We are recruiting!

Autonomous Intelligent Systems lab

Robot Learning lab

Neurorobotics lab

UNI FREIBURG

The University of Freiburg currently offers **multiple open full-time PhD positions** (collective agreement TV-L E13) in a collaboration of multiple computer science research groups to work on the intersection of robotics and machine (deep) learning.

The positions offer a novel perspective to relevant problems in robot perception, state estimation, manipulation, and navigation. The focus is on the development and application of methods of self supervised and unsupervised learning as well as reinforcement learning to improve the skills of autonomous systems and robots in order to enable them to reliably operate in more complex domains and real-world environments. The tasks will concentrate on the visual perception, but also integrate the processing of other sensor data such as LiDAR and audio with applications ranging from mobile manipulation to self-driving cars.

We currently also are involved in interdisciplinary projects investigating the principles of interaction between the human brain and novel autonomous systems. More specifically, robotic systems controlled by brain-machine interfaces will be developed to perform service tasks for paralyzed users. Tasks in this context include the application of learning methods to the decoding of brain activity, peripheral data such as heart rate or skin resistance with the goal to generate actions of a service robot. Further the interaction of human and robot will be improved using a combination of the bio-feedback, given by the aforementioned decoding, scene perception and reinforcement learning.

The candidate should have:

- Master of Science degree in robotics, machine learning, computer science, applied mathematics or a related field
- Strong mathematical background
- Programming skills including in deep learning frameworks such as PyTorch or TensorFlow

- Prior research experience in one or more of the following areas:
    - deep learning methods for robot vision, SLAM, or navigation
    - self-supervised and unsupervised learning,
    - imitation and reinforcement learning
    - multimodal learning
    - grasping or manipulation
- Excellent communication skills in English

We furthermore expect outstanding qualifications, the motivation to obtain a Doctoral degree and the interest to work in an interdisciplinary environment. The candidates are expected to conduct independent research and at the same time contribute to the ongoing projects, and guide master and bachelor students. International candidates are encouraged to apply; knowledge of the German language is not mandatory.

About the labs:
The Autonomous Intelligent Systems lab headed by Prof. Wolfram Burgard, the Robot Learning lab headed by Prof. Abhinav Valada, and the Neurorobotics lab headed by Prof. Joschka Boedecker are part of the newly established ELLIS unit in the University of Freiburg which is one of the first four ELLIS units in Germany and one of the 17 ELLIS units across ten European countries and Israel. The labs are also part of the university's center BrainLinks-BrainTools. Outstanding experts in the research fields of Simultaneous Localization and Mapping (SLAM), long term navigation, autonomous driving, deep learning, computer vision, object detection and tracking, motion planning, mobile manipulation, aerial robotics, brain machine interfaces and many more work in our labs. Our labs are equipped with over 26 robots ranging from industrial robot arms, mobile service robots, UAVs and heavy outdoor agricultural robot platforms. We have state of the art computing resources in the form of multiple GPU clusters with over 490 TFLOPS. A new research building "Intelligent Machine-Brain Interfacing Technology (IMBIT)" will be opened next year.

About Freiburg:
Wikipedia says about Freiburg: "...The city is known for its ancient university and its medieval munster, as well as for its high standard of living and advanced environmental practices. The city is situated in the heart of a major wine-growing region and serves as the primary tourist entry point to the scenic beauty of the Black Forest. According to meteorological statistics, the city is the sunniest and warmest in Germany..."

The application documents should consist of a single PDF file and include:
- Research statement
- Copy of bachelors and masters transcript of records

- Email addresses of at least two professors or persons authorized to supervise dissertation projects that can provide a reference
- Curriculum vitae. Please indicate your relevant skills, scientific publications, awards, research videos and/or code, professional profile(s)
- Any documents providing evidence of academic achievements, relevant practical experience, and qualifications earned at or outside of the university

Applications should be sent via email to **rl-apply@cs.uni-freiburg.de**. Applications will be considered until the positions have been filled. Preference will be given to applications received before July 15, 2020, 23:59 CET.