Brady McAtee

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Education

Portland State University, BS in Computer Science, Minor in Physics — Expected March 2026

- GPA: 3.9/4.0

Experience

Software Engineer Intern, MSEI Biotronik – Lake Oswego, OR — June 2025 – Present

- Built internal developer tools and simulation models in C#/.NET used across R&D teams to accelerate pacemaker design validation and reduce dependency on physical hardware prototypes
- Migrated legacy .NET Framework 4.8 WPF library to dual-target .NET 8/Standard 2.0 by separating UI from core logic, maintaining full backward compatibility using extension methods, factories, and dependency injection
- Developed DMA simulation model for new simulation platform supporting data transfers, clock cycle accuracy, and signature validation using async/await patterns and message-passing architecture
- Created automated report generation tool converting XML logs to markdown, integrating with Git workflows to eliminate manual documentation overhead
- Designed reusable NUnit test harness that became standard infrastructure for validating simulation models

Projects

recipeBox - Full-Stack Recipe Management System — github.com/bradymcatee/recipeBox

- Developed and deployed production web app for restaurant recipe/ingredient management with full CRUD operations, deployed on AWS EC2 for real restaurant staff use
- Designed normalized PostgreSQL schema and RESTful API architecture ensuring data consistency across complex recipe relationships
- Implemented responsive React interface with search, filtering, and intuitive forms for non-technical users

Tennis Shot Tracker - Computer Vision Ball Tracking — github.com/bradymcatee/servetracker

- Implemented TrackNet-style PyTorch model (3-frame temporal input, 9-channel) for tennis ball heatmap detection using focal BCE loss and Adadelta optimizer
- Built OpenCV inference pipeline with RANSAC homography estimation for court perspective transformation and real-world coordinate mapping
- Computed ball velocities via per-frame displacement and Savitzky-Golay smoothing, outputting mph statistics

C++ Ray Tracer - Physically-Based Rendering Engine — github.com/bradymcatee/RayTracer

- Built CPU ray tracer with physically-based materials (Lambertian, metal, dielectric), reflections, refractions, anti-aliasing, and depth of field effects
- Parallelized rendering with OpenMP and thread-safe RNG, achieving 3x speedup on 8-core CPU
- Structured engine using OOP principles with CLI for quality/performance tuning

Interactive Photo Refocusing - Depth Estimation Web App — github.com/bradymcatee/refocusing

- Trained Multi-Scale CNN (87.9M parameters) achieving 79% accuracy on monocular depth estimation
- Built Flask web app with real-time click-to-focus interaction simulating DSLR depth-of-field effects
- Containerized with Docker for consistent deployment across environments

Skills

Languages: C#, C++, Python, JavaScript, SQL, C, Java

Technologies: .NET, Git, Azure DevOps, Docker, PyTorch, PostgreSQL, React, Node.js

Practices: Object-Oriented Design, Test-Driven Development, CI/CD, Agile, Parallel Programming