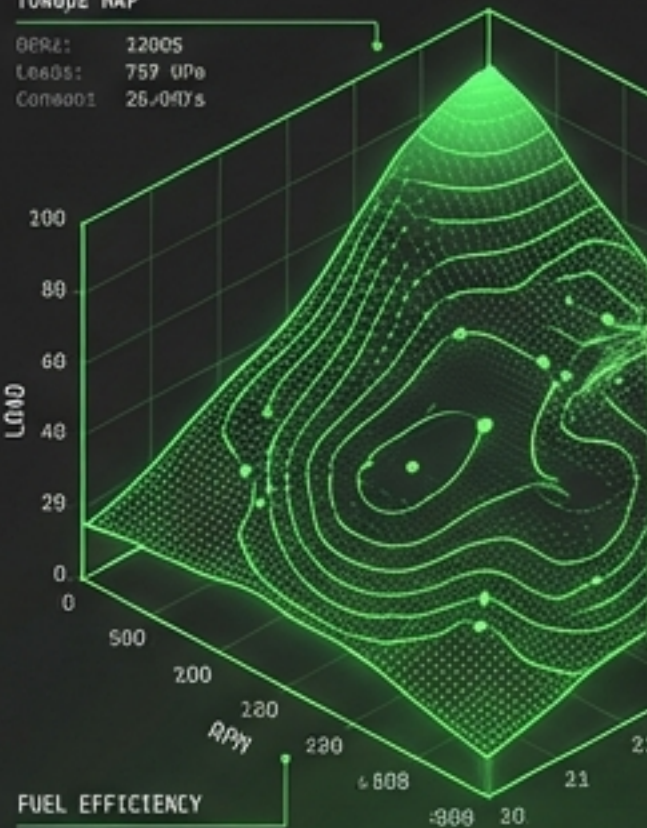


CIE Pro

Optimization

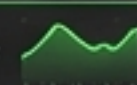
TORQUE MAP

GEAR: 1200S
LEADS: 757 0Pa
CONSUM: 25.00Ys



FUEL EFFICIENCY

TEMP: 7222
AXES: 620



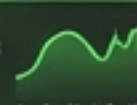
FUEL EFFICIENCY

TEMP: 7222
CONSUM: 25.00Ys
100S



EXCESSIVE CONTROL

SIGNAL: 9000
CONTROL: 9000
VALUE: 9000



DiagAI

Intelligence

FAULT PREDICTION

Data: 3.8S
Route: 6.90S
Beta: 0.882290s



ANOMALY DETECTION

920S
820S
220S

The Modern Automotive Intelligence Suite

A Unified Web-Native Ecosystem for Optimization, Intelligence, and Connectivity

PREDICTIVE MAINTENANCE

FRONT: 92222
BACK: 92222

SELF-LEARNING ALGORITHMS

Success: 8.180v0E
DataKbs: 22270S

HELIX

Connectivity

REMOTE DIAGNOSTICS

Data: 8.8S
Metric: 20.85N/s
RT60: 67SM

OTA UPDATES

OT5: 6.358s
Leads: 2360
