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Control in the IoT: How to deal with various heterogeneous non-idealities?

Raphaël M. Jungers[1]

I. Abstract

In the last decades, in the broad field of Systems and Control several different paradigms have emerged to deal with the control of IoT-enabled cyber-physical systems. Indicative examples include: hybrid behaviour, quantized control, varying delays, safety-criticality, nonlinear control, etc. Although these are typically met together in IoT environments, the research activities have led to disconnected communities, and likewise very specific control techniques, that limit their implementability in a holistic framework. In a real-life IoT control application, these non-idealities take place all together. We will survey the main classes of nonidealities and recent results that link them separately to the quality of performance guarantees for control systems. We will raise the question of how these results can be merged in a holistic IOT-control paradigm.

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[1]ICTEAM Institute, Université catholique de Louvain, Belgium; raphael.jungers@uclouvain.be

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