IEK-10 and IBG-1 invite applications for two positions in computational epidemiology. Having broad expertise in optimization, parameter estimation and optimal control, we teamed up with further Helmholtz Centers to propose the development of a Helmholtz Platform for Early Detection and Management of Epidemic Outbreaks. The platform shall integrate data streams from various sources and utilize machine learning as well as SEIR-type epidemiological models to detect outbreaks, track and predict the course of infection, and derive optimal intervention strategies under data uncertainty. For this, suitable models, state-of-the-art methods, and cutting-edge algorithms shall be integrated into automatized workflows that enable real-time analysis of incoming data streams, simulation, and optimization as well as interactive visualization of the results in a unified web application. The platform will be rolled out in cooperation with the Academy for Public Health Services to selected local health authorities in Germany, where it shall be operated and validated under real-world conditions.

We are looking to recruit a Postdoc Positions – Automated Parameter / State Estimation, Uncertainty Quantification, and Optimal Control for Epidemiological Models

Your Job: Development of this platform is about to start in January 2022, and we are now looking for two candidates with strong commitment to bring state-of-the-art research algorithms into production software. The postdoc candidates will be responsible for contributing the functionalities related to automated parameter/state estimation, uncertainty quantification, and optimal control. The advertised positions therefore center on the orchestration and implementation of numerical methods and statistical algorithms from the research domain into a fully automated workflow that becomes a core part of the envisioned platform. To this end, we will work closely with the Jülich Supercomputing Center.

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
Centre (JSC) operating one of the top-10 supercomputers. Furthermore, extensive collaboration and joint software development with our partners from the Helmholtz Association will be integral to the project. As the platform is supposed to be used by non-scientific personnel, also knowledge transfer plays an important role. Particularly, features and functionalities of the platform shall be developed according to FAIR and open principles and tested jointly with the potential end users.

Your Tasks in Detail:

- Transfer methods and algorithms related to parameter/state estimation, identifiability analysis, uncertainty quantification and optimal control from the research domain to a real-world application for detection and management of epidemic outbreaks
- Orchestrate and implement relevant methods and algorithms into fully automated real-time workflows
- Link and coordinate all software development activities with the participating partners
- Develop features and functionalities jointly with the potential end users
- Perform extensive testing and validation under (close-to-)real-world conditions
- Contribute to the creation of training materials and on-site trainings
- Publish findings, software and reports on the developed tools in scientific journals

Your Profile:

- Very good Master’s and subsequent PhD degree in computational engineering, simulation/data science, physics, applied mathematics or a relevant discipline
- Expert knowledge in parameter/state estimation, uncertainty quantification and numerical optimization applied to differential-algebraic models
- Expert knowledge in data analysis and machine learning
- Expert knowledge in software development and workflow automation
- Excellent skills in spoken and written English
- Excellent organizational and time-management skills and the ability to work independently
- Excellent cooperation and communication skills and commitment to work as part of a team
- Strong desire to translate research findings into society and make a difference

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:

- Being part of highly motivated, interdisciplinary research groups in one of the biggest research centers in Europe working on parameter inference, optimization, and machine learning in diverse application fields
- Participation in a large joint undertaking of the Helmholtz Association: Besides Forschungszentrum Jülich (FZJ), the Helmholtz Centre for Infection Research (HZI), the German Aerospace Center (DLR), the Helmholtz Center for Information Security (CISPA), and the Helmholtz Centre for Environmental Research (UFZ) are involved in this project
- Supervision by Prof. Alexander Mitsos and Prof. Wolfgang Wiechert
- Close cooperation with the Institute of Process Systems Engineering (AVT.SVT) at RWTH Aachen University also headed by Prof. Alexander Mitsos
- An excellent scientific and technical infrastructure
- Full-time position with the option of slightly reduced working hours and 30 days of annual leave
- Targeted services for international employees, e.g. through our International Advisory Service
- A large research campus with green spaces, offering the best possible means for
networking with colleagues and pursuing sports alongside work
We offer you an exciting and varied role in an international and interdisciplinary working environment. This is a 2-year appointment, with the possibility of a 2 years’ extension based upon satisfactory performance and availability of funding. Salary and social benefits in conformity with the provisions of the Collective Agreement for the Civil Service (TVöD). Depending on the applicant’s qualifications and the precise nature of the tasks, salary grade 13 TVöD-Bund.

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.