



Master Thesis - Optimization of strain gauge placement

Background

Advanced engineering in fields such as aerospace and automotive requires high quality information about the structural loads which the designs are subjected to. One way to obtain this information is by measuring the small displacements (strain) in the structure when it is loaded. The strain can be measured with strain gauges that are glued onto the structure. By measuring the response of the gauges when the structure is subjected to a known load the transfer functions between the loads and the strain can be calculated. By inverting this matrix the load can then later be calculated from the strain measured in service.

The locations of the strain gauges have a large impact on the accuracy of the results. Currently, most companies use “rules of thumb” and engineers’ best guesses to select the locations for the strain gauges. For complex structures that are exposed to several different loads (vehicles for example), it is difficult to intuitively choose good positions for the strain gauges.

It would be beneficial to many engineers to have a better method for selecting strain gauge locations in their structures. Widespread use of the Finite Element Method has created an opportunity to develop software to do this automatically, but with a very large number of possible locations a good optimization algorithm is needed.

Assignments

Perform a literature study on the scientific papers written on this subject.

Take the lead in developing an optimization algorithm which finds optimal strain gauge locations.

Personal characteristics

You are someone who has a passion for programming and optimization. Knowledge about strength and FEM is a plus.

About Us

We are a startup company situated in Stockholm.

Application

Cover letter, CV and copies of university transcripts in English or Swedish sent to info@lwengineeringsoftware.com.

Contact

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