Security of Distributed Cyber-PSecurity of Distributed Cyber-Physical Systemshysical Systems with Connected Vehicle Applications

This project aims at accelerating the deployment of security measures for cyber-physical systems (CPSs) by proposing a framework that combines anomaly identification approaches, which emphasizes on the development of decentralized cyber-attack monitoring and diagnostic-like components, with robust control countermeasure to improve reliability and maintain system functionality. One of the main challenges for cyber physical systems is the security of transmitted data over the communication network. The accuracy of transmitted data over the communication network, corresponding to the performance of different parts of CPS, is highly valuable and is dependent on the capabilities of the applied technology for measurements and data transmissions. Wireless shared communication networks reduce the maintenance cost and provide flexibility to system architecture design especially for large scale distributed systems; however, they introduce a sets of new challenges from the security point of view. In this proposal, we develop security measures for cyber-physical systems by cyber-attack detection and control countermeasure methodologies to make the cyber physical systems resilient to worst-case cyber-attack scenarios. More specifically, this project focuses on applications to connected vehicle systems where vehicles are capable of sharing information via dedicated short range communication (DSRC) network, with the goal of improving performance of the system to known set of attacks such as Denial of Service and improving the fuel efficiency of the system in the presence of malicious vehicle.

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