

# ACOUCTECT

## Open Position at Siemens Industry Software in the Field of Advanced Numerical Methods for Building Acoustics

### Advanced BEM for binaural synthesis including moving source or listener (ESR15)

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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. The coordinator of the project is Eindhoven University of Technology (TU/e).

Within this project we are seeking an early-stage researcher (ESR) with a duration of 36 month to join the Acoustic solvers team of **Siemens Industry Software** in **Leuven, Belgium**.

#### Siemens Industry Software NV

Siemens Industry Software N.V. (SISW, formerly known as LMS) is an engineering innovation company, with proven track record in the area of system modelling for noise, vibration, durability and dynamics, performing substantial in-house research on advanced methods and applications. SISW is part of the Siemens PLM Software, a world-leading provider of product lifecycle management and manufacturing operations management software. We help thousands of companies realize innovation by optimizing their processes, from planning and development through manufacturing, production and support. Siemens PLM Software, is a business unit of the Siemens Digital Factory Division, with more than fifteen million licensed seats and 140,000 customers worldwide. Siemens PLM Software is headquartered in Plano, Texas.

#### 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 research will concentrate on development of advanced numerical methods first and will have a test validation track afterwards. Accordingly, the ESR will be supervised by the two departments of SISW, i.e. 3D simulation and Test.

The numerical part will focus on evaluation and implementation of fast Boundary Element Methods (BEM). This includes comparison of H-Matrix, H2-Matrix and Fast Multipole BEM (FM-BEM) techniques. Most recent algorithmic improvements to these methods will be observed. The next step will be the industrialization of the fast BEM, which will depend on the outcome of the comparison. Emerging software libraries and computing hardware (GPU and Xeon Phi architectures) will be evaluated for their applicability to BEM.

The test part will focus on the validation of the developed numerical tools. In particular, binaural synthesis for interior acoustics will be carried out using BEM's efficient post-processing feature. In addition, the identification of material

properties of geometrically-complex structures using the developed models will be investigated.

## 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 computer science or engineering (e.g. mechanics, acoustics, physics).

- Good background in computational mechanics (BEM or FEM) is required.
- Good knowledge of programming languages (C/C++, Fortran, ...) and/or of Matlab is required.
- Experience in acoustic measurements and signal processing is an asset

Candidates get the opportunity to perform this work as part of a PhD study at KU Leuven.

All members of the network are equal opportunity employers, both female and male candidates are invited to apply. The research activities will mainly be carried out at Siemens Industry Software NV located in Leuven, Belgium, combined with research visits and/or short-term secondments to other members of the network.

## 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.

## 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

Siemens PLM Software offers, besides an attractive salary and benefits package, an internationally oriented and innovative high-tech environment. It is a fast growing, financially healthy company with a flat structure, in an informal, flexible atmosphere. People working within the business unit appreciate the room for initiative and career development. PLM Solutions are driven by innovation and therefore management fosters the creativity of its employees. Siemens PLM Software provides continuous training and competence development, stimulating personal development with respect to technical and/or management skills.

## 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).