Ehaab Basil

(443) 875-2658 | ehaab@umd.edu | www.ehaabbasil.com | LinkedIn | Crofton, MD

EDUCATION

University of Maryland   **2025**
Master of Science – Computer Science, GPA 3.6/4.0

University of Maryland   **2022**
Bachelor of Science – Computer Science, Minor: Business Analytics, 3x Dean's List

TECHNICAL

Programming Languages	Python – C/C++/C# – Java – JavaScript – Ruby – OCaml
Libraries and Frameworks	TensorFlow – PyTorch – Node.js – .NET – React – Django – Flask
Databases	MySQL – MongoDB – Firebase
Other	Docker – Kubernetes – Git – Linux – AWS – CI/CD – Jenkins – JUnit

SKILLS

Test-Driven Development – Algorithms – Advanced Data Structures – Object-Oriented Programming – Relational Databases – Distributed Systems – Operating Systems – Automation – Compilers – Computer Architecture – Machine Learning – Deep Learning – Large Language Models – Time Series Analysis – Data Visualization – Data Modeling – Feature Engineering

PROFESSIONAL EXPERIENCE

Wardah Technologies LLC.   **Remote**
Software Development Engineer   *Sep 2023 – Jul 2024*
- Directed the end-to-end development cycle of a scalable financial and ticket management platform for an airline GSA that streamlined operations for 100+ travel agencies by automating bulk ticket requisitions, payment approvals and reporting
- Built and integrated an interactive dashboard for the real-time tracking of financial metrics, agent balances, payment statuses and ticket lifecycle management to provide visibility to senior leadership teams and influence strategic decision-making
- Developed a bulk ticket requisition system that integrated hierarchical approval workflows to reduce manual follow-ups by 40% and accelerate ticket issuance
- Implemented and integrated a comprehensive ticket management module with dedicated features for voiding, refunds, and debit memo conversions to facilitate a streamlined customer experience while upholding compliance with airline policy
- Developed a finance module that supported payment tracking across multiple methods (bank, cheque, cash), automated balance updates and alerts for overdue payments to enhance financial oversight and audit compliance
- Produced financial reports for sales, ledgers, taxes, balances, and revenues to support decision-making and transparency
- **Tech Stack**: C# – .NET Framework – SQL Server

University of Maryland   **College Park, MD**
MINDLab Research Assistant   *Jan 2022 – May 2022*
- Applied Machine Learning models to analyze patient-specific breathing signals, optimizing data pre-processing and feature engineering to improve accuracy in the detection of health-related variations
- Conducted extensive research centered on analyzing breathing patterns to help detect patient respiratory symptoms
- Spearheaded the development of a custom object detection system for PDF documents using TensorFlow and OpenCV

RESEARCH EXPERIENCE

Lensless Imaging Reconstruction at University of Maryland
- **Description**: Developed hybrid optimization-deep learning algorithms for real-time image reconstruction in compact cameras where the goal was to balance computational efficiency with clinical-grade quality using the DiffuserCam dataset (25k images). Achieved 26.1 PSNR and 1.72 sec/image inference via Learned ADMM with U-Net regularizers.
- **Tech Stack**: PyTorch – TensorFlow – Raspberry Pi

Adaptive RL Policy Design with LLM Planning at University of Maryland
- **Description**: Created uncertainty-aware reinforcement learning agents that request human/LLM feedback when encountering novel obstacles, and implemented bootstrap ensembles for 90% obstacle detection accuracy and SSIM-based OOD detection that outperformed GradNorm by 40%.
- **Tech Stack**: Python – PyTorch – ChatGPT API – LLM

PROJECT EXPERIENCE

Amadeus GDS Automation Interface
- Implemented multi-threaded parsing by leveraging data structures and algorithms to automate data extraction from concurrent terminal outputs, ultimately reducing manual intervention time by 97%
- Set up a manual provision for outlier cases such as duplications of infant ticket records associated with parent details, and applied algorithmic approaches to ensure 100% traceability for infant passengers
- Led the reverse-engineering of terminal text patterns to extract passenger details (PNRs, names, passport details, flight and ticket numbers, fare classes, etc.) and added validation rules to flag discrepancies, leading to 99.8% accuracy rates
- Designed and implemented a .NET service using optimized data structures, regex and custom parsers to convert unstructured data into JSON for SQL ingestion
- Managed the integration with the airline's existing ticket management system to auto-generate internal records that enabled real-time validation and eliminated 98% of orphaned ticket records
- **Highlight**: Optimized performance to process 200+ daily terminal files while elevating efficiency rates from 85% to 99.8%
- **Tech Stack**: C# – .NET – Regex – SQL

Musical Shoes – Interactive Gaming System
- Developed a 2-player competitive game mode for smart insoles that translated foot pressure into real-time music and gameplay using Force Sensitive Resistors (FSRs), an ESP32 microcontroller, and WebSockets
- Programmed the ESP32 microcontroller (C++/Arduino) to read analog values from three FSRs per insole (toes, heel, side) and transmit pressure data as JSON payloads via WebSockets for real-time processing
- Implemented threshold-based triggering in the game mode to facilitate specific pressure levels activating scoring mechanics, and calibrated sensors using algorithmic threshold adjustments to account for user weight variations
- Designed and implemented a real-time web interface to guide players with visual cues and display randomized pressure targets, and used WebSockets for bidirectional communication between the ESP32 and the interface for seamless gameplay
- Optimized wireless data transmission to transition from USB to Wi-Fi-based WebSockets that eliminated mobility constraints while ensuring low-latency performance
- Engineered a durable, ergonomic design that integrated 3D-printed insole casings and hand-stitched sensor protection for comfort, durability and longevity
- **Highlight**: Pioneered an innovative approach to real-time motion-based competition that demonstrated the viability of wearable technology for interactive gaming
- **Tech Stack**: Arduino (C++) – WebSockets – JavaScript – HTML – CSS – ESP32 – FSRs – 3-D Printed Components

Pretty Good Privacy REST API
- Developed a REST API with Python, FastAPI, JavaScript, and Heroku that optimized performance and scalability
- Enhanced data privacy by +12% by implementing a feature generating public and private key pairs for secure communication
- Designed a secure encryption mechanisms that enabled the server to retrieve client requests and encrypt messages using dynamically generated public keys
- **Tech Stack**: Python – FASTAPI – JavaScript – Heroku