HNO-Klinik   Abteilung Phoniatrie und Pädaudiologie

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Kopf- und Halschirurgie
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Öffentliche Verkehrsmittel:
Buslinie 289, 293, 294
Haltestelle Krankenhausstraße
21.11.2022

Research Assistant (PhD Student - Dr.-Ing.)
or
Postdoctoral Researcher

(TV-L E13 -100%)

Deep learning networks & feature analysis to understand speech-motor-control processes in hearing impaired patients

Speech production is a highly complex process involving the coordination of the respiratory, laryngeal, and oral motor systems as well as a large network of brain regions being involved in motor, somatosensory, and auditory tasks. The auditory feedback plays an important role in tuning the so called **speech motor control (SMC)** system. It is well known that auditory deprivation, due to hearing loss, may result in significant deteriorations of speech processes.

The **central objective in this study** on SMC in hearing impaired patients is the identification of the impact of disturbed auditory input on audio-kinesthetic processes. By applying and analyzing multi-sensor based data including laryngeal high-speed imaging, electroencephalography (EEG), and the acoustic voice signal the project aims to delineate the interaction between auditory perception and motoric.

Your tasks: (1) Develop and find machine learning approaches to reveal differences in underlying SMC parameters in high-speed videos, EEG, and acoustic data between normal hearing subjects and hearing impaired. This yields clinical relevant parameters (feature analysis) which represent SMC deterioration. (2) Support execution of the experiments with another PhD student within the project.

Supervision is enabled by the membership of Prof. Döllinger (supervisor) at the Technische Fakultät (Department Informatik). Our team is highly interdisciplinary and has several collaborations with technical and natural science chairs at FAU. In this project we cooperate with Prof. Hoppe (ENT hospital), Prof. Nöth (LS Informatik 9) and Dr. Abur (Netherlands) We foster personal development and exposure to an international, cutting-edge environment.

What we expect:
- M.Sc. / PhD in artificial intelligence, data science, computer science, mathematics, medical engineering, computational engineering, or similar
- Profound knowledge in machine learning methods (e.g. deep learning, …)
- Programming skills in Python and / or similar
- Structured and independent working practice, good communication and English skills

Additional Information:
- **Time frame**: as soon as possible
- **Duration:** 3 years (= duration of project, funded by DFG), 100% TVL-E13

Please send your application (CV, certificates, skills) to
Prof. Dr.-Ing. Michael Döllinger, Dipl.-Math. (michael.doellinger@uk-erlangen.de), Tel. 09131- 85 33814

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