Gdcross: 2260u

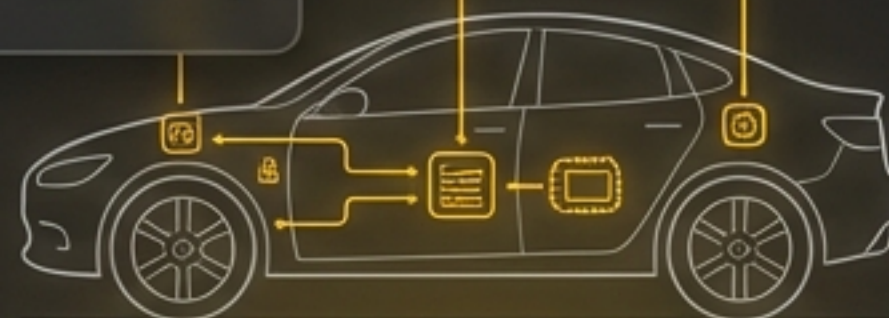


FLEET MANAGEMENT

Data: 88TT
Protocol: 000
Protocol: CAN B0TES

REAL-TIME MONITORING

80TT 68K BUS
80TT 68K BUS



Architecture: Cloud-Native Python/React Stack

Deployment: Browser-Based SaaS

Scope: Model-Based Calibration to Remote ECU Management

CIE Pro: The Calibration Intelligence Engine

Complete Model-Based Calibration (MBC) in the Browser

Core Value Propositions

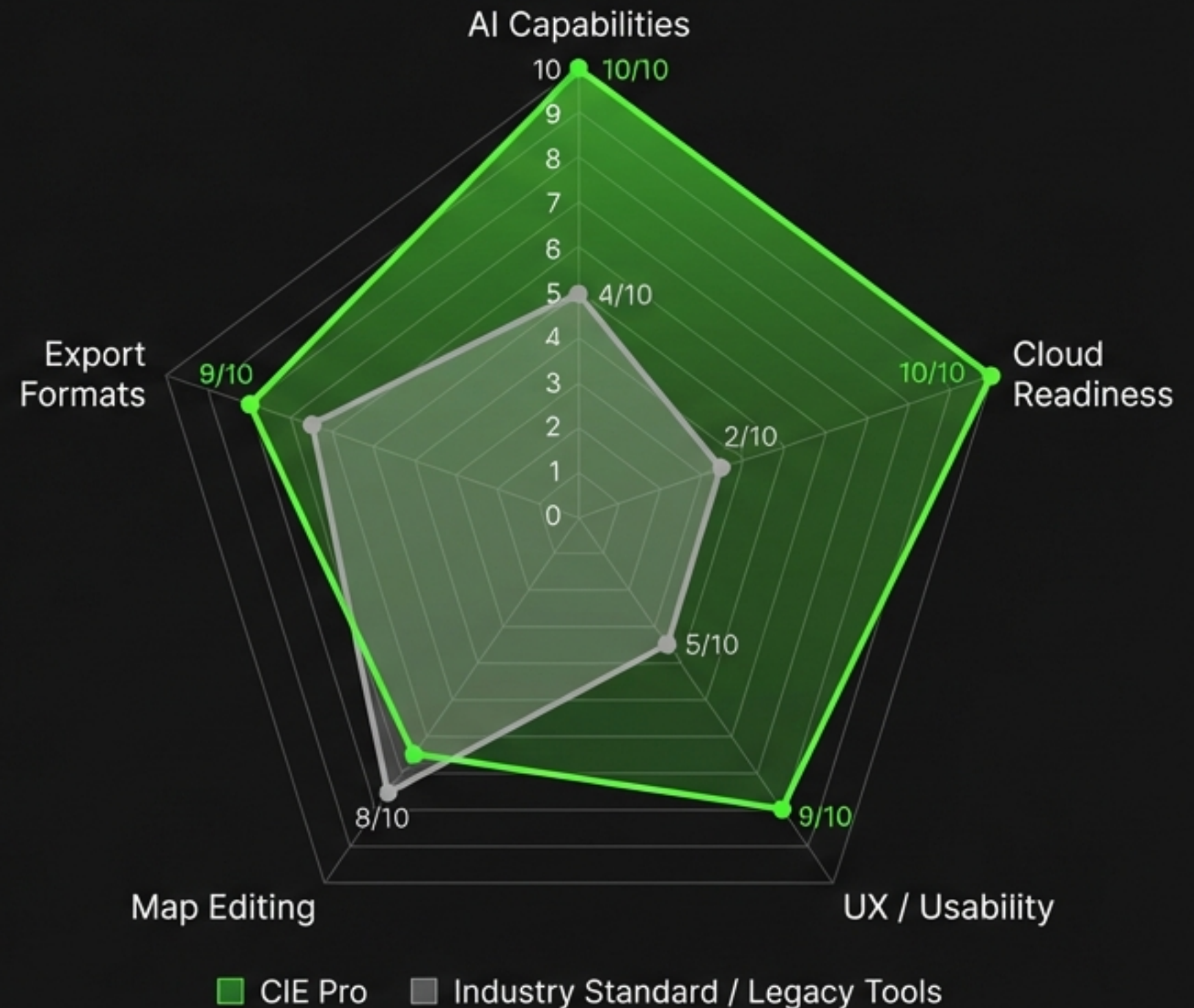
- ✓ **Efficiency:** Delivers 50-70% test time reduction via Constrained Bayesian Optimization.
- ✓ **Zero-Install:** Fully web-based interface replacing desktop-heavy tools like AVL CAMEO.
- ✓ **Status:** Production Ready (92.9% success rate across 14 critical test categories).

Technical Specifications

Input: Multi-format data ingestion (MDF, CSV, Excel, HDF5)

