The *Laboratory of Measurement and Sensor System Technique (MST)* and the *Competence Center BIOLAS* of the *Faculty of Electrical and Computer Engineering* offer a position as

Research Associate: Optogenetic System Engineering

+++ Digital Holography +++ Image Processing / AI +++ Microscopy +++ Organoids +++

The position offers the chance to obtain further academic qualification (Dr.-Ing. / habilitation).

The Laboratory MST and the Competence Center BIOLAS is conducting research on the light stimulation and read-out of cardiomyocytes (cardiac muscle cells). This research field at the interface between laser-optical system engineering and biomedicine is called optogenetics, where the activity of transgenic cells is controlled by means of light-sensitive proteins. Our aim is to study the onset and termination of light-induced spiral excitation waves in cardiomyocyte networks and organoids by means of in-vivo experiments.

Your possible tasks (selection):

- setup a holographic, three-dimensional, two-wavelength light excitation system based on fast ferroelectric spatial light modulators (SLM)
- compensate aberrations by adaptive optics to achieve subcellular resolution
- measure the 3D cardiomyocyte motion by using a specially designed point-spread function; implement Deep Neural Networks (DNN) to track the 3D contraction and to determine the excitation wavefront
- make experiments on cardiomyocyte samples and study the cell motion in dependence of different light excitation patterns; mimic spiral heart waves and arrhythmia

We offer:

- a diverse, ambitious, and burning research issue
- an interdisciplinary and international research team
- creative possibilities and room for self-development and own research interests
- visits of international conferences
- cooperation with excellent partners from biotechnology
- modern laboratories with state-of-the-art equipment

Your requirements: Above-average university degree in electrical engineering, mechatronics, information technology or similar studies; ability for working autonomously and goal-driven within a team; great commitment, analytical thinking and taking joy in practical work and basic research are expected. Prior knowledge in wave optics and holography is advantageous.

Please address topical questions to Lars Büttner (e-mail lars.buettner@tu-dresden.de, phone +49 351 463 35314). Submit your comprehensive application including the usual documents preferably as a single pdf file by mail to: **grp-mst-sekretariat@msx.tu-dresden.de**.

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