

Dissertation Release**14.10.2022**

Digitalising metrology forms a foundation for the trustworthiness of measurement data in industrial IoT

Title of the dissertation	Digitalisation of metrology for improving trustworthiness and management of measurement data in industrial IoT systems
Contents of the dissertation	Measurements help us evaluate physical properties of objects or examining physical phenomena, thus being an essential part of our daily lives. The science enabling trustworthy measurements is metrology, i.e., the science of measurement, which has its roots tracing all the way back to the ancient civilisations. In the 21st century the digitalisation of our society and the emergence data driven technologies, especially in industrial applications, has led to the situation where metrology is becoming more important than ever. However, since metrology has traditionally been slow to transform, the growing demand for keeping up with the recent developments in the other fields of science are driving metrology towards a revolutionary digital disruption. The research presented in the dissertation aimed to investigate how the digitalisation of metrology could be optimally exploited to improve trustworthiness of data in industrial internet of things (IIoT) applications. The results of the research indicate that digitalisation of metrology will enable significant improvements in terms of efficiency and reduction of operation costs in the industrial processes and applications where calibrations are needed. Additionally, digitalisation also enables extending metrological traceability to applications where conventional methods have been infeasible. However, as the digital disruption of metrology is still at a relatively early stage, there are still several obstacles that the metrology community needs to overcome, especially considering the global applicability of digital solutions.
Field of the dissertation	Mechatronics
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Place of the defence	Aalto University School of Engineering, Department of Mechanical Engineering, Otakaari 4, 02150 Espoo, Finland, Auditorium K216.
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