

Autonomous Creative Engineering

Deterministic Headless Engines for Autonomous AI Coding Fleets

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BENCHMARK: M3 Proof Suite

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Figure 1: Figure 1: Grand Tetons developed headlessly via LightCraft (+0.45 EV exposure, tone mapping, Display P3).

The traditional creative computing stack—dominated by monolithic desktop applications such as Adobe Photoshop, Illustrator, Premiere, and Acrobat—was architected around human interactive pointers and synchronous GUI event loops. When modern autonomous coding agents interface with these environments, the mismatch creates profound inefficiency: slow synthetic clicks, brittle coordinate tracking, and token-expensive screenshot OCR.

To resolve this impedance mismatch, the Froogle workspace reconstructs the creative workstation as a fleet of eight headless native engines. Each engine exposes high-throughput command-line interfaces and stdio FastMCP servers, enabling language agents to manipulate creative media with the same determinism, speed, and precision as code.

Vector Transformation & Conformance

Subpixel Spline Tracing

Raster artwork undergoes multi-stage conversion through `vtracer`, `svgo`, and `resvg` before native compilation into VectorCraft canvas hierarchies. By eliminating intermediate raster buffers during compositional manipulation, rendering fidelity remains mathematically exact regardless of downstream magnification.

```

$ vtracer -i logo.png -o raw.svg
$ svgo raw.svg -o min.svg
$ vectorcraft-cli convert min.svg
  
```

PDF Stream Conformance

Publication documents compiled via Typst are inspected structural object by structural object via `pdfcraft-cli`, guaranteeing full conformance with ISO 32000-1 specifications.

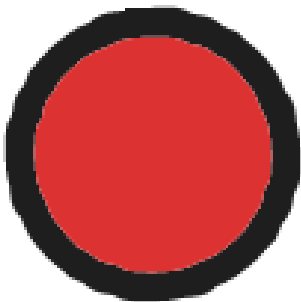


Figure 2: Figure 2: VectorCraft canvas preview.

Architectural Invariant

“Every creative engine runs in sub-second wall time with deterministic exit codes and zero cloud network round-trips.”

Benchmark Performance Verification (Apple Silicon M4)

Workflow Engine	Operation Pipeline	Duration	Output Verification
LightCraft	RAW tone curve + HSL grading	345.4 ms	296 KB (Quality 94)
VectorCraft Stack	vtracer + svgo + resvg preview	175.4 ms	131 KB Native Canvas

Typst + PDFCraft	Tagged compilation + QPDF audit	473.5 ms	28 KB Validated PDF
Suite Aggregate	3 End-to-End Creative Tasks	994.3 ms	Byte-level Verified

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