Internship Institut ∂'Alembert – LAM Team – 2024

Real-time room acoustics: late reverb stitching

Place: LAM team, Institut Jean le Rond d'Alembert, Jussieu (Sorbonne Univ.), Paris

Duration: 4-6 months

Start: March (can adapt to school schedules)

Supervision: David Poirier-Q.[1] (researcher)

Co-supervision: Brian F.G. Katz[2] (research director)

Salary: Following university policy.

Context and goal

Part of the LAM team, the Sound and Space group conducts research on room acoustics, spatial sound and interaction in mixed realities. The group recently took part in the development of a real-time acoustic solver, based on an Image Source Model (ISM) coupled to a Feedback Delay Network (FDN). The goal of the internship is to design methods for adjusting both the gain and the overall delay of the FDN so that it seamlessly blends with the output of the ISM. The proposed methods will be assessed though objective and perceptual comparison with real Room Impulse Responses (RIRs).

Expected results

The intern will be tasked to design and propose an algorithm to adjust the gain and the overall delay of an FDN coupled to an ISM. The various stages of the algorithm will be justified based on the literature, objective metrics or perceptual validation. The algorithm will be interfaced with the acoustic solver to facilitate evaluations in interactive environments (dynamic ISM order, moving source/receiver, changing room geometry, etc.). If time allows, the intern will be in charge of designing and running a full experiment to validate the proposed approach.

Sought skills

Matlab, Max/MSP, Javascript, basic foundations of room acoustics, spatial perception, and signal processing.

Contact

David Poirier-Q. (`david.poirier-quinot@sorbonne-universite.fr`)

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[1]David Poirier-Q. website: `https://pyrapple.github.io`.

[2]Brian F. G. Katz website: `http://www.lam.jussieu.fr/Membres/Katz/index.php?page=accueil`.