

# APURV GAURAV

AI Product Leader — Trust & Reliability Infrastructure

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## SUMMARY

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Senior AI Product and platform leader building **deterministic trust infrastructure for enterprise AI** — product platforms that verify behavior, preserve provenance, replay decisions, and constrain execution under real operating conditions. Combines 11+ years of large-scale reliability, telemetry-driven decision systems, and release governance at Comcast (40M–70M-device scale) with patent-backed independent research across deterministic code authorization, decision replay, cross-modal provenance, runtime execution control, and deterministic code remediation.

**Core thesis.** Enterprise AI will not scale safely on model capability alone. It needs a deterministic control layer after inference — one that makes AI-assisted decisions observable, replayable, policy-bound, provenance-aware, and auditable before they affect customers, code, systems, or regulated workflows.

**Independent IP portfolio.** One U.S. patent application with **Notice of Allowance; issue fee paid; awaiting patent number** (Deterministic Code Authorization). Three additional filed U.S. utility applications, including one continuation-related application. One further AI trust infrastructure application in preparation.

## SELECTED IMPACT

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- **Deterministic Code Authorization:** U.S. patent application with **Notice of Allowance; issue fee paid; awaiting patent number**. Defines a deterministic authorization layer for AI-assisted code changes using static analysis, rule evaluation, replay verification, and policy-controlled release gates.
- **Follow-on filing:** continuation-related utility application filed for deterministic offline code remediation using ledger-verified replay and template-based patch generation.
- Designed a five-system **Enterprise AI Trust Stack** — deterministic code authorization, decision replay, cross-modal provenance, runtime execution control, and deterministic code remediation — translating large-scale reliability principles into runtime AI governance.
- At Comcast, supported broadband field triage and release-readiness across a **40M+ device** footprint; release governance and production-readiness across connected-device ecosystems representing **70M+ devices**.
- Built a public AI trust infrastructure platform — portfolio site, GitHub-based technical artifacts, technical READMEs, LinkedIn analysis, YouTube briefings, and the *AI Product Thinking* podcast.

## CORE STRENGTHS

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**AI Product & Platform Strategy** — product strategy, platform strategy, PRDs, 6-pagers, success metrics, roadmap tradeoffs, stakeholder alignment, executive narratives, developer-platform thinking.

**AI Trust & Runtime Governance** — deterministic control layers, decision replay, provenance systems, policy gates, auditability, runtime execution control, human-in-the-loop review, risk escalation, Responsible AI, AI safety infrastructure, model and behavior evaluation.

**Reliability & Rollout Governance** — large-scale systems reliability, telemetry-driven triage, incident review, regression detection, release validation, rollout governance, go/no-go decision support, customer-impact risk, observability.

**Technical Fluency** — LLM systems, AI agents, ML system design, distributed systems, OpenTelemetry, OWASP LLM Top 10, NIST AI RMF, OPA policy concepts, Microsoft Presidio, Temporal workflows, SQL, Python, GitHub.

## INDEPENDENT AI TRUST INFRASTRUCTURE PORTFOLIO

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**Independent Researcher — AI Trust Infrastructure & Deterministic Systems** *Camden, NJ · Jan 2024 – Present*

Independent product and architecture research on deterministic infrastructure for enterprise AI: verifiable behavior, provenance, decision replay, runtime execution control, and deterministic code remediation. Concurrent doctoral work in AI at Penn State.

**Enterprise AI Trust Stack — five-system architecture**

- **Deterministic Code Authorization** (*U.S. patent application — Notice of Allowance; issue fee paid; awaiting patent number*) — system gating AI-assisted code changes pre-merge via static analysis, deterministic rule evaluation, replay verification, and policy-controlled release gates. **Related filed utility application:** deterministic offline code remediation with ledger-verified replay and template-based patch generation.
- **Decision Replay & Ledger-Verified Execution** — architecture for reconstructing AI-assisted decisions using input snapshots, rule-path capture, cryptographic ledger records, replay engines, and audit reports.

