# ADHAVAN ALEXANDER

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## EDUCATION

**Northeastern University** *Boston*, MA
*Khoury College of Computer Sciences* (class of 2025)
**Coursework**: Program Design Paradigm, Algorithms, DBMS, Web Development, Fundamentals of Artificial Intelligence, Mobile Application Development

**PSG College of Technology** *Coimbatore*, India
*Bachelor of Engineering in Computer Science*
**Coursework**: Design and Analysis of Algorithms, Software Engineering, Machine Learning, Artificial Intelligence

## SKILLS

**Languages & Frameworks** : Java, Python, C++, C, JavaScript, SQL, React.js, Node.js, Spring Boot
**Databases & Libraries** : MongoDB, MySQL, NoSQL, Google Firebase, Axios, OpenCV
**Tools & Infrastructure** : Postman, Git, Jira, Docker, Android Studio, Codemagic
**Testing & Methodologies** : Agile, Scrum, JUnit, Selenium, Debugging

## WORK EXPERIENCE

**O9 Solutions Inc.** *Coimbatore*, India
Business Operations Specialist Aug. 2022 – Jul. 2023

- Maintained and standardized diverse raw data files (CSV, Excel, JSON) into structured formats, implementing data normalization techniques to ensure consistency, integrity, and seamless integration into downstream analytics processes.
- Enhanced data analysis workflows, reports, and interactive dashboards in the O9 platform using Visual Studio and **SQL**, implementing advanced data modeling and visualization techniques to streamline operations.
- Orchestrated configuration and monitoring of batch runs on the production run, ensuring seamless end-to-end execution, timely processing, and data integrity for business-critical operations.
- Led the development of **SSIS** automation solutions that streamlined data transformation processes, cutting manual effort by 90% while maintaining flawless handling of complex, multi-source client datasets.

## PERSONAL AND ACADEMIC PROJECTS

Kanbas Learning Management System May. 2024 - Aug. 2024

- Built an innovative online platform facilitating user authentication; created customized experiences for each of the 200 enrolled students through engaging course materials, resulting in enhancement of overall teaching effectiveness.
- Developed front-end with **Express.js** (hosted on Netlify) and back-end with **Node.js** and **MongoDB** ensuring high availability for hundreds of concurrent users with zero crashes during peak traffic.
- Featured over ten modules, robust course management tools, and real-time analytics to enhance user engagement for individual learners in diverse educational settings.

Image Manipulation Software Sep. 2023 - Dec. 2023

- Coded using **Java** an advanced photo editing tool capable of performing color correction, histogram generation, and applying filters like greyscale and sepia; received positive feedback from over 95% of initial testers for usability.
- Developed a sophisticated image filtering system using customized kernels that transformed pixel values into numeric sequences, achieving sharp enhancements and garnering remarkable recognition for usability.
- Created a responsive **Swing** interface, enabling seamless application of over 12 distinct image transformations in real-time, enhancing user engagement and streamlining the editing process for uploaded images.

Pool Simulator Software Sep. 2023 - Dec. 2023

- Produced a software application to create a functional simulation that replicates specified behaviors and conditions, including the movement of a ball on a rectangular pool table, utilizing two distinct physics models in **Java**.
- Emphasized discrete step simulation and handling collisions for constant speed and simplistic physics using kinematics equations, also providing a graphical interface to observe the ball's movement and interactions in real-time using **Swing**.
- Formulated comprehensive test scenarios for each condition including edge cases; findings led to fixing three major causes of discrepancies between expected outcomes and actual results during simulations.

## PUBLICATIONS

Helmet Violation Detection Application for Road Safety Nov. 2021

- An automated system to detect bikers without helmet through live video feed, using the **YOLOV3** algorithm delivering a model accuracy of 90.13% for effective helmet detection even in varying lighting conditions and angles.
- Labelled images to capture key features related to helmet usage and trained a custom model, fine-tuning parameters for improved accuracy ensuring reliable real-time detection of helmet violations, adapting well to different conditions.
- Planned an advanced inference system that flagged over 1,000 instances of helmet-less biking behavior during pilot testing; directly facilitated strategic discussions on improving local traffic safety regulations and awareness campaigns.