Technische Universität Berlin

Technische Universität Berlin offers an open position:

Research Assistant - salary grade E13 TV-L Berliner Hochschulen- 1st qualification phase (PhD candidate)

part-time employment may be possible

PhD Position in Hardware Development for Multimodal Wearable Neurotechnology: The Intelligent Biomedical Sensing (IBS) lab, led by Dr.-Ing. Alexander von Lühmann at TU Berlin/BIFOLD, is seeking a highly motivated PhD candidate for the ERC Starting Grant project "INTEGRAL – Enabling Unobtrusive Real-World Monitoring of Brain-Networks with Wearable Neurotechnology and Multimodal Machine Learning." This project aims to develop the next generation of wearable neurotechnology for continuous brain-body imaging in real-world environments.
The position focuses on the development of ultra-lightweight, multimodal wearable hardware systems for High-Density Diffuse Optical Tomography (HD-DOT), Electroencephalography (EEG), and peripheral physiological signals. This includes novel optoelectronic sensor technologies, embedded systems, and real-time data processing.

Faculty IV - The Berlin Institute for the Foundations of Learning and Data (BIFOLD)
Reference number: IV-105/25 (starting at the earliest possible / for 4 years / closing date for applications 11/04/25)

Working field:

As a PhD candidate in this project, you will:

- Develop miniaturized optoelectronic sensor systems for HD-DOT and EEG.
- Design ultra-low-noise analog and mixed-signal circuits for real-time brain imaging.
- Implement real-time electronics for multimodal data acquisition, preprocessing, and synchronization.
- Optimize energy-efficient and space-saving architectures for wearable devices, including flexible electronics and thermal management.
- Collaborate interdisciplinarily with neuroscientists, electrical engineers, and machine learning experts.
- Test and validate prototypes in real-world applications with human subjects.
- Publish research results in renowned scientific journals and conferences.
- Perform teaching tasks.

Requirements:

- Outstanding succesfully completed university degree (Master, Diplom or equivalent) in Electrical Engineering, Biomedical Engineering, Embedded Systems Engineering, Optoelectronics, or a related field.
- Hands-on experience in electronic circuit design, from schematics to fully functional prototypes.
- Experience in PCB design (Altium, KiCad, Cadence) for high-performance analog and mixed-signal systems.
- Strong expertise in embedded systems and real-time programming (C/C++/RTOS).
- Experience with optoelectronics and photonics.
- Knowledge of sensor calibration and noise suppression for physiological signals.
- The ability to teach in German and/or English is required; willingness to acquire the missing language skills

Preferred Qualifications (Beneficial but Not Required):

- Experience in wearable and flexible electronics.
- Knowledge of low-power wireless communication protocols (BLE, LoRa, etc.).
- Experience with mechanical design, 3D printing, and rapid prototyping.
- Understanding of time- and frequency-domain analysis for optical sensors.
- Experience with multimodal biosignal acquisition (EEG, fNIRS, PPG, etc.).
- Research experience (scientific publications are a plus).
- Strong teamwork and communication skills.
- Creativity, analytical thinking, and problem-solving skills.

What We Offer:

- A fully funded (100%) PhD position in an internationally recognized research group.
- Access to cutting-edge lab facilities, including rapid prototyping, electronics workbenches, and biosignal testing equipment.
- Collaboration with leading research institutions
- The opportunity to contribute to the development of next-generation neurotechnology with real-world applications in neuroscience and healthcare research.
- A highly interdisciplinary and dynamic work environment, working alongside leading experts in wearable neurotechnology, signal processing, and machine learning.

Please send your written application, stating the **reference number**, with your application documents to the Technische Universität Berlin - Die Präsidentin - **Fakultät IV, Institut für Softwaretechnik und Theoretische Informatik, BIFOLD –**

IRG Lühmann, Dr. Alexander von Lühmann, MAR 4-1, Marchstr. 23, 10587 Berlin or by e-mail (a PDF file, max. 5 MB) to: **jobs@bifold.berlin**.
The application documents required for consideration for this position are: 1) Motivation letter, 2) CV, 3) Academic transcripts/certificates, 4) at least two recommendation letters.

The application documents will not be returned. Please only submit copies.

By submitting your application via email you consent to having your data electronically processed and saved. Please note that we do not provide a guaranty for the protection of your personal data when submitted as unprotected file. Please find our data protection notice acc. DSGVO (General Data Protection Regulation) at the TU staff department homepage: https://www.abt2-t.tu-berlin.de/menue/themen_a_z/datenschutzerklaerung/ .

To ensure equal opportunities between women and men, applications by women with the required qualifications are explicitly desired. Qualified individuals with disabilities will be favored. The TU Berlin values the diversity of its members and is committed to the goals of equal opportunities. Applications from people of all nationalities and with a migration background are very welcome.

The vacancy is also available on the internet at
https://www.personalabteilung.tu-berlin.de/menue/jobs/

Zertifikat seit 2008
audit familiengerechte hochschule