Wild Project Seeds

Wild Project Seeds — One-in-a-Million and One-in-a-Hundred Ideas

This document provides **deliberately non-obvious project seeds** for each capstone category.

These are **not assignments**. They are provocations.

The goal is not to copy these ideas, but to **expand the perceived design space**.

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1. Coordination Under Partial Trust

A. *Mutually Suspicious Replicas*

A system where two replicas deliberately distrust *each other's* state transitions and must periodically justify updates with proofs or narratives, rather than logs. Each replica can temporarily fork reality.

B. *Consent-Based State Mutation*

A shared system where no state change is final until a quorum of stakeholders explicitly consents *after* seeing the consequences of the change.

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2. Systems That Remember (and Forget)

A. *Memory with Grief*

A storage system that models deletion as an irreversible loss event: when data is deleted, downstream summaries and models degrade in measurable ways, exposing the cost of forgetting.

B. *Asymmetric Recall Archive*

A system that remembers different levels of detail depending on *who* is asking, even when access is permitted.

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3. Failure-First Systems

A. *Failure as Input*

A system whose primary signal is failure frequency and pattern; normal operation is inferred *only* through absence of failure signals.

B. *Delayed Failure Revelation*

Failures occur immediately but are revealed to the system only after a random delay, forcing designs that tolerate unknowable partial failure.

4. Governance and Constraint Engines

A. *Rules That Can Sue You*

A governance engine that can formally accuse its operators of violating policy and requires a structured response or appeal.

B. *Policy Drift Simulator*

A system that intentionally lets policies diverge across regions or components, then measures how quickly governance coherence collapses.

5. Invisible Infrastructure

A. *Infrastructure That Lies*

A core service that sometimes returns plausible but false metadata, forcing dependents to verify assumptions instead of trusting infrastructure.

B. *Silent Dependency Death*

An infrastructure component that degrades quietly instead of failing loudly, revealing which services notice and which do not.

6. Economics-Shaped Systems

A. *Moral Budget Exhaustion*

A system where exceeding budget does not disable features, but forces ethically questionable tradeoffs (e.g., reduced fairness or accuracy).

B. *Negative Cost Resources*

Resources that are cheaper the *more incorrectly* they are used, exposing perverse economic incentives.

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7. Edge–Core Hybrid Systems

A. *Amnesic Edge*

Edge devices that periodically forget everything except what they personally derived, forcing the core to rebuild shared truth.

B. *Hostile Network Edge*

The edge actively lies to the core under certain conditions (bandwidth pressure, power loss), simulating adversarial sensors.

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8. Human-in-the-Loop Pipelines

A. *Human as Fault Injector*

Humans are intentionally given incomplete or misleading information and the system must detect and mitigate resulting errors.

B. *Responsibility Gradient Pipeline*

Tasks escalate not by severity but by *moral responsibility*, changing latency and accountability characteristics.

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9. Time-Dominated Systems

A. *Non-Transitive Time*

A system where A happens before B, B before C, but C before A depending on observer perspective.

B. *Time-Locked Correctness*

Outputs are only correct within a narrow time window; replaying results later produces incorrect answers by design.

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10. Ethically Load-Bearing Systems

A. *Right-to-Be-Wrong System*

A system that intentionally preserves incorrect decisions to protect autonomy, even when correct information exists.

B. *Harm-Deferred Architecture*

A system that chooses designs that reduce immediate harm while knowingly increasing long-term risk, and tracks that debt explicitly.

Instructor Note

These ideas are *pressure tests for imagination*, not prescriptions. If a student even partially adapts one, they are almost guaranteed to encounter real resistance.