Master Thesis

Ultra-Low-Latency Wireless Networking for Mission Critical Applications (multiple theses)

Motivation

Wireless Sensor Networks are wireless networks of small, embedded computing devices. These are becoming key building blocks of the Internet of Things or modern Cyber Physical Systems including wireless control systems, networked cars, and other safety-critical systems.

As wireless communication is often dynamic due to interference and mobility an adaptive design is an essential requirement. This is further underlined by the observation that critical safety systems require highly reliable communication at a low delay.

Challenge

This work aims to extend our existing ultra-low-latency protocol stack called CHAOS with new functionality and performance improvements. We have multiple theses on this topic: (1) integrate the concepts of Chaos with TSCH, a recent standard in the Internet of Things and (2) implement quorum based consensus protocols for robust communication. Our Chaos protocol stack is released as open source and is increasingly used by other research groups around the world. With our support, you shall design and implement the protocol extensions and evaluate them in simulation and real-world testbeds. You can conduct this thesis individually or as a team of two students. We will adapt the content accordingly. For details and further questions, please contact us. Just come over for a coffee and discuss this thesis with us.

Background & Requirements

- Computer Science or related programs
- Courses in computer networks, distributed systems, or related ones
- Solid experience in C or C++
- Experience with Linux

Contact

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