

# Abdelrahman ElShafay

(343) 987-1641 | [abdelrahmanelshafay@gmail.com](mailto:abdelrahmanelshafay@gmail.com) | [LinkedIn](#) | [Github](#)

## EDUCATION

### Carleton University

*Bachelor of Science Honours in Computer Science, specializing in AI and ML*

- Fourth year standing

Ottawa, ON

*Sep. 2022 – June 2027*

## WORK EXPERIENCE

### Carleton University

*Undergraduate Teaching Assistant - COMP 2404: Intro to Software Eng.*

Ottawa, ON

*Jan 2025 – April 2025*

- Leading weekly tutorial sessions designed to reinforce course material, provide in-depth explanations of C++ concepts, and guide students through hands-on problem-solving activities to enhance their understanding and application of programming principles.
- Leading weekly office hours, explaining core C++ concepts such as object-oriented programming, data structures, and debugging, while providing one-on-one assistance with assignments and troubleshooting code.
- Evaluating assignments and exams, providing actionable feedback to foster student learning and academic success.

## TECHNICAL SKILLS

**Languages:** Java, Python, C/C++, SQLite, JavaScript, TypeScript, HTML/CSS, R, Scheme, Prolog

**Technologies:** React, Node.js, Material-UI, Rest API, openCV, Cython, TensorFlow, TCP/IP

**Developer Tools:** Git, Docker, Google Cloud Platform, Kubernetes, VS Code, PyCharm, IntelliJ, Qt Creator, DrRacket

## PROJECTS

### iTunesfy | JavaScript, TypeScript, Node.js, AngularJS, SQLite, Rest API

*Sep 2024 – Dec 2024*

- Developed a full-stack web application with Angular for the Front-end and Node.js with SQLite for the Back-end, allowing users to store and manage song and user information seamlessly.
- Implemented robust SQL security features, including authentication, access control, and encryption, to protect sensitive user data.
- Created a platform fostering a vibrant online music community, enabling users to store songs in playlists, create and publish new songs, and explore a library of content.
- Integrated user authentication workflows for secure account creation and management.
- Utilized the iTunes search API via a RESTful interface to dynamically fetch song, album, and artist data.

### ASCII Camera | Python, OpenCV, NumPy, Computer Vision

*May 2025 – May 2025*

- Designed and developed a real-time camera application that transforms live webcam video into ASCII art, processing up to 30 frames per second with less than 50 ms latency per frame.
- Implemented a custom pixel-to-ASCII character mapping algorithm, achieving a 92% improvement in visual clarity compared to traditional fixed-ramp approaches
- Optimized image resizing and terminal rendering, resulting in a 40% reduction in CPU usage while maintaining consistent output quality across diverse hardware setups.

### RaDoTech Simulation | C++, Qt, Git, AgileUML

*Dec 2024 – May 2025*

- *Collaborated with a team* to develop an intuitive Qt-based user interface for a RaDoTech device and app, ensuring a seamless and engaging user experience.
- Simulated device battery behaviors and implemented Bluetooth connectivity to enhance realism and usability.
- Created detailed documentation, including class diagrams, a traceability matrix, and use case diagrams, to support project understanding and future scalability.

### BMP 280 device driver | Linux Kernel, C, I<sup>2</sup>C, sysfs, Raspberry Pi, BMP280

*June 2025 – July 2025*

- Developed a Linux kernel I2C driver module for the BMP280 temperature and pressure sensor, including sensor reset, register configuration, and sysfs user interface.
- Implemented calibration logic for BMP280 using datasheet-based compensation formulas to compute accurate temperature and pressure readings.
- Implemented proper handling of device probing, register initialization, and I2C communication using *i2c\_smbus\_\** APIs.
- Exposed real-time sensor data to userspace via sysfs attributes, following standard Linux driver conventions.