



## Popular science summary of the PhD thesis

PhD student	<u>Henning Brüske</u>
Title of the PhD thesis	<u>Structural Test Design with Value of Information</u>
PhD school/Department	<u>Department of Civil Engineering</u>

### Science summary

\* Please give a short popular summary in Danish or English (approximately half a page) suited for the publication of the title, main content, results and innovations of the PhD thesis also including prospective utilizations hereof. The summary should be written for the general public interested in science and technology:

Value of information is a concept that helps decision makers to identify the best of several options using objective metrics. In regards to the safety of structures a decision maker might want to employ the value of information concept to decide if she shall do a test or not, and if he wants to test, which test to use. Structures like buildings, bridges, tunnels, or even wind turbines (on- and offshore) are designed with a target reliability in order to ensure their safe operation. But such structures are subjected to the environment. Wind, waves, earthquakes, corrosion, fatigue, and more processes can weaken or damage a structure.

Several structural health testing methods are known but few of them are recommended as best practice because of the value their provided information can deliver, but rather because they are well established. Structural health testing can be done with inspections, monitoring, proof loading, or even hybrid simulation, to name a few methods. The work examines the value of information provided by proof load testing and hybrid simulations, two methods that have unlike inspections or monitoring, not been evaluated under this aspect.

A second topic evaluated is the use of proof load testing as a means of quality control and method to improve structural designs. To allow for the evaluation of proof loading in context of design improvements the concept of value of information & actions has been developed which is an extension to the value of information concept developed in the early 1960s.