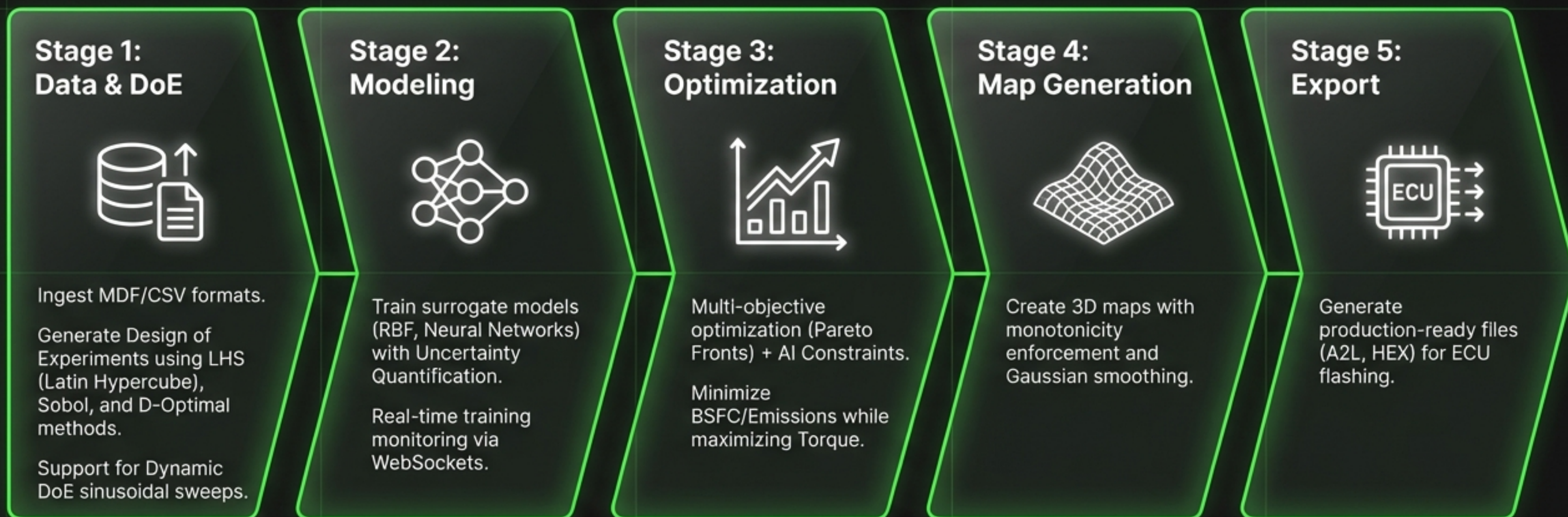
Modeling: Random Forest, Neural Networks, Gaussian Processes

