Zain Dana Harper

Independent Cross-Disciplinary Researcher | Returning Student & Fellowship Candidate

Seattle, WA (Local / Hybrid / Remote Open) | zaindharper@gmail.com | harperz9.github.io | github.com/HarperZ9 | linkedin.com/in/zaindanaharper | orcid.org/0009-0001-7175-5393

30-SECOND WORK-SAMPLE PROOF STRIP

- **30 Empirical Studies:** 13 disciplines; 12 explicit null results
- **13 Zenodo DOIs:** Public data, controls & reproductions
- **11 Yrs Field Ecology:** Hands-on urban canopy & tree biology
- **41 Merged PRs:** External peer-reviewed codebases

EXECUTIVE PROFILE

Self-directed empirical researcher and field practitioner applying for university admission and research fellowships to formalize 13 years of cross-disciplinary inquiry bridging ecology, biology, optics, ethics, human behavior, and verifiable computing. Author of 30 public empirical studies across 13 disciplines (13 Zenodo DOIs, including 12 published null results to uphold anti-p-hacking standards) alongside 11 years of practical urban-forestry crew leadership and open-source scientific software.

TECHNICAL SKILLS

Research & Epistemic Methods: Preregistered Study Design, Negative & Planted-Failure Controls, Honest Null Reporting, Fisher Exact & Confidence-Interval Analysis, Cross-Domain Associative Synthesis

Disciplines Bridged: Urban Ecology & Tree Biomechanics, Spectral Optics & Color Science, AI Evaluation & Epistemic Accountability, History/Sociology of Institutions, Numerical Simulation

Scientific Computing: Python, Rust, C++23, PyTorch, IEEE-754 f64 Verification Kernels (91/91), SQLite FTS5, DuckDB/Parquet, Reproducible SHA-256 Artifact Ledgers

INDEPENDENT RESEARCH PORTFOLIO & PUBLIC SCHOLARSHIP

Independent Cross-Disciplinary Researcher | Harper Research & Open-Source Ecosystem

Seattle, WA | 2013 - Present (Full-Time Independent Research 2025 - Present) | harperz9.github.io/findings/ | orcid.org/0009-0001-7175-5393

- **30 Reproducible Empirical Studies (13 Zenodo DOIs):** Designed, executed, and archived 30 public investigations across 13 fields with explicit controls and reproduction code, publishing 12 null results (including a preregistered fixed-target COCO aRT optimizer rerun) rather than selecting for positive outcomes.
- **AI Verification & Neural Operator Ablations:** Trained and evaluated JFC3P-7B-Oracle-v1 (lifting adversarial trap rejection from 16.67% to 95.83%, Fisher exact p = 4e-6) and built NOH-3/NOH-4 dimensionless Buckingham-Pi neural operators (18x to 78x OOD and recovery MSE reductions).
- **Physical-Science, Optics, Cryptography & Compiler Verification:** Verified 91 IEEE-754 float64 kernels across optics, color, ecology, and physics (91/91 known-answer and planted-wrong kills), published bio-research and crypto-margins (reproducible FIPS 203/204 lattice security margins across 159 public repos), built a 512^3 CUDA P3M N-body benchmark matching Cosmic Emu within 3%, and verified a V5 e-graph superoptimizer (1.88x-2.59x at -O3, 0.0 error).
- **Knowledge Preservation & Open Peer Review:** Authored 41 merged upstream pull requests across 34 external open-source projects, built CMMNS (local-first provenance archival, 1,735 tests), and delivered 148/148 accessible research chart descriptions.

FIELD PRACTICE, TEACHING & ACADEMIC READINESS

Tree Care Crew Lead & Client Educator | Legendary Tree (Seattle Area, WA | 2015 - 2026)

- **Applied Biology & Analogical Teaching:** 11 years leading commercial arboriculture crews and teaching homeowners about living tree structure, load paths, and biology using clear everyday analogies.

Academic Background & 2026 Formal Credentials

- **Education & Exams:** High School Diploma, Wilsonville High School (2013); Google DeepMind badges (100/100); BlueDot Impact AGI Strategy; 4 Microsoft Applied Skills; 6 Qualys Specialist exams; Cisco Ethical Hacker (100%). Seeking formal university training and faculty mentorship to deepen mathematical, ecological, and scientific methodology.