

PhD Student Position: Agent-Based Spatial Accessibility Modeling

We are inviting applications for a fully-funded PhD position for 3.5 years (with the possibility of extension to 4 years) in the area of spatial accessibility analytics. The PhD position is part of the DIZH-funded research project «SISAL: Situation-Aware Individualized Spatial Accessibility Analytics». The DIZH (Digitalization Initiative of the Zurich Higher Education Institutions) aims to promote cooperation between Zurich's higher education institutions in the field of digitalization and thus strengthen Zurich as a center of research and business in this domain. The PhD student will be supervised by Dr. Hoda Allahbakhshi (Postdoctoral Fellow, Digital Society Initiative, University of Zurich) and Prof. Robert Weibel (Head of GIS Unit, Department of Geography, University of Zurich).

About the project

Spatial accessibility is highly context-dependent; dependent not only on environmental context, such as available transport infrastructure, means of transport, or weather conditions but also on the capacities for locomotion and wayfinding of the individuals seeking to access e.g., public facilities and services. These capacities are highly variable between individuals. Therefore, this project aims to use agent-based models (ABMs) to simulate the effects of varying capacities of individuals (e.g., mobility impairments) as well as the effects of variations and thus heterogeneity in the environmental context (e.g., pavement surface changes by rain/snow, changes in visibility at different times of day/night) on spatial accessibility patterns and behavior.

Your responsibilities

On this position, you will

- be expected to develop a detailed PhD research proposal, starting off from a set of initial research objectives and questions that have been identified for the SISAL project
- design, execute, calibrate and validate innovative agent-based models for simulating human spatial accessibility behavior under different circumstances
- conduct quantitative and qualitative studies in the area of simulating human spatial accessibility behavior and variations of their behavior
- analyze tracking sensor data (e.g., GPS, accelerometer)
- publish findings of the research
- collaborate with researchers, public organizations, and other institutions
- support teaching activities in a limited temporal extent

Your profile

We are looking for a highly motivated researcher with a passion for science and an independent, efficient, and effective work style, with the following profile:

- A completed master's degree in Geography, GIScience, Computer Science, Data Science, or a related field is required before appointment.
- A strong background in quantitative data analysis, computational modeling, and programming (e.g., JAVA, C++, C#, Python, R) is a prerequisite. Ideally, the candidate also has experience in machine learning/deep learning, and spatial data analysis.
- Experience in simulating human movement behavior through agent-based models is considered an asset.
- Experience in analyzing tracking sensor data is considered a plus.
- Skills in statistical analysis are mandatory.
- Previous experience in interdisciplinary or inter-institutional projects is considered an asset.
- Excellent written and strong spoken English communication skills are mandatory. Knowledge of German is considered a plus.

What we offer

We offer:

- a team of young and highly motivated colleagues who are passionate about research
- strong support for your personal development and career planning
- travel and equipment funds
- an attractive work environment: the University of Zurich is a world-leading university in the middle of a vibrant, cosmopolitan city that regularly ranks as one of the cities with the highest quality of life in the world
- a highly successful PhD program of our Graduate School (<https://www.geo.uzh.ch/en/graduate-school.html>), with graduates at top-rated institutions worldwide.

Further Information and Application

For informal inquiries, contact Hoda.allahbakhshi@dsi.uzh.ch.

Digital Society Initiative (DSI): <https://www.dsi.uzh.ch/en/about.html>

Geographic Information Systems (GIS) Unit:

<https://www.geo.uzh.ch/en/units/gis/research/Publications.html>

Please apply online at <https://apply.mnf.uzh.ch/position/12582912> by uploading PDF documents containing

- 1) motivation letter
- 2) curriculum vitae, including
 - contacts of two referees
 - if available, access information to repositories that showcase your programming in an academic context, for example your GitHub portfolio
- 3) transcripts of academic degrees
- 4) summary of the MS/MA thesis (max. 2 A4 pages)

The position is available until filled (**first deadline: September 30, 2021**). Starting date: January 1, 2022 or as soon as possible thereafter. Applications from women and under-represented groups are especially encouraged.