Matthew Penner

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FORMAL EDUCATION

Portland State University, Portland, OR - *Bachelor of Science, Computer Science (University Honors College)*

SEPTEMBER 2021 - DECEMBER 2025

Focused on developing a strong foundation in programming, algorithms, data structures, and software engineering principles. Engaged in various projects and coursework to enhance technical skills and practical experience.

Thesis: Experience from a Distance - Improving Transparency for the Multnomah Athletic Club

- Identified and addressed marketing challenges for the Multnomah Athletic Club (MAC), focusing on the difficulty of showcasing extensive amenities to prospective members remotely.
- Collaborated with a six-person team of PSU Computer Science students over two academic terms to deliver a Senior Capstone project.
- Developed a custom web application designed to bridge the gap between the club's high entry costs and the visual transparency needed to entice new members.
- Integrated complex technical features, including 360-degree photography, a third-party tour platform, and a dynamic interactive mapping system.
- Delivered a professional solution that successfully aligned strict academic requirements with the sponsor's vision for modernizing recruitment and shaping the club's future.

RELEVANT PROJECTS

Micro-Blogging Platform – "Brevity" – Go / React

- Developed a high-performance micro-blogging platform in Go and React to efficiently process and display user updates in a real-time, reverse-chronological timeline.
- Engineered a scalable containerized architecture using Docker, distributing the application across a statically served frontend, a Go API, PostgreSQL, and a Redis cache to maximize delivery performance.
- Implemented automated CI/CD pipelines and infrastructure as code, utilizing GitHub Actions and Terraform to allow for streamlined testing, linting, and production deployments to AWS.
- Ensured strict thread safety and data integrity by utilizing sync.RWMutex locks for synchronized read and write access within the backend's in-memory data store.
- https://github.com/mtepenner/brevity-sharing

3D Topography Visualizer – "SiloHD" – React / Node.js

- Developed a full-stack 3D visualization application in React and Node.js to simulate and render the surface topography of feed inside a grain silo using Three.js.
- Engineered a real-time rendering architecture using React Three Fiber, efficiently processing and displaying thousands of procedurally generated 3D point clouds to maximize visual responsiveness.
- Implemented interactive simulation controls, allowing for dynamically configurable silo fill levels and surface variances via a custom dashboard that instantly calculates volume metrics.
- Ensured mathematical accuracy and realistic simulation integrity by utilizing distance-based funneling algorithms and trigonometric sine waves to accurately mimic natural grain clumping and rat-holing.
- https://github.com/mtepenner/3d-grain-silo-topography-visualizer

Augmented Reality Stargazing App – "Stargazer" – Kotlin

- Developed an Augmented Reality (AR) Android application in Kotlin to accurately project celestial bodies and markers directly over a live CameraX background feed.
- Engineered a real-time spatial tracking architecture using Android hardware sensors, continuously extracting orientation matrices from the Rotation Vector sensor to maximize tracking performance.
- Implemented a dynamic 2D rendering overlay using Jetpack Compose Canvas, allowing for the real-time mapping of mock celestial data anchored to accurate compass headings and sky altitudes.
- Ensured precise spatial projection and visual integrity by applying angular distance calculations and custom degree-to-pixel scaling to translate 3D hardware orientation into responsive screen coordinates.
- https://github.com/mtepenner/stargazer

Full-Stack Mobile App – "Pragmattic" – React Native / Node.js

- Developed a cross-platform mobile application ecosystem in React Native and Node.js to efficiently manage user tasks and scheduling across modern mobile operating systems.
- Engineered a robust RESTful backend architecture using Express and Prisma ORM, seamlessly managing type-safe data persistence within a relational database to maximize data integrity.
- Implemented seamless Google Calendar integration, allowing for the automatic synchronization of timeboxed tasks and dynamic event scheduling via a custom OAuth2 flow.
- Ensured consistent cross-component data flow and responsive UI rendering by utilizing Zustand for centralized state management alongside React Navigation for smooth tab-based routing.
- https://github.com/mtepenner/pragmattic-todo

EXPERIENCE

Intel – Inventory Technician Intern, Hillsboro, OR

MAY 2023 - PRESENT

- Created custom scripts to streamline work processes
- Conducted audits of multiple inventory rooms containing parts for Ethernet boards.

- Sent out weekly inventory reports
- Responsible for worldwide shipping
- Transported electronic components to local manufacturing warehouses
- Performed quality control on inventory facilities
- Received a letter of recognition from management

SKILLS

Programming languages

- C, C++, Python, Java, Typescript, JavaScript, SQL, Rust

Data structures and algorithms

- Linked lists (C++ and Python), hash tables (C++), binary trees (C++ and Python), object-oriented programming (C++), and recursion (C++ and Python), Network Programming (TCP/IP) (C), Multi-threading (POSIX Threads) (C), Concurrency (C), Mutex Locks (C), Linux System Calls (C), POSIX APIs (C), Command-Line Interface (CLI) (C)

Testing Methodologies

- Unit Testing (C), Black Box Testing (C)

Debugging

- GNU Debugger (GDB) in Linux environments.

Database management

- SQL, relational algebra (RA), MongoDB.

Software development

- React (frontend development), Node.js (backend development), Express.js (backend framework), real-time chat applications (ZapChirp project).

Web development:

- HTML, CSS, RESTful APIs

ACTIVITIES AND SOCIETIES

Civil Air Patrol (2016 - 2020)

- Participated in the Air Force's annual National CyberSecurity competition as a member on my squadron's team
- Learned effective qualities of leadership
- Volunteered for community events, including site security
- Participated in orientation flight lessons
- Advanced my rank from Cadet Airman Basic to Cadet Technical Sergeant

Computer Action Team (2023 - 2024)

- Volunteered at Portland State's student-led IT department
- Responded to tickets and proxy tickets
- Assisted other students and faculty with software issues and administrative tasks