Ebad Ahmad

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Education

Wilfrid Laurier University Expected May 2027
Bachelor of Science in Computer Science ***GPA: 10.5 (3.7/4.0)***
Relevant Coursework: Data Structures and Algorithms I and II, Discrete Math, OOP, Digital Electronics, Microprocessors

Projects

unitrack.me | *React, Node.js, OAuth 2.0, JWT* Sep 2025 – Jan 2026

- Built a competitive study platform used by **20+** registered users to log **100+** study sessions, turning unstructured self-study into quantifiable, competitive metrics.
- Implemented a real-time leaderboard using **MongoDB** aggregation pipelines achieving ~**15 ms p95** response time, and built a friends system (up to **99** friends/user) with **online/offline presence** tracking.
- Developed a Node.js (Express) REST API with **27** endpoints, securing **22** routes with **JWT** auth (Google OAuth 2.0) and implementing role-based access control and secure session management.
- Introduced onboarding and personalization by adding profile editing, status updates, and **Cloudinary** hosted profile photos with secure uploads and validation with file-type/size validation and authorization checks.
- Improved data integrity and UX reliability by enforcing **one active session per user** (server-side start/end validation; **0 overlaps across 100+ sessions**) and implementing persistent client-side auth/session state with refresh-safe error/loading handling.

Real vs Synthetic Image Detection | *Python, PyTorch, CNN* April - May 2025

- Developed an image classifier to distinguish AI-generated images from real photographs using **120,000 labeled samples**
- Engineered and trained a custom **5-layer CNN**, achieving **96.2%** test accuracy and an F1 Score of **0.965**.
- Utilized real-time GPU augmentations with **Kornia** and automatically saved optimal model weights for reproducibility.
- Preprocessed images for visual features (edges, color histograms, texture metrics) using **OpenCV** and **scikit-learn**.

Blood Spatter Analysis Tool | *Python, PyTorch, scikit-learn, OpenCV* June - July 2025

- Developed a forensic application that classifies blood spatter patterns (passive, projected, transfer) and estimates impact angles to support crime scene reconstruction in real time.
- Achieved **89%** classification accuracy using a **Random Forest model** trained on **5,000+** labeled images
- Implemented angle-of-impact estimation with a **Support Vector Regressor (SVR)**, achieving a mean absolute **error under 3.5°** and visualizing trajectories for scene reconstruction.
- Used **OpenCV** for shape analysis and feature extraction to quantify droplet geometry and spatter dispersion.

Backend API for Real-Time Image Classification | *Python, FastAPI, Pillow, Docker* August 2025

- Processed and classified **100+** user-uploaded images per minute with **>99%** request success rate by building optimized image upload, validation, and preprocessing endpoints using **FastAPI** and **Pillow**
- Supported **50+** concurrent inference requests using async FastAPI endpoints and efficient request handling.
- Reduced setup and deployment time by **70%** by containerizing the app with Docker for reproducible, scalable builds.

Experience

Wilfrid Laurier University September 2025 – Present
Teaching Assistant *Waterloo, ON*

- Teaching assistant for **CP104 (Introduction to Programming)**, leading weekly lab sessions for **70+ students** teaching Python fundamentals such as loops, conditionals, functions and recursion.
- Provided guidance with **debugging**, **environment setup**, and **best coding practices**, helping students resolve logic errors and improve code efficiency, a student's grade improved from **62%** to **92%** after targeted support.

The Water Store Milton November 2022 – June 2025
Retail Associate *Milton, ON*

- Provided troubleshooting and technical guidance, ensuring efficient problem resolution and customer satisfaction.
- Diagnosed equipment issues such as valve malfunctions, pressure inconsistencies, and connectivity errors.

Technical Skills

Languages: Python, Java, C, C++, C# JavaScript, TypeScript, SQL, HTML, CSS, Go
Frameworks: React, Node.js, Express.js, FastAPI, MongoDB, AWS, Docker, Git, PyTorch, scikit-learn, OpenCV, NumPy
Concepts: REST API Design, Fullstack Development, Software Engineering, Data Structures & Algorithms (DSA), System Design, Asynchronous Programming, Database Design, Performance Optimization, Machine Learning, Model Deployment, Neural Networks, Computer Vision, Regression & Classification, Data Preprocessing, CI/CD.