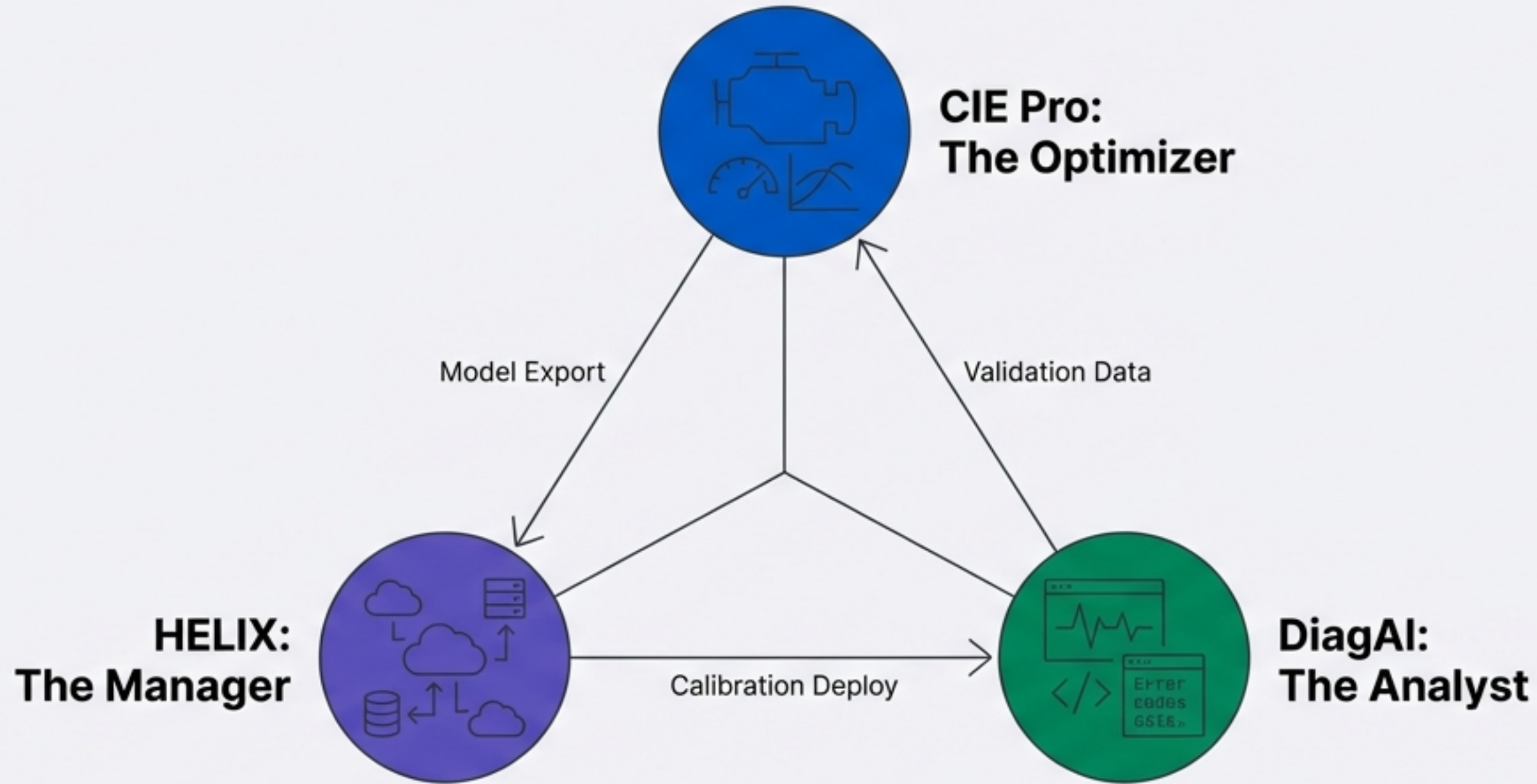


Next-Generation Automotive Software Suite

Detailed Workflow Analysis: CIE Pro, DiagAI, and HELIX



Target Audience: Automotive Engineers, Calibration Specialists, Software Architects

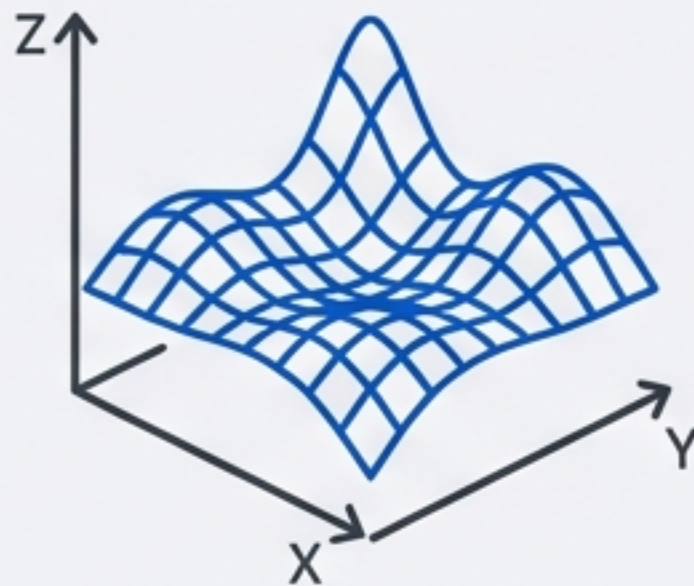
Modernizing the Automotive Toolchain

CIE Pro (The Optimizer)

Focus: Model-Based Calibration (MBC) & AI Optimization.

Status: Production Ready (v9.2.0).

Key Value: 50-70% reduction in test time via Constrained Bayesian Optimization.



DiagAI (The Analyst)

Focus: Vehicle Lab with Multi-Agent LLM Diagnostics.

