PhD candidate

Published	Deadline	Location
4 Mar	tomorrow	Leiden

Leiden Institute of Advanced Computer Science in collaboration with Leiden University Medical Centre is looking for a PhD candidate for "Machine learning to enhance temporal coding for cochlear implants" project

JOB DESCRIPTION

- Over 5% of the world's population suffers from hearing loss. Today, for deaf and severely hearing impaired people, cochlear implants (CIs) are the standard treatment. However, CIs have a limitation in properly transmitting detailed temporal information from the sound to the auditory nerve. This manifests itself in difficulties with speech understanding with background noise, tonal languages, directional hearing and music perception. TEMPORAL is a joint project with the Leiden University Medical Centre (LUMC) that aims to develop improved speech coding strategies for the CI speech processor that better transmits temporal information to the auditory nerve. To do this, a combination of three techniques will be used: computer modeling, artificial intelligence (AI), and patient-centered research. These new speech coding strategies will lead to improved perception in the difficult listening situations.

Key responsibilities

You will focus on using state-of-the-art Machine Learning techniques for tuning configurable parameters of the CIs to better approximate the spike trains that normally transmit the information to the brain. You will use nonlinear optimization through evolutionary algorithms and develop suitable loss functions for spike trains and noise handling. Appropriate machine learning and cross-validation techniques will be developed in this research too, for assuring generalizability of the results.

During the project, you are expected to write the research articles that together will form the basis of a thesis to attain a PhD degree (dr.) at Leiden University. The PhD student will participate in the education and supervision program of the Leiden Graduate School of Science.

REQUIREMENTS

- A MSc or equivalent degree in *Computer Science, Computer Engineering*, *Artificial Intelligence* or a similar field;
- Expertise through your field of study in particular in machine learning, evolutionary computation, nonlinear optimization, multiple criteria optimization, simulation, deep learning, and audio data analysis;

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(one day remaining)

Specifications

- PhD
- Natural sciences
- University graduate
- # 21-113

Employer

Universiteit Leiden

Leiden University

Learn more about this employer

Location

Einsteinweg 55, 2311 BD, Leiden

View on Google Maps

- Excellent proficiency with Python and C++; Matlab will also be useful;
- Excellent communication skills and interest in the interdisciplinary character of the project and the required ability to communication between computer science and the medical side as well as the medical device production company;
- Creative thinking and highly motivated;
- Excellent proficiency in the English language.

CONDITIONS OF EMPLOYMENT

We offer a full-time temporary position for initially one year. After a positive evaluation of the progress of the thesis, personal capabilities and compatibility the appointment will be extended by a further three years. Salary range from € 2.325,- to € 2.975,- gross per month (pay scale P in accordance with the Collective Labour Agreement for Dutch Universities).

Leiden University offers an attractive benefits package with additional holiday (8%) and end-of-year bonuses (8.3 %), training and career development and sabbatical leave. Our individual choices model gives you some freedom to assemble your own set of terms and conditions. Candidates from outside the Netherlands may be eligible for a substantial tax break.

All our PhD students are embedded in the Leiden University Graduate School of Science. Our graduate school offers several PhD training courses at three levels: professional courses, skills training and personal effectiveness. In addition, advanced courses to deepen scientific knowledge are offered by the research school.

Diversity
Leiden University is strongly committed to diversity within its community and especially welcomes applications from members of underrepresented groups.

EMPLOYER

Leiden University
This PhD position is part of the Health Holland TEMPORAL project that combines computational modelling, state-of-the-art Machine Learning techniques and patient testing, to develop a new speech coding strategy which allows for better neural encoding of temporal fine structures. This will lead to improved perception of music and tonal languages, improved speech understanding in (fluctuating) noise and enhanced directional hearing, with either two CIs or a CI and a contralateral hearing aid (bimodal hearing).

In total, this project will be recruiting 2 PhDs to be based at LUMC (see open positions at the LUMC site) and 1 PhD to be based at LIACS as advertised here. LIACS supervisory team will consist of Prof. dr. Thomas Bäck and dr. Anna V. Kononova. Both are experts in evolutionary computation and machine learning.

The Leiden Institute of Advanced Computer Science is the Artificial Intelligence and Computer Science Institute in the Faculty of Science of Leiden University. We offer courses at the Bachelor and Master of Science level in Artificial Intelligence, Computer Science, ICT in Business, Media Technology, and Bioinformatics. According to an independent research visitation, we are one of the foremost computer science departments of the Netherlands. We strive for excellence in a caring institute, where excellence, fun, and diversity go hand in hand. We offer a clear and inviting career path to young and talented scientists with the ambition to grow. For more information about LIACS, see the website.

At the Leiden University Medical Center, we continuously work on improving patient

researchers and supporting staff, we aim for the best quality in health care, education and international research. And we need you to realize our goals!

ADDITIONAL INFORMATION

Additional information about the PhD position can be obtained from the member of the supervision team, Anna Kononova, email a.kononova@liacs.leidenuniv.nl

Application procedure

You can apply for this PhD position **no later than March 31th, 2021**. Your application should include pdf-versions of a Curriculum Vitae, a Letter of Motivation, and an MSc diploma with transcripts (courses + grades).

To apply for this vacancy, please send an email to jobs@liacs.leidenuniv.nl. When applying, please use the following subject: “vacancy number – your name”.

Make sure to apply no later than 31 Mar 2021 23:59 (Europe/Amsterdam).

Apply for this job

This application process is managed by the employer (Leiden University). Please contact the employer for questions regarding your application.

› Apply for this job via the employer's website