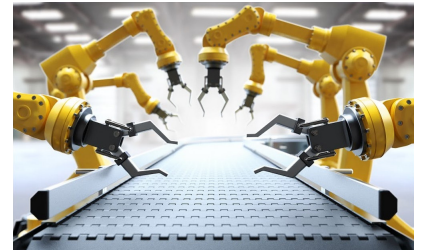


Embedded Testbed for Reproducible Measurements

Motivation

With comprehensive automation in all fields of industry, from energy to automotive, the importance of Cyber-Physical Systems (CPS) steadily grows. Trustworthiness and capabilities of CPS are vital requirements for reliable and performant systems. Reproducible measurements of embedded components constitute an important tool on the way towards secure and thoroughly understood systems. Especially in the automotive context, where the amount of available power and computational resources increases, more complex and capable embedded components are installed.



In this IDP, we extend the existing measurement infrastructure of the chair. The measurement testbed already features a plethora of servers, as well as an orchestration system. To model powerful, modern CPS components, multiple Raspberry Pi 4B Boards [1] are to be integrated into the testbed, during this IDP. After configuration and integration into the orchestrator, simple throughput and latency measurements are conducted to approximate the baseline performance of the boards.

Your Tasks

- Familiarize yourself with the chair testbed and orchestrator
- Create a working image/setup for the Raspi4B
- Integrate all available boards into the testbed
- Conduct baseline performance measurements
- Evaluate your findings

References

- [1] Raspberry Pi Foundation, "Raspberry Pi Model 4B", <https://www.raspberrypi.org/products/raspberry-pi-4-model-b/>, [Online] last-accessed: 2020-09-15

Prerequisites

- Experience with Linux-based operating systems and networking
- Experience with programming networking applications

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