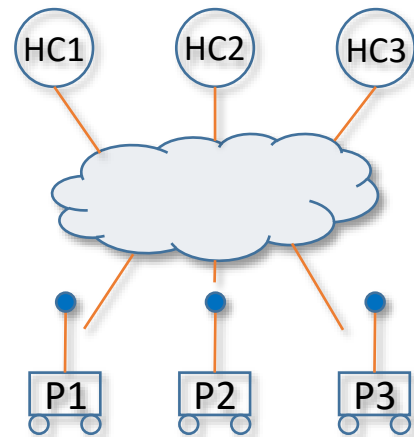
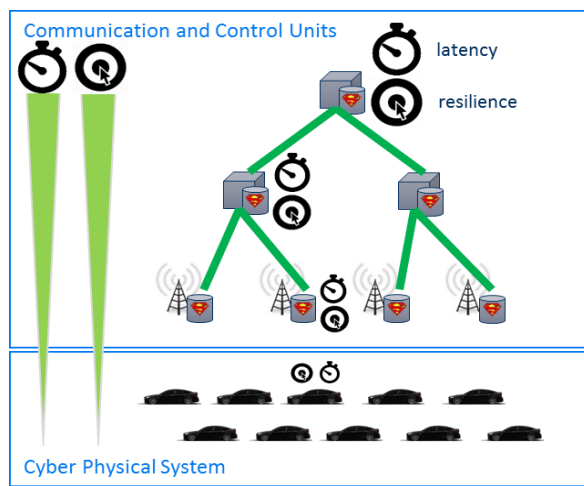


# “In the Search for the Optimal Solution for Controlling Coexisting Networked Control Systems”

Project Topic in OS Kommunikationssysteme WS 2019/20



**Summary:** Networked Control Systems (NCS) are control systems in which the control loop is closed via a communication network. Placing the controller in the cloud may lead to delays and packet losses in the communication that could make the system unstable. Furthermore, having multiple systems attached to the same network requires a centralized processing unit to coordinate them all, having a complete overview of the scenario and being able to bypass the local control units to prevent potential collisions.

In order to overcome the effects of delays and packet losses in the communication, replicas of dedicated controllers and hierarchical controllers of multiple NCS' (inverted pendulums in this case) will be placed, to make sure that the actuators get the required input on time. However, we cannot trust all of the replicas of the controllers, and thus a good strategy need to be implemented.

Therefore, the question is: **which controller to choose?**

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**Tools:** MATLAB, Simulink, C/C++

**Keywords:** Control Theory, Networked Control System, Inverted Pendulum, Hierarchical Controller, Packet Delay, Packet Loss, Replica

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