GUANKAI ZHAI

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RESEARCH INTERESTS

Reinforcement Learning, Computer Vision, 3D Reconstruction, Control and Estimation, Simultaneous Localization and Mapping, Robotics

EDUCATION

Cornell University *Sept. 2020 - May 2024*
Bachelor of Arts in Computer Science, GPA: 4.1/4.3

PUBLICATIONS

- **Guankai Zhai.** "Cockpit Ergonomics: A Historical Study of the Ergonomic Considerations in Aircraft." The Pioneer Research Journal, 2019.

RESEARCH EXPERIENCE

Pioneer Academics *June 2019 - Oct. 2019*
Advisor: Professor Thomas Mullaney, Stanford University

- Examined how the designs and layouts of cockpit instruments have evolved over the last century
- Analyzed the ergonomic considerations of engineers from different times in history using the instruments they designed
- Proposed furture developments in the field of Crew Resource Management(CRM)

TECHNICAL PROJECTS

Cornell University Unmanned Air Systems *Oct. 2020 - Oct. 2021*
Autopilot Engineer

- Participated in the international AUVSI competition as the top fixed-wing aircraft team in the world
- Studied the MAVLink Messaging Protocol to find methods to receive in-flight aerodynamic data from the UAV, including airspeed, relative altitude, etc.
- Implemented the back end of the navigation light control system with over 500 lines of Python code, which utilizes in-flight information to generate optical signals for ground personnel automatically
- Rebuilt the front end of the customized Ground Control Station with Svelte and node.js to achieve 40% increase in operational speed

Ludo Online Game *Jan. 2021 - May 2021*
Software Engineer

- Designed with three engineers the architecture of an online Ludo Game with over 4000 lines of OCaml code, a functional programming language
- Implemented features such as auto-timing and the AI player with heuristic algorithms
- Created a quiz-based tutorial that prepares new players for the main game

INDUSTRY EXPERIENCE

ByteDance, Gauthmath Group *Dec. 2020 - Mar. 2021*
Data Specialist

- Designed the overall backend logic of Gauthmath, a program to solve elementary school mathematical problems intelligently
- Prepared raw data using Python and Excel to train machine learning models
- Tested iterations of the product and gave feedback to the engineering team for their reference
- Conducted competitor analysis to determine the optimal commercialization plan, including pricing strategies, services offered, etc.

COMMUNITY SERVICE

Airline Charter Organization for Chinese International Students *May 2021 - Aug. 2021*
Co-founder & Analyst

- Served as the connection between Cathay Pacific Airways and Cornell Chinese Students and Scholars Association to organize a charter flight from Shanghai to New York
- Carried out budget analyses with Excel to determine optimal ticket prices for each cabin class
- Helped over 300 students safely travel back to campus under the COVID-19 pandemic and relevant international travel restrictions

e-Takeoff Civil Aviation Forum *Aug. 2018 - Aug. 2020*
Translator & Reviser

- Translated the *MH370 Safety Investigation Report* into Chinese to help relatives of the 153 Chinese passengers on board and relevant aviation scholars better understand the disaster
- Published the *report* via Guizhou People's Express
- Donated all revenue from the book's sales to the e-Takeoff Civil Aviation Forum for further research on aviation safety

AWARDS

- Cornell University, Dean's List *Jan. 2021*
- YK Pao School, Full Scholarship *Aug. 2019*
- PhysicsBowl Division I, Global Top 30 *May 2019*

CERTIFICATES

- DeepLearning.AI Convolutional Neural Networks *Oct. 2021*
- DeepLearning.AI Structuring Machine Learning Projects *Oct. 2021*
- DeepLearning.AI Improving Deep Neural Networks: Hyperparameter Tuning, Regularization and Optimization *Oct. 2021*
- DeepLearning.AI Neural Networks and Deep Learning *Oct. 2021*
- IBM Data Science Specialization *Aug. 2020*

COURSES

Undergraduate Level Courses

- OOP and Data Structures
- Functional Programming
- Linear Algebra for Engineers
- Feedback Control

Graduate Level Courses

- Introduction to Machine Learning
- Reinforcement Learning
- Learning with Big Messy Data
- Computer Vision