Status: Production Ready (v2.0).

Key Value: Intelligent indexing of 1,800+ signals with "Engineer-Level" reasoning.



HELIX (The Manager)

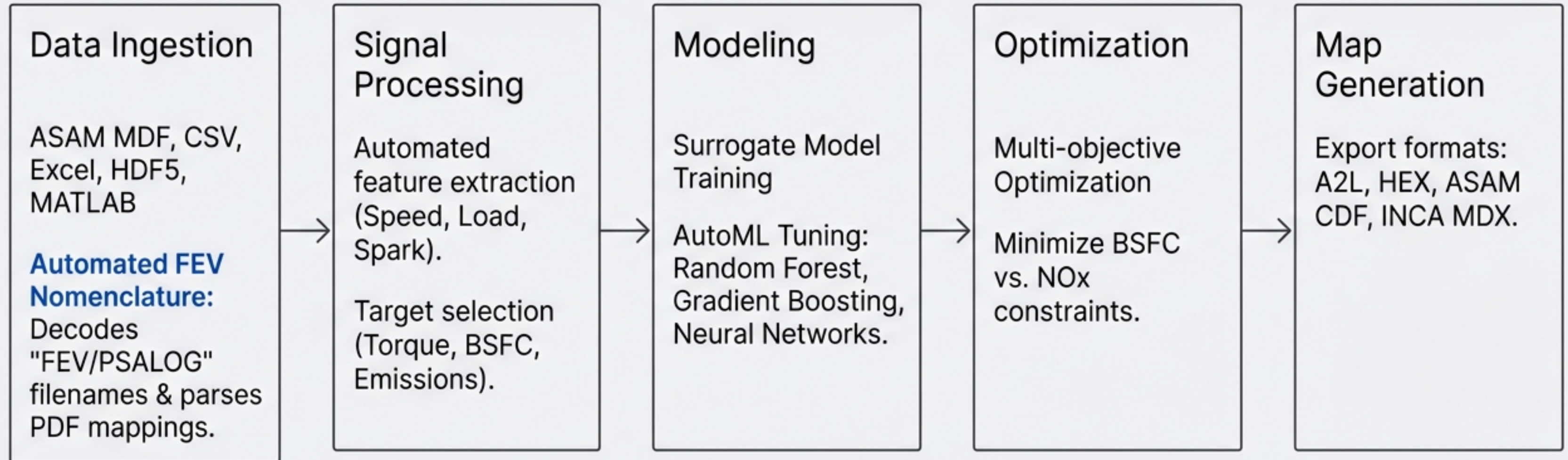
Focus: Cloud-Native ECU Calibration & Data Management.

Status: **Foundation Complete** (v2.0.0); Real-time layer in development.

Key Value: SaaS architecture replacing local A2L/HEX management.

