Zarnab Haider

Software engineer building simulation and scientific computing systems for physical problems.

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SUMMARY

Software engineer applying statistics, experimental design, and robust software practices to simulation and scientific computing. Builds measurable, reproducible experiments for robotics and other physical systems.

SELECTED PROJECTS

C-1N + Robotics Test Bench | Python, MuJoCo, Robotics Simulation | c1n.mhaider.dev *Aug 2026–Present*

- Expanded C-1N from 12 to 18 actuated joints by adding six orthogonal coxa hinges.
- Defined a 10-second standing test with six contacts, a 0.23 m support margin, 0.45 m torso height, and zero angular speed.
- Built a 33-case, 200 ms horizontal-force suite across eight bearings; retained 1x-body-weight failures as a boundary.

Indigo Circuit | Independent data application | 2026

- Built a nightly tournament-data pipeline that rebuilds dbt models in a shadow DuckDB database, validates results, and promotes the database atomically.
- Computed Glicko-2 player ratings and Bayesian expected-value estimates with 90% credible intervals.

PROFESSIONAL EXPERIENCE

University of Virginia | IT Analyst Intermediate, BI Developer | Charlottesville, VA *May 2025–Mar 2026*

- Led analytics projects from stakeholder interviews through deployment and maintenance; translated loosely defined operational questions and cross-organizational data needs into SQL-backed Tableau dashboards.
- Built ReUSE Store environmental and economic-impact reporting.
- Collaborated on telemetry-informed optimization that cut organization-wide dashboard load times by approximately 20%.
- Reconciled conflicting purchase-order states across financial systems and built a dashboard that surfaced deltas and impact.

Microsoft | Software Engineer I | Redmond, WA *Jul 2021–Jul 2024*

- Owned an end-to-end migration from SSAS Multidimensional to Tabular; defined parity checks, monitored four weeks of pipeline behavior, and kept the legacy service available until the replacement met cutover criteria.
- Deployed Azure Data Factory verification scripts for daily pipeline monitoring and legacy-to-Tabular data consistency.
- Validated downstream financial-reporting workflows that showed up to 200x faster filtering and approximately 4x faster Excel loading.
- Built a full-stack C#/.NET configuration and output-validation prototype.

TECHNICAL SKILLS

Languages: Python, SQL, C#, R

Simulation and scientific computing: Python, MuJoCo, NumPy, pandas, Matplotlib, Jupyter

Engineering and data workflow: Kusto (KQL), Tableau, Azure Data Factory, Azure Synapse, Git, GitHub Actions, Codex, Claude Code, Hermes

EDUCATION

Virginia Tech | B.S. in Statistics *2021*

Coursework: Bayesian Statistics, Experimental Design, and Statistical Computing