Output: ASAM CDF, A2L, HEX, INCA MDX



CIE Pro: End-to-End MBC Workflow

From Raw Data to Production ECU Export



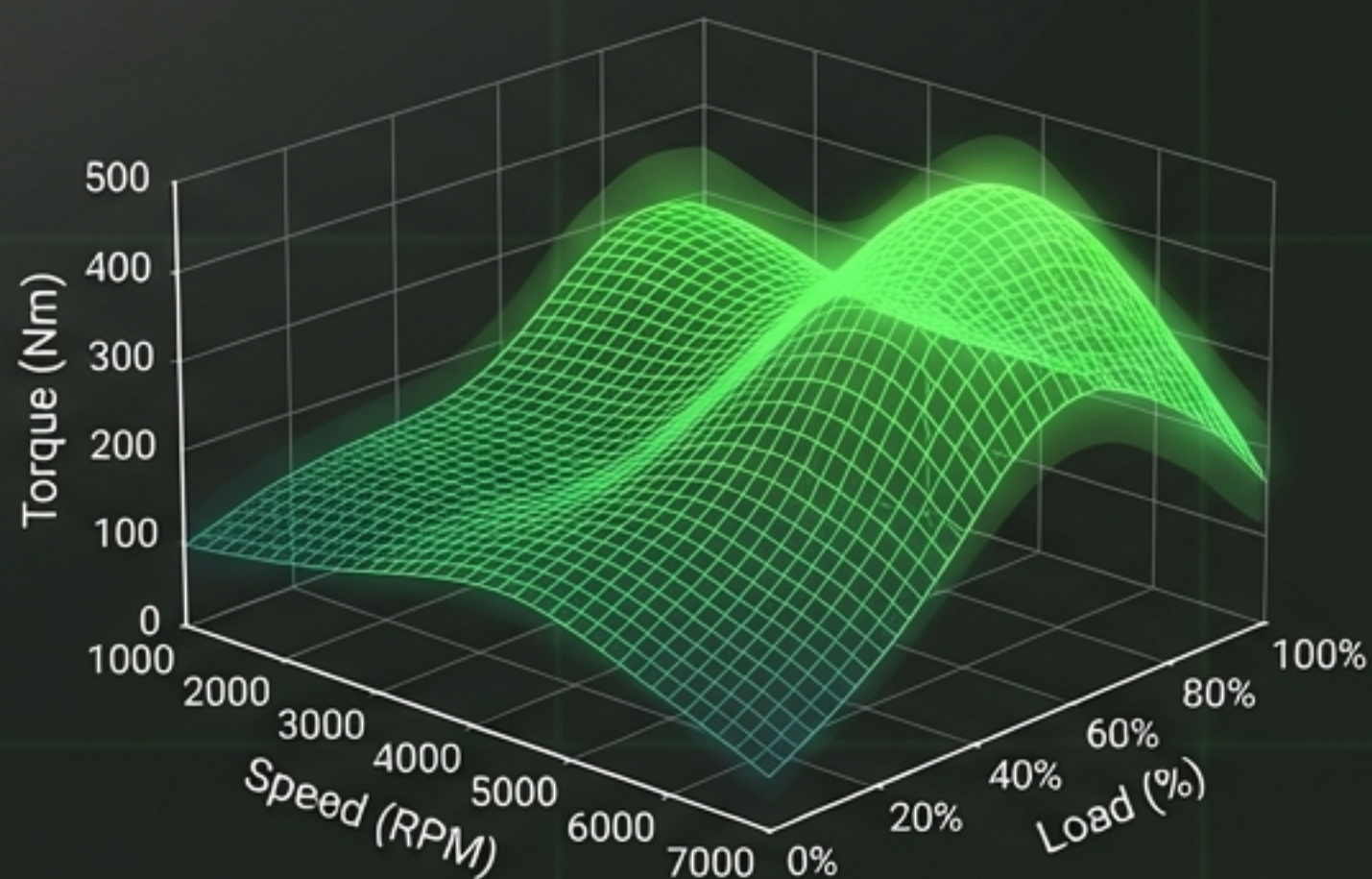
Web-Native & Automated

Advanced Optimization & Explainable AI

The AI Core: Constrained Bayesian Optimization & SHAP Analysis

Constrained Bayesian Optimization (CBO)

Utilizes risk-aware algorithms to navigate calibration search spaces 50-70% faster than grid-search methods. Includes Uncertainty Quantification to provide confidence intervals.



Explainable AI (XAI)

Uses SHAP (Shapley Additive Explanations) and LIME to demystify 'Black Box' models. Visualizes which signals drive predictions.



Driveability DNA & Automated Analysis

Quantifying Vehicle Feel with AI Recommendations

Concept:

Advanced profiling that quantifies "vehicle feel" using 0-10 ratings, comparable to AVL Drive standards.

AI Recommendations:

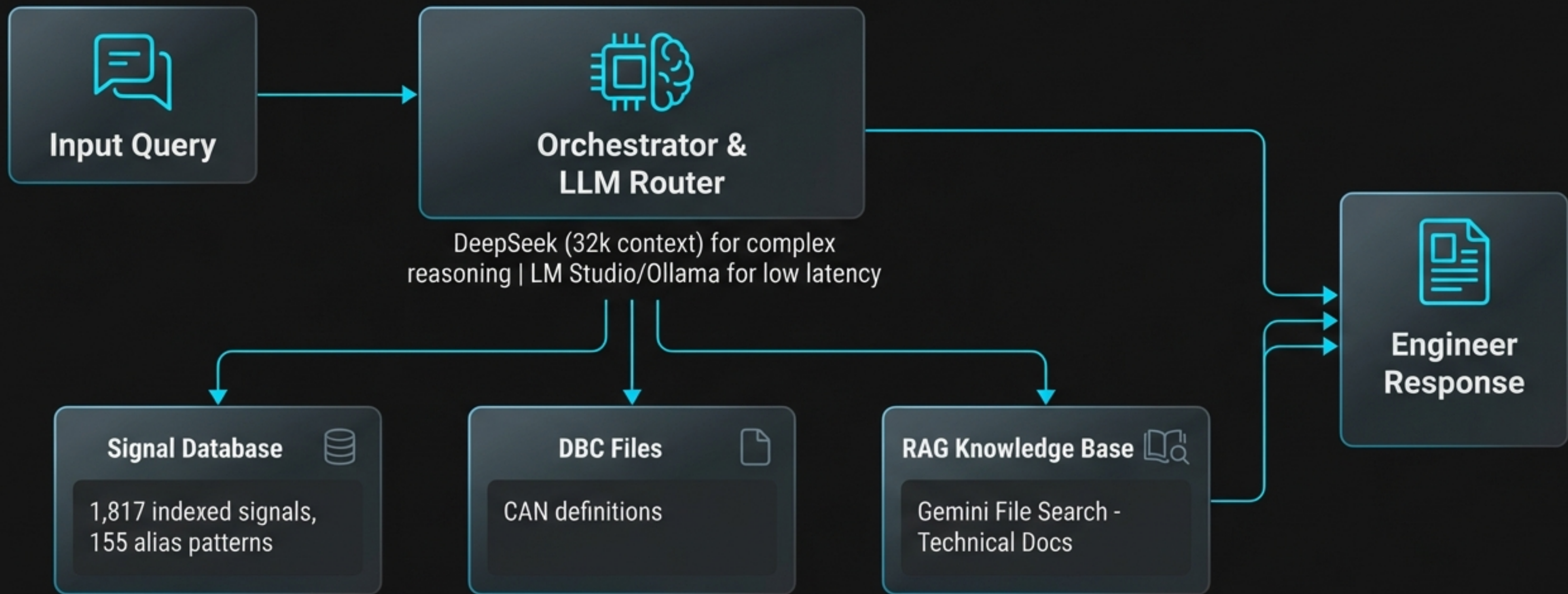
The system analyzes issues (e.g., "Tip-in response delay") and outputs actionable calibration guidance with severity levels (HIGH/MEDIUM).

