PhD Position in Neurotechnology

Job description

We look for a talented and motivated researcher with a passion for studying the function of the brain in motor control by computational modeling and/or closed-loop brain stimulation. The focus of this project will be on advanced versions of transcranial alternating current stimulation (tACS), targeting multiple brain areas in an optimized way. Depending on your background, this may include neural network / neural mass modeling of large-scale brain activity during and after stimulation, tACS in healthy participants, electric field simulation, setting up a brain-computer interface for closed-loop stimulation in healthy participants, or a combination of these topics.

The successful applicant will join the Biomedical Signals and Systems group of the Department of Electrical Engineering at the Faculty of Electrical Engineering, Mathematics and Computer Science at the University of Twente (UT), Netherlands.

About the project

Transcranial alternating current stimulation (tACS) is a non-invasive technique to modulate neural activity in the human brain. While its effects on neurophysiology and behavior are typically small in size, the technique has the advantage to be very flexible in terms of application sites and time courses of the applied currents, leading to large parameter spaces for applications. To optimize tACS towards a technique of network stimulation in the human brain, we use computational modeling at the population level (neural mass models) as well as at the neuron level (neural network models), in part including plasticity. Electric fields will be estimated based on finite-element method models. Furthermore, we plan to adapt multi-site tACS in a closed-loop fashion, adjusting parameters of stimulation based on behavior or electrophysiology. The project can be adapted to your specific interests and your background.

Your profile

We look for a highly motivated, enthusiastic researcher who is driven by curiosity and has:

- or will shortly acquire, a M.Sc. degree in electrical engineering, biomedical engineering, technical medicine, (applied) mathematics, (applied) physics or a related field;
- programming experience (e.g. Matlab, R, Python, or C++);
- experience with biomedical and dynamic systems models and advanced biomedical signal analysis;
- affinity to the clinical application of neurotechnology;
- a creative and interdisciplinary approach to pushing boundaries;
- a high proficiency in English.

Our offer

We offer an exciting temporary research position in a dynamic and international environment, combining the benefits of academic research with a topic of high industrial relevance. The UT offers excellent working conditions, an exciting scientific environment, and a green and lively campus with lots of sports facilities and an international scientific community. The terms of employment are in accordance with the Dutch Collective Labour Agreement for Universities (CAO) and include:

- A fulltime PhD position for four years, with a qualifier in the first year.
- Full status as an employee at the UT, including pension and health care benefits.
- The salary will range from € 2.434,- (1st year) to € 3.111,- (4th year) gross per month, plus a holiday allowance of 8% and a year-end bonus of 8.3%.
- A solid pension scheme.
- A minimum of 29 leave days in case of fulltime employment based on a formal workweek of 38 hours. A fulltime employment in practice means 40 hours a week, therefore resulting in 96 extra leave hours on an annual basis.
- For candidates from abroad, the 30% ruling might be applicable, which can result in up to a maximum of 30% of the gross salary as a tax-free cost allowance.
- Excellent facilities for professional and personal development.
- We encourage a high degree of responsibility and independence, while collaborating with close colleagues, researchers and other university staff. A collaboration with the University Medical Center Hamburg-Eppendorf (Germany) and/or the University of Oxford (UK) are possible.

Information and application

Are you interested to be part of our team? Please send your application via e-mail to Dr. Bettina Schwab (b.c.schwab@utwente.nl) and Dr. Ciska Heida (t.heida@utwente.nl) and include:

- a letter of motivation, emphasizing your specific interest, qualifications and motivation to apply for this position;
- a detailed CV;
- an academic transcript of B.Sc. and M.Sc. education;
- contact information of two referees.

For more information you are welcome to contact Dr. Bettina Schwab (b.c.schwab@utwente.nl).

The organization

The UT stands for life sciences and technology, high tech and human touch, education and research that matter, new technology which leads change, innovation and progress in society. The UT is the only campus university of the Netherlands; divided over five faculties we provide more than fifty educational programs. We have a strong focus on personal development and hardworking researchers are given scope for carrying out groundbreaking research.

We are an equal opportunity employer and value diversity at our company. We do not discriminate on the basis of race, religion, color, national origin, gender, sexual orientation, age, marital status or disability status. Because of our diversity values we do particularly support women to apply.

The faculty of EEMCS comprises three disciplines that shape Information and Communication Technology (ICT). ICT is more than communication. In almost every product we use mathematics, electronics and computer technology and ICT now contributes to all of societies' activities. The faculty works together intensively with industrial partners and researchers in the Netherlands and abroad and conducts extensive research for external commissioning parties and funders. The research which enjoys a high profile both at home and internationally, has been accommodated in the multidisciplinary research institutes: Mesa+ Institute, TechMed Centre and Digital Society Institute.

The group Biomedical Signals & Systems aims to enable improved diagnosis and treatment of patients with motor, sensory and cardiopulmonary dysfunction in clinical and home/self-care setting. Our research is embedded in the multidisciplinary research institute Technical Medicine (TechMed) Centre.