Karlsruhe Institute of Technology (KIT)
Institute of Technology and Management in Construction
Am Fasanengarten, Bldg. 50.31
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Germany
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www.tmb.kit.edu

Ph.D. Research and Teaching Associate in Digital Engineering and Construction

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 Prof. 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.

Qualifications:

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, Computer Vision, 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. Knowledge of AI and machine learning techniques (both supervised and unsupervised learning) for practical pattern recognition **(required)**.
5. Demonstrated knowledge of computer programming languages such as C++, Python, Matlab, and etcetera **(required)**.
6. Aptitude for scientific discovery and deep desire to learn concepts from academic disciplines, outside of their area of specialization **(required)**.
7. Demonstrated ability to work on collaborative projects as a part of a team **(required)**.
8. Working knowledge of virtual reality (VR) and augmented reality (AR) programming **(desired)**.
9. Working knowledge of BIM-based platforms such as Revit, Synchro, BIM 360, Navis Works, and etcetera **(desired)**.
10. Working knowledge of or demonstrated ability to learn point cloud processing tools such as Cloud Compare, Cyclone, and etcetera **(desired)**.
11. Preference will be given to candidates with Master's thesis related to digitization in construction engineering and management **(desired)**.
12. Demonstrated knowledge in concepts of random matrix theory and quantum computing is an asset **(desired)**.

Application Process:

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 12 (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, Prof. 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 Prof. 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 **Dominik Waleczko** at **dominik.waleczko@kit.edu.** In the subject line of the email, please indicate that you are applying to pursue Ph.D. in Digital Engineering and Construction.

Start date:

Immediate.

Application Closing:

Applications are accepted until a suitable candidate is selected. Only the short-listed applicants will be contacted and notified.

Contract Particulars:

The role can be occupied for a maximum of six years, contingent upon satisfactory performance and recommendation of the supervisor. The renumeration will be on the basis of the “Tarifvertrag für den öffentlichen Dienst der Länder” collective agreement (TV-L) step E13 level 1.

Responsible Faculty:

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.

About the Institution:

Karlsruhe Institute of Technology (KIT) – The Research University in the Helmholtz Association creates and imparts knowledge for the society and the environment. It is our goal to make significant contributions to mastering the global challenges of mankind in the fields of energy, mobility, and information. For this, about 9,300 employees of KIT cooperate in a broad range of disciplines in research, academic education, and innovation. KIT, Germany’s oldest technical university, has hosted many Nobel laureates, reputable scientists, and prominent entrepreneurs, such as **Fritz Haber**, **Heinrich Hertz**, and **Carl Benz**.

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.

KIT is an equal opportunity employer. Women are especially encouraged to apply. Applicants with disabilities will be preferentially considered if equally qualified. KIT is certified as a family friendly university and provides part time employment, leave of absence due to family issues, Dual-Career-Service and coaching or support for reconciling work and family life.

We are looking forward to receiving your applications,

Prof. Dr. Reza Maalek
Department of Digital Engineering and Construction
Head of Department, Endowed Professor

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