Vehicle DNA Profile



DiagAI: The Vehicle Diagnostics Brain

Senior Engineer-Level Analysis via Multi-LLM Architecture

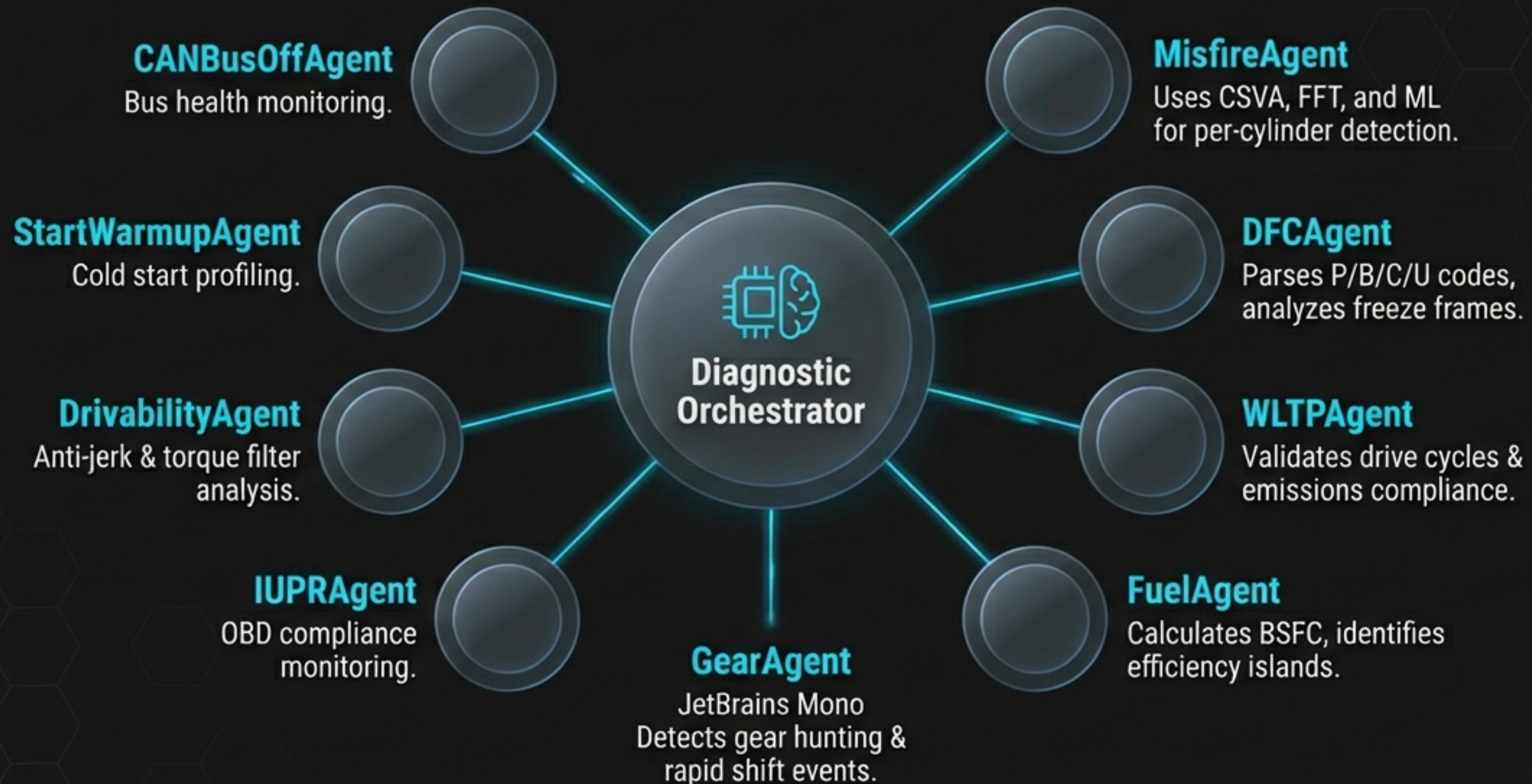


Roboto

The Intelligence Core: Not just a code reader, but an engineer-level analyst capable of complex reasoning.

Specialized Multi-Agent Architecture

9 Specialized Agents Coordinated by a Central Brain



DiagAI: From Raw Data to Engineer Report

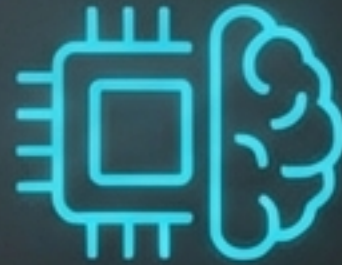
Workflow: Smart Signal Matching & Automated Reporting

Ingestion



- Supports MDF/MF4 (up to 1GB), CSV, and Excel.
- Auto-detects FEV nomenclature files for signal renaming.

