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Methodological Guidelines for Modelling and Design of Embedded Systems

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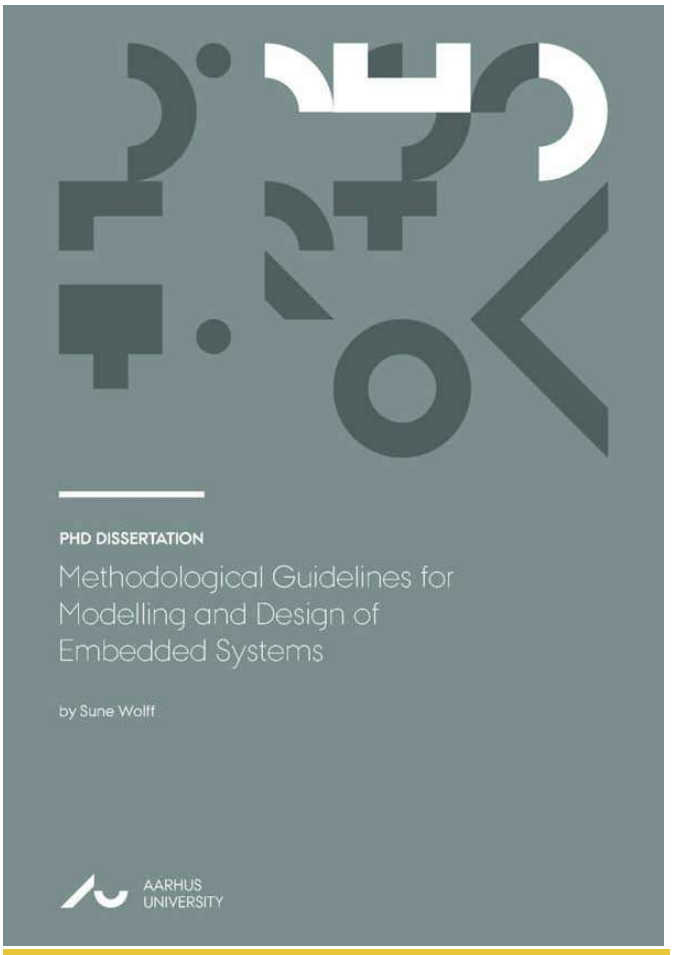
The development of heterogeneous embedded systems is a demanding discipline. Technical challenges arise from the need to develop complex, featurerich products that take the constraints of the physical world into account. This thesis shows how a modelling approach to embedded systems development can address some of these challenges. Methodological guidelines supporting various levels of modelling fidelity are presented. These range from: mono-disciplinary modelling, where the embedded controller as well as its environment are modelled in a single formalism, to multi-disciplinary modelling where separate formalisms are used to describe the controller and environment. The use of the guidelines is demonstrated by means of several industrial case studies from the electronic warfare domain. To support the project management aspect of using a modelling approach to embedded systems development, the integration of formal modelling and agile methods is described. The result is a collection of lightweight methodological guidelines which can be integrated into industry strength development processes.



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