AI Applications for Space Systems

Strategic Use Cases for Falcon & Starship

✓ Where AI Adds Real Value

Engineering Knowledge RAG

Query: "What caused Raptor pressure anomaly?" → Instant answer with citations from telemetry & reports.

Autonomous Mars Agents

Onboard AI diagnoses issues and executes fixes during 20-minute communication delays.

Multimodal Inspection

Real-time vision models detect manufacturing defects before assembly progresses.

Telemetry Narrative Analysis

Generate human-readable summaries from engine test data with RAG citations to sensor traces & historical precedents.

✕ Keep It Simple - No AI Needed

Physics Calculations

Trajectory optimization and thermal models use proven equations, not neural networks.

Flight Control Systems

Safety-critical decisions need deterministic, traceable algorithms - not black boxes.

Implementation Approach

- **Architecture:** Multi-agent systems with LangGraph
- **Data:** Historical telemetry + engineering reports
- **Safety:** AI advises, engineers decide
- **Rollout:** Ground systems first, then flight

Core Principle

Always ask: "Can we solve this without AI?"
AI should augment engineers, not replace proven systems.

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