Muhammad Umar Khan

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EDUCATION

Wayne State University | Detroit, MI, USA **Jan. 2025 - Dec. 2026**
M.S. in Computer Science
Relevant Courses: Cybersecurity Practice, Intelligent Systems: Algorithms and Tools

University of Windsor | Windsor, ON, Canada **Sep. 2020 - April 2024**
B.S. in Computer Science with Software Engineering Specialization
Relevant Courses: Artificial Intelligence, Data Structures and Algorithms, Software Development, Object-Oriented Programming, Database Management

TECHNICAL SKILLS

Languages: C, **Java**, JavaScript, **Python**, R**,** C++, SQL, HTML**,** CSS, C#, Assembly, SQLite
Tools & Technologies: Git, GitHub, Docker, VSCode, PyCharm, Eclipse, JUnit, Node.js, Snowflake, MySQL, SQLite, Office 365, AutoCAD, NumPy, Pandas, Matplotlib, TensorFlow, PyTorch, Spacy, Pygame
Concepts & Methodologies: Machine learning, image classification, data structures, algorithms, unit testing, agile software development, data management, software development, debugging.
Soft Skills: Analytical thinking, teamwork, critical thinking, leadership, problem solving, communication, organizational skills, time management.

EXPERIENCE

University of Windsor| Windsor, ON, Canada **April 2023 - Nov. 2024**
Research Assistant

- Assisted Dr. Luis Rueda in his research of image classification and segmentation with the use of Super Pixels
- Implemented Python to code a program to split an image into random clusters and identify the centroid using the Euclidean distance to grab all similar clustered pixels to be later identified as super pixels.
- Implemented a program that uses the Convolutional Neural Networks (CNN) and the Graph Convolutional Neural Network to identify the pixels on an image and explained how these two neural network models could be beneficial in our research.
- I implemented an SQL server and integrated it with Snowflake for data querying and processing and demonstrated how it can be used to ease the process of managing important data and information on our super pixels.
- Created a small-scale Python program and integrated it with Docker to further explain and demonstrate how coding a large-scale program can be effective and beneficial when within a virtual environment.

University of Windsor| Windsor, ON, Canada **Jan. 2024 - April 2024**
Teaching Assistant

- Hosting **3** weekly office hours and grading exams and assignments for over **100** students enrolled in Database Management Systems.
- Assisted in students' understanding in the concepts of SQL and offered assistance for any problems and questions related to assignment and coursework.
- Aided the professor and **5** other graduate and undergraduate teaching assistants during an exam proctoring.

University of Windsor| Windsor, ON, Canada **Jan. 2023 - April 2023, Sep. 2023 - Dec. 2023**
Teaching Assistant

- Hosting **2** weekly office hours and grading exams and assignments for over **150** students enrolled in Data Structures & Algorithms for 2 semesters.

- Assisted in students' understanding in the multiple concepts with regards to Data Structures and Algorithms as well as offering assistance for any problems and question related to assignment and coursework.
- Aided the professor and **5** other graduate and undergraduate teaching assistants during an exam proctoring and lab for the first semester, while aided the professor and **9** other graduate and undergraduate teaching assistants for the second semester.
- I was the lead teaching assistant for the second semester for a lab time slot and managed and supported tasks for **3** other undergraduate teaching assistants.
- Assessed students capabilities in the various data structures such as; linked lists, binary trees, stacks and queues, hash tables, maps, etc., as well as pseudocodes and important algorithm concepts such as time and space complexity to help them progress their lives and skill in the field of computer science.

University of Windsor| Windsor, ON, Canada **Sep. 2022 - Dec. 2022**

Teaching Assistant

- Hosting **3** weekly office hours and grading exams and assignments for over **150** students enrolled in Object Oriented Programming.
- Assisted in students' understanding in the concepts and topics of the Java programming language and offered assistance for any problems and questions related to assignment and coursework.
- Aided and understood the struggles faced by students when learning and coding in Java, and how to help them understand and program with the topics and concepts in mind to ease their learning in Java.
- Aided the professor and **7** other graduate and undergraduate teaching assistants during exam proctoring and lab.

VOLUNTEER

Windsor Islamic Association | Windsor, ON, Canada **May 2019 - June 2019**

Security Guard

- Directed and signaled drivers to an open parking spot while ensuring a smooth flow of traffic and no incidents.
- Analyzed instructions from managers and co-workers and implemented required processes leading to a 100% success rate.
- Communicated and collaborated with managers and assessed situations with 3-4 security guards to ensure the building was secure.

PROJECTS

K-Means Market Basket Analysis | Java

- Developed a program using **K-Means clustering** and the **Apriori algorithm** to analyze large-scale market transaction datasets.
- Clustered customer transactions based on **purchasing behavior** to identify distinct buying patterns.
- Applied **Apriori** to discover frequent item sets and associations between products within each cluster.
- Done to extract insights to support **marketing strategies** and **product placement optimization.**
- Collaborated with a partner through the whole design and implementation.

Computer Calculator | C

- Created a simple calculator in C that handles arithmetic expressions and calculations such as addition, multiplication, subtraction, and division.

Pokémon Simulator | Java

- Created a simulator game between the user and the system to simulate a Pokémon battle with turns and moves.
- From a pre-given list, the user and the opponent are given a full team of 6 random Pokémon, each with a defined move set that functions as they do in the game, and deals respected damage to the other when used, with each Pokémon having their own health bar and specific power points on each move.

Aerial Shooter Game| Java

- Designed and developed a 2-level fixed shooter game featuring a **starter level** and a **boss battle.**

- Implemented gameplay mechanics including **enemy waves**, **boss AI**, and **player controls.**
- Created an engaging storyline where a lone commander battles enemy forces to achieve victory.
- The game consists of having to defeat 20 enemies to clear the first wave and then defeat the boss all while maintaining the players health.

Car Escape Game | Python

- Developed a **2D fixed shooter game** with horizontal gameplay and a **scrolling background** for dynamic visual effect.
- Programmed enemy behavior, player controls, and victory/loss conditions to enhance gameplay.
- Designed a storyline where the player evades and defeats pursuing mercenaries to reach safety.
- The game consists of defeating **20** enemies all while maintaining the player's health and **3 lives.** Victory is given when the enemies are defeated.

Paint Application | Python

- Built a **Microsoft Paint–style drawing program** with core features such as freehand drawing, shapes, color selection, and erasing.
- Integrated **Assassin's Creed–themed backgrounds** as optional canvases and included **character stamps** for creative customization.
- Designed a user-friendly GUI and implemented drawing tools and image manipulation features.

Sonic Shooter Game | JavaScript

- Developed a **2-level shooter game** featuring a main enemy wave and a challenging **boss fight against Dr. Eggman**
- Designed gameplay elements including **limited lives**, **environmental hazards** (e.g., background fire), and increasing difficulty.
- Created a storyline where Sonic defends his home and saves his planet through combat-driven progression.
- Collaborated with a partner through the whole design and implementation.

Space Invaders | JavaScript

- Designed and developed a **classic-style fixed shooter game** inspired by *Space Invaders*, featuring enemy waves and a **final boss battle.**
- Implemented **scoring system**, player controls, and win/lose conditions to enhance gameplay.