NATHAN CARD

SOFTWARE ENGINEER | PRODUCT-FOCUSED | MOBILE & FULL-STACK DEVELOPER
613 921 6990 | NCARD24@GMAIL.COM | TORONTO, CANADA | GITHUB.COM/NATECARD

SUMMARY

iOS and macOS Software Engineer with a Master's in AI and a background in full-stack development. Skilled in building high-performance apps using modern Swift concurrency and protocol-oriented MVVM. Developed an iOS multimedia app with precise location-based content triggering and a dynamic configuration system for seamless content updates. Eager to leverage expertise in Swift and iOS development to contribute to innovative projects.

WORK EXPERIENCE

Software Engineer, iOS | Single Thread Theatre Company | Swift, SwiftUI, UIKit, XCTest   **May 2024 – Present**

- Developed an iOS multimedia experience app featuring an unguided tour, which achieved a 99.9% accuracy rate in location-based content triggering by overcoming challenges in iBeacon integration using CoreLocation API.
- Implemented a signal strength management system to process data from 40+ Bluetooth beacons, achieving <100ms latency in audio track triggering despite signal overlap and environmental interference.
- Architected a dynamic configuration system by integrating a continuous delivery pipeline with a remote JSON configuration file, eliminating App Store review cycles, and enabling content updates without app redeployment.

Head of Operations/Co-Founder | Wild Card Brew Co. | Python, JavaScript, React   **May 2015 – Sept. 2023**

- Implemented software for operations and production scheduling, improving quality control tests by 25%.
- Drove company growth from startup by spearheading nationwide expansion while managing a team of 6, resulting in diversified revenue streams from e-commerce, B2B and retail sales.
- Orchestrated the successful sale of the company by a strategic buyer in 2023.

PROJECTS

Web of Uncertainty | Python, NumPy, PyTorch   **Sept. 2024 – April 2025**

- Research thesis building a Python-based Monte Carlo Graph Search (MCGS) algorithm to leverage entropy to optimize search paths, able to elicit better outputs by the LLM resulting in improvement of 10+% on benchmarks.
- Utilized Google TPUs and PyTorch XLA for distributed training and distributed inference, achieved a 60x reduction in training and inference time.

arXiv Reader | Swift, SwiftUI, Swift Testing, XCTest, PDFKit

- Engineered a cross Apple OS app for accessing the Arxiv repository, with advanced search, dynamic criteria, user-managed collections, and an integrated PDF viewer with annotation capabilities powered by PDFKit.
- Architected a scalable and testable client-server system using a protocol-oriented MVVM pattern.
- Developed a network layer to optimize Rest API interactions and persistence service for offline data access.

Children's Audiobook Player | Swift, Python, SwiftUI, Firebase, LangGraph

- Engineered an iOS audiobook player using SwiftUI and Firebase, integrating AI agents to dynamically generate personalized children's audiobooks with synchronized text highlighting.
- Developed a custom AI agent system to generate age-appropriate stories in natural-sounding narration, appropriate for young listeners.

TECHNICAL SKILLS

Languages: Swift/SwiftUI, UIKit , JavaScript, Python, SQL, HTML/CSS
Frameworks: Node.js, TypeScript, React, Next.js, Zustand, Redux, TailwindCSS, FastAPI, Flask
Tools/Skills: Git, Docker, Firebase, Google Cloud Platform, Rest API, MVVM, TCA, XCTest, Swift Testing, XCode

EDUCATION

Master of Science in Computer Science | University of York   **May 2023 – May 2025**
Bachelor of Arts Honours in History | Trent University   **Sept. 2010 – May 2015**