GPA:** 3.96/4.0
- **Coursework:** *Programming Design Paradigm (A); Pattern Recognition and Computer Vision (A); Algorithms (A); Advanced Reinforcement Learning (A); Foundations of AI (A); Machine Learning (A-); Human-Computer Interaction (A); Statistical Inference (A)*

Nankai University   **Tianjin, China**
Bachelor of Science in Statistics, College of Mathematical Sciences   Sept. 2017 - Jun. 2021
- **GPA:** 85.73/100
- **Major Coursework:** *Mathematical Analysis (83); Advanced Algebra and Analytic Geometry (92); Probability Theory (98); Fundamentals of Computer for Science and Engineering (92); Data Structures and Algorithms (92); Database (85); Introduction to Machine Learning (92)*
- Awarded "Best Paper Award" for my bachelor thesis

University of California, Berkeley   **Berkeley, CA, USA**
Berkeley International Study Program   Aug. 2019 - Dec. 2019
- **GPA:** 3.57/4.0
- **Coursework:** *Numerical Analysis (A); Concepts of Statistics (A-); Introduction to Partial Differential Equations (B)*
- Awarded "Global Nankai" Abroad Study Scholarship

TECHNICAL SKILLS

- Programming Languages: Python, JAVA, C++, JavaScript
- Others: OpenCV, R, MATLAB, Latex, Markdown, Android Development, Spark, MySQL, Azure

RESEARCH & ACADEMIC EXPERIENCE

Research Program in Prof. Gang Luo's Lab   **Harvard University, Boston, USA**
Summer Research Intern   May. 2022 – Oct. 2022
Project: **Eyeturn Measurement based on Computer Vision and Cloud Computing**
- Used OpenCV to perform traditional Computer Vision processing such as binarization and edge detection on the gazeNet results in order to locate the corneal reflection points for eyes with different colors and sizes
- Used matrix optimization techniques to do ellipse fitting on the iris, and found the center of the iris based on the binarization results
- Determined whether the patient had strabismus based on the detection results and ophthalmic knowledge; if so, we were able to quantify the severity of the strabismus

Course Project: Advanced Reinforcement Learning   **Northeastern University, Boston, USA**
                                                                                                                                   Mar. 2022 - May. 2022
Project: **An Improved Approach to Hierarchical Object Detection with Deep Reinforcement Learning**
- Refined the detection strategy by refining the sub-sections that needed to be processed by the agent; updated the state, action, and reward space design of the RL part. Results showed overall AP increase with simply refining the action-selection strategy
- Performed experiments with DQN, DDQN, and D3QN; although DDQN achieved the highest observed accuracy, D3QN had the largest mAP
- The final model using D3QN reduces the average number of steps to process an image from 7 to 4 and the maximum number of steps from more than 10 to 7

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Bachelor Thesis	**Nankai University, Tianjin, China**
	Jan. 2021 - Jun. 2021

Project: **An Exploration of Transformer-Based Object Detection Technology**
- Proposed modifications to the DETR model, results showed better performance on large object detection tasks and the potential to do vehicle, pedestrian, and sign detection for autonomous driving cars

- Analyzed the built-in defects of DETR and proposed further theoretical improvement methods
- Won the Best Paper Award for undergraduate students

Research Program in Prof. Hong Zhao's Lab	**Nankai University, Tianjin, China**
Research Assistant	Jun. 2020 - Mar. 2021

Project: **Copper Wire Melting Mark Classification Algorithm (Jul. 2020 – Mar. 2021)**
- Classified four typical melting mark pictures using C++ and OpenCV
- Completed the algorithm design to improve the pictures identification accuracy of pictures classification by combining our algorithm with classification models

Project: **Motor Vehicle Fire Scene Information Reporting System (Jun. 2020 - Jul. 2020)**
- Developed a vehicle fire scene information reporting system (an Android APP implemented by JAVA) for Tianjin Fire Research Institute of MEM, which has been put into practical use

National College Students Innovation Training Program	**Nankai University, Tianjin, China**
Group Leader	Mar. 2019 - Mar. 2021

Project: **Geometric View and Algorithm Optimization of Generative Adversarial Network (GAN)**
- This project was selected as one of the two national-level projects in the College of Mathematics, Nankai University
- Explained the principle of GAN with differential geometry and optimal transportation theory
- Proposed a generative model - OTVAE based on optimal transport and VAE, which could train 10 epochs to obtain the image quality produced by WGAN training 200 epochs with 60% less time

Course Project: Introduction to Machine Learning	**Nankai University, Tianjin, China**
Group Leader	Nov. 2020 - Jan. 2021

Project: **Machine Learning Financial Aid Rater**
- Optimized the existing algorithm of aiding economically disadvantaged students in Nankai University
- Structurized the original unstructured data using tokenization in NLP, realized dimensionality reduction using the t-SNE algorithm, achieved label refinement using a t-SVM model in semi-supervised learning
- Nankai University Student Financial Aid Center have adopted the model to rate economically disadvantaged students to provide suggestions to the experts for helping students

INTERNSHIP EXPERIENCE

OpenBayes	**Beijing, China**
AI Engineer Intern	Jan. 2020 - Feb. 2020

- Explored the basic algorithm of machine learning and created a 5-chapter tutorial for new interns

Wuhan Shuosi Software Co., Ltd	**Tianjin, China**
Data Scientist Intern	Jun. 2019 - Aug. 2019

- Used Numpy, Pandas, and basic analysis methods of Python in processing and interpreting stock data
- Tracked several stocks, collected, and cleaned the financial data, performed specific transformations (such as log transformation), and conducted a market analysis with Python

EXTRACURRICULAR ACTIVITIES

New Media Center of College of Mathematics	**Nankai University, Tianjin, China**
Department Officer	Jun. 2018 - May. 2019

- Received and processed activity information from other college student organizations in the college and arranged daily news reports on the media platforms
- Led a team of 10 people, organized more than 30 online activities, and released more than 1,000 messages and articles on media platforms within one school year