Jesper Brunnström

Education

2021– **PhD candidate**, *KU Leuven*, Supervised by Marc Moonen
Marie Skłodowska-Curie early stage researcher in the project Service-Oriented, Ubiquitous, Network-Driven Sound (SOUNDS). The project has included a 5-month research stay at Aalborg university and a 5-month research stay at Bang & Olufsen. The research topic is sound field estimation and sound field reproduction, applied to personal sound zones and active noise control. Skills developed during the project include:
- Sound field modelling
- Bayesian inference
- Hilbert space methods
- Riemannian optimization
- Convex optimization

2019–2020 **Research studies**, *University of Tokyo*, Supervised by Shoichi Koyama
Researched spatial active noise control for two semesters. In addition to a master's thesis lead to one journal paper, two conference papers, and a patent.

2015–2021 **Bachelors & M.Sc. Degree**, *KTH*
Electrical engineering programme with a focus toward signal processing. Weighted GPA 4.6/5

Publications

Journal Papers

2025 Jesper Brunnström, Martin Bo Møller, and Marc Moonen
Bayesian sound field estimation using moving microphones. IEEE Open Journal of Signal Processing.

2023 Jesper Brunnström, Toon van Waterschoot, and Marc Moonen
Signal-to-interference-plus-noise ratio based optimization for sound zone control. IEEE Open Journal of Signal Processing.

2021 Shoichi Koyama, Jesper Brunnström, Hayato Ito, Natsuki Ueno, and Hiroshi Saruwatari
Spatial active noise control based on kernel interpolation of sound field. IEEE/ACM Transactions on Audio, Speech, and Language Processing.

Conference Papers

2025 Jesper Brunnström, Martin Bo Møller, Jan Østergaard, Toon van Waterschoot, Marc Moonen, and Filip Elvander
Spatial covariance estimation for sound field reproduction using kernel ridge regression. *Accepted* in European Signal Processing Conference (EUSIPCO).

2025 Jesper Brunnström, Martin Bo Møller, Toon van Waterschoot, Marc Moonen, and Jan Østergaard
Experimental validation of sound field estimation methods using moving microphones. *Accepted* in Forum Acusticum.

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2024 Jesper Brunnström, Marc Moonen, and Filip Elvander
Robust signal and noise covariance matrix estimation using Riemannian optimization. In European Signal Processing Conference (EUSIPCO).

2024 Jesper Brunnström, Martin Bo Møller, Jan Østergaard, and Marc Moonen
Bayesian sound field estimation using uncertain data. In International Workshop on Acoustic Signal Enhancement (IWAENC).

2023 Jesper Brunnström, Toon van Waterschoot, and Marc Moonen
Sound zone control for arbitrary sound field reproduction methods. In European Signal Processing Conference (EUSIPCO).

2023 Jesper Brunnström, Martin Jälmby, Toon van Waterschoot, and Marc Moonen
Fast low-rank filtered-x least mean squares for multichannel active noise control. In Asilomar Conference on Signals, Systems, and Computers.

2022 Jesper Brunnström, Shoichi Koyama, and Marc Moonen
Variable span trade-off filter for sound zone control with kernel interpolation weighting. In International Conference on Acoustics, Speech, and Signal Processing (ICASSP).

2021 Shoichi Koyama, Tomoya Nishida, Keisuke Kimura, Takumi Abe, Natsuki Ueno, and Jesper Brunnström
MeshRIR: A dataset of room impulse responses on meshed grid points for evaluating sound field analysis and synthesis methods. In IEEE Workshop on Applications of Signal Processing to Audio and Acoustics (WASPAA).

2021 Jesper Brunnström and Shoichi Koyama
Kernel-interpolation-based filtered-x least mean square for spatial active noise control in time domain. In International Conference on Acoustics, Speech, and Signal Processing (ICASSP).

Teaching

2021–2024 **Teaching assistant**, *KU Leuven*, Audio processing
In charge of lab sessions and associated examinations, covering topics such as frequency-domain filtering, noise reduction, and active noise control.

2024 **Supervisor M.Sc. thesis**, *KU Leuven*

2021 **Teaching assistant**, *KTH*, Calculus in several variables

2017 **Teaching assistant**, *KTH*, Calculus in one variable

Other

2021– **Peer review**, *Contributed reviews to the following publications*
IEEE Transactions on Signal Processing
IEEE/ACM Transactions on Audio, Speech, and Language Processing
IEEE Open Journal of Signal Processing
Journal of the Acoustical Society of America
EURASIP Journal on Audio, Speech, and Music Processing
International Workshop on Acoustic Signal Enhancement (IWAENC)

Software, *Python packages using NumPy & JAX*
aspcol: Sound field estimation and control methods from published research papers
aspcore: Core signal processing functionality
aspsim: Room simulation for adaptive audio processing and moving microphones
riecovest: Covariance estimation using Riemannian optimization

Datasets, *Published under permissive licenses*
RoMMS : Sound field recordings with both moving and stationary microphones.
MeshRIR : Room impulse responses on a densely sampled grid from up to 32 loudspeakers

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2021 **Patent**
Pending patent on a method for spatial active noise control. Patent number JP2022172659A.

2024 **Outreach**
Contributed to a spatial audio demonstration for the purpose of science communication, used for Life is Science in a Digital World.

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