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Autor(en): Samuele Zoppi; Onur Ayan; Fabio Molinari; Zenit Music; Sebastian Gallenmüller; Georg Carle; Wolfgang Kellerer

Titel des Berichts: Reproducible Benchmarking Platform for Networked Control Systems

Abstract: The evolution of the Internet of Things accelerated the development of Cyber-Physical Systems. Among them, Networked Control Systems (NCSes) gained notable attention thanks to their application to industrial operations. Experimental NCSes require expertise from control, computation with the fragmentation of hardware and software used for the implementation of NCSes, represents a challenge for the reproducibility of research results. In this paper, we present the first reproducible experimental benchmarking platform for NCSes. The proposed platform is open-source and designed to be easily reproducible and extensible by anyone. Additionally, we present an NCS benchmarking methodology that aids the reproducibility of NCS experiments. To this end, it defines the parameters of the experiment and the relevant Key Performance Indicators (KPIs) that need to be observed during its execution. Finally, we evaluate in details the proposed KPIs and validate the benchmarking methodology by reproducing the platform and comparing the KPIs in different scenarios. Results present the performances of the two platforms and prove the validity of the proposed NCS benchmarking methodology.