



At HafenCity University (HCU), subject to the provision of funds, the following position is expected to be available in the area of Digital City Science from 01.01.2024 as a

**Research Associate (m/f/d) – CIRC-BOOST:
IT-/Software Engineer**
(Pay group 13 TV-L)

to support research with 50% of the regular weekly working time. The position is a fixed-term appointment until 31.12.2024.

About us

The HafenCity University Hamburg, University of Architecture and Metropolitan Development (HCU) is a university that focuses on the built environment. The HCU unites all aspects of building and design, engineering, and natural sciences as well as geoscientific and social sciences under one roof.

The position is assigned to the Professorship of Prof. Jörg Rainer Noennig. The professorship for Digital City Science (DCS) at HCU researches digital technologies for urban development and planning and applies them on national and international level. The highly international and interdisciplinary team develops data-based tools for the analysis and design of complex urban systems, bringing together expertise from architecture, urban and spatial planning, computer science and media technology, among others. With its extensive partner network, it develops innovative digital tools for application in fundamental research, professional planning practice, and academic education.

Funded by the Horizon Europe program, the Innovation Action "CircBoost - Boosting the uptake of Circular Integrated Solutions in Construction Value Chains" develops integrated circular approaches and solutions for the construction industry. The overall objective of the project is to introduce and demonstrate Integrated Circular Solutions (ICS) in the European construction value chains. The EU-wide consortium with around 30 partner institutions will demonstrate integrated, recycling-oriented construction solutions through five large-scale pilot projects across Europe, and provide crucial support for the uptake of circular solutions in the EU.

Your tasks

This consortium has five pilot projects in five different countries, namely the Czech Republic, Norway, Serbia, France and Spain. DCS takes part in the working package (WP) led by the University of Belgrade/Faculty of Civil Engineering (FCE). This WP engages with geometry reconstruction of the existing building stock, including the missing CE indicators, both on the building, and the municipal level. The EU's Building Digital Logbook framework

has been launched only recently, and now its widescale implementation and showcasing are needed. This WP aims to produce progress such as an interactive GIS-based map of existing building stock will be generated using a methodological 5-step approach:

- (1) protocol for data acquisition and data pipeline.
- (2) developing of CityGML 3.0 models for the existing building stock;
- (3) assigning and linking the material inventory data to CityGML;
- (4) calculating of CDW and CE indicators and generating of CE passports.
- (5) mapping into 3D GIS environment.

Your specific task is to formulate a protocol for the acquisition of spatial data and to create an algorithm for the reconstruction of building geometries, considering the IT environment in DCS. The data will be commissioned by partners involved in the pilot projects and by a in-depth investigation of these 5 pilot-cases. The protocol must specify the required technologies, data pipeline, data conversion, DB management, security, available data or proxies, outline the methodology for capturing the required geometric building information, and detail the CityGML algorithm for reconstructing the geometries, using existing BIM models of buildings, city open data, where and publicly available in the pilot studies.

Outputs of these activities should be integrated into the existing software ecosystem of the chair, including its standards in terms of data formats, database systems and server infrastructure (in Docker containers). Please consult the standards and tools listed in the key requirements and preferred experiences.

At a later phase, within a contract extension, and in cooperation with FCE, you might contribute to the development of an Open Source Circular Economy map containing a database of building materials. The web application visualises semi-automated, semantically enriched CityGML models of existing buildings at an urban scale and links material inventory data to them. On this basis, you will collaboratively collect and transform location- and material-specific construction demolition waste and circular economy indicators and fuse this data into a web application.

Your profile

mandatory requirements

- a completed academic degree (master's degree or comparable) in computer sciences, geoinformatics, software engineering or proven professional experience in IT systems development with an academic degree in urban planning and design, civil engineering, architecture and related areas
- an academic degree (Bachelor or equivalent) in the above-mentioned subjects and four years of work experience in the relevant work areas of the vacant position

You may also apply, when you have completed your Bachelor degree, but have not yet obtained the necessary four years of work experience. In this case the salary group will be 12 TV-L with the corresponding tasks and responsibilities.

additional requirements

- knowledge of data analysis, data handling and data management would be a plus.
- knowledge and experience in RANSAC Algorithm would be a plus

- development and maintenance of web-services, including REST-API management (e.g. Flask), in a containerized manner (e.g. via Docker)
- programming languages and frameworks, especially related to (geo-)data preparation (e.g. Python, GeoPandas), storage (e.g. PostGIS, Postgres) and transformation (conversion between GIS and BIM formats)
- experience in software version control with Git, experience with GitHub Actions and automated deployment is of advantage
- command of German language
- interest in the field of urban development and digitization
- relevant experience working with R&D teams in the field of construction and (digital) urban research

Contact

For questions and further information, do not hesitate to contact Catherine Vandermeulen, +49 (0) 40 42827-4076.

The applicant's classification in regard to the level of experience within the advertised TV-L pay group is based on the candidate's individual work experience and reviewed by the HR department. Legally binding statements can only be made by the HR department of the HCU.

Please send your application (including CV, cover letter, and copies of relevant certificates), no later than **21.12.2023** (preferably by email as one PDF file) to:

HafenCity Universität
Personalverwaltung
Stellen-Nr.: 2023-142
Henning-Voscherau-Platz 1
20457 Hamburg
E-Mail: HCU-bewerbung@vw.hcu-hamburg.de

Please include the reference number „**2023-142**“ in your application.

Please be aware that in case of an invitation to an interview, HCU will not be able to cover any expenses for travel and lodging.

Due to the high number of applicants, the HCU will not be able to return application documents. Therefore, please do not submit originals of certificates. If you add a post-paid envelope, the HCU will return your application documents.