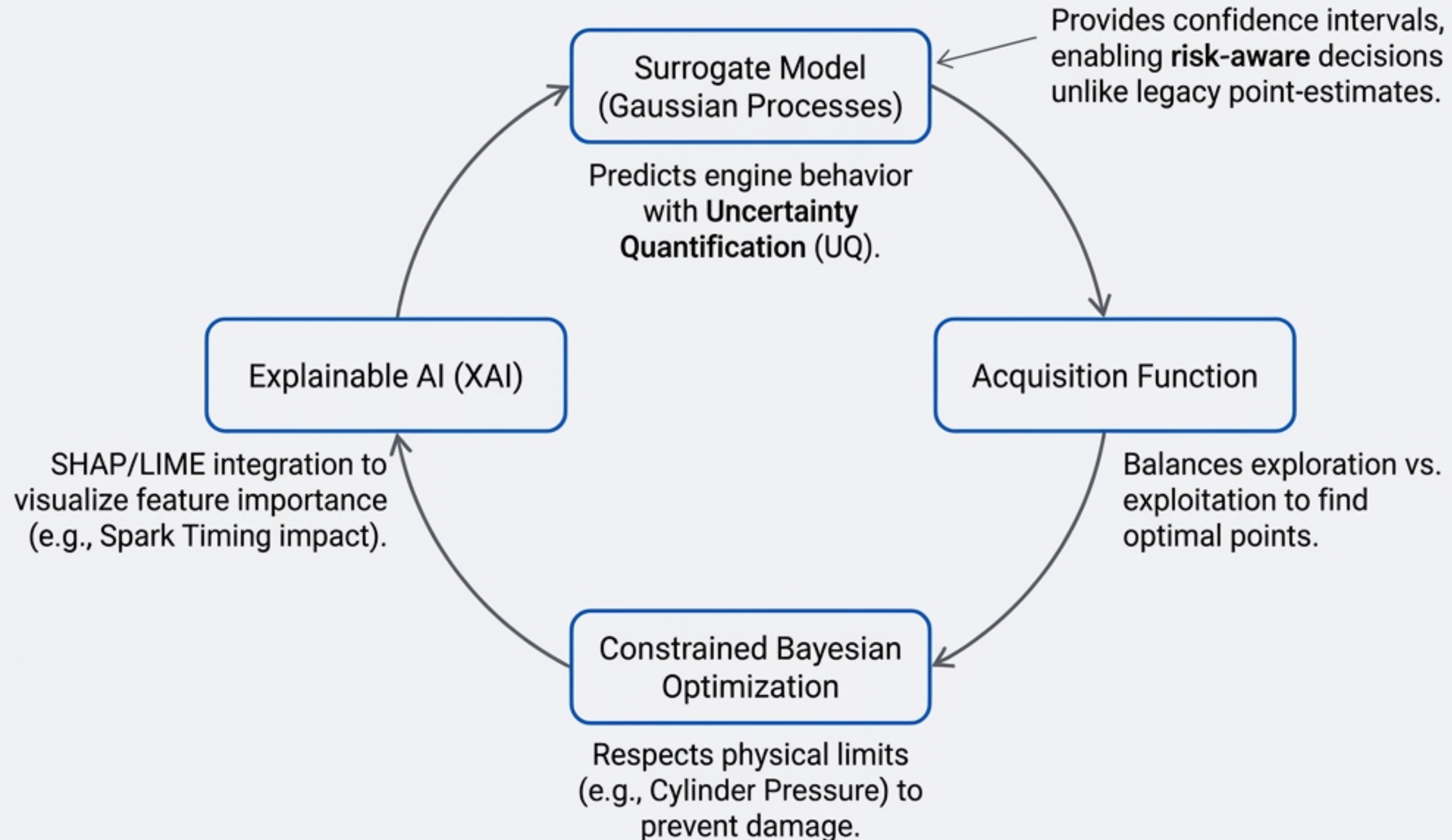


CIE Pro: End-to-End MBC Workflow



Impact: Validated reduction of test planning and execution time by 50-70%.

The Optimization Engine: AI & Uncertainty



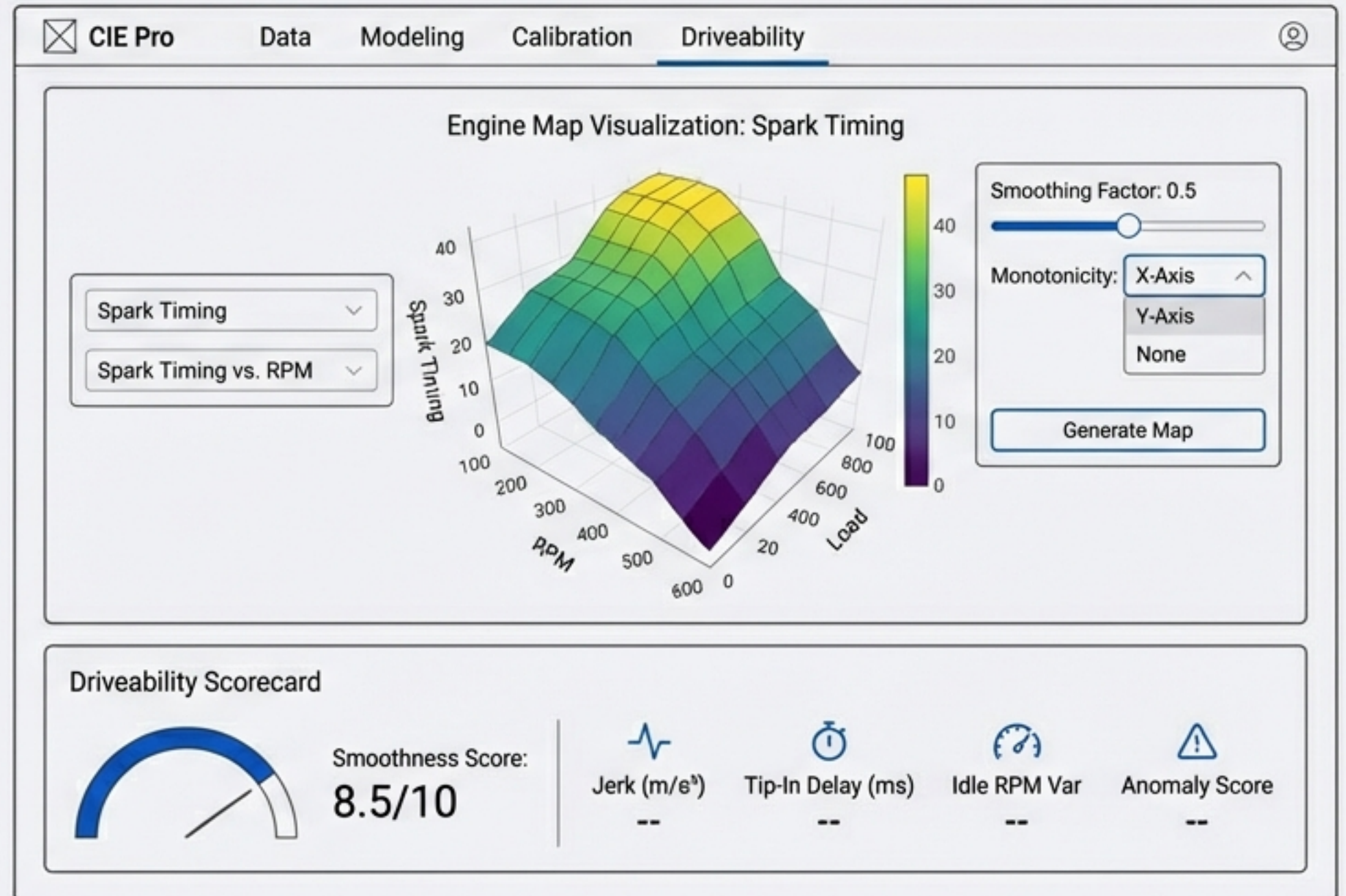
Map Interface & Driveability DNA

Visualization Suite (Plotly.js)

- Three View Modes: Interactive 3D Surface, 2D Heatmap, Contour.
- Editing Tools: Gaussian smoothing, monotonicity enforcement, RBF interpolation.
- High-performance, WebGL-accelerated rendering.

