# Guochen Liao

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## Education

**Grinnell College, Grinnell, Iowa**                                                                         **2021 – Present**
Student, Bachelor of Science in Computer Science

- Exhibit academic excellence through rigorous coursework encompassing Data Structures & Algorithms, Web and Mobile Development, Object-Oriented Programming, Software Development, and Computer Architecture.
- Distinction of placement on the Dean's List, achieved by consistently upholding an outstanding cumulative GPA of 3.95 and a perfect 4.0 in Computer Science major.

## Professional Experience

**Research Assistant,** Grinnell College, Grinnell, IA                                                **June – Present**

Strategically delegated tasks by leveraging the distinct expertise and competencies of each team member. Conducted research on community preservation using a pioneering approach that quantified the ousted population collaboratively. Skillfully steered the team in alignment with project objectives, offering support to colleagues encountering obstacles, fostering transparent communication with the supervising professor, and spearheading the presentation of research outcomes.

*Key Accomplishments:*

- Spearheaded a dynamic research team of four members focusing on gerrymandering and the Community of Interests.
- Utilized GeoPandas for streamlined data manipulation, coupled with Julia programming to conduct comprehensive data analyses. This included generating strategic plans through the sophisticated application of the Metropolis-Hastings algorithm.
- Employed Python for test automation, streamlining the generation of test samples by selecting areas within state shapefiles, thereby enhancing the efficiency and accuracy of the testing process.
- Authored the research "Redistricting Score for Community Preservation," which was selected for presentation at the PME Student Poster Session during the 2024 Joint Mathematics Meeting (JMM).

## Key Projects

- **DSI-Performance-Tool:** A Python and Flask-based tool for visualizing food security policy data
  - Contributed to Grinnell-DSI's "Impact Performance Tool" in a startup non-profit setting, focusing on scalable food security analytics and data visualization using Python and Flask.
  - Played a key role in data ingestion, cleaning, and integration for food security data (2000-2023), enhancing tool accuracy and scalability.
  - Collaborated effectively in a Scrum environment to refine user experience and analytical capabilities for policy trend assessment, leveraging strong communication skills to support tool expansion and integration of policy issues.

- **SocialPlus:** A Cloud and React-based Social Network
  - Engineered a React JS-based short-video web application and elevated user engagement through post creation, seamless browsing, and efficient keyword search capabilities.
  - Orchestrated a secure user experience by incorporating JWT token-based registration, login, and logout procedures; effectively integrating React Router v4 for seamless navigation.
  - Leveraged Go and SQL technologies to efficiently manage posts, data storage, and database operations with successful deployment on Google Cloud via Google App Engine.
  - Elevated search performance and fine-tuned ElasticSearch functionalities to enable swift retrieval of pertinent posts in response to user queries and enhance application's responsiveness.

- **DashDoor:** A Spring and Hibernate-based Online Food Ordering System
  - Developed foundational REST API using Spring MVC and anchored crucial backend functionalities, such as registration, menu searching, order processing, and checkout within application.
  - Employed Hibernate for seamless data storage management, while enforcing stringent security measures through Spring Security for authentication and authorization.

- o Crafted client-side interface using ReactJS and Ant Design to provide user-friendly experience for adding items to cart and seamlessly placing orders.
- o Employed Spring's core technologies for loose coupling among all application components to enhance maintainability and scalability.
- o Created application's entire backend by architecting core functionality and business logic using Java.

- **Tinnews:** A Tinder-like News App
  - o Conceptualized a cutting-edge news application to draw inspiration from Google Component Architectural MVVM Pattern, while incorporating captivating Instagram-style features.
  - o Executed an intuitive user interface by implementing a bottom bar and seamless page navigation, employing JetPack Navigation Component.
  - o Enhanced user experience by facilitating swipe gestures for liking and disliking news through integration of third-party CardStackView (RecyclerView).
  - o Streamlined real-time data updates by integrating Retrofit and LiveData, allowing for efficient retrieval of latest news data from a RESTFUL endpoint.
  - o Fortified application's offline capabilities by constructing a robust Room Database; paired with LiveData and ViewModel for local data caching and retrieval.

## Technical Proficiencies

**Programming Languages:**   Java | Python | JavaScript | Go | C | SQL | Julia | Racket | R

**Tools & Frameworks:**   React | Spring | Docker | Hibernate | Apache Tomcat | GeoPandas | Flask

**Database/Cloud:**   AWS EC2 | GCP | Elasticsearch | MySQL | GAE | GCE