PhD Student/Research Assistant in Digital Engineering and Construction (f/m/d)

Job description:

The Institute of Technology and Management in Construction (TMB) invites exceptional candidates to apply for a Ph.D. position in the Department of Digital Engineering and Construction, under the supervision of Dr. Reza Maalek. The successful candidate is expected to partake in both teaching and research activities in various areas, pertaining to digitization and automation in construction engineering and management. The teaching duties will focus on development of innovative methods and creation of remotely accessible content for the new profile of Digital Engineering and Construction within the Master’s program in Construction Management. The research areas of focus include the application of Building Information Modeling (BIM) to field along with field to BIM with particular emphasis on:

(i) the application of remote sensing technologies for automated digital documentation of construction projects;

(ii) automated analysis of spatial data using advanced machine learning techniques, especially laser scanner and photogrammetric point clouds; and

(iii) automated monitoring and control of prefabricated elements to promote lean construction.

Qualification:

The successful candidate must possess the following qualifications:

1. Obtained a thesis-based Master of Science (M.Sc.) or Master of Applied Science (M.A.Sc.) in Civil Engineering, Building Science, Construction Management, Geomatics Engineering, Computer Vision, Mathematics or a closely related field from a university, recognized by KIT (required).

2. Proficiency in both English and German languages in writing, reading, and speaking (required).

3. Proficiency in basic mathematical concepts involving matrix algebra, principal component analysis, characteristic polynomials, and etcetera, along with the area of robust computational and applied statistics (required).

4. Aptitude for scientific discovery and deep desire to learn concepts from academic disciplines, outside of their area of specialization (required).

5. Demonstrated ability to work on collaborative projects as a part of a team (required).

6. Knowledge (or demonstration of willingness to learn) of AI and machine learning techniques (both supervised and unsupervised learning) for practical pattern recognition (required).
7. Knowledge (or demonstration of willingness to learn) computer programming languages such as C++, Python, Matlab, and etcetera **(required)**.

8. Knowledge (or demonstration of willingness to learn) of virtual reality (VR) and augmented reality (AR) programming **(desired)**.

9. Knowledge (or demonstration of willingness to learn) of BIM-based platforms such as Revit, Synchro, BIM 360, Navis Works, etc. **(desired)**.

10. Knowledge (or demonstration of willingness to learn) of point cloud processing tools such as Cloud Compare, Cyclone, and etcetera **(desired)**.

11. Knowledge (or demonstration of willingness to learn) of concepts pertaining to random matrix theory and quantum computing is an asset **(desired)**.

**We offer:**

The Institute for Technology and Management in Construction (TMB) offers an excellent environment for the outlined research and teaching activities with unparalleled opportunities for collaboration with a diverse research network. TMB consists of four professorships, which cover the entire life cycle of civil infrastructure projects with a strong and established reputation in the construction and real estate industry, along with many research associates to share knowledge and exchange ideas.

**Salary:**

The remuneration occurs on the basis of the wage agreement of the civil service in TV-L E13.

**Institute:**

Division IV - Natural and Built Environment, Faculty of Civil Engineering, Geo- and Environmental Sciences, Institute for Technology and Management in Construction (TMB), Department of Digital Engineering and Construction.

**Contract duration:**

Limited for 5 years

**Starting date:**

As soon as possible

**Application up to:**

Applications are accepted until a suitable candidate is selected.

**Contact person in line-management:**

For technical details please contact: **Reza Maalek** at reza.maalek@kit.edu. In the subject line of the email, please indicate "Ph.D. in Digital Engineering and Construction".

**Application:**

The successful candidate must provide a concise essay with maximum 1,000 words (one-two pages), outlining how exactly they meet the **required** qualifications. For items 8 through 11 (the desired qualifications), in case a gap in your knowledge exists, please provide the steps you are planning to take to bridge these gaps (if you do possess these skills, please elaborate). Please provide real-life examples from your previous academic experiences when writing the essay. In addition, a cover letter, addressed to, Dr. Reza Maalek, including a one-page statement of purpose on the reasons you have chosen to pursue your Ph.D. at KIT in the area of Digital Engineering and Construction, in particular with Dr. Reza Maalek. The documents must be provided in **both English and German**. Please send your **scientific essay, cover letter and curriculum**.
vitae (CV) in both English and German via E-Mail to: Reza Maalek at reza.maalek@kit.edu.

We prefer to balance the number of female and male employees. Therefore, we kindly encourage female applicants to apply for this job.

Recognized severely disabled persons will be preferred if they are equally qualified.

KIT is certified as a family-friendly university (familienfreundliche Hochschule) and offers part-time employment, leaves for family-related reasons, dual career options, and individual coaching for family-work balance.