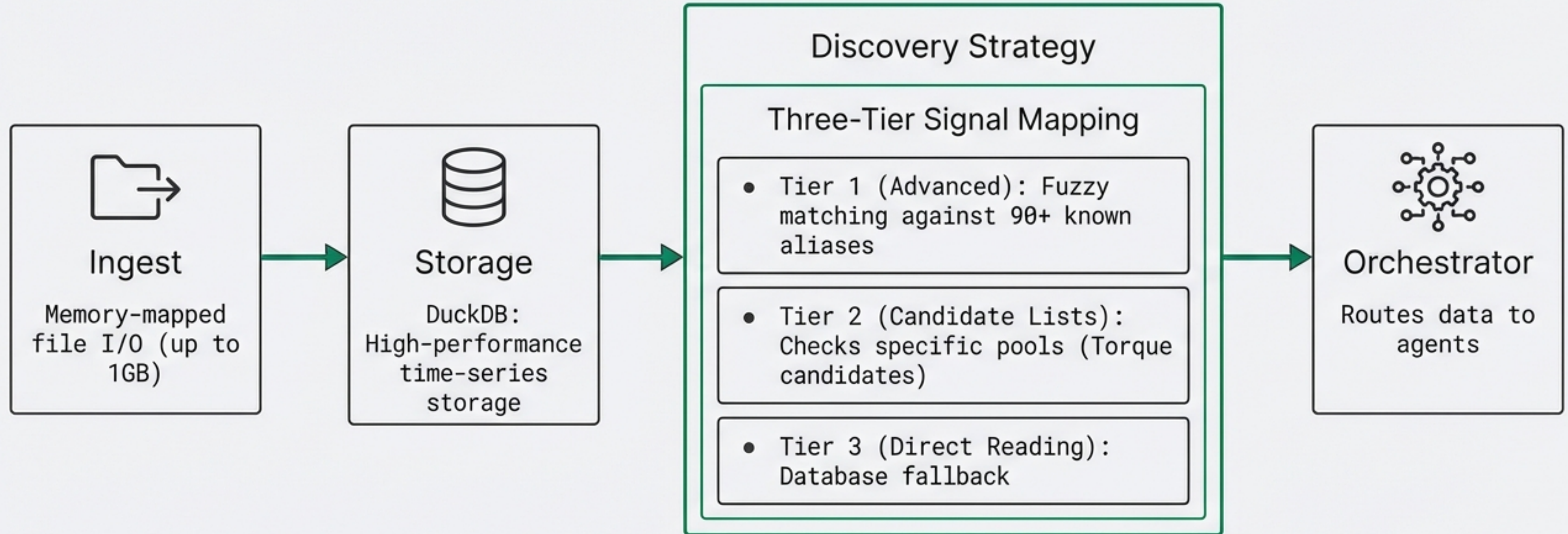
Driveability DNA Profiling

- Automated Jerk Analysis.
- Tip-In response with delay calculation.
- Idle Quality assessment.
- Anomaly Detection via Isolation Forest.



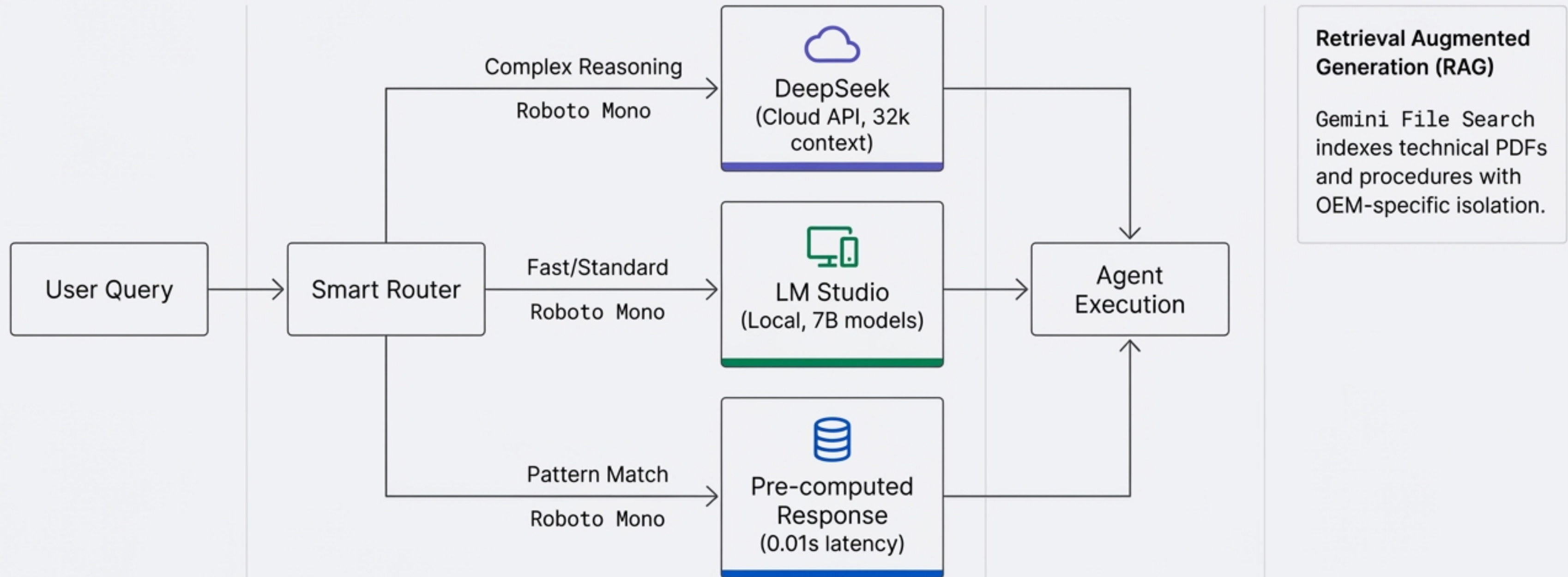
DiagAI: Signal Intelligence Architecture

