

PhD student for computational methods in cardio-metabolic imaging (f/m/d)

The Chair of Biological Imaging (CBI) at the Technical University of Munich (TUM) and the Institute of Biological and Medical Imaging (IBMI) at **Helmholtz Munich** are an integrated, multi-disciplinary research structure and form the cornerstone of a rapidly expanding bioengineering ecosystem in Munich, Germany; including the Research Center TranslaTUM and the Helmholtz Pioneer Campus, which integrate bioengineering with oncology and metabolic disorders, respectively. CBI scientists develop next-generation imaging and sensing methods to measure previously inaccessible properties of living systems, hence, catalyzing breakthroughs in biology, medicine and the environment. Comprising 11 inter-disciplinary laboratories and scientists from more than 25 countries, CBI offers state-of-the-art infrastructure for innovative research and a perfect environment to accelerate your career.

Join our team and be part of our rich and dynamic research culture of enquiry and innovation. CBI researchers come from the top ranks of physics, chemistry, engineering, and biomedicine and attract significant investment from national and international sources. Our scientists serve in international societies and conferences and are recipients of a multitude of top international and German awards, including the prestigious Gottfried Wilhelm Leibniz prize and 11 ERC awards. In addition to scientific excellence, CBI promotes entrepreneurship, company spin-off activities, and collaborations with other top academic institutions and leading corporations in the photonics, pharmaceuticals and healthcare sectors.

We now seek a highly qualified and motivated **PhD student (f/m/d)** to drive the development of computational tools and data analysis methods in multispectral optoacoustic tomography for label-free imaging of metabolic parameters in animals and humans.

The Mission:

Multispectral optoacoustic tomography (MSOT) enables label-free imaging of oxy- and deoxyhemoglobin as an intrinsic tissue biosensor to resolve oxygen saturation and utilization as a metabolic indicator. Moreover, it images lipid distribution and water. Therefore, it has strong potential to provide dynamic measurements of cardio-metabolic status. However, MSOT is currently not optimized and not validated for metabolism studies. Our goal is to develop a deeper-reaching MSOT and confirm *in-vivo* MSOT assays for measuring tissue bioenergetics and lipid profiles *in-vivo* in animals and humans in the context of metabolic diseases.

The successful candidate will be instrumental in re-designing MSOT and adapting it to studies of metabolism and validate the re-designed system for cardio-metabolic imaging against established gold-standard imaging techniques. You will develop data analysis methods to extract metabolic markers from the rich spectral imaging datasets generated by MSOT imaging systems and help design optimized system specifications for improved data quality, especially in deeper tissue layers.

Given the prevalence of cardio-metabolic disease in modern societies, this project has huge potential for high-impact research findings and exploitation. You will be integrated into a network of high-profile researchers within a novel DFG-funded research group, giving you excellent opportunities for scientific interaction and professional growth.

Your profile:

The successful applicant must have the following:

- A master degree in Computer Science, Mathematics, Statistics, Data Science, Physics, Engineering or a related discipline.
- Strong motivation, scientific curiosity and commitment to scientific excellence.
- Experience in at least two of the following topics: signal and image processing, data analysis, machine learning, mathematical modelling and simulation, inverse problems.
- Expertise in biomedical imaging is an advantage.
- Good programming skills (preferably Python, MATLAB).
- Team player skills and enthusiasm to work in a multi-disciplinary, collaborative environment.
- Excellent command of the English language.

Our offer

We offer you the unique chance to make a difference in future healthcare. At CBI, we strongly believe in scientific excellence and innovation. This is your opportunity to be part of and to advance your career in a world-leading research institute, where bioengineering principles meet today's challenges in biology, medicine and environmental health to develop the solutions of tomorrow. CBI provides a highly international, multi-disciplinary environment with excellent opportunities for professional growth. You will be part of a dynamic, professional and highly motivated team within a stimulating environment and gain international exposure through our partners and collaborators across Europe and the world. We support career development, continued education and life-long learning. For PhD students, TUM offers a wide variety of inspiring and challenging PhD programs, which will supplement your research training with outstanding opportunities for early career development.

Situated on the foothills of the Alps, Munich is consistently ranked as one of the most vibrant and enjoyable cities in the world, with an exceptionally quality of life. Greater Munich is also home to several world-class universities and research institutes, creating a truly inspiring intellectual atmosphere.

The successful applicant will initially have a 3-year contract, with the possibility of extension. Salary will commensurate with work experience and seniority (Free State of Bavaria, TV-L E13-75%). As an equal opportunity and affirmative action employer, TUM explicitly encourages applications from women as well as from all others who would bring additional diversity dimensions to the university's research and teaching strategies. Qualified applicants with physical disabilities will be given preference.

Your application:

We are looking forward to receiving your comprehensive application including your letter of motivation, CV and academic transcripts of records preferably in English and in a single PDF file, via email to cbi.recruitment@tum.de. Please indicate "PhD for computational methods in cardio-metabolic imaging" in the subject line.

For any question, please contact:

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