HAMZA MEHMOOD

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EDUCATION

University of Toronto ***2021 - 2026***

Bachelor of Science - Computer Science

Courses: Software Tools ⟨LINUX/C⟩, Computer Networks, Web Development, Information Security, Computational Complexity⟨P-NP⟩, Software Design ⟨Java⟩, Processor Architecture, DSA

SKILLS

Languages: Python, C, C++, Java, JavaScript, Assembly ⟨Risc-V⟩, PHP, HTML, CSS

Libraries/Frameworks: Django, React, Arduino, OS, Tailwind, JWT, PyGame, jQuery, TensorFlow

Tools: Git, Postman, PostgreSQL, MongoDB, Bash, Unit Testing, Virtual Machines, Kali, Sockets, GCP, GDB, TCP/UDP

PROJECTS

LowkeySpots | Repo | Live ***Django REST, React, TypeScript, MapBox, Docker, GCP, PostgreSQL***

- Created an interactive **social** platform offering utility for marking locations and **constructing routes** on **savable maps**, thereby filling the void present in typical map application (such as google and apple map apps)
- Used **docker** to containerize the backend, deploying the app on **GCP cloud run**, while hosting **PostgreSQL** server **locally**, and placing the static frontend on an **AWS S3** bucket (both with **SSL encryption** and **Firewalls** for security)
- Employed **Django REST framework** in a **macroservice** architecture for a robust and **scalable API**
- Enabled **CRUD** operations through Django **ORM** and **OS** for secure and rapid **user data management**
- Wrote a thorough **testing suite** for the API, utilizing Django **unit tests,** and **postman**
- Ensured security of users through using **JWT** to create sessional tokens upon login, and using **bcrypt** for user password **security/privacy**
- Achieved up to **50%** reduction in required API calls by serving image-based content **statically** and optimizing **browser cache**
- Offered **customizability** with the inclusion of names, descriptions, custom images**,** dates, and a privilege system for map sharing, thereby allowing users to find their own best fit

Autonomous Plane | Repo | Demo ***Arduino C/C++, PyGame, [Physical]***

- Engineered a physical airplane with **autonomous** capabilities **Arduino-nano**
- Utilized an autopilot algorithm that takes location input and **triangulates** the destination distance using the haversine formula to **maneuver** the plane according to tshe bank and steer functions
- Designed and implemented a **responsive** control system and **user-friendly interface**, showcasing expertise in **Human-Computer Interaction**
- Utilized a PlayStation controller to allow for **90%** accurate user maneuverability

Music Taste | Repo ***NumPy, MatPlotLib, TensorFlow***

- Developed a **neural network** model to predict individuals' anxiety, depression, insomnia, and OCD levels based on music preferences
- Achieved an average prediction accuracy of **73%** through parameter tuning and **regularization optimization**
- Authored a **technical report** detailing the neural network architecture**, learning rate optimization**, and recommendations for future improvements

EXPERIENCE

Freelance - Programming Instructor ***Sep 2020 – Mar 2021***

- Taught Python to **50+ students**
- Incorporated core concepts such as **object-oriented-programming,** files, **algorithms**

INTERESTS

• Biking • Music • Video Games • International Relations • MMA