

## Event-Based Control over Wireless Communication Networks

With the avenue of Industry 4.0, the Internet of Things and 5G Networks, wireless networked controlled systems are becoming more prominent. Envisioned applications range from automated agriculture passing through production lines all the way to autonomous driving.

Classic approaches to tackle control applications are based on periodic updates. For networked control systems connected over shared networks, e.g. 5G, this adds stress on the network when attempting to fulfil the sometimes-overestimated communications requirements.

A different approach of communications for control, namely event-driven or event-based control is a promising technique to reduce the communications demand over the network. This control paradigm consists of transmitting information to actuators or other agents only when information needs to be updated.

Assessing the usefulness of such information for designing communications triggering conditions and their stability are still active areas of research. Event-driven control is hence a promising methodology for reducing the communications requirements.

The candidate for this position is expected to perform

- Literature review, including a comparison and feasibility study of existing event-based frameworks for networked control systems.
- Implementation of selected methodologies in a MATLAB-based software framework
- Evaluation of the selected methodologies under specific use-cases, e.g. longitudinal platooning, formation control or trajectory tracking
- Comparison with other state-of-the art methodologies under communications constraints
- Analysis and interpretation of the results

The skills required from the candidate are:

- Good understanding of control and communication systems.
- Good knowledge in MATLAB programming.
- Knowledge of system theory, signal processing and differential equations are advantageous
- Ability to work independently
- Very good analytical and critical thinking abilities
- Excellent communication skills in English, both written and spoken

For further questions or in case this position appeals you, please send your CV, score sheet and a description of relevant projects / lectures you have engaged in, to:

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