

# Jiawei Chen

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## EDUCATION

University of California, Berkeley

Aug 2020 - May 2024

B.A. Computer Science

Berkeley, CA

Core Courses: Advanced Algorithms, Database Systems, Computer Security, Machine Learning, Artificial Intelligence, Optimization Models, Computer Graphics and Imaging, Data Structures, Data Science, Game Theory.

## WORK EXPERIENCE

Research Assistant

Sep 2022 - Present

Kennesaw State University, Dr. Yixin Xie's Lab

Kennesaw, GA

- Apply and Optimize Machine Learning Algorithms (random forest, GNN, etc.) for biological data analysis.
- Write Scripts to perform Molecular Dynamic simulations, **increasing calculation speed by 80%** compared to traditional workflows.
- Develop and maintain the lab website using Docker for containerization and SSH for secure remote management.
- Coordinate collaboration between lab members and external partners to ensure communication and project alignment.

## PROJECTS

Machine Learning Projects (Python)

July 2023 - May 2024

- Developed a Convolutional Neural Network (CNN) to classify CIFAR-10 images with 85.3% accuracy, ranking in the top 3% in Kaggle competition.
- Performed data cleaning, feature engineering and built a Random Forest model to predict Titanic survival with 82% accuracy, ranking in the top 5% in Kaggle competition.
- Implemented Recurrent Neural Network (RNN) and Neural Network to classify digits and language identification.

Database Management System (Java)

March 2024

- Implemented a **distributed database system** with lock-based concurrency control mechanism to manage multiple transactions concurrently, incorporating 2-Phase Commit (2PC) and 2-Phase-Locking (2PL).
- Worked on indexing mechanisms and SQL query optimization, leading to a **20%** improvement in performance.
- Implemented the ARIES recovery algorithm to ensure robust database recovery and fault tolerance.

Pac-Man AI (Python)

Sep 2023 - Dec 2023

- Developed advanced artificial intelligence algorithms (A\*, Markov Decision Process, Reinforcement Learning, and Machine Learning) to optimize Pac-Man's path in the maze for efficient pellet collection while evading ghosts.
- Implemented Bayes Nets and Hidden Markov Models to accurately track the position of ghosts using noisy sensor data, and utilized Particle Filtering to enhance Pac-Man's decision-making process under uncertainty.

File Sharing System (Go)

July 2023

- Implemented RSA authentication for user logins and HMAC with SHA-256 to tag critical data, maintaining data integrity.
- Utilized AES encryption to securely store and transfer files, ensuring data confidentiality.

## PUBLICATIONS

- [1] **Chen, J.**, Chen, L., Quan, H., Lee, S., Khan, K. F., Xie, Y., ... & Xie, Y. (2024). A Comparative Analysis of SARS-CoV-2 Variants of Concern (VOC) Spike Proteins Interacting with hACE2 Enzyme. *International Journal of Molecular Sciences*, 25(15), 8032.
- [2] **Chen, J.**, Potlapalli, R., Quan, H., Chen, L., Xie, Y., Pouriye, S., ... & Xie, Y. (2024). Exploring DNA Damage and Repair Mechanisms: A Review with Computational Insights. *BioTech*, 13(1), 3.

## TECHNICAL SKILLS

**Programming Languages:** Java, C/C++, Python, Go, Assembly Language, Shell Script

**Frameworks and Tools:** AWS, Databricks, Docker, Git, SQL, NoSQL (MongoDB), Linux, HTML/CSS

**Others:** Agile Methodology, System Design, Matplotlib, Tableau, Scikit-learn, pandas, NumPy, PyTorch