HelmholtzZentrum münchen
German Research Center for Environmental Health

Helmholtz Zentrum München is a research center with the mission to discover personalized medical solutions for the prevention and therapy of environmentally triggered diseases and promote a healthier society in a rapidly changing world.

Germany's largest research organization, the Helmholtz Association, launches Helmholtz AI: This dedicated, interdisciplinary platform will compile, develop, foster and promote applied artificial intelligence (AI) methods nationwide for all Helmholtz centers in collaboration with its external and university partners. Its central unit is currently being implemented in Munich, one of Germany's major hubs for applied AI, at the Helmholtz Center Munich.

PhD in Deep Federated Learning with Medical Imaging (Data Heterogeneity)

Full time | Neuherberg near Munich | PhD

Your mission

Albarqouni lab's research focuses on developing innovative deep Federated Learning (FL) algorithms that can distill and share the knowledge among AI agents in a robust and privacy-preserved fashion. Research topics include, but not limited to,
i) handling distributed DL models with data heterogeneity including non i.i.d, and domain shifts,
ii) developing explainability and quality control tools for distributed models, and
iii) robustness to data and model poisoning attacks.

In this context, we are looking for a PhD Candidate who has a strong background in machine/deep learning to push our understanding of the influence of data heterogeneity including non-iid and domain shift on Semi-/Fully-supervised Federated Learning algorithms.

Your responsibilities

- Build and create clinical use-cases for benchmarking existing state-of-the-art (SOTA) Federated Learning algorithms. This includes running a few pre-processing pipelines.
- Develop SOTA FL algorithms that tackle data heterogeneity; namely non-iid and domain shift, e.g. multi-modal data acquired by different scanners and imaging protocols.
- Publish and present scientific results at international conferences and high-impact journals.
- Close collaboration with team members and colleagues.

Your qualifications

- M.Sc. in Computer Science, Machine Learning, or equivalent with interest in Medical Imaging and Deep Learning.
- Strong knowledge in Machine/Deep Learning with experience in discriminative models, domain adaptation, and variational inference.
- Excellent analytical, technical, and problem solving skills.
- Excellent programming skills in Python and PyTorch including fundamental software engineering principles and machine learning design patterns.
- Be highly motivated and a team player with excellent communication and presentation skills, including experience in communicating across discipline boundaries.
- A fluent command of the English language.

Desirable qualifications:

- Track record of publications at top-tier conferences and high-impact journals in the field.
- Hands-on experience with Federated Learning frameworks.
- Hands-on experience with MONAI framework.
- Working in a Linux environment, with experience of shell scripting, cluster, or cloud computing.
- Fluency in spoken and written German.

What we offer you

goal-orientated professional development	**career consultation**
work-life balance	**mobile work**
flexible working hours & time off in lieu	**on-site nursery**
30 days annual leave	**company pension scheme**
on-site health management service	**discounted public transport ticket**

Munich, with its numerous lakes and its vicinity to the Alps, is considered to be one of the cities with the best quality of life worldwide. With its first-class universities and world-leading research institutions it offers an intellectually stimulating environment.

This position also provides the opportunity for you to build specialist knowledge and collect significant professional experience, both of which will help advance your scientific career. Remuneration and social benefits are based on the collective wage agreement for public-sector employees at federal level (TV EntgO Bund). The position is (initially) limited to three years, with possibility to extend by another year.

The candidate is encouraged to join the Munich School for Data Science (MuDS) along with one of the TU Munich graduate schools. There are no associated teaching duties, but there are many opportunities for those who are interested.

We are looking forward to receiving your comprehensive **online application until 20 June 2021**. **Please send your application (in English) in a single PDF file – including:**
a) Motivation letter: Describe the reason for applying to be part of our lab and why you think you are the right candidate to fill this position (max. 2 pages).
b) Curriculum vitae incl. list of publications.
c) copy of your diploma/degree certificates.
d) At least two reference letters (or the names of two referees).
Applicant guidance on the Corona pandemic

Interested?
Please send your application via email with a **subject "AlbarqouniLab_PhD_Data_Heterogeneity"** to **Shadi Albarqouni, shadi.albarqouni@helmholtz-muenchen.de**.

Helmholtz Zentrum München
Deutsches Forschungszentrum für Gesundheit und Umwelt (GmbH)

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85764 Oberschleißheim

Award for excellent gender equality policy for women and men. Helmholtz Zentrum München is particularly committed to promoting professional equality between women and men. It therefore aims to increase the proportion of the underrepresented sex in the respective field.

The Helmholtz Zentrum München is part of the Helmholtz Association, Germany's largest scientific organization. Altogether 42.000 people currently work in its 19 scientific-technical and biological-medical research centers. The Association's annual budget amounts to around 5 billion Euros.