

Energy Optimized Autonomous Vehicle

We showed the **U.S. Army** how to make smart decisions in real time.

Clients:
U.S Army
Exergie Predictive

Sector:
Defense

Technology:
Custom Firmware
Python
High Performance Computing (HPC)
PyTorch
React
Postgres
Hypertables

Resources:
Exergi Predictive LLC: <https://exergipredictive.com/>

<https://clutch.co/go-to-review/0533cf36-1cd4-4c33-9eab-5bc7d9fdf501/305599>

Challenge: The U.S. Army requires autonomous vehicles capable of real-time optimization, dynamically adjusting to energy availability—whether gasoline or hybrid. These vehicles needed to continuously evaluate mission constraints and make autonomous decisions while factoring in fuel efficiency, system performance, and operational constraints.

Solution: We developed an advanced autonomous vehicle system with full-duplex communication, enabling seamless interaction with the vehicle's control systems. Our solution integrated multiple real-time data streams, including system temperature monitoring, fuel consumption estimates for range calculations, and battery management for hybrid vehicles. AI-driven algorithms allowed for continuous mission optimization, adapting to changing constraints and ensuring maximum efficiency. To enhance operational visibility, we built an interactive visualization dashboard that mapped the vehicle's position and displayed critical telemetry data, providing mission operators with real-time insights into system performance.

Result: The system successfully met the Army's contract requirements, and we continue to collaborate with other teams involved in the project. Our approach leveraged high-performance computing, custom firmware, and purpose-built hardware to deliver a robust and scalable solution.



“They delivered on time and exceeded our expectations.”