AutoSF — Responsible and Intelligent Fleet Management

1. Overview

AutoSF — Responsible and Intelligent Fleet Management is an RD&I initiative of the Research Center on Cyber-physical Systems Security (SecCPS) at UFSC, along with Stellantis, Mobilis, IAV, Trackli, and Mobway, sponsored by Program MOVER. The project's main goal is to develop a set of reusable software components that can be integrated into partners' existing fleet management systems to add value, mainly by leveraging Artificial Intelligence for vehicle, driver and trajectory profiling and a Gamified HMI to stimulate responsible driving.

1.1. AutoSF Architecture

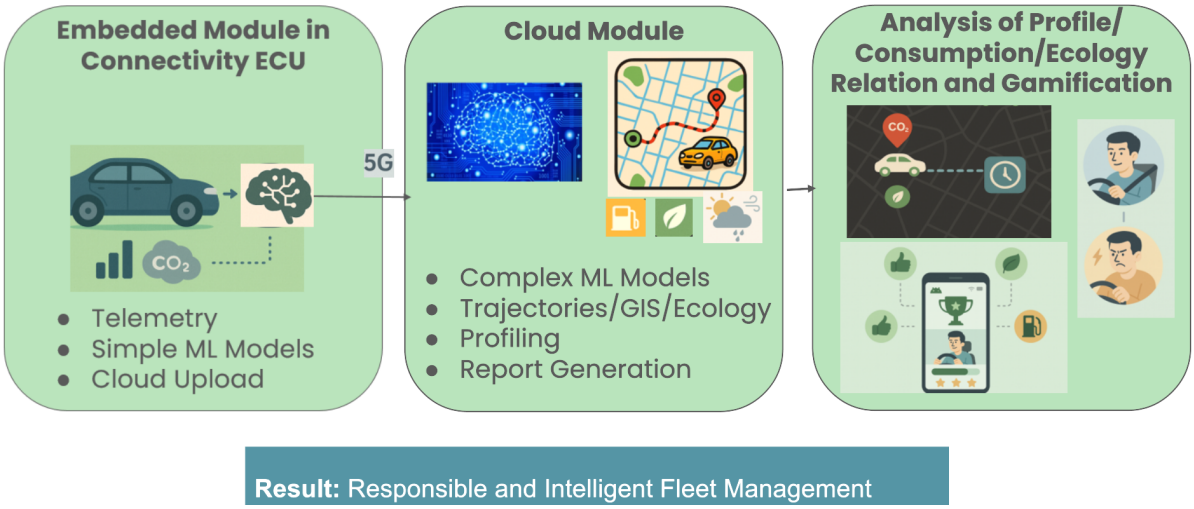
The project's architecture is defined by the three synergistic software components that will be developed as reusable subsystems for fleet management:

- Vehicle and Driver Profiling: This component will implement a classification model for vehicle emission profiles (based on vehicle dynamics and emissions data) and driver profiles (based on the same data plus attitude information). It will be developed for both cloud and embedded (connectivity ECU) use. A less precise version for legacy systems will use smartphone sensors.

- Trajectory Profiling: Based on the profiles from component A, this component will correlate vehicle data with cartographic, traffic, signaling, and meteorological information. The main profiling component will be cloud-based, but components for incorporating these profiled trajectories into ECU-based systems will also be

considered.

- Gamified HMI for Drivers: This component will be an Android application (for vehicles and smartphones) that allows the components above to interact with drivers, promoting safe, ecological, and efficient attitudes through gamification strategies.



2. AutoSF Consortium

The Research Center on Cyber-physical Systems Security (SecCPS) at UFSC leads the consortium, bringing a set of research labs with a long tradition of cooperation with the automotive sector.

Stellantis is a constellation of 14 iconic automotive brands. As an automaker partner, Stellantis will provide access to data, vehicles, and technical expertise for the validation of predictive maintenance use cases.

Mobilis Veículos Elétricos is the second automaker partner. Like Stellantis, Mobilis will provide access to data, vehicles, and technical expertise to validate the project's use cases.

IAV do Brasil is the consortium's systems provider ('sistemista'). IAV will contribute its expertise in instrumentation and embedded systems development.

Trackli is a startup partner and connectivity specialist. Trackli will support the integration and standardization of data, ensuring the solution's industrial applicability.

[https://www.mobway.cloud/|Mobway] is a Brazilian startup that maintains a vehicle data platform connected to automakers. As a connectivity specialist, Mobway will support the integration and standardization of data for the project.

3. Related Projects

- Auto5G — Intelligent Vehicle Telemetry and Supervision System
- AutoDL — Secure and Privacy-Aware Data Lake
- AutoSM — Optimized Vehicle Assistance
- SmartData on Wheels — a Safe and Secure Runtime Support System