AUTOMOTIVE INTRUSION DETECTION SYSTEM USING AI UNSUPERVISED LEARNING ON INFINEON AURIX™ 2G MICROCONTROLLER FAMILY

Using unsupervised learning algorithms, an IDS designed for the Automotive CAN bus can detect anomalies in the traffic patterns without explicit training on what qualifies as normal or abnormal behavior.

HOW IT WORKS?

This IDS ensures that false positives are reduced by integrating additional methods, such as rule-based systems and statistical analysis. This leads to enhanced vehicle security and reliability eliminating the need for hardware redesign.

The features of AURIX™ 2G Microcontroller family from Infineon made it possible to build software libraries that continuously capture and store CAN Bus data.

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KEY FEATURES

- CAN bus data is continuously captured and stored in a database for analysis.
- Collected data is pre-processed to remove any irrelevant information.
- Unsupervised machine learning algorithms are applied to the pre-processed data to identify any anomalies or deviations from the normal patterns.
- False positive alarms are reduced by integrating an ensemble of filtering machine learning based algorithms to improve the accuracy of the IDS. As a future improvement, the IDS might continuously update the machine learning models to ensure ongoing effectiveness against intrusions.

COST EFFICIENCY

Dramatic cost savings by enabling hardware and software reuse.

INDEPENDENCE

Independence from the protocol over CAN Bus.

RELIABILITY

Enhanced reliability thanks to the continuous data analysis and automatic improvements.

ROBUSTNESS

Intrinsic robustness in time due to unsupervised learning approach.

SECURITY

Improved security on any vehicle architecture without redesign.

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