

Title: Specification and Validation of a TSN-compliant Ethernet Network for industry 4.0

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Objective:

To cope with the emerging requirements for Industry 4.0, the main objective of this thesis is to specify a new TSN-compliant Ethernet network guaranteeing the main constraints while improving the costs and performance of such systems.

Main Steps:

- **Related work:** to understand the TSN standard and the recent work for industry 4.0 from the communication point of view to define the main requirements. Afterwards, we need to select the most adequate TSN mechanisms vs the industry 4.0 requirements ;
- **Specification:** we need to specify a communication network based on TSN guaranteeing the requirements of the industry 4.0, while decreasing the costs of implementation and maintenance ;
- **Performance and safety evaluation:** we need to evaluate the performance of the specified network to verify the real-time constraints and to evaluate the dependability of such network to validate the safety level
- **Design methodology:** knowing the specification and the evaluation methods, we need to define a design methodology for dimensioning the network for a given context.
- **Prototyping and measurement on a testbed :** we need to prototype the specified network and integrate within Factoring platform to enable measurements and evaluation on a representative test bed.

Dates:

1st October 2021 (or later if the internship finishes later) to 30 September 2024

Deadline: June 28th

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