CAN Newsletter Online

CES 2020

Detecting anomalies in CAN networks

Saferide Technologies (Israel) demonstrated in Las Vegas at the CES 2020 its vSentry anomaly detection software. The software checks automotive ECUs (electronic control unit) on unusual behavior.

The anomaly detection software provides OEMs, fleet operators and automotive suppliers the possibility to prevent cyber-attacks (Source: Saferide)

Saferide presented in Las Vegas the CAN Optimizer, a machine learning based data compression solution for CAN frames. The software reduces the cost of CAN data upload to the cloud by providing 96 % reduction in data size without any information loss, states the provider. It was shown running on NXP's vehicle network processors and on the Telemaco3P processor by ST Microelectronics. Additionally, the company presented its multi-layer cyber-security software for Linux-based connected ECUs, at the Automotive Grade Linux (AGL) stand.

The vSentry Edge AI software uses advanced machine learning and deep learning technology to establish the normal behavior of the vehicle, without dependencies on previous knowledge of the vehicle system's properties and protocols. Customers can execute the automated training mode at multiple points across the vehicle development lifecycle beginning with synthetic data generated from early-stage functional models and software-in-loop all the way to training based upon measured data from hardware-in-the-loop, and full vehicle development fleets.

Normal behavior is iteratively refined and verified to comply with system requirements. During the iterative process, and post start of production, the machine learning models detect, categorize, and flag any abnormal behavior and report it in real-time. Embedded in the central vehicle gateway, the AI (artificial intelligence) software monitors all the in-vehicle communications, including control signals and sensors data.

Several OEMs (original equipment manufacturers) and Tier-1 suppliers have validated the integrated CAN Optimizer. The messages transmitted via CAN networks carry untapped value for vehicle health monitoring, predictive maintenance, vehicle performance optimization, driver behavior analysis, and more. Legacy telematics solutions collect little information from vehicles and rely on restricted computational power. As a result, OEMs receive limited and filtered information about their fleets, resulting in suboptimal operational performance.

While uploading raw CAN data to the cloud can enable advanced data services, the process consumes a significant amount of bandwidth and storage. Based on customer case studies, the CAN Optimizer decreases the bandwidth needed by providing a 96-percent reduction in data size. The CAN Optimizer provides a compression performance that is six times better than any other solution on the market, the software provider claims. "Existing telematics solutions use low bandwidth data-plans and provide limited data capabilities to OEMs and fleet managers," said Yossi Vardi, Saferide's CEO (central executive officer) and co-founder. "CAN Optimizer dramatically extends the value of existing telematics solutions without the need for hardware changes, while still maintaining the same, or lower, data cost."

The CAN Optimizer library was integrated and validated on several telematics chipsets, including the Telemaco3P by ST Microelectronics. It consumes just a fraction of the available processing power and memory of these components.

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