Zain Dana Harper

Returning Student & Cross-Disciplinary Research Fellowship Statement

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November 26, 2026 | Statement of Purpose: Cross-Disciplinary Research & Formal Academic Study

Dear Admissions and Fellowship Committee,

I am applying as a returning student and fellowship candidate to bring formal mathematical, scientific, and institutional mentorship to a body of independent research I have been building for over a decade. While spending 11 years operating and leading commercial tree-care crews in the Seattle area, I used every quiet hour to study how complex systems behave across disciplines: living tree biomechanics, atmospheric optics, human behavior, institutional ethics, and the verification of modern machine learning systems.

My work follows an associative, cross-domain web rather than a single silo. Reading canopy stress in the field led directly to modeling coupled Williams/Almeras tree bending and wind-load dynamics; studying visual perception led to verifying 91 double-precision optics and color-science kernels and shipping lighting work adopted by over one million users; confronting unreliable AI outputs led to designing fail-closed verification oracles (Three-Plate 115/115 recall), training JFC3P-7B-Oracle-v1 (95.83% adversarial trap rejection, p = 4e-6), and building Buckingham-Pi scale-normalized neural operators (NOH-3/NOH-4, 18x to 78x OOD and recovery MSE wins).

Above all, I care deeply about scientific honesty. Across 30 public empirical studies spanning 13 disciplines (archived with 13 Zenodo DOIs under orcid.org/0009-0001-7175-5393), I deliberately published 12 null results with full controls and reproduction steps so negative findings stay part of the record. Forty-one merged pull requests across 34 external open-source codebases reflect my commitment to contributing carefully within shared scholarly and technical communities.

Formal university study or a research fellowship is the exact environment where my field intuition, cross-domain synthesis, and empirical tooling can mature through rigorous coursework, peer critique, and faculty collaboration. My full archive of studies, code, and reproducible datasets is open at harperz9.github.io/findings/, and I welcome any conversation about how I can contribute to your cohort.

SELECTED VERIFIED PROOF POINTS

- **Published Independent Archive:** 30 empirical studies across 13 fields (12 null results, 13 Zenodo DOIs) with full open reproduction pipelines.
- **Field & Technical Breadth:** 11 years hands-on urban forestry leadership, 41 merged upstream PRs, and five open-source scientific/systems platforms.

Respectfully,

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