Analysis Logic



- Smart Signal Matching: Uses Fuzzy logic to map signals (e.g., "Veh_spdVeh" -> "Speed").
- Statistical Analysis: Z-score, IQR, and cross-domain correlation.

Output



- Professional PDF Reports with automated Plotly visualizations.
- Content: Time-series plots, FFT analysis, Heatmaps, and Engineering Summaries.

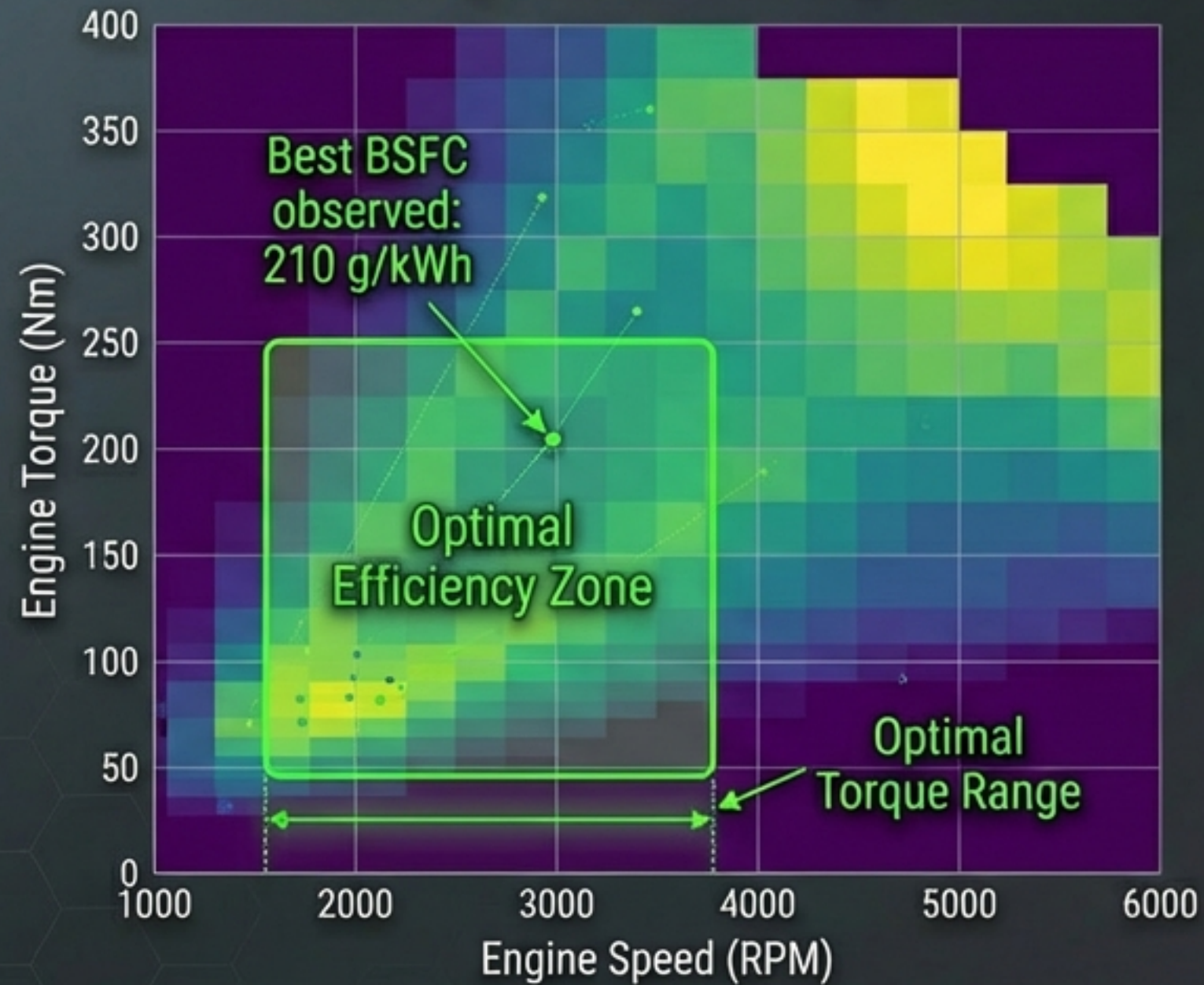
Example Case

User Query: "Analyze Misfire" → MisfireAgent detects event → Generates Severity Plot → Outputs Engineer Report.

