THESIS IN SOFTWARE ENGINEERING



We search students for a range of thesis projects in collaboration with DHI Water & Environment

IT UNIVERSITY OF COPENHAGEN

End-User Development of Hydraulic Simulation Systems

(Supervisors Yvonne Dittrich and Andrzej Wasowski)

End-User Development (EUD) is a research area addressing tools and practices of end-users developing there software by configuration as well as customisation or even programming from scratch. A sub discourse addresses EUD in the context of scientific computing.

DHI develops and uses high-end hydraulic simulation software. The Solution departments adapt the software for specific consultancy projects as decision support systems. This adaptation takes place by configuration, customisation and “wrapping” - that is adding services and customer specific functionality around the standard products. Both can be regarded as End-User Development.

A master thesis should elicit practices and needs of the End User Developers at DHI solutions and explore the applicability of existing solutions promoted by literature. Examples for questions are: What are typical customisation features? What kind of source code changes are involved in the implementation of typical customisation features? How are they documented today? What are the problems in locating and maintaining a customisation feature? How are solutions and expertise shared within DHI?

Distributed Development of Hydraulic Simulation Systems

(Supervisor Yvonne Dittrich)

DHI develops and uses high-end hydraulic simulation software in a distributed manner. Recently teams in Denmark are cooperating with teams in China and India around the development of a framework adding services around a standard simulation system to support decision support for water management.

DHI offers a Master student the possibility to study the distributed development in the context of scientific software, that is hydraulic modelling for decision making purposes, which requires a high level of expertise in the application domain. The student should investigate the distributed development, identify difficulties and explore the literature on distributed developments for possible remedies.

Requirements for Traceability for Reliable Decision Support Systems For Water Management

(Supervisor: Kasper Østerbye and Andrzej Wasowski and/or Yvonne Dittrich)

To improve the quality of software, it is important that design is done on the basis of requirements, programming is done on the basis of design, that bugs are corrected, that documentation is up to date, etc. A traceability system tracks such relationships.

DHI develops hydraulic simulation software and applies it in water management applications. The Master student is expected to investigate - through interviews, code and document analysis - the traceability requirements both during development and during usage of the water management systems. The result of the thesis is expected to influence development of a modern traceability platform.

Cross-Organisational Cooperation for Software Product Evolution

(Supervisor: Yvonne Dittrich)

DHI develops, and uses high-end hydraulic simulation software. The software development is divided in the development of standard products and of customer specific solutions. These take place in different units but depend on each other - both seen from technical and business process perspective: technically, e.g. the solutions development establishes requirements towards the standard products, and releases have to be coordinates; and business-wise, e.g. the solution department software often includes use and sale of standard products and solution people often have closer interactions with the user than the standard product people.

The Master thesis is expected to investigate - through interviews and document analysis and the like - the potentials and challenges of this cooperation. The analysis should relate the findings to research on community based development (open source) and on User Driven Innovation.

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