

DATA SCIENCE USE CASE: PREDICTION OF VEHICLE FUNCTIONS

AI-Based Safety Monitoring for E-Drive Systems using Annotated Neural Networks



SOFTWARE AND
FUNCTIONS



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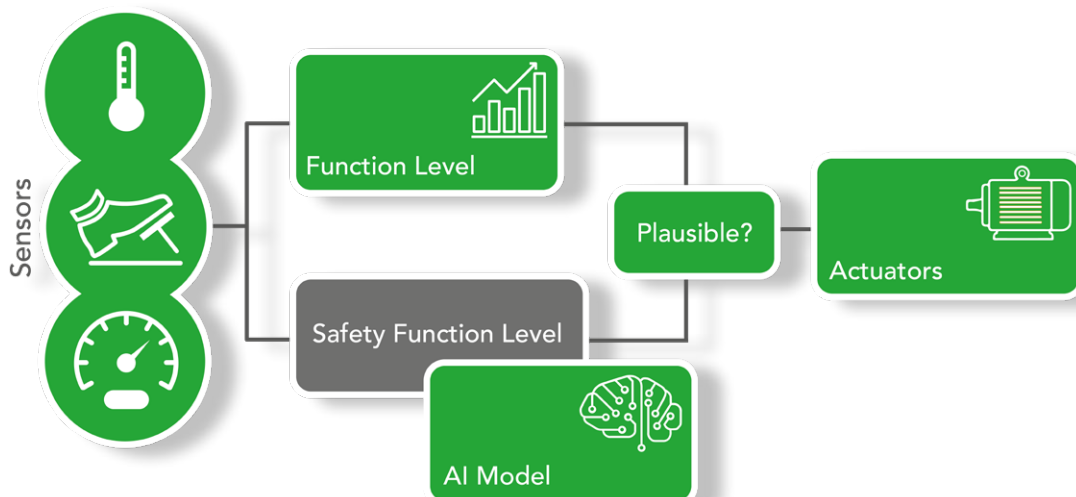
AI-Based Safety Monitoring for E-Drive Systems with Annotated Neural Networks

MOTIVATION

Due to the constantly increasing number of features in vehicles that actively intervene in the vehicle control, the development of safety functions is becoming ever more complex and expensive.

WHY DATA SCIENCE AND AI?

Neural networks are much faster to set up than conventional approaches. In addition, neural networks can be trained to represent highly non-linear functions, as they occur in safety monitoring functions due to the use of mappings and filtering techniques.



APPROACH

AVL trained a neural network to replicate the safety function monitoring for a drive-by-wire system, enabling it to predict engine torque based on drive demand. The labeled training data were collected from an electric vehicle and evaluated using safety-compliant factors.

INPUT

- Driver demand (e.g.: gas pedal)
- ADAS demand (e.g.: cruise control)

OUTPUT

- Engine torque in Nm

BENEFITS

- Reduction of development time compared to conventional safety function
- More accurate prediction of engine torque
- Scalable for different approaches

PREDICTED VS. MEASURED ENGINE TORQUE