Indexing 1,817+ **signals** across 330+ DBC files

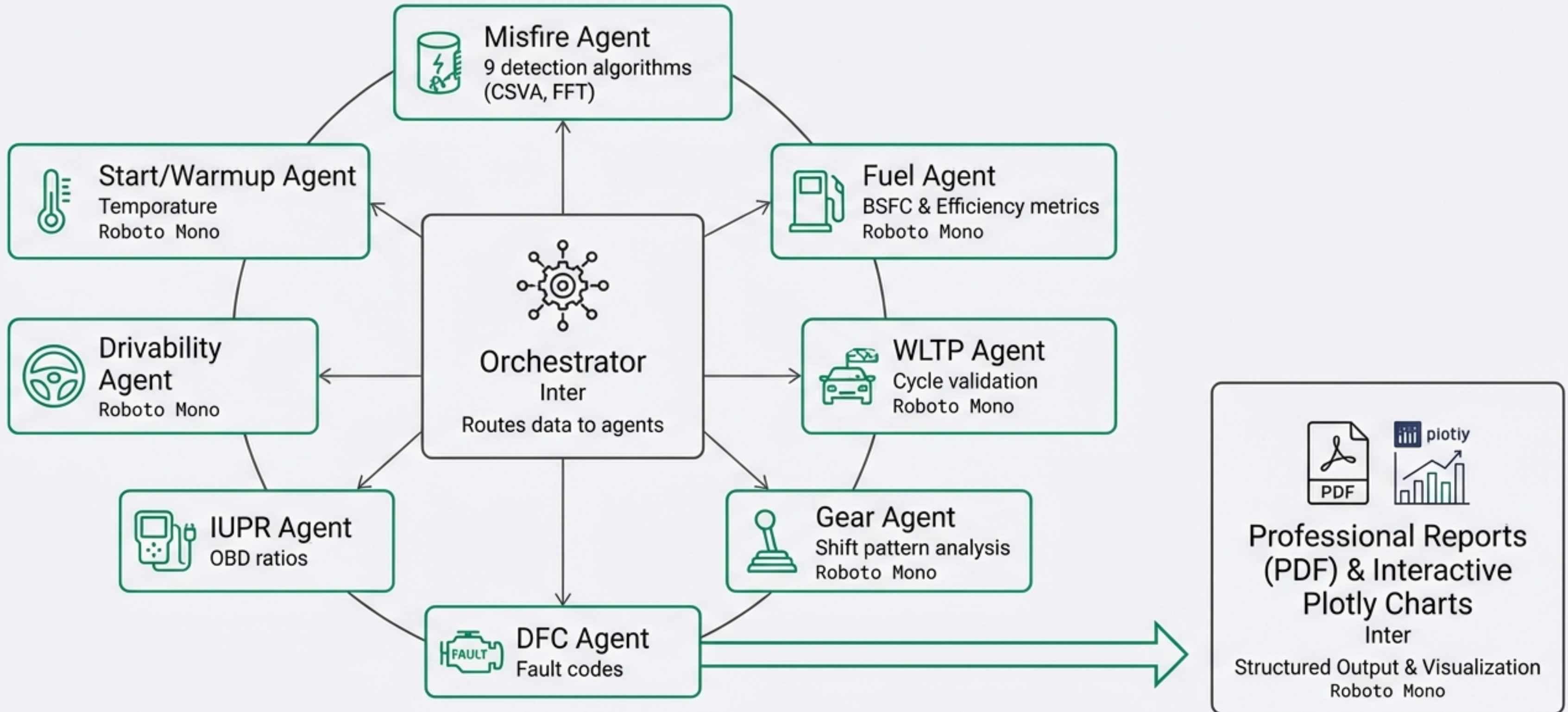


Tech Stack: Flask Core + DuckDB + Plotly

