SENIOR SOFTWARE ENGINEER

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Ben Racine

Applying computational and scientific expertise to deliver correct and maintainable solutions.

EXPERIENCE

CIMARRON SOFTWARE SERVICES → AXIOM SPACE — Houston, TX — 3/2023-present
- Developed ground and crew software for Axiom Station on-orbit operations.
- Authored Rust systems supporting Critical and Commercial Crew user interfaces.
- Porting the command-scripting engine to Rust for safety, determinism, and full test coverage.
- Designed APIs and telemetry flows linking Ground and Crew systems to station flight software.
- Built a supervisory control and data acquisition interface with overlaid telemetry.
- Delivered the AxEMU spacesuit Display and Control Unit trainer for astronaut operations.
- Led Critical Design Review test strategy, ensuring compliance across flight-critical UIs.
- Established DevSecOps pipelines enforcing linting, testing, and security.
- Created a Bolt Joint Analysis app, accelerating structural simulation workflows.
- Mentored engineers in software architecture, type systems, and deterministic testing.

WEATHER SOURCE — Salem, NH — 4/2021-3/2023
- Developed a mission-specific weather alerting system with team-wide notifications.
- Published type-safe geographic and meteorological APIs with OpenAPI documentation.
- Applied functional programming to ensure modular, verifiable, maintainable systems.
- Built microservices for auth, billing, mapping, data transforms, and weather-rule logic.
- Deployed a secure Snowflake–DWAS portal as the single source for client analytics.
- Scaled and hardened production to support and retain multiple Fortune 500 clients.

RACINE DESIGNS — Box Elder, SD — 4/2020-3/2021
- Developed online learning software using C#, React, Redux, and Azure for enterprise clients.
- Enforced strict TDD discipline, sustaining 80-100% coverage for React components.
- Delivered high-volume software on tight timelines, ensuring consistent, high-quality output.
- Led biweekly client demos, driving alignment and satisfaction across stakeholders.
- Founded and operated Racine Designs LLC, managing full-cycle projects and client relations.

CORNERSTONE SYSTEMS NW — Lynden, WA — 4/2011-3/2019
- Enhanced CISNET's C++ Smoking History Generator for lung cancer research modeling.
- Modeled U.S. smoking-policy outcomes using C++ and Python simulation frameworks.
- Shipped Daycast.com, a real-time planner using Node, SQL, WebSockets, and Electron.
- Delivered a single-page application that meets complex PHMSA regulatory requirements.
- Developed genetic-simulation frameworks for the National Cancer Institute
- Created a web-based data visualization dashboard for Massachusetts General Hospital cancer-surveillance analytics.

GLOSTEN — Seattle, WA — 11/2006-3/2011
- Predicted hydro-elastic loads on the SR520 floating bridge for Washington State DOT.
- Optimized anemometer performance for Boeing's Sea-Based X-Band (SBX) Radar using OpenFOAM CFD and a custom-built Linux Beowulf cluster to perform parallel simulation.

- Designed underwater transducer fairings for NOAA research vessels using CFD.
- Built a tool mapping FEA results from MAESTRO to NASTRAN for detailed fatigue analysis.
- Successfully authored proposals securing over $85k in engineering services.

SKILLS AND TOOLS

- Core Languages: Rust, TypeScript, C#, C++
- Systems & DevOps: Linux, Docker, Git, AWS, GCP, Azure, CI/CD (GitLab CI, Jenkins), Datadog
- Data & Storage: PostgreSQL, Snowflake, SQLite, Cosmos DB, Firebase, SQL Server
- UI & Testing: React, Redux, WebSockets, Radix, Playwright, Vite/ViTest, React Testing Library
- Scientific & Eng Tools: Python, ecosystem, MATLAB, ANSYS, Femap, OpenFOAM, NASTRAN
- Other: Jira/Confluence, Stripe, Twilio, Keycloak

EDUCATION

MS in Computational Fluid Dynamics, Pennsylvania State University, State College, PA

BS in Naval Architecture and Marine Engineering, Webb Institute, Glen Cove, NY

REFERENCES

Mark Gibbas (Weather Source), Shawn Freeman (Weather Source), Stephen Schutt (CSNW), John Cross-Whiter (Glosten), and Dr. Eric G. Paterson (PSU-ARL)

PUBLICATIONS

CFD-Based Methods for Simulation of Marine-Vehicle Maneuvering, B. Racine and E. Paterson, AIAA 2005-4904, 35th AIAA Fluid Dynamics Conference and Exhibit, June 2005, Toronto, Canada

Application of the Free Wave Spectrum to Minimize and Control Wake Wash, Justus Heimann, Bruce L. Hutchison, and Benjamin J. Racine, Paper No. SMTC-049-2008, SNAME Annual Meeting and Expo, 15-17 October 2008, Houston, TX

Holford, T. R., Levy, D. T., McKay, L. A., Clarke, L., Racine, B., Meza, R., … Feuer, E. J. (2014). Patterns of birth cohort-specific smoking histories, 1965-2009. American journal of preventive medicine, 46(2), e31–e37. doi:10.1016/j.amepre.2013.10.022

Peng, B., Chen, H. S., Mechanic, L. E., Racine, B., Clarke, J., Clarke, L., … Feuer, E. J. (2013). Genetic Simulation Resources: a website for the registration and discovery of genetic data simulators. Bioinformatics (Oxford, England), 29(8), 1101–1102. doi:10.1093/ bioinformatics/ btt094

Peng, B., Chen, H. S., Mechanic, L. E., Racine, B., Clarke, J., Gillanders, E., & Feuer, E. J. (2015). Genetic data simulators and their applications: an overview. Genetic epidemiology, 39(1), 2–10. doi:10.1002/gepi.21876