Conducting research for a changing society: This is what drives us at Forschungs-zentrum Jülich. As a member of the Helmholtz Association, we aim to tackle the grand societal challenges of our time and conduct research into the possibilities of a digitized society, a climate-friendly energy system, and a resource-efficient economy. Work together with around 7,500 employees in one of Europe's biggest research centres and help us to shape change!

We are looking for an experienced and motivated person to join our team and drive forward the further development of the open-source software JuPedSim.
We are a dynamic research group at the Institute for Advanced Simulation - Civil Safety Research (IAS-7) working at the interface between research and application in the field of pedestrian dynamics. JuPedSim is not developed in isolation, but in collaboration with a growing community of developers and users from science and industry.
Would you like to understand complex systems, live good architecture, and develop in an open research community? Then take a look at our repository, documentation, and community, and if you like what you see, we look forward to receiving your application!

Join our team to the next possible date as

Software Developer (C++/Python) – JuPedSim

The job will be advertised until the position has been successfully filled. You should therefore submit your application as soon as possible. We look forward to receiving your application via our
Online-Recruitment-System!

Questions about the vacancy?
Get in touch with us by using **our contact form.**
Please note that for technical reasons we cannot accept applications via email.
www.fz-juelich.de

Your Job:
JuPedSim https://jupedsim.org is a platform for simulating people flows, developed in C++ with a Python API and a C interface to SUMO https://eclipse.dev/sumo/ . A React-based web frontend (https://app.jupedsim.org) simplifies the creation and editing of scenarios, while simulations are orchestrated via a FastAPI interface. In recent years, JuPedSim has been fundamentally modernized, evolving from a collection of individual tools to a modular, maintainable, and testable architecture with clearly defined interfaces and CI/CD processes. This modernization has laid the foundation for further developing JuPedSim as a reliable, reproducible, and expandable platform for research and application. You can find more information about the development history here https://www.jupedsim.org/stable/history.html
You will be responsible for the further development and maintenance of JuPedSim as a central open-source software for simulating people flows.

Your specific tasks will include:

- SUMO connection: (Re)design and implementation of a C++ interface to SUMO for seamless coupling of people and traffic simulation
- New models & features: Implementation, refactoring, and integration of new functionalities, architecture-compliant, tested, and documented.
- Performance & code quality: Implementation of CI/CD, automated testing, code reviews, profiling/performance optimization
- Web integration (nice to have): If you are interested in or have experience in web development, we welcome contributions to the React frontend (web-jupedsim) or the FastAPI interface in the backend.
- Research & Supervision: Development of topics for student projects (e.g., bachelor`s or master`s theses) and their supervision.
- Community & open source: Active participation in the JuPedSim community and initiatives such as deRSE with presentations at conferences and exchanges with other research software teams

Your Profile:

Our software development takes place openly on GitHub. We are looking for someone who values open communication and good collaboration, both within the team and with the open-source community. Ideally, you are someone who shares knowledge, listens actively, accepts and gives constructive feedback, and who puts the common good above individual interests.

What you bring:

- A master`s degree or equivalent qualification with relevant professional experience in software development
- Very good knowledge of C++ and/or Python; willingness to work productively in both with proven experience in developing and maintaining larger software projects
- Understanding of software architecture, modularization, and maintainability; you can read, evaluate, and improve complex code bases while preserving the character of the software
- Interest in simulation, modeling, and the connection between research and engineering

Our Offer:

We work on the very latest issues that impact our society and are offering you the chance to actively help in shaping the change! We support you in your work with:

- MEANINGFUL TASKS: The position offers a varied and diverse role in an international environment
- INTERNATIONALITY & NETWORKING: At IAS-7, you will work in a highly international environment with researchers and partners from numerous countries. This will provide you with a wide range of professional and intercultural stimuli and a broad professional network, both within research and in industry.
- INTERDISCIPLINARY & INNOVATIVE WORK: The project combines cutting-edge research with concrete industrial applications. You will work closely with experts from various disciplines in flat hierarchies and have the opportunity to contribute your own ideas at an early stage and play a key role in shaping the project.
- WORK-LIFE BALANCE: Optimal conditions for balancing work and private life, as well as a family-friendly company policy. The option of flexible working (in terms of location) is generally available after consultation and in accordance with upcoming tasks and (on-site) appointments.
- FLEXIBILITY: Flexible working time models, including options close to full-time (https://go.fzj.de/near-full-time), allow you to tailor your working hours to suit your individual needs
- FAIR REMUNERATION: Depending on your existing qualifications and the tasks

assigned to you, you will be classified in pay grade 13 of the TVöD-Bund (Collective Agreement for the Public Service). All information on the TVöD-Bund collective agreement can be found on the BMI website: https://go.fzj.de/bmi.tvoed . The monthly salaries in euros can be found on page 69 of the PDF download

- PERSPECTIVE: After a 3-year fixed-term contract, our goal is to retain you for the long term. Let`s use this time together to find out how well we fit together.
- VACATION: You will receive 30 days of vacation plus additional days off (e.g., between Christmas and New Year`s).

In addition to exciting tasks and a collegial working environment, we offer you much more: https://go.fzj.de/benefits

We welcome applications from people with diverse backgrounds, e.g. in terms of age, gender, disability, sexual orientation / identity, and social, ethnic and religious origin. A diverse and inclusive working environment with equal opportunities in which everyone can realize their potential is important to us.

The following links provide further information on diversity and equal opportunities: https://go.fzj.de/equality and on specific support options for women: https://go.fzj.de/womens-job-journey