Sean Arackal

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Education

Worcester Polytechnic Institute (WPI) Worcester, MA
Master of Science in Artificial Intelligence Expected May 2028
Bachelor of Science in Computer Science, GPA 3.53/4.0 May 2026

Projects

Observatory - AI-Native Usage Tracker, Personal Project Aug 2026 to Present

- Connected SwiftUI and C#/.NET desktop apps to Python/Node collectors, normalizing activity and AI-usage records into a shared schema across macOS and Windows.
- Reconciled request-level and cumulative token counters, deduplicated copied session logs, and withheld inconsistent breakdowns to prevent double-counting and misleading usage totals.
- Constrained cross-device telemetry to allowlisted aggregates over SSH and read-only SQLite queries, keeping prompts, credentials and dictation content on their originating devices.

ReVIEW - AI-Assisted Research Video Analysis, WPI Senior Capstone Oct 2025 to May 2026

- Unified Gemini video input, frame-sampled GPT-4o and local LLaVA/Ollama behind a Node/Express bridge, enabling interchangeable model backends in a React/TypeScript review workflow.
- Grounded recording summaries in timestamped evidence by combining Whisper transcription, Tesseract OCR and PySceneDetect events in Python with a seekable review timeline.
- Decoupled atomic analysis saves from background semantic indexing using versioned TypeScript artifacts and revision-linked embeddings, preserving completed reviews after indexing failures and excluding stale search results.
- Implemented persistent MiniLM inference with a Python worker and bounded Node.js queue, eliminating per-query model reloads while supporting cancellation, timeouts and worker recovery.

Exercise Form Classification System, Graduate Deep Learning Course Jan 2026 to May 2026

- Co-developed a video-classification pipeline on a three-person team, combining YOLOv11 pose estimation (17 keypoints per frame) with BiLSTM, Temporal Transformer, TSM and Skeleton CNN models.
- Fine-tuned EfficientNet-B0 achieved 84.4% exercise classification accuracy and 81.9% form correctness accuracy across 168 exercise classes.
- Processed QEVD videos through labeling and pose-extraction workflows, normalized keypoint sequences into (30, 17, 3) tensors, and trained Skeleton CNN and ST-GCN models.
- Adapted pose sequences into skeleton images for transfer learning with an ImageNet-pretrained EfficientNet-B0.

Brigham and Women's Hospital Kiosk, Undergrad Soft Eng Course Mar 2024 to Jun 2024

- Led back-end development within an 11-person Agile team building a hospital kiosk application.
- Collaborated across front-end and back-end roles through Scrum to deliver navigation, service-request and data-management features.

Experience

WPI Computer Science Department - Peer Learning Assistant Aug 2024 to May 2026

- Supported computer science students through office hours, lab assistance and grading feedback.
- Courses: Machine Learning, Algorithms, Operating Systems, Database Systems and Object-Oriented Design.

iD Tech - Lead Instructor Summers 2024 and 2025

- Led teams of 7–9 instructors in 2024 and 10–15 in 2025, coordinating instruction, curriculum and daily camp operations.

iD Tech - On-Site and Online Instructor Jun 2023 to Dec 2023

- Delivered classroom programming courses and 1:1 online lessons, tailoring instruction to students' learning goals.

Skills

AI Engineering: Multimodal inference pipelines, embedding-based retrieval, persistent inference workers, bounded job queues, revision-aware indexing, local vision-language models
Machine Learning: PyTorch, TensorFlow, CNNs, temporal Transformers, BiLSTMs, transfer learning, pose estimation, multi-task learning, class-imbalance handling, model evaluation
AI Tools & Workflow: Codex, Claude Code, Antigravity, Cursor/Grokbot, Wispr; WSL
Languages & Applications: Python, TypeScript, JavaScript, Java, C/C++, C#; React, Next.js, Node.js
Data & Infrastructure: PostgreSQL, SQLite, MongoDB, Git, Docker, AWS EC2/RDS