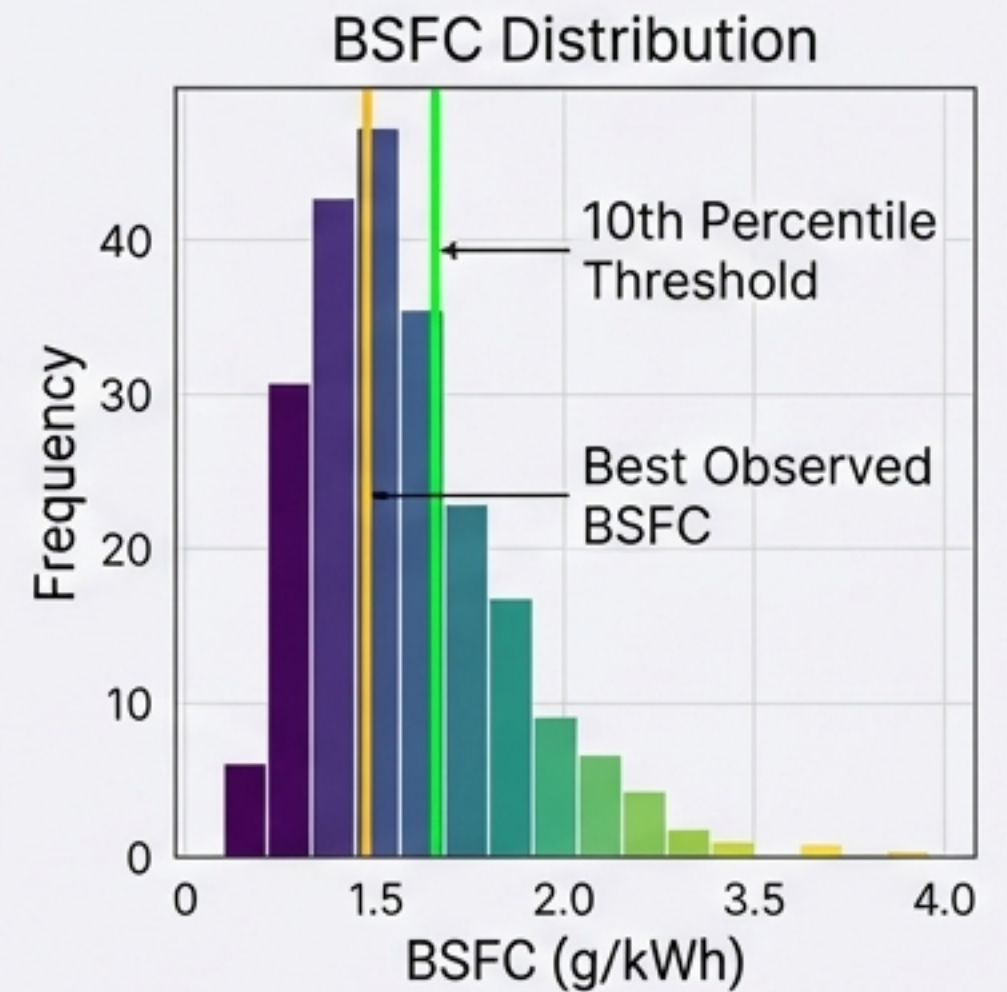
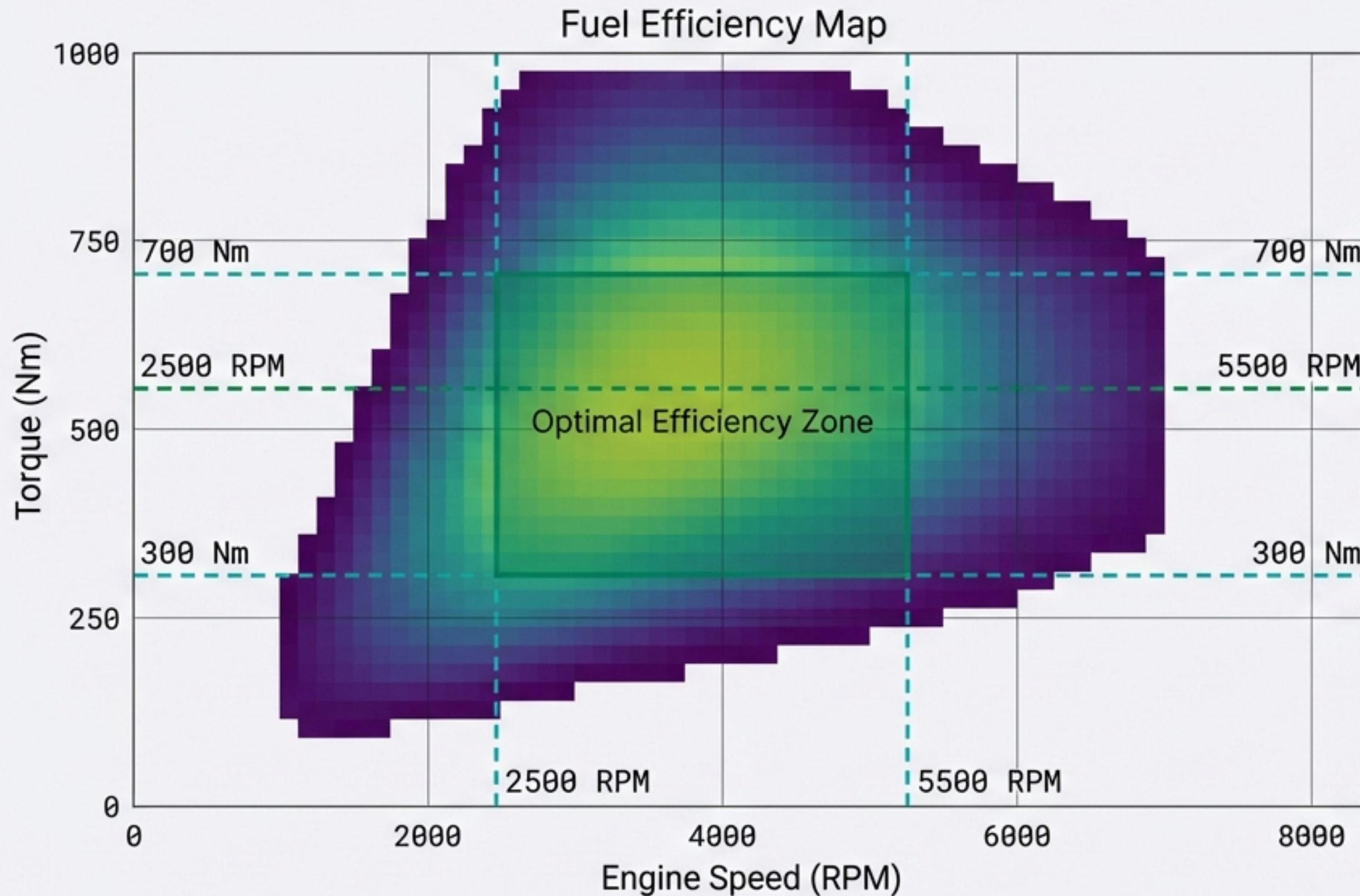
The Diagnostic Brain: LLM Routing & RAG



