Data Engineering Research Group
TUM School of Computation, Information and Technology
Technische Universität München

Doctoral Researcher (TVL E-13 100%)

Knowledge Graphs for Materials Science

About Us

The Data Engineering research group at the Technical University of Munich (Campus Heilbronn) is looking for a doctoral researcher for the Collaborative Research Centre (CRC) on **Atomic-scale understanding and design of multifunctional compositionally complex solid solution surfaces.**

This is a large-scale, interdisciplinary project involving materials science, physics, chemistry, and computer science experts. Our research focuses on understanding and controlling the surface structures of materials, paving the way for more efficient and sustainable materials. In addition to the Ruhr University Bochum (RUB) as the coordinator, the Max Planck Institute for Iron Research, the University of Copenhagen, the University of Duisburg-Essen, and the Technical University of Munich are also part of the CRC. More information about the project can be found on the website: https://www.ruhr-uni-bochum.de/crc1625.

Job Description

Your contribution to the CRC is the development of **knowledge graph** techniques to integrate and analyze the data generated by simulations, experiments, and machine learning methods. The research tasks include:

- Investigating suitable representations of surface atom arrangements in a knowledge graph
- Developing data extraction and integration of heterogeneous data sources of the CRC
- Incorporating complex knowledge, such as rules generated by experts or machine learning models
- Deploying a querying infrastructure for accessing the knowledge graph

As part of the CRC, you are expected to:

- Collaborate in an interdisciplinary team
- Participate in project meetings, colloquiums, and retreats
- Supervise undergraduate theses and seminars on topics related to the project

The possibility of doctoral studies is given in the case of fulfillment of the admission requirements of the corresponding TUM doctoral regulations.

Requirements

We seek an outstanding candidate who brings the following:

- Excellent master's degree in computer science or related subjects
- Strong demonstrable commitment to research
- Strong background in databases or knowledge representation
- Proficiency in the programming language Python
- Proficiency in English, excellent speaking and writing skills
- Strong interpersonal and communication skills
- Ability to work in an interdisciplinary team
- Experience in software development projects is a plus

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We Offer

- The position offered at the CRC is for a doctoral researcher (m/f/d) (remuneration group TV-L E13, 100%), limited to an initial period of two years with an extension option of up to 4 years in total. The starting date is April 2024
- A working place at the Data Engineering group located at the modern TUM Campus Heilbronn (https://bildungscampus.hn/en/)
- An exciting research and training environment as a member of the CRC Graduate School
- Vast opportunities to develop your research, professional, and entrepreneurial skills with courses available at the TUM Graduate School

Application

Please send your application documents (motivational letter, curriculum vitae, references, thesis, certificates, list of publications, if applicable) in a single PDF file by e-mail to maribel.acosta@tum.de.

TUM strives to raise the proportion of women in its workforce and explicitly encourages applications from qualified women.

The position is suitable for disabled persons. Disabled applicants will be given preference in case of generally equivalent suitability, aptitude and professional performance.

As part of your application for a position at the Technical University of Munich (TUM), you will submit personal data. Please note our data protection information in accordance with Art. 13 of the General Data Protection Regulation (GDPR) on the collection and processing of personal data in the context of your application https://portal.mytum.de/kompass/datenschutz/Bewerbung/. By submitting your application, you confirm that you have taken note of TUM's data protection information.

Contact

Prof. Dr. Maribel Acosta (maribel.acosta@tum.de) will be glad to answer any questions.