- **Cross-Modal Provenance** — framework for preserving lineage across AI-generated and AI-transformed text, code, documents, images, and workflow artifacts via metadata capture, transformation mapping, and verification views.
- **Runtime Execution Control Layer** — control-plane model for approving, blocking, escalating, or constraining AI-driven actions before they affect customers, systems, or regulated workflows.
- **Deterministic Offline Code Remediation** — continuation-related architecture for offline, ledger-verified patch generation: template-based remediation, replay-verifiable patch records, and deterministic diff-and-apply workflows.
- **Product strategy artifacts across the AI Trust Stack** — PRDs, buyer/user framing, success metrics, rollout risks, roadmap tradeoffs, and executive narratives for platform adoption.

**IP portfolio** — one NOA-stage U.S. application (issue fee paid, awaiting patent number); three additional filed U.S. utility applications, one continuation-related; one further application in preparation.

## PROFESSIONAL EXPERIENCE

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### COMCAST — PHILADELPHIA, PA

#### Senior Product Manager — Intelligent Systems & Reliability

*Mar 2021 – Present*

Lead reliability analysis, telemetry-driven decision support, release validation, and operational integrity across broadband and Wi-Fi. Since Q3 2025, focused on broadband field triage, RDK-B behavior, and customer-impact risk across the 40M+ device footprint.

- Lead reliability analysis for broadband and Wi-Fi platform issues spanning RDK-B behavior, state synchronization, VAP/BSSID behavior, driver-level responses, memory pressure, device stability, and release quality.
- Translate customer-impact signals, logs, telemetry patterns, and device behavior into engineering and release-readiness decisions across the 40M+ device footprint.
- Convert low-level technical evidence — logs, telemetry, memory behavior, process health, driver responses — into clear narratives for engineering, QA, field, platform, and release stakeholders.
- Drive go/no-go signals by connecting telemetry evidence, engineering constraints, high-risk device populations, regression patterns, and customer-impact risk into controlled rollout decisions.
- Partner with engineering, QA, field operations, and platform teams on investigation workflows, escalation paths, and validation evidence; help reduce repeat failures and protect service continuity across large-scale connected-device deployments.

#### Product Manager — Data, Experimentation & Release Governance Platforms

*Jul 2018 – Mar 2021*

Owned data, experimentation, telemetry, and release-readiness workflows across multiple connected-device product lines.

- Drove release governance and production-readiness across Video, Broadband, Cameras, and Home Security ecosystems representing 70M+ connected devices.
- Tracked blocker issues, regression patterns, validation gaps, and deployment-risk signals — connecting technical readiness, customer-impact risk, and release timing into deployment recommendations across engineering, QA, operations, and field stakeholders.
- Built experimentation and telemetry-driven decision workflows that improved visibility into feature impact, platform behavior, and post-release quality.

#### Associate Product Manager — Systems Reliability & QA

*Oct 2014 – Jun 2018*

Supported systems reliability, QA strategy, release validation, and production-readiness across connected-device and platform environments.

- Supported test-driven deployment and release validation that improved production readiness and reduced post-release risk; tracked defects, validation gaps, and regression patterns across engineering and QA workflows.
- Supported multi-variant testing and reproducibility practices that improved visibility into platform behavior before broader rollout.

### MASSACHUSETTS HEALTH EXCHANGE PLATFORM — BOSTON, MA

#### Software Engineer

*Mar 2014 – Oct 2014*

High-availability public-sector platform for regulated healthcare workflows. Improved system throughput and built early experience in software reliability and operational discipline.

## EDUCATION

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**Doctor of Engineering, Artificial Intelligence** — Penn State World Campus · Aug 2025 – Dec 2027 · *Focus: trustworthy, verifiable, deterministic AI systems.*

**M.S., Information Systems & Spatial Analysis** — University of Pennsylvania · 2009 – 2011

**B.Tech, Information Technology** — Acropolis Institute of Technology and Research · 2005 – 2009

**Public platform:** *AI Product Thinking* podcast; portfolio, GitHub artifacts, LinkedIn analysis, YouTube briefings on AI trust infrastructure.