Multi-Agent Orchestration



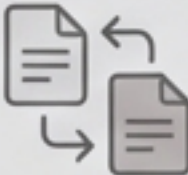



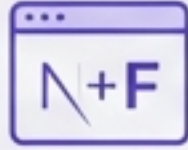



Visual Intelligence: Efficiency Islands



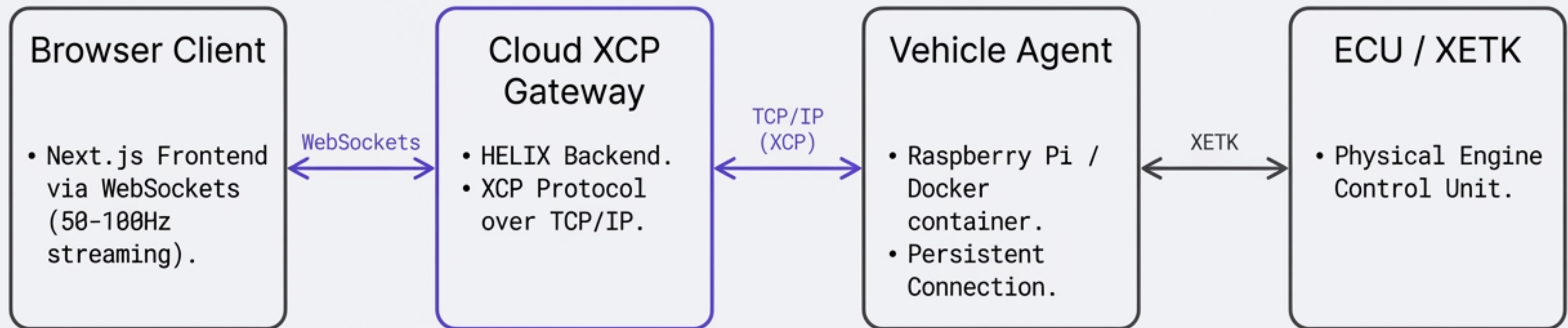
Automated identification of optimal operating regions allows instant correlation of statistical data with physical performance.

HELIX: Cloud-Native Calibration Management

	Legacy Reality
	Complex desktop installations.
	VPN requirements for remote access.
	File-based conflicts (check-in/check-out).
	Dongle licensing.

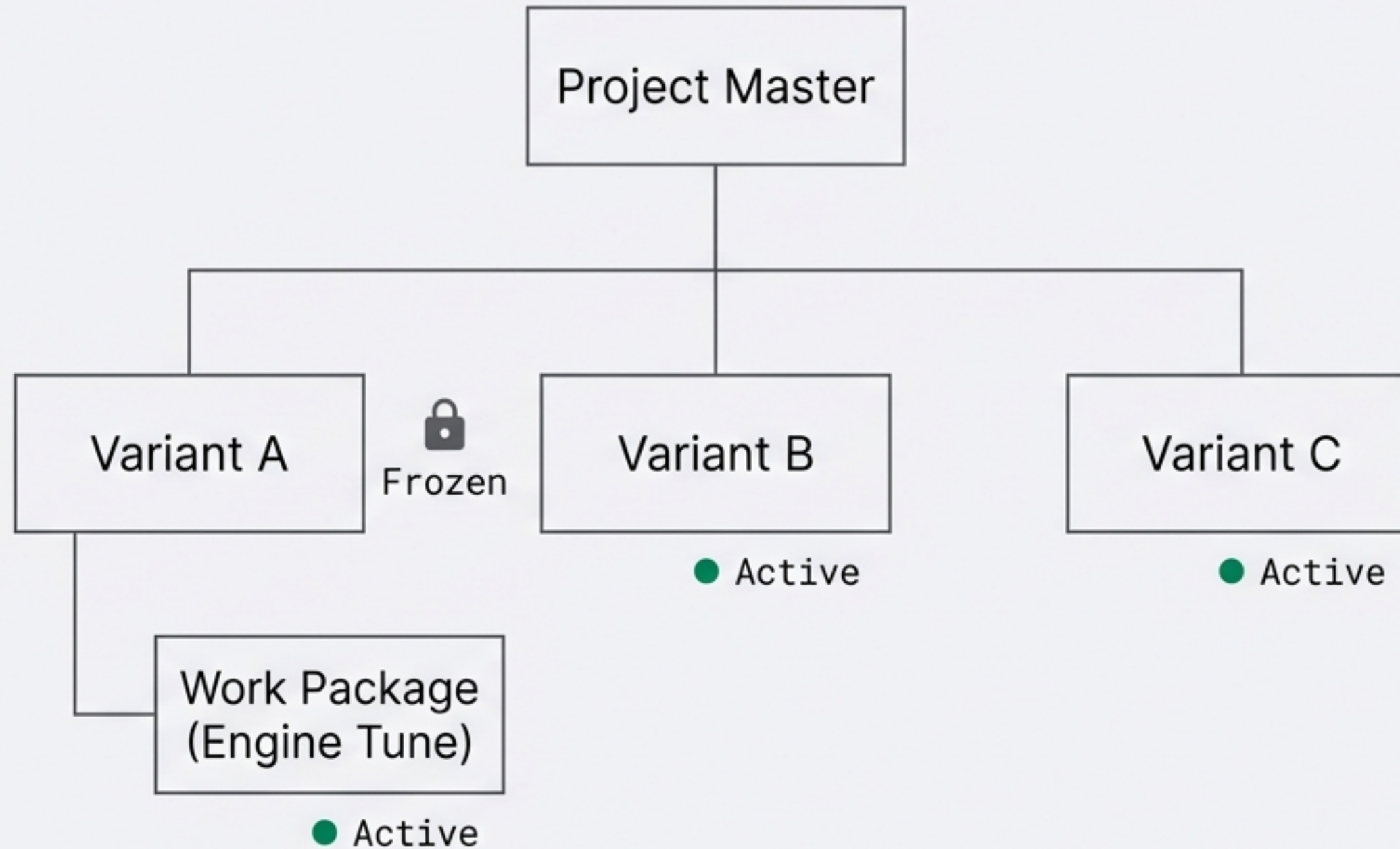
	HELIX Vision
	Web-First Architecture (Next.js + FastAPI).
	Cloud-Hosted & Auto-Scaling.
	Zero-installation.
	Foundation Complete (v2.0.0): A2L/HEX parsing, Role-Based Access Control (RBAC), Project Lifecycle Management.

