



The Medical Physics Group at the Department of Medical Physics and Acoustics, Faculty of Medicine and Health Sciences, seeks as soon as possible within the Cluster of Excellence Hearing4all and other projects

3 PhD students

(m/f/d, 75 % of full time TV-L E13 positions, 3 years)

in the fields of

Position A) Psychophysics and medical classification

Position B) Speech recognition with multilingual tests for normal and hearing impaired listeners

Position C) Development of a virtual (hearing) clinic for mobile devices

For more information on the research topics see the attachment.

Successful applicants must hold an academic university degree (master or equivalent) with above-average grades in physics, engineering physics or related subjects (e.g. hearing technology & audiology, biomedical engineering, psychology). They must have experience in the field of hearing research, audio and speech processing or other fields relevant to the subject matter.

Participation in teaching courses offered by the Department of Medical Physics and Acoustics according to the current LVVO is required.

For more information about the group see <https://uol.de/en/mediphysics-acoustics/mediphysics> and <https://hearing4all.eu/EN/>.

The University of Oldenburg is dedicated to increase the percentage of female employees in the field of science. Therefore, female candidates are strongly encouraged to apply. In accordance to § 21 Section 3 NHG, female candidates with equal qualifications will be preferentially considered.

Applicants with disabilities will be given preference in case of equal qualification.

Applications including a CV, a motivation letter, copies of the two most important certificates and the name and contact details of at least one person who is willing to give a reference should be sent as a single pdf-file by July 22nd. 2020 to birger.kollmeier@uni-oldenburg.de (preferred) or to the Medical physics group of the Department of Medical Physics and Acoustics, Carl von Ossietzky University, D-26111 Oldenburg, Germany.

Attachment

Description of PhD research projects

The overarching aim of the three collaborating PhD projects is to contribute to the construction of a “virtual hearing clinic” for mobile personal devices that combines self-controlled auditory diagnostics, machine-learning supported classification of hearing disorders, and provisions to fit and test “virtual” hearing devices to derive predictions about the individual benefit from a real hearing aid. Depending on the skills and interests of the successful candidates, the three projects will combine an individual mixture of basic research, audiological evaluations with normal and hearing-impaired volunteers, data science, auditory modelling, algorithm and software development, and project management as follows:

Position A) Psychophysics and medical classification

The psychophysical and psychometrical methods involved in multimodal tests (including auditory tests) with mobile devices need to be optimized and tested for robustness, reproducibility, and validity for classifying the underlying hearing disorder. One goal is to create an auditory profile with a minimum set of highly controlled and efficient clinical-audiological tests that allow the fitting of relevant individual model parameters. A second goal is to develop medical classification methods operating on these sets of tests in combination with auditory models and with machine learning methods such as Bayesian nets for interpreting the results and prediction of missing data.

Position B) Speech recognition with multilingual tests with normal and hearing-impaired listeners

The self-controlled, optimized tests to be run on the virtual hearing clinic include speech recognition tests in noise that will be further developed together with international partners to address more languages (covering >90 % of EU and > 65% of world population), and to be more realistic in real life (e.g. using virtual acoustic technology) in order to assess the individual benefit from advanced hearing solutions. One goal is to systematically assess the differences across tonal and non-tonal languages in collaboration with our Chinese partners and to both empirically and theoretically (i.e., using auditory models) assess the influence of speaker, language, the Lombard effect, and reverberation on speech recognition.

Position C) Development of a virtual (hearing) clinic for mobile devices

The aim of this project is to integrate model-based audiological, multilingual diagnostics, statistical classification and virtual hearing aid simulation into consistent, user-centered building blocks for the “virtual hearing clinic” that can be used for mobile Health “virtual clinics” solutions in other clinical disciplines as well. By the use of a fixed, optimised test set, even a reduced, screening-test-like approach within the virtual (hearing) clinic should provide enough information to sufficiently characterize and at least coarsely classify the individual (hearing) disorder as a means for deriving a treatment recommendation. The emphasis in this project will be put on data management, statistical learning methods, usability engineering, and empirical

studies on the feasibility, strengths and shortcomings of the “virtual (hearing) clinic” with a growing set of voluntary test subjects and patients.

Research Environment:

The Medical physics section (<https://uol.de/en/mediphysics-acoustics/mediphysics>) performs world-class research in Hearing and technical audiology in a highly interdisciplinary and rich research environment, characterized by large award-winning research consortia (e.g., the Cluster of Excellence Hearing4All, see <https://hearing4all.eu>, or the comprehensive research centre “Hearing Acoustics”, see <https://uol.de/en/sfb-1330-hearing-acoustics>) and by collaboration with high-profile extra university research institutions such as HörTech gGmbH and Fraunhofer IDMT/HSA. They are directed by Prof. Dr. Birger Kollmeier (see google --> images --> “Professor”) who will also serve as supervisor of the PhD theses described above. Until now, B. Kollmeier has supervised more than 75 successful PhD candidates. Most of them have consecutively pursued impressive careers in academia, science and the industry.