SIEMENS

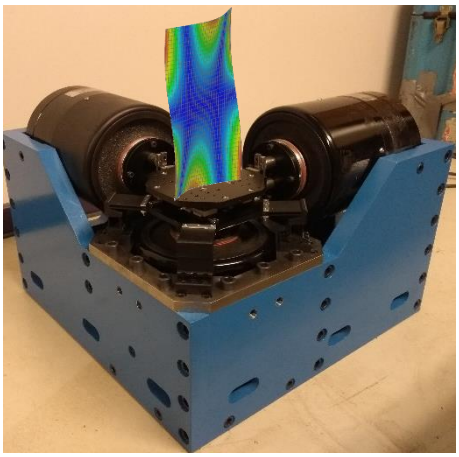
Siemens Industry Software NV
Digital Factory Division PLM
Simulation and Test Solutions
Interleuvenlaan 68
B-3001 Leuven (Belgium)

T +32 16 384 200
F +32 13 384 350
www.siemens.com

Internship / Master thesis proposal

Digital Twins for full-field monitoring in vibration control applications

Start: February 2023
Duration: 6 months



Background

Vibration control testing is of paramount importance in the qualification campaign of aerospace components. However, the evaluation of the dynamic responses is restriced to the information provided by a limited number of physical sensors installed in the structure under test. The introduction of Digital Twins for vibration control aims at extending the test data by combining the physical responses with virtual solutions obtained from refined multi-physics models, allowing test engineers to inspect the structure in locations that are not instrumented.

Research Topics and Activities

The student will perform numerical and experimental analyses on a small-scale shaker platform available in our facilities at Leuven. She/he will investigate different methodologies to correlate the simulation and experimental data onsite, as well as new techniques to improve the model predictions:

- Generate multi-physics models of the test plant including shaker response, test rig dynamics and structural specimen coupling.
- Perform open and close-loop vibration tests to identify the system responses and correlate them against the simulation model.
- Investigate different Model Order Reduction methods to compress the simulation model and update the virtual solutions, e.g. machine learning, modal models,…
- Evaluate full-field solutions obtained during the control test

Requirements

- Enrolled student in a Master course of Mechanical or Aerospace Engineering or similar field of study.
- Strong interest in physical modelling, numerical simulation and dynamic testing.
- Good knowledge in modal analysis, control tests and FEM.
- Experience in numerical computing (Matlab preferred).
- Fluent level of English.
- Good communication skills, result-oriented mindset and able to work independently.

Contact

Does the proposal fit your objectives and profile? If you wish to apply for this internship, or you have any questions regarding the position description, please contact Alberto Garcia de Miguel (alberto.garcia_de_miguel@siemens.com) or Mattia Dal Borgo (mattia.dal_borgo@siemens.com) including your cover letter, CV and current certificate of enrolment.