

# ACOUTECT

## Open Position at Aalto University in the Field of Spatial Sound combined with Room and Building Acoustics

### Novel measurement and auralization techniques for building acoustics (ESR13)

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Acoutect is a European project running from January 2017 until December 2020. This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement number 721536.

Acoutect marries "Acoustics" and "Architect" and responds to the important role that Acousticians have in the design of modern buildings. The overarching aim of Acoutect is to set up a PhD training network on building acoustics and react to the acoustic challenges stemming from modern building concepts to deliver sustainable indoor environments with respect to health and well-being.

Within this project we are seeking an early-stage researcher (ESR) for a duration of 36 months to join the Virtual Acoustics Team at the Department of Computer Science, Aalto University, in Finland.

### The Virtual Acoustics Team at Aalto University

The main research area of the Virtual Acoustics Team at Aalto University is room acoustics and spatial sound. The team has worked over two decades on room acoustics modeling and auralization. Moreover, during last decade the team has concentrated on concert hall acoustics, and results in human perception, novel spatial sound measurement and auralization techniques have raised the team to be one of the best in the world in room acoustics.

Prof. Tapio Lokki and Prof. Lauri Savioja lead the team, which has state-of-the-art multichannel listening rooms, measurement equipment, and working conditions. The team has also very good connections in academia world-wide and with companies in Finland.

### Project Background

To ensure a healthy environment for people living and working in buildings, research and engineering in the area of building acoustics is essential. Developments in modern building concepts, such as sustainable low-energy consuming buildings, buildings with lightweight materials and open plan working environments, as well as the need to build in extremely noisy areas, require involvement of acoustic experts in order to successfully (re)design buildings without negatively impacting upon people's health and well-

being. Taking up current and future acoustic challenges requires innovative solutions based on a thorough understanding and mastering of modern methods and tools, as well as a holistic acoustic approach involving acoustic design, products and subjective evaluation. However, in the complex field of building acoustics, research activities typically are not holistic and have become slightly marginalised. As a consequence, there is a lack of building acoustics experts.

To meet the future acoustic needs of the built environment, Acoutect is constructed around two objectives:

1. Establish a long-lasting European-wide training programme on building acoustics.
2. Launch an innovative research programme.

With these objectives, Acoutect will equip early stage researchers (ESRs) with skills to ensure acoustic quality of modern and future building concepts, and with excellent perspectives for a career in industry or academia within the area of building acoustics. The training and supervision to reach these objectives is offered by the Acoutect consortium.

### Vacancy description

The Virtual Acoustics Team has recently developed the Spatial Decomposition Method (SDM), which allows spatial analysis of measured impulse responses. In addition, the SDM enables very realistic auralization of measured spaces with any spatial sound reproduction method. This project extends the SDM and aims to develop novel spatial sound recording and reproduction techniques.

This project will result in a new parametric spatial sound recording and reproduction technique. The task includes design and construction of a microphone array, development of a parametric analysis method and multi-channel and binaural auralization methods. Moreover, the developed methods will be continuously evaluated with small scale listening tests to assure the high fidelity in the reproduction. Moreover, intuitive visualization techniques for spatial sound will be investigated. The Aalto Virtual Acoustics Team has a lot of experience on all the required research fields and the project will have strong support by the other PhD students, post-docs, and the supervising professor.

To conclude, your research project will focus on the development state-of-the-art spatial sound recording and reproduction techniques that enable perceptual studies of room and building acoustics in laboratory conditions.

## Candidate Profile

All candidates must be fluent in spoken and written English. The R&D is highly multidisciplinary. An ideal candidate has an M.Sc. in engineering (e.g. acoustics, computer science, building physics, physics, mathematics).

- Knowledge of audio signal processing, mathematics, audio technology, and matlab skills is a strong advantage.
- Candidates get the opportunity to perform this work as part of a PhD study.
- All members of the network are equal opportunity employers, both female and male candidates are invited to apply.

## Job conditions

The host organisation will appoint the successful applicant under an employment contract with a very competitive salary according to EU regulation, including social security. The duration of the contract is, at least, 36 months. The fellow is expected to join their host organizations starting from July 2017 (estimated time). The salary is composed from the following allowances depending on the personal status of each fellow (see more details at [www.acoutect.eu](http://www.acoutect.eu)):

- Living allowance: Monthly rate of €3,110. This amount will be multiplied by the Country Correction Coefficient of the recruiting institution. This amount includes the monthly salary for the fellow before any deductions (contributions of both employers and employees to social security, pension, taxation, voluntary deductions, etc).
- Mobility Allowance: Monthly rate of €600. Contributes to the expenses of the researcher caused by the mobility.
- Family Allowance: Monthly rate of €500. For all the recruited fellows who have family at the time of the recruitment.

Additional funding for participation to courses, workshops, international conferences, etc. is ensured.

This position includes doctoral studies. The successful applicant must register for the PhD program at Aalto University School of Science. The duration of the doctoral studies in Finland is 4 years. Therefore, this position includes an additional year contract at the end of Acoutect (the employment contract conditions for this last year are according to Aalto regulations).

## EU Eligibility criteria for candidates (in short)

The applicant may be of any nationality.

The applicant shall at the time of recruitment be in the first four years of his/her research career and have not been awarded a doctoral degree. This is measured from the date when the applicant obtained the degree, which would formally entitle him/her to register as PhD candidate.

The applicant must not have resided or carried out his/her main activity in the country of the host institute for more than 12 months in the 3 years immediately prior to the recruitment.

## Benefits

Aalto University is a multidisciplinary community where science and art meet technology and business. Aalto University offers to the selected candidate an innovative and ambitious research environment with the best scientists in their fields. Aalto, having about 20 000 students and 4 500 employees, is located in Espoo, 11 minutes with metro from downtown of Helsinki. Finland is known for its excellent social security system and beautiful nature. For the selected candidate assistance for finding accommodation can be given.

## How to Apply

Follow the instructions at [www.acoutect.eu](http://www.acoutect.eu).

**APPLY NOW!** Application open from February 1<sup>st</sup> 2017. The evaluation process of the applications will start from April 1<sup>st</sup> 2017.

Questions regarding this position: [info@acoutect.eu](mailto:info@acoutect.eu).