# Abel Thomas Babu

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## SKILLS

**Programming:** Java, Python, JavaScript, Swift
**AI/ML/Data:** PyTorch, OpenCV, Scikit-learn, Keras, LangChain, Gymnasium, Stable Baselines3, NumPy, Pandas, Apache Spark
**Web:** HTML5, CSS3, React, Bootstrap, Tailwind CSS, Flask, FastAPI, Spring Boot
**Databases:** MySQL, Firebase
**Tools/Platforms:** Git, Docker, Xcode, Power BI, Roboflow

## WORK EXPERIENCE

**Apps Team Technologies** | *Swift, Xcode, UIKit*                                                    *Dec 2022 – Feb 2023*
*Software Developer Intern*                                                                              *Kerala, India*
- Designed and implemented numerous key UI screens and custom UI components for a logistics iOS app, ensuring intuitive navigation.
- Resolved critical list rendering inefficiencies, improving scrolling performance (est. 35% faster interaction) and app responsiveness.
- Created unit tests, increasing early bug detection coverage by 40% and contributing to product stability.

## PROJECTS

**Vision-Based AI for Idle Game Automation** | *Python, OpenCV, PyTorch, Gymnasium, Roboflow, Machine Learning*
- Built a vision-based RL agent that automates idle games using real-time object detection (YOLOv8) and DQN.
- Trained the agent over 990,958 steps, achieving stable long-term strategies via a custom reward system based on visual UI cues, avoiding game-specific logic.
- Boosted object detection performance by 50%+ using multi-threading and MSS, achieving 30+ FPS real-time inference on low-resource hardware.
- Unified the detection model with mAP@0.5 of 0.994, enabling the agent to interact with UI elements across three distinct idle games.
- Demonstrated generalisation by transferring the trained agent across 3 different games with no retraining.
- Designed a custom Gymnasium environment and implemented reward shaping techniques, including exploration and diversity bonuses.

**Contact Manager** | *Python, React, Flask, SQLAlchemy*
- Built a full-stack contact manager application featuring CRUD operations and a responsive React interface.
- Implemented RESTful API for CRUD functionality and managed SQLite database with SQLAlchemy.
- Created an interactive and responsive user interface with React, featuring reusable components and state management with hooks.

**JP Morgan Software Engineering Job Simulation on Forage** | *Java, Maven, Kafka, Spring, Rest API*
- Developed and integrated a transactional Kafka-based messaging system within a financial application, ensuring message processing for reliable fund transfers.
- Integrated an external RESTful API to incorporate incentive calculations into financial transactions, updating recipient balances based on the API's response.
- Implemented a REST API endpoint for real-time user balance queries, enhancing system transparency and user access to financial data.

## EDUCATION

**Newcastle University — *M.Sc. Advanced Computer Science (Distinction)***                   *Sept 2023 – Dec 2024, Newcastle*
*Vice Chancellor's International Scholarship recipient, NCL+ Award for Extracurricular Involvement*