He Qi

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SUMMARY

Highly skilled Ph.D. candidate, proficient at algorithm, OOD and programming.

EDUCATION

George Mason University (GMU), Fairfax, Virginia, USA **Aug. 2019 - Dec. 2024 (Expected)**
- Ph.D. in Mathematical Statistics Science (Graduate Teaching Assistant)
- **Relevant Courses:** Algorithm and Simulation for Statistics in C, Machine Learning, etc.

The George Washington University, Washington DC, USA **Aug. 2016 - May 2018**
- Master of Science, Statistics   **Relevant Courses:** Data Structure and Algorithms, System Design, OOD, etc.

WORK EXPERIENCE

Oracle America, Inc, Remote, USA   **Software Engineering Intern** **May 2022 - Aug. 2022**
- Designed and built a robust Oracle OBIEE dashboard, handling millions of archived data and streamlining the report generation process for managers, resulting in a 10% improvement in overall operational cost.
- Developed a search and filter functionality to help managers generate daily/monthly operation reports efficiently.
- Implemented a cron job agent for automated report generation, resulting in a 50% reduction in time expenditure.
- Enhanced the user experience by optimizing dashboard performance through HTML and SQL code refactoring, contributing to improved landing and browsing speeds.
- Gained practical experience with Oracle Autonomous Database in Oracle Cloud, expanding knowledge of cloud technologies.

Ph.D. DISSERTATION WORK

ROC Curve and Likelihood Ratio Estimation for Forensic Evidence **Aug. 2019 - Present**
- Used the likelihood ratio method to evaluate medical diagnostic and biometric trait analysis in forensic evidence interpretation.
- Proposed advanced Machine Learning and Statistical models, conducted simulation studies to compare the model performance.
- Applied the proposed machine learning models to 3.5+ million records of large-scale real datasets.

PROJECTS

A Personalized Twitch Video Recommendation Engine Based on AWS
- Designed and built a **Java EE** full-stack web application for users to browse Twitch resources and get recommendations.
- Built 15+ **RESTFUL APIs** to support user register/authorization, content search, favorite, and content-based recommendation through **Java Servlet** and **Apache Tomcat.**
- Created a **MySQL** database on **AWS RDS** to store the user's profile and 500k rows of Twitch real game data.
- Developed a user-friendly web page with **ReactJS** and **Ant Design**, deployed the whole application to **AWS EC2** to achieve better performance and reliability, and used **JMeter** to test the web application bandwidth providing a server with 50 QPS throughput.

Staybooking: An online stay rental application based on React and Spring Boot
- Designed and built a single-page full-stack web application for users to book reservations.
- Implemented backend services based on **Spring Boot** to support stay, upload, delete, search, and reserve functionality and used **Spring MVC** to create 10+ **REST APIs**.
- Created **MySQL** database to save user-generated data and stored media files on Google Cloud Storage, and developed location-based stay search by creating geo-indexes on **Elastic Search**.
- Created web pages using **React-Bootstrap** and **Ant Design**, implemented **JWT** server-side user authentication based on the **Spring Security** framework, and deployed the application to **Google App Engine** for better scalability and reliability.

Social Network platform based on Go and React
- Created a social network web application with **Go** and **React** for users to upload and search for photos and short videos.
- Created UI using **JavaScript, HTML, CSS**. Implemented functionalities for users to upload media files and save them to **GCS.**
- Utilized **Elastic Search** to optimize search functions so users can search recent posts and list individual posts.
- Developed the backend services with **Go** and deployed them to **Google Cloud** (Google App Engine).

A Tinder-like News Android App
- Designed and implemented a News recommendation Android Application based on the **Google MVVM** Pattern.
- Utilized the **JetPack** navigation component to support bottom bar, used **Room** Database to support local cache and offline model.
- Displayed the news content image with **Picasso**, used **Retrofit** to pull the latest news from the **RESTFUL** endpoint (newsapi.org).

Generatively Pretrained Transformer (GPT) Model based on OpenAI's GPT-2 / GPT-3
- Built character-level GPT model using Python **PyTorch** following the theories in the paper "Attention is All You Need".
- Implemented the bigram language model supporting **multi-head attention** mechanism and **positional encoding** layer.
- Applied the embedding to convert the input token and used linear transformation and **softmax** to convert the decoder output.
- Trained the GPT model iteratively (supported both CPU and GPU) using **AdamW** optimizer with the tiny Shakespeare dataset.
- Reduced data loss to 1.48 by combining the **Feed-Forward** neural network with linear transformation and **ReLU** activation function.

TECHNICAL SKILLS

- **Programming languages:** Java, Python, C++, Go, SQL, NoSQL, PyTorch, OpenAI API, R-Studio, JavaScript, HTML/CSS,.
- **Databases and Tools:** AWS EC2, AWS RDS, Google Cloud, Linux, Docker, Multithreading, Git/Github.
- **Web/Mobile Development:** Spring Boot, Hibernate, React, Java Servlet, Node.js, REST API, Android.

PRESENTATION & MEMBERSHIP

- **AWS Summit** Washington, DC, 06/7/2023. **Grace Hopper Celebration (GHC) 2023**, in person. **Society of Women Engineers** (SWE). **Tapia Conference 2023,** in person - Association for Computing Machinery Member.