

Semester / Master Thesis:

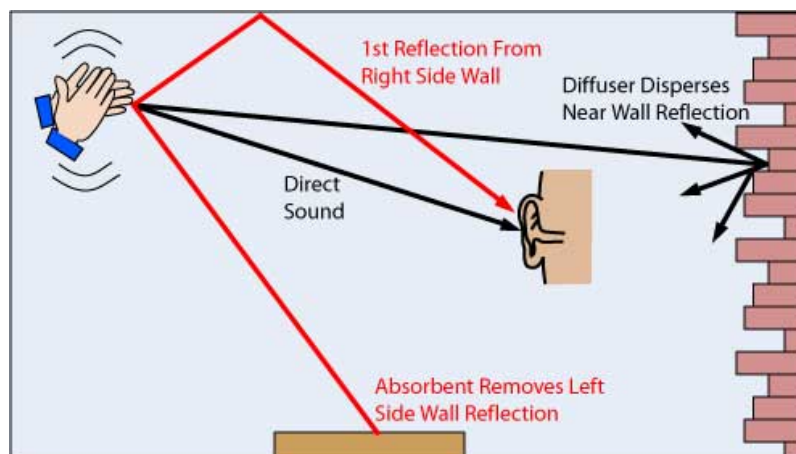
## Efficient Sound Simulation of Room Acoustics

**Motivation and Informal Description:** This project is done in collaboration with Autonomous system Lab and the main supervisor is Florian Perrodin from MAVT lab.

Designing a concert hall or enabling realistic sound effects in video games have in common that they both require an accurate simulation of the sound propagation in the environment. But most of the accurate simulators available are very slow, because they need to discretize both space and time, resulting in high memory and power consumption. Recently, a technique related to domain decomposition methods (DDM) was introduced and drastically reduces the computing requirements as well as it increases the overall accuracy. The student will be in charge of understanding existing techniques and implementing a simulator able to quickly simulate simple room acoustics.

### Work Packages:

- Literature review of sound simulation techniques.
- Implementation of a 3D simulator based on DDM/DCT (discrete cosine transform) using Matlab for simple geometries.
- Assessment of simulator quality using already implemented simulators.



**Requirements:** Some background in MATLAB is preferable.

**Interested?** Please have a look at <http://www.tec.ethz.ch/research.html> and contact us for more details!

### Contacts

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