Remote Real-Time Architecture (Planned)



Bridging the gap between web browsers and physical ECUs using XCP over TCP.

Variant & Work Package Management



- 1. Ingest:** Regex-based A2L parsing & HEX memory map generation.
- 2. Manage:** Variant Tree allows granular Freeze/Unfreeze of calibration states.
- 3. Collaborate:** vCDM-compliant Work Packages track parameter changes with audit trails.
- 4. Validate:** Integrated test suites run against parameter sets before export.

Competitive Technical Advantage

Capability	Our Suite	Legacy Tools (INCA/CANape)	Manual/Excel
Calibration Logic	Integrated Optimization + Driveability (CIE Pro).	Separated tools (CAMEO vs Drive).	None.
Architecture	SaaS / Cloud-Native / No Install.	Desktop-bound / Dongles.	N/A.
Diagnostics	Automated "Engineer-Level" LLM Reasoning .	Manual signal plotting.	Hours of analysis.
Workflow	End-to-End (DoE -> Optimization -> Export).	Disjointed toolchain.	Fragmented.

The 'Killer Feature': A unified web stack replacing disjointed legacy workflows.

System Readiness & Roadmap

CIE Pro

Version: v9.2.0

Status: Production Ready

- Advanced AI
- MBC Workflow
- Map Interface.

DiagAI

Version: v2.0

Status: Production Ready

- Signal Intelligence
- Multi-Agent System
- LLM Routing.

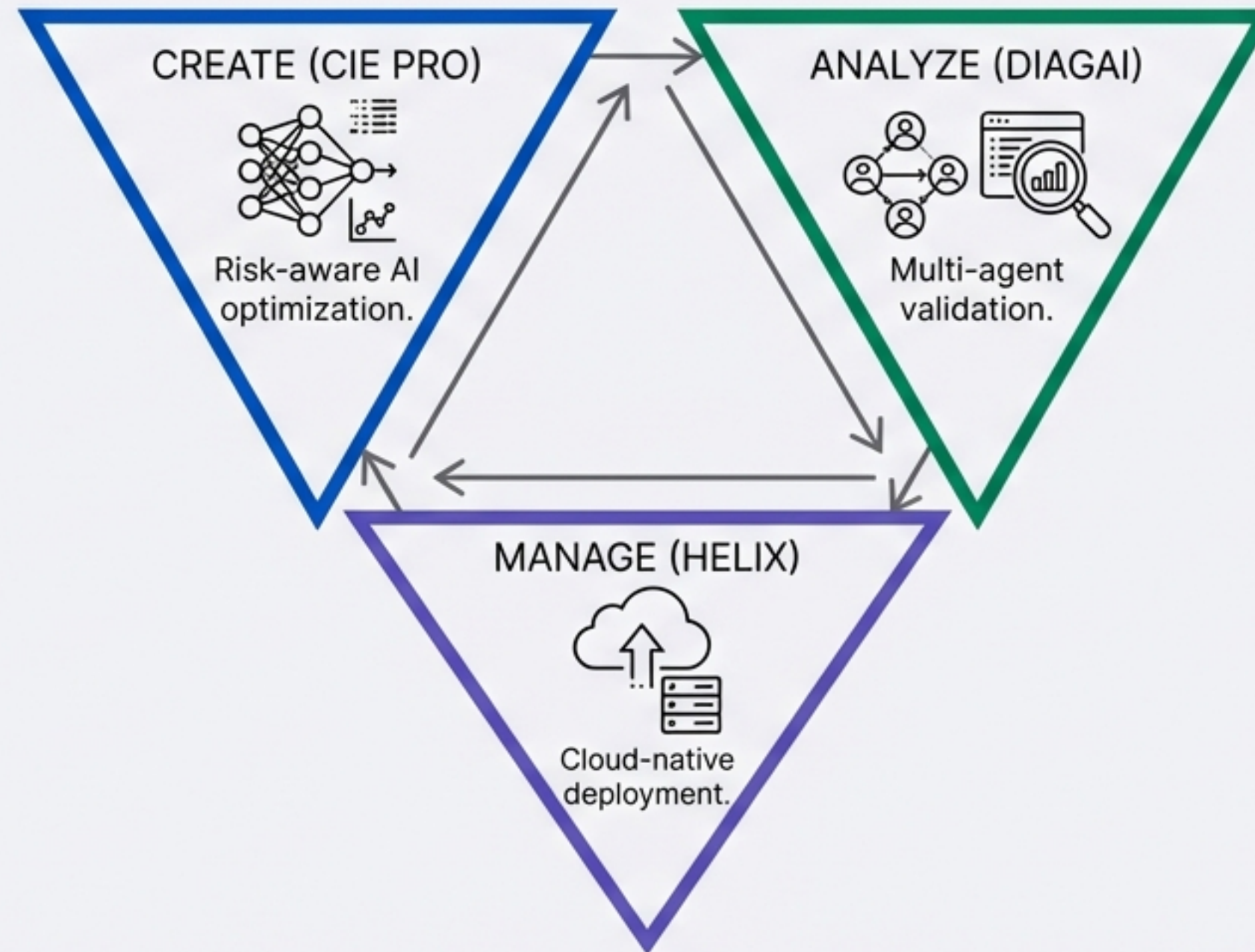
HELIX

Version: v2.0.0

Status: Foundation Complete

Active Development:
XCP Master Layer &
Real-Time Streaming.

The Unified Future of Calibration



A cohesive, intelligent, and accessible web-based ecosystem for the modern automotive engineer.