iGP: Autonomous Car

iGP Module: A Secure Over the Air Updater Framework for Automotive Systems

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The normal high complexity in future car applications will require to every now and again updating those applications plus the underling systems of in-car electronic components and ECUs. Regardless of the fact that in-car components are trusted, potential attacks on over the air data exchange force stringent prerequisites on both safety and security.

Last year a prototype operating system (KiTOS) for microcontrollers had been developed in a graduation project (In the context of IoT). A bootloader was introduced and a proof of concept was illustrated.

This year project will focus on implementing a dedicated version of the KiTOS for in-car ECUs with a secure boot loader that can defend against attacks for over the air updates.

Beside writing the required drivers for the vehicular network and communication (CAN and/or Flex Ray), the security part including integrity checks, encryption and digital signature will be included inside the OS Kernel.

The system will be ported to s suitable ECU microcontroller. Plus, an integration with a 3G receiver will also be investigated.