Mahmoud **Abu Jayyab**

Software Engineer

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Education

University of Alberta | BSc with Specialization - Computing Science **Sept 2018 - Jun 2022 (Expected)**

- **Major GPA:** 3.6
- **Courses:** Python and C/C++ Programming, Algorithms and Data Structures, Database management Systems, Software Engineering, Software Quality, User interaction, Game AI, Visual recognition, Web applications and architecture, Computer Architecture
- **Degree Honors:** with Distinction

Technical Skills

Programming Languages: C/C++, Python, java, JavaScript, MIPS, C#
Technologies: Django, Git, HTML5, CSS3, SQL, PostgreSQL, Docker, JUnit, Selenium, React, Gradle, Firestore, XML
Tools: VScode, Visual Studio, Android studio, SonarQube, SpotBugs, PMD, ErrorProne

Projects

Learning Guides | A web app for learning and viewing courses **Apr 2022**

- **Built** a web app for a client while actively partaking in all stages of the software development cycle (eliciting requirements, design, development, testing, deployment, and maintenance) by utilizing SCRUM and an agile software process model.
- **Led** UI design and created wireframes that satisfied the client's requirements while leveraging feedback from the client as well as team members.
- **Leveraged** the Django web framework, HTML, CSS, JavaScript, PostgreSQL, Selenium and GitHub.

Hollow heap Implementation | A new and efficient data structure **Apr 2022**

- **Implemented** an efficient hollow heap data structure in C++ with all heap operations taking O(1) time in worst case, except deletion taking O(logn) amortized time, by referring to its original research paper.
- **Improved** Dijkstra's algorithm worst case run time from O(|E|log|V|) to O(|E|+|V|log|V|) on large dense graphs by using this implementation of a hollow heap.
- **Leveraged** OOP and C++ pointers.

Smartbot | A bot for Starcraft2 **Dec 2021**

- **Built** a Starcraft2 bot that placed 4th in a tournament against 12 other Starcraft2 bots and achieved a 91% win rate against the built-in hard-difficulty AI by utilizing a state-machine design pattern.
- **Designed** and implemented a greedy structure-placement algorithm that finds a valid and optimal placement location for structures by rotating a vector around a certain 2D point on a Starcraft2 map.
- **Leveraged** OOP in C++.

PocketBook | An android app for borrowing and lending books **Dec 2020**

- **Developed** an android app, that allows users to list their books and lend them to other users, by working effectively in a team environment while utilizing the appropriate project management practices and processes including agile and SCRUM methodologies.
- **Designed** the app while applying the appropriate software design patterns and OOP principles (Abstraction, Encapsulation, Inheritance, and Polymorphism).
- **Leveraged** OOP in java, Android studio, Firestore, JUnit, Selenium and GitHub.

Volunteering Experience

Software Developer **Apr 2022-Present**
Imagine Cities **Edmonton, AB**
A non-profit organization dedicated to preparing communities for the future

- **Integrated** the learning guides app into the organization's software eco-system.