Run-Time Assurance Governor Console

authrex.systems · browser simulation · seeded PRNG · synthetic data only · client-side execution

> **Scope.** Everything in this document describes independent research artifacts: browser simulations, formal models, and unbuilt hardware reference designs. Maturity is self-assessed. Nothing here is a certification, an Authorization to Operate, a government endorsement, or evidence of a fielded system. Model-checking results apply to the stated finite model and assumptions, not to physical implementations.

PURPOSE

Run-time-assurance authority gate for a complex controller, on the ASTM F3269 and Simplex reference model: an independent invariant monitor evaluates each proposed authorization before it is applied and admits, holds, or reverts it, keeping the controller inside its safety floor under the modeled conditions.

CONTROLS AND DISPLAY

- Controller view shows the synthetic plant and proposed authorizations; the queue shows admitted, held, and reverted actions.
- Scenario selector with seeded PRNG; the seed field reproduces any run exactly.
- RUN / PAUSE / STEP drive the decision loop; the V&V panel reruns the packaged check suite inside the page.
- Ledger panel shows the SHA-256 hash-chained decision record.

READING THE VERDICTS

- APPLIED / HELD / REVERT-TO-SAFE per authorization; the monitor is independent of the controller it governs.
- The proposed governance layer is designed to keep the controller within its safety floor; results apply to the modeled conditions only.

LIMITATIONS

Self-assessed TRL 2 to 4 concept demonstration of run-time-assurance governance logic, aligned conceptually with the ASTM F3269 and Simplex reference model. Not an emulation of any real controller, plant, or certified safety system.

CANONICAL TERMINOLOGY

SATA: Sensor & Actor Trust Assessment · HMAA: Human-Machine Authority Allocation · ADARA: Adversarial Deception-Aware Reasoning · MAIVA: Multi-Agent Integrity Voting · FLAME: Forced Latency for Authority-Managed Escalation · CARA: Controlled Authority Recovery Architecture · ERAM: Escalation Risk Assessment Model

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