Visual Intelligence: Efficiency & Misfire Mapping

Automated Identification of Optimal Operating Zones

Efficiency Islands Analysis



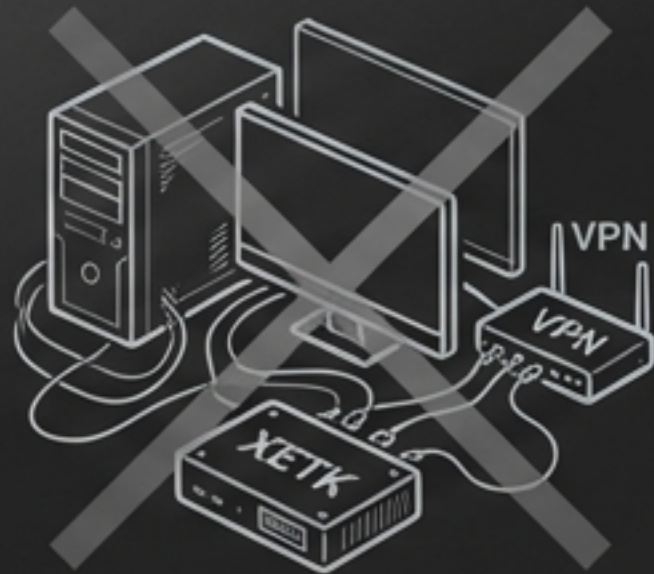
Misfire Severity Analysis



HELIX: Cloud-Native ECU Calibration

Removing the Desktop Dongle Dependency

The Problem - Legacy



Legacy tools require expensive dongles (XETK), VPNs, and per-seat licensing (approx €10k).

The Solution - HELIX



Web-based XCP Master Proxy replacing local software. SaaS model with real-time WebSocket capabilities.

Technical Specs

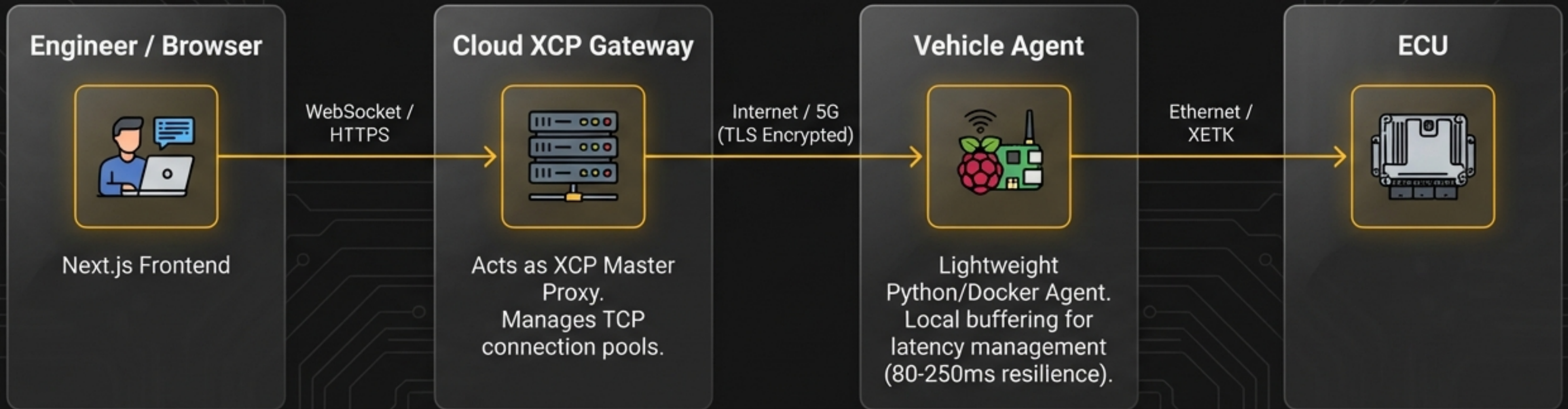
Architecture: Backend (FastAPI) + Frontend (Next.js) + Real-time WebSocket Layer.

Transport: Supports XCP on TCP/IP (Ethernet) and UDP.

Status: Foundation Complete, Active Development on Real-Time Layer.

Remote Calibration Architecture

Latency-Resilient XCP Streaming





Latency Management: Uses command batching and local buffering to ensure stable flashing and 50-100Hz DAQ streaming over unstable cellular connections.


Enterprise Data & Workflow Management


vCDM-Compliant Project Control

The screenshot displays the HELIX software interface. On the left, the 'Variant Tree' shows a hierarchy starting with 'Project_V8_Engine', which includes 'Base_Calibration_v1.0', 'Variant_US_Market (Active)', and 'Variant_EU_Market (Frozen)'. The main area is a 'Work Packages Kanban' board with four columns: 'To Do', 'In Progress', 'Validation', and 'Done'. Each column contains work package cards with titles, status labels, user avatars, and dates. For example, 'Tune Idle Spark' is in the 'To Do' column with a 'Pending' status, while 'Boost Control v2' is in the 'Done' column with a status of '13' and a date of 'Jan 3 25'.

