

Internship Proposal

Nearfield Acoustic Holography in confined spaces adopting an Equivalent Source Method in presence of a mean flow: assessing strengths and limitations of the approach and investigation of de-noising techniques.

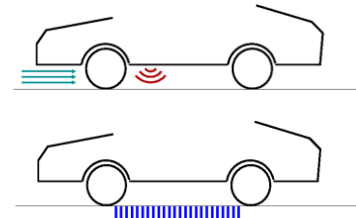
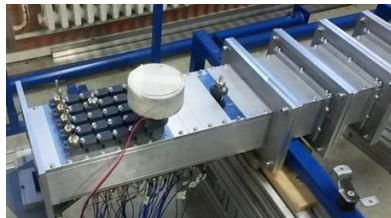
Internship location: Siemens Industry Software NV, Leuven, Belgium

Local coach: Ir. Claudio Colangeli (claudio.colangeli@siemens.com);
Dr. Jacques Cuenca (jacques.cuenca@siemens.com);
Dr. Karl Janssens (karl.janssens@siemens.com);

Internship duration: 4 to 6 months

Project summary:

The proposed work is included in a broader contest in which the acoustic sources generated by the wind in the underbody of a car are studied by means of acoustic imaging techniques. A dedicated Nearfield Acoustic Holography method for confined spaces in presence of a mean flow is therefore required. The presence of a flow pollutes the signals recorded by the flush mounted microphones of the array with uncorrelated background noise dramatically decreasing the Signal-to-Noise-Ratio. For mitigating this issue, de-noising methods are required. A measurement campaign on test rigs (see figures) representative of such complex acoustic scenarios has been performed for providing a validation case for the developed methods. The proposed thesis focuses on the study of the above mentioned de-noising techniques with the main goal of investigating their effectiveness through a systematic analysis.



Project main objectives:

- Gain skills on signal acquisition, signal processing, experimental acoustics techniques.
- Gain insight in acoustic phenomena in ducts and reverberant environments.
- Sensitivity analysis of the effectiveness of the de-noising techniques.

Candidate profile:

- Master student in Mechanical Engineering, applied physics, with knowledge in acoustics.
- Skills in experimental acquisition and related signal processing.
- Fluent in English.
- Hardware/ software: Matlab, LMS Test.Lab is an asset.

Practical remarks:

- Siemens Industry Software NV is hosting the student and affords for accommodation.