Mohammed Alam

New York, NY 10027
929-543-7171 | ma4368@columbia.edu | LinkedIn | GitHub

EDUCATION

Columbia University, The Fu Foundation School of Engineering and Applied Science Expected May 2027
Candidate for Bachelor of Science – Computer Science, GPA: 3.1
Relevant Coursework: Data Structures & Algorithms, Java Programming, Python Programming
Awards: Rocco & Catherine Commisso Scholar, FTC Software Control Award, National Science Honors Society

SKILLS

Programming Languages & Frameworks: JavaScript, TypeScript, Java, Python, React, Node.js, ExpressJS
Cloud Computing: Google Cloud Platform, AWS Services (EC2)
Databases: MongoDB, PostgreSQL, Firebase, Redis
Development Tools: Git, Docker

EXPERIENCE

Software Developer **Bronx, NY**
Freelancer *September 2023 - Present*
- Developed and implemented custom scalable web applications and bots for Discord and Twitch
- Scaled back-end infrastructure to efficiently process and manage millions of daily messages, supporting a user base of over 12,000,000 across 13,000+ unique communities
- Cultivated strategic partnerships to deliver tailored software solutions to 100+ clients

FTC Robotics **Bronx, NY**
Programming Mentor *September 2023 - Present*
- Guided FTC Robotics team in comprehending advanced Java concepts and documentation for robot programming
- Instructed object-oriented programming in Java, enabling the creation of complex robot solutions
- Facilitated development of autonomous movement and optimized PID-controlled mechanics for robot software

Columbia University **New York, NY**
Data Science Research Intern *June 2022 - August 2022*
- Conducted collaborative research with Ph.D. candidates investigating nitrogen oxide (NOx) production during hydrogen combustion
- Utilized Python and specialized software (Cantera, Spyder, Matplotlib) for advanced data manipulation and visualization to analyze experimental data.
- Presented 6 weeks of findings and research to Columbia faculty and students

PROJECTS

Guess The Number | NodeJS, MongoDB, Redis
- Created an Discord application enabling users start guessing games in designated channels within their servers
- Employed MongoDB for persistent data storage, efficiently managing server and game data
- Utilized Redis and local in-memory cache to optimize data retrieval and handle high volume of messages across thousands of active games spanning over 13,000 guilds with a user base exceeding 12,000,000

Discord Metric System | NodeJS, ExpressJS, ReactJS, Redis, MongoDB
- Engineered an application for real-time metrics collection, using Discords API, and visualization (MERN Stack)
- Streamlined a multi-layered data processing and caching pipeline using Redis, local in-memory cache, and MongoDB to handle high-throughput message data from Discord servers, increasing read/write speeds by over 90% (1-10ms)
- Implemented RESTful APIs using Express.js to access real-time metrics data, ensuring seamless updates and visualization of metrics on the ReactJS website

Whack-A-Mole | NodeJS, ExpressJS, ReactJS, Socket.IO
- Designed a real-time game interface synchronized with physical sensors and motors connected to an Arduino board
- Leveraged Node.js and Express.js to establish WebSocket connections and manage bidirectional data transmission between the physical game setup and the React.js frontend
- Implemented a responsive user interface using React.js, synchronized with the real-time game events via a Socket.IO server for dynamic score tracking, timer updates, and music playback