AUTOMOTIVE IN-VEHICLE COMMUNICATION ARCHITECTURES

Timing analysis, design space exploration, flexibility, Ethernet ...

- Delay and buffer analysis (FlexRay, Ethernet, ...)

- Schedule synthesis (timing constraints, extensibility requirements)

AUTOMOTIVE COMMUNICATION-AWARE CONTROLLER SYNTHESIS

Control software and schedule synthesis for FlexRay …

- Distributed implementation of automotive control software

- Debayan Roy, Licong Zhang, Wanli Chang, Dip Goswami, Samarjit Chakraborty: Multi-Objective Co-Optimization of FlexRay-Based Distributed Control Systems. RTAS 2016
NEIGHBOR DISCOVERY IN WIRELESS NETWORKS

Bluetooth Low Energy (BLE) …

• How to bound latency, energy consumption in neighbor discovery?

• How to parameterize protocols?

• Philipp H. Kindt, Daniel Yunge, Gerhard Reinerth, Samarjit Chakraborty: Griassdi: mutually assisted slotless neighbor discovery. IPSN 2017

ENERGY EFFICIENT PROTOCOL DESIGN

Wearables, IoT, ...

Send packets only when there is low signal attenuation in the channel (use machine learning)

- Philipp Kindt, Han Jing, Nadja Peters, Samarjit Chakraborty: ExPerio - Exploiting periodicity for opportunistic energy-efficient data transmission. INFOCOM 2015
- Philipp Kindt, Daniel Yunge, Mathias Gopp, Samarjit Chakraborty: Adaptive online power-management for Bluetooth Low Energy. INFOCOM 2015

Smartphone App + MicroApp = HybridApp
- Synthesize apps on the fly using natural language commands and transmit them to everyday devices