

IDENTIFICATION OF THERMAL SYSTEMS

Assignment

The goal is to develop and test a frequency based identification method, such as LPM, for a thermal system and show the accuracy of this method.

Activities

- Make a (simple) model of the thermal system to be tested (i.e. lumped mass).
- Apply traditional step-response identification for first-order identification.
- Develop a frequency based identification (LPM / LRM).
- Test accuracy of this frequency based identification.
- Fit the parameters of model to the measured response.

Context

In the development of mechatronic products and systems, thermal effects often affect the performance or the precision. As the demands on performance are continuously increasing, the challenge to handle these effects is becoming more important.

High quality thermal systems models are essential to optimize overall system performance. Next to the modelling, verification and identification on system hardware or is required.

Internship overview

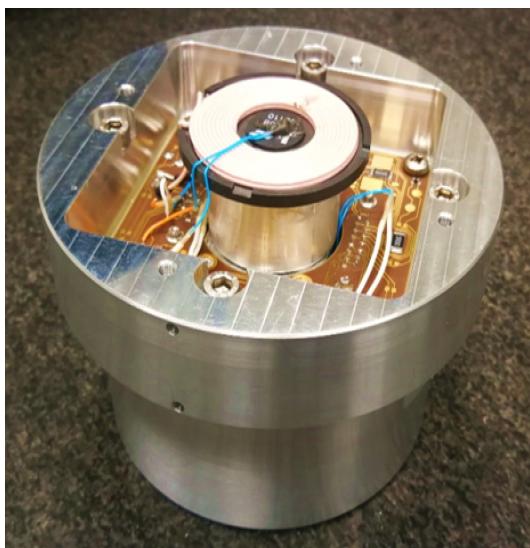
- Master Student
- Internship Assignment
- Mechatronics
- Location: Nuenen

Technologies

- Thermal
- Modeling
- Lumped mass
- System identification
- Step-response
- LPM / LRM
- Multi-sine



Traditionally thermal identification is done by performing step-response measurements and fitting time-constants. This method is time consuming and gives only limited insight into the system. State-of-the-art identification algorithms, such as local polynomial method (LPM), result in more information (frequency information), shorter experiments and better rejection of disturbances.



*Thermal setup for identification,
with multiple heaters and sensors*

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- Working on innovative technology
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Get in touch!

Would you like to know more about this student assignment?

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