Zain Dana Harper

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Independent Systems Architect & AI / Tooling Director

30-Second Work-Sample Proof Strip

- **12-Target Compiler:** BuildLang + V5 e-graph (1.88x-2.59x -O3)
- **1.18M / 156 ms:** Pure-BuildLang corpus (86 MB RSS)
- **159 Public Repos:** 5 flagships + 1-command SHA256 installers
- **4,500+ Auto Tests:** Fail-closed specs & 41 external PRs

Executive Profile

Hands-on systems architect and technical director who specifies, directs, verifies, and ships end-to-end software platforms across compilers, embedded storage, AI verification, multimodal indexing, and cross-browser tools. Excels at defining tight architectural invariants, directing AI-assisted and multi-agent build pipelines against deterministic oracles, and shipping fail-closed 1-command binaries across 159 public repositories. Backed by 41 merged upstream PRs across 34 external repos and 11 years leading field crews.

Core Capabilities & Skills

Architecture & Distribution: System Specification, Fail-Closed Oracle Design, Multi-Agent Direction, 1-Command SHA256SUMS Installers, Platform Consolidation (5 Flagships, 159 Public Repos), PyPI & crates.io Releases

Compilers, Storage & Data: BuildLang 1.15.0 (12-Target: C/HLSL/GLSL/MSL/WGSL/Wasm/x86-64/RISC-V), Universal Hourglass Lifters (port/), V5 Certified E-Graph Superopt, BuildDB qdb.exe, SQLite FTS5, DuckDB/Parquet

Verification, AI & Web: Flywheel 2.0.0, Rowan Unified Local/Sub/API Router, engine-receipt/1 Receipts, JFC3P-7B / NOH-4, MCP Studio (22 Tools), CMMNS (MV3), Articulate (LSP/SARIF), Rust, C++23, Python, TypeScript

Systems Architecture & Technical Direction

Founder, Systems Architect & Tooling Director | Harper Research & Open-Source Ecosystem
Seattle, WA | 2025 - Present (Independent Systems R&D since 2013) | github.com/HarperZ9 | harperz9.github.io

- **BuildLang 1.15.0 (12-Target Compiler), Universal Hourglass & V5 Superopt:** Shipped a Rust-hosted 12-target capability-effect compiler (adding MSL, WGSL, and RISC-V64; 147/147 reproducible hashes; 2,132.3x procgen and 115x-191x f64 kernels), deterministic Universal Hourglass lifters (C/Python/Plain-English → .bld with 0 LLM in loop), and a V5 certified e-graph superoptimizer (1.88x to 2.59x at -O3, 0.0 error).
- **BuildDB Embedded Storage & 1.18M-Record Pure-BuildLang Corpus Engine:** Built BuildDB qdb.exe (2.89 MB paging footprint, 31.31 ms query, 0/500 fuzz failures) and a pure-BuildLang corpus engine indexing 1.18M records in 156 ms cold within 86 MB RSS, alongside a 14.45M-file / 6.01M-word FTS5 (3.66 ms) multimodal knowledge brain.
- **Flywheel 2.0.0, Rowan Unified Router & Local Model Verification:** Consolidated 30 verification packages behind engine-receipt/1 receipts and the Rowan unified local/subscription/API router (46.73% AVTR-4R token savings, strict offline refusal); delivered 115/115 Three-Plate recall, 95.83% JFC3P-7B trap rejection, and 18x to 78x NOH-3/NOH-4 wins.
- **Zero-Friction Distribution & Upstream Collaboration:** Shipped fail-closed 1-command SHA256SUMS installers across all flagships, Articulate (2,096 tests), CMMNS (1,735 tests), RAW DX12 Wave 72 (522/522 runtime tests), and 41 merged external PRs across 34 repos (grimp, Biome, TOMLKit, Datasette, DeepEval).

Field Crew Leadership, Research & Credentials

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

- **Crew & Client Direction:** 11 years running high-hazard commercial tree-care operations, scoping complex projects with homeowners, coordinating crews, and teaching clear structural rationale before execution.

Publications, Support & Credentials

- **Track Record:** 30 empirical studies (13 DOIs, 12 nulls); Xbox Networking Support (2014 - 2015); DeepMind badges (100/100), 4 Microsoft Applied Skills, 6 Qualys Specialist certs, Cisco Ethical Hacker (100%); High School Diploma (2013).