

Masters Thesis Proposal

Time-sensitive networking for power grids

Position available at Hitachi Energy Research in Västerås, Sweden

Opportunity:

- The path to decarbonization and sustainable development involves massive integration of renewable energy sources in power grids
- Reliable and time-sensitive communications are essential for high-performance control and protection of renewable power grids
- Emerging networking standards, such as IEEE 802.1 Time Sensitive Networking (TSN), offer new features that can improve the communication performance in power grids, facilitating the integration of renewables and simplifying the path to a sustainable future
- Hitachi Energy, a world-leading supplier of power grid equipment, including control, protection and communication devices, has interest in exploring these possibilities

Topic:

The thesis aims at exploring the performance and capabilities of IEEE 802.1 TSN in the context of critical communications in power grids. Specifically, the focus is on how TSN features can allow deterministic communication in IEC61850 substations, as discussed in IEC reports [1].

The work includes theoretical analysis, network simulations and experimental prototyping of simple TSN networks.

Competences needed:

Successful applicants should have experience with software programming and networking protocols, with a preference for candidates that have been exposed to IEEE 802.1 TSN and network simulation tools.

Previous experience and/or strong interest in energy and power applications are a plus.

Other desired skills are fluency in English (both written and spoken), time management and ability to work autonomously.

References:

[1] IEC TR 61850-90-13:2021, "Communication networks and systems for power utility automation - Part 90-13: Deterministic networking technologies"

How to apply:

Send an email to michele.luisotto@hitachienergy.com, including your CV and transcripts (BSc and MSc)