



UNIVERSITÄTSmedizin.

MAINZ

Clinical Epidemiology and Systems Medicine

For our Statistics & Data Science group, we are looking for you as a

PhD Student (m/f/d) in Biostatistics / Data Science

About us

The University Medical Center of the Johannes Gutenberg University Mainz comprises more than 60 clinics, institutes and departments that work together across disciplines. With around 8 500 employees, it is one of the largest employers in the region and an important driver of growth and innovation. Our research in the Clinical Epidemiology and Systems Medicine group focuses on advancing medical care through cutting-edge systems medicine research (<https://www.unimedizin-mainz.de/pkmp-draft/overview.html?L=1>). We specialize in patient-oriented translational research with the overarching goal to improve prevention, diagnosis, treatment, and prognosis of common diseases. Our approach is holistic, taking into account the various factors that can influence disease, including genetics, lifestyle, social factors, and environmental exposures. To tackle the complex multidimensional nature of these factors, we are exploring, evaluating, and developing innovative techniques in statistical learning and artificial intelligence.

PhD Project

The PhD position is part of the research core DiaSym, funded by the German Federal Ministry of Education and Research (BMBF), which combines research groups with expertise in mass spectrometry, systems medicine and (bio)informatics (<https://diasym.mscoresys.de/>). The goal of the PhD project is to explore supervised machine learning methods that account for nonlinear relationships, interaction effects, and confounders. This research is particularly relevant as it will help improve the accuracy and reliability of our predictions and models in multidimensional biodata bases related to heart failure. The selected techniques will be benchmarked and applied to relevant research questions in the field.

Tasks of the PhD student

- Exploration of novel ensemble learning methods for variable selection in large biodatabases with sequential collection time points (e.g. MyoVasc, Gutenberg Health Study)
- Implementation and optimization of tree-based bagging and/or boosting meta-algorithms while adjusting for confounding variables in terms of regression equations
- Development of visualization techniques and/or metrics to improve the interpretability of the models
- Participation in interdisciplinary projects on established large-scale cohort studies and biodatabases through biostatistical analyses
- Present data at meetings with interdisciplinary partners (both academia and industry) and scientific congresses, and publish research results as original articles in peer-reviewed journals
- Collaboration in the preparation of research proposals and acquisition of external funding

Desired competences of the PhD candidate

- Completed university studies (M.Sc. or equivalent) in the field of (bio)statistics, mathematics, epidemiology, possibly also other natural sciences related to statistics and data science
- Knowledge of statistical methods, structured working style and confident handling of data
- Good knowledge of at least one of the common statistical programming languages (e.g., R, Python, Julia)
- Strong interest in working on complex scientific questions in the field of biostatistics with a strong sense of initiative, teamwork and creativity
- Good communication skills in English

Compensation and benefits

- A very interesting and multifaceted job in an interdisciplinary team with long-standing expertise in biostatistical methodological research as well as the analysis of clinical studies and biodatabases with extensive multi-omics data (<https://www.unimedizin-mainz.de/pkmp-draft/research-studies/studies-bio-databases.html?L=1>)
- Diverse opportunities for personal and professional development (e.g., interdisciplinary education, training in technical skills and soft skills)
- Collaboration with local, national and international partners
- Remuneration in accordance with the company's collective wage agreement (EG 13), subject to eligibility, as well as additional pension provision and social benefits
- Numerous employee offers such as job ticket, bicycle leasing and participation in benefit programs Childcare option

If we have piqued your interest and you have any questions, we are happy to assist you at any time. Please don't hesitate to contact us.

University Medical Center of the Johannes Gutenberg-University Mainz Clinical Epidemiology and Systems Medicine

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We are looking forward to your application!