 **Variant Management:** Full variant tree structure with freeze/unfreeze capabilities.

 **File Handling:** Advanced parsing for A2L (ASAM MCD-2 MC) and HEX files. (Roboto and JetBrains Mono)

 **Work Packages:** Track changes with status transitions, permissions, and merge logic. (Roboto)

 **RBAC:** Role-Based Access Control for departmental security. (Roboto and JetBrains Mono)

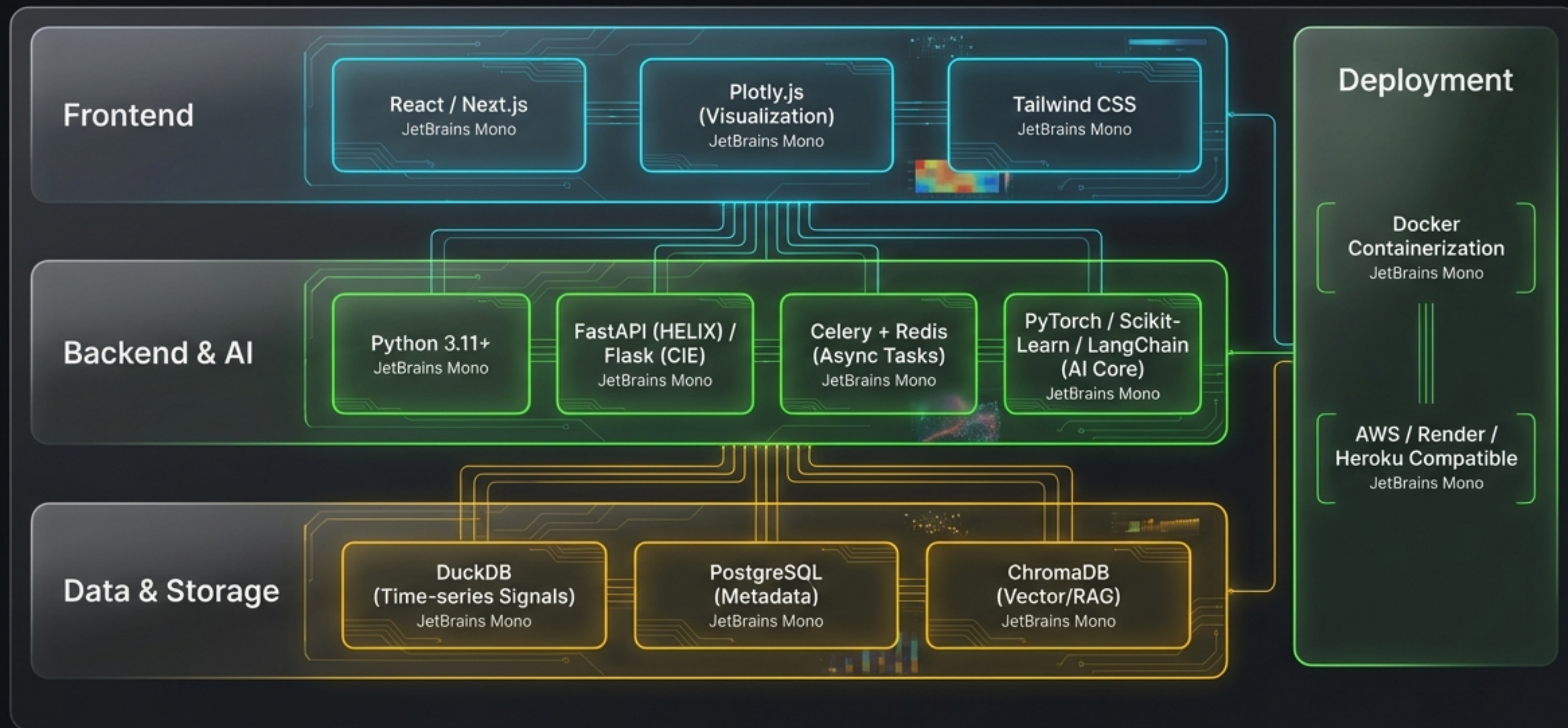
Competitive Advantage Matrix

The Modern Suite vs. Legacy Incumbents (AVL, ETAS, Vector)

Feature Category	Legacy Tools	CIE / DiagAI / HELIX Suite
AI / ML	Basic / None	Advanced (Bayesian Opt, XAI, Multi-Agent)
Platform	Desktop / Windows-Only	Web-Native / Cloud SaaS
Cost Model	High per-seat (€10k+)	Scalable SaaS
Collaboration	File-based / Siloed	Real-time / Multi-user
Optimization	Manual / Grid Search	Automated Constrained Bayesian
Deployment	Complex Hardware (Dongles)	Zero-Install / Cloud Gateway

Modern Implementation Stack

Scalable Technology for IT & DevOps



The Future of Automotive Engineering

Production-Ready Intelligence. World-Class Optimization. Anywhere Connectivity.

CIE Pro

50-70%

Test Time Reduction

92.9% Feature
Success Rate



DiagAI

1,817

Signals Indexed

Engineer-Level
Multi-Agent Analysis



HELIX

vCDM

Fully Compliant

Remote XCP
Architecture Validated



Transforming the stack from fragmented desktop tools to a unified, intelligent cloud ecosystem.