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GIScience Research Group
Heidelberg University
https://www.geog.uni-heidelberg.de/gis/index_en.html
<http://heigit.org>

PostDoc Job advertisement Heidelberg University – GIScience

At the Institute of Geography, GIScience Research Group, Heidelberg University the following position is to be filled for a limited period.

Position Overview:

- Starting Date: January – February, 2025
- Duration of the Contract: 30 months
- **Application Deadline: December 6, 2024** (applications received after this date may still be considered until the position is filled)
- Main Location: Heidelberg University, Heidelberg, Germany
- Remuneration is according to TV-L 13 salary scale

Postdoctoral Position in GIScience for Enhancing Elderly Mobility and Urban Accessibility, Academic Researcher (f/m/d)

Are you driven by a desire to improve urban environments and enhance the quality of life for older adults through innovative geographic and routing solutions? Do you have a background in Geographic Information Systems (GIS) and urban studies? If you are keen to apply your expertise in a multidisciplinary project that focuses on mobility, accessibility, and urban planning, then Heidelberg University has an exciting opportunity for you.

We are inviting applications for a 30-month postdoctoral position to join our GIScience / Geoinformatics Research Group at the Institute of Geography, Heidelberg University. You will contribute to the "Silver Ways: Integrating a Walkable Routing System with a 15-Minute Neighborhood Index to Enhance Mobility for Older People" project. This initiative, co-funded by HORIZON EU and DLR in Germany, is part of the Driving Urban Transitions (DUT) program. It encompasses a collaborative network spanning Germany, Sweden, and Türkiye, which includes three universities, three municipalities, and a non-profit organization, all dedicated to piloting and implementing urban mobility solutions across diverse landscapes.

In this role, you will contribute to understanding and enhancing walking routes and preferences of older adults in various urban settings. Your work will involve collecting and analyzing data on walking preferences, developing quantitative models to predict route choices, implementing a personalized routing system tailored to the needs of older adults, and developing a walkability index aimed at guiding urban improvements by identifying areas where accessibility and walkability can be most effectively enhanced for older adults.

Project Overview:

Active mobility improves health outcomes among older adults. This project enhances urban mobility by integrating the development of an age-friendly 15-minute neighbourhood index with a walkable routing system. Unlike conventional shortest-path methods, our approach prioritizes routes that align with the specific needs and preferences of older adults. Initially, we map their walking routes via travel diaries in diverse urban settings across three countries. Detailed route attributes are then extracted through Geographic Information Systems data and street-level

images, analyzed using deep learning techniques. We develop discrete choice models to quantify the impact of these attributes on older adults' walking preferences and use these models to determine the weighting mechanisms for route optimization algorithms. The generated age-friendly routes are then validated and refined through guided city walks for older adults, during which their feedback is captured via surveys and analyzed statistically. The Silver 15-Minute Neighbourhood Index is developed to evaluate the accessibility of essential amenities like healthcare and shopping along these age-friendly routes. In partnership with municipal stakeholders, this index and the walkable routes are used to co-design urban planning solutions that improve accessibility and enhance the quality of life for older adults.

Your tasks:

The selected candidate will actively engage in all phases of this project, supported by a consortium of academic and municipal partners.

Key Responsibilities:

- **Data Collection and Analysis:** Participate in designing and articulating travel diaries, and analyze responses from surveys to understand older adults' walking preferences.
- **GIS and Route Processing:** Assist in digitizing walking routes and enriching them with GIS- and ML-derived attributes.
- **Route Development:** Support the generation of alternative walking routes and contribute to the development of a tailored routing system with our development partners.
- **Experimental Design and Implementation:** Collaborate in designing and conducting urban walking tours, analyzing outcomes to refine routing algorithms and approaches.
- **Index Development:** Contribute to the development and analysis of the Silver 15-Minute Walkability Index to assess and enhance urban walkability for older adults.

Job Requirements

Qualifications / Experience:

- **Education:** PhD degree in GIS, Urban Planning, Transport Planning, Geography, Computer Science, Statistics, or a related field.
- **Academic interests:** An interest in urban studies and human mobility.
- **GIS and Spatial Analysis:** Proficiency with GIS software and tools for data collection, cleaning, and analysis; familiar with platforms like QGIS.
- **Programming Skills:** Skills in programming, particularly in Python and/or R, for data analysis, statistical modeling, and automation of data processes.
- **Quantitative Research Methods:** Foundation in quantitative research methodologies, including survey design, data collection, and statistical analysis.
- **Language Proficiency:** Fluency in German is essential due to contact with local stakeholders, along with proficiency in English for this role.
- **Professional and Communication Skills:** Excellent verbal and written communication skills, adept at working in an international environment with multiple stakeholders, accountability and independence.

Desired:

- **Advanced Analytical Techniques:** Experience with data science for image processing, network analysis, machine learning, econometric or other relevant analytical methods.
- **Experience with Routing System:** Familiarity with open-source routing services using OpenStreetMap (OSM) data.
- **Stakeholder Communication:** Experience in communicating with stakeholders and international partners.

Application Process:

Interested candidates should submit the following documents to nir.fulman@uni-heidelberg.de and sven.lautenbach@uni-heidelberg.de.

- Curriculum Vitae (CV)
- Two reference letters
- Certificate/Transcripts with grades
- Cover letter/Personal statement
- Sample of recent research work (published paper or thesis)

Please attach all of the above as a single PDF document.
We are looking forward to your application!

Benefits:

- **Advanced Technical Skill Development:** Gain experience with cutting-edge GIS technologies, data analysis techniques, and modeling tools.
- **International Collaboration and Networking:** Work within an international consortium, including academic institutions, municipalities, and non-profits across three countries, providing networking opportunities and fostering long-term professional relationships.
- **Visibility in High-Impact Projects:** Participate in a high-profile, EU co-funded project that offers visibility, contributing to research that directly influences urban mobility and planning policies across multiple nations.
- **Conference Participation and Presentation:** Possibility to present research findings at international conferences, enhancing your professional profile and engaging with leading experts in urban studies and GIScience.

Heidelberg University is a comprehensive university with a strong focus on research and an international outlook. With around 30,000 students and 8,400 employees, including numerous top researchers, it is a globally respected institution that also has outstanding economic significance for the Rhine-Neckar metropolitan region.

Detailed information about the GIScience Research Group under https://www.geog.uni-heidelberg.de/gis/index_en.html

Heidelberg University stands for equal opportunities and diversity. Persons with severe disabilities will be given preference if they are equally qualified. Information on job advertisements and the collection of personal data is available at www.uni-heidelberg.de/en/job-market.