Richard Barella

Senior Software Engineer

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Professional Summary

Senior Software Engineer and Technical Lead with over 9 years of experience in designing and developing scalable software systems, APIs, and data-intensive applications. Expertise in Python-based backend development, microservice-oriented architectures, asynchronous processing, and high-performance data engineering. Proven ability to optimize data pipelines, build comprehensive monitoring and telemetry solutions, and lead engineering teams in delivering complex projects. Skilled in full-stack development, CI/CD best practices, and leveraging AI tools for enhanced development workflows. Adept at translating complex user needs into robust technical solutions and fostering strong cross-functional collaboration.

Skills

- **Coding Languages:** Python, C++, C, Bash/Shell, JavaScript, TypeScript, Java
- **API & Backend:** API Design & Development, Microservice Architecture, REST APIs, Scalable Systems
- **High Performance Computing:** SLURM, PBSPro, BMC/Redfish, HPCM, Syslog, Warewulf, pdsh, System Design
- **Databases:** PostgreSQL, SQLite, Firestore, Elasticsearch (ELK Stack), TimescaleDB
- **Data Engineering:** Kafka, Grafana, Polars, Pandas, Prefect, Luigi, Dagster, Jupyter, Matplotlib, Plotly, Data Ingestion, Data Quality, Data Analysis, Pydantic
- **DevOps / Platform Engineering:** Docker, Ansible, Jenkins, GitHub Actions, Artifactory, Systemd, CI/CD
- **AI / LLMs:** LangChain, ChatGPT/Gemini, Marvin AI, Pydantic-AI, Pytorch, GitHub Copilot, Cursor, LLM-assisted Development
- **Full-Stack:** Node/React/Nextjs/Vue, Django/Flask, Plotly Dash, Bootstrap, Firebase/Supabase
- **Technical Documentation:** System Requirement Specifications, UML Diagrams, API Documentation, User Guides, Onboarding Materials, Technical Tutorials

Experience

Intel Corporation   Hillsboro, OR
Lead HPC Full-Stack Data Engineer   07/2022 - Present

- Spearheaded architecture, UI/UX design, and development of a Plotly Dash-based data analytics platform and a modular, microservice-oriented backend infrastructure for the Aurora Supercomputer, enabling real-time health monitoring and advanced historical analysis.
- Developed a Prefect-based data pipeline to incrementally process new HPC failure data, transforming legacy batch scripts into a 100x faster, automated workflow.
- Engineered scalable, asynchronous data ingestion systems using Kafka; evolved critical data pathways from REST APIs to event-driven architectures to meet scaling demands for systems with 10,000 nodes.
- Designed event-based database schemas to correlate system failures with configurations; developed key health indicators and data-driven workflows that significantly improved failure disposition, repair processes, and health reporting to Argonne National Labs.
- Designed an AI-powered system utilizing Langchain and ChatGPT to auto-generate Sphinx documentation for a large monorepo, ensuring seamless integration with ongoing code changes.
- Developed flexible Grafana dashboards for monitoring Aurora telemetry data stored in TimescaleDB, giving mechanical and electrical engineers access to data they need to analyze and solve pertinent hardware issues.
- Automated resource-manager-agnostic HPC system regressions, streamlining the testing process by launching test cycles across both SLURM and PBSPro.
- Established a robust CI/CD pipeline using Docker, accelerating testing and deployment.
- Led and mentored a team of approximately 3 engineers, managed project priorities, delegated tasks, and onboarded new members for a large-scale data monitoring and analytics platform.

Intel Corporation   Hillsboro, OR
DevOps and Validation Framework Engineer   08/2021 - 07/2022
- Created a novel resource management plugin for test harnesses, facilitating adaptation to new HPC systems.
- Maintained and resolved issues in an ElasticSearch cluster, ensuring availability of essential system debug data.
- Directed successful migration of repositories and JIRA issues under stringent deadlines, demonstrating leadership skills.
- Enhanced system usage dashboard, bolstering system reliability and data confidence.

Intel Corporation   Hillsboro, OR
BMC Test Infrastructure Engineer   12/2020 - 07/2021
- Automated the triage process by auto-generating JIRA issues per unique failure signature, accelerating debug efficiency and improving the test pass rate from 60% to 95%.

Intel Corporation   Hillsboro, OR
HPC Validation Framework Engineer   06/2016 - 11/2020
- Main contributor developing a Django-based test automation framework, accelerating development of new test content.
- Designed Ansible configuration for HPC clusters, reinforcing infrastructure reliability by automating installs and backups.

Washington State University   Vancouver, WA
AI Research Assistant   06/2014 - 06/2016
- Used Machine Learning Apache Spark to detect powerline faults on 10TB of data with 99.5% accuracy.
- Co-published 5 Machine Learning Research papers, including the "Best Student Paper Award" for Springer.

Education

Georgia Institute of Technology   Online
Additional coursework in Machine Learning   2019-2021

Washington State University   Vancouver, WA
Bachelor's in Computer Science — Bachelor's in Electrical Engineering — GPA: 3.83   2012 - 2016

Lower Columbia College   Longview, WA
Associate's in Computer Science — GPA: 3.79   2010 - 2012

Personal Projects

OFTW Data Analytics Dashboard — oftw-dashboard.onrender.com   2025
Interactive Plotly Dash dashboard analyzing OFTW donation data since 2014, featuring dynamic visualizations, custom filters, and AI-driven insights for exploring donation patterns and fundraising metrics.
- **Technologies:** Plotly, Dash, Python, Vizro, Vizro-AI

MN Bookkeeping — mnbookkeeping.biz   2025
A React based bookkeeping website allowing clients to submit receipts and view financial statements.
- **Technologies:** React, Supabase

Personal Finance App   2022
Vue.js, Firebase, and Plaid API, using a webhook to load live data from my bank into a dashboard.
- **Technologies:** Vue.js, Firebase, Plaid API

Webpage Editor — ppr-show.web.app   2020
React and Firebase app for writing custom web pages with a WYSIWYG text editor.
- **Technologies:** React, Firebase

Quadtree Photo Stylizer — codingwithricky.com/.../1-quadtree-photo-stylizer-python   2019
A Python CLI and module for generating art from photos using Wand and ImageIO.
- **Technologies:** Python, Wand, ImageIO

Personal Blog — codingwithricky.com   2019 - Present
Statically-generated Hexo Blog with coding tutorials.
- **Technologies:** Hexo, JavaScript

Lunar Lander   2018
Double-DQN Reinforcement Learning with Keras in an OpenAIGym simulation.
- **Technologies:** Python, Keras, OpenAIGym, Reinforcement Learning