



Shaping change: this is what drives us at Forschungszentrum Jülich. As a member of the Helmholtz Association with some 7,600 employees, we conduct interdisciplinary research into a digitalized society, a climate-friendly energy system, and a sustainable economy. We focus on the natural, life, and engineering sciences in the fields of information, energy, and bioeconomy. We combine this with expertise in high-performance computing and artificial intelligence using unique scientific infrastructures.

You want to make an impact by connecting high-throughput cell microscopy with machine learning and physics-based simulation? This is the position for you! Microfluidic live-cell imaging enables researchers to observe the behavior of microbes at the level of individual cells under precisely controlled conditions. This project treats these experiments as adaptive bioagent-environment systems and develops modern, data-driven decision-making methods to unlock intelligent, real-time strategies for actively steering cells within their microenvironment. The Helmholtz School for Data Science in Life, Earth and Energy (HDS-LEE) provides an interdisciplinary environment for educating the next generation of data scientists in close contact to domain-specific knowledge and research. All three domains – life & medical sciences, earth sciences, and energy systems/materials – are characterized by the generation of huge heterogeneously structured data sets, which have to be evaluated in order to obtain a holistic understanding of very complex systems. Visit HDS-LEE at: <https://www.hds-lee.de/>

We are looking to recruit a

PhD Position - Interactive Learning for Closed-Loop Control of Microfluidic Live-Cell Experiments (HDS-LEE graduate school)

Your Job:

We are looking for a PhD student in machine learning to work within a project linked to the "Helmholtz School for Data Science in Life, Earth and Energy (HDS-LEE)".

Your Job:

- Develop physics-aware simulations of growing cell populations, including their spatiotemporal manipulation in microfluidic environments
- Design and implement reinforcement learning algorithms for control and manipulation, first in simulation and later on real experimental setups

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

- Refine a real-time planning and execution architecture for information-driven experiment steering (closed-loop control)
- Work in an interdisciplinary team of engineers, computer scientists, and life scientists
- Present your work at international conferences and learn about state-of-the-art methods in machine learning, reinforcement learning and computer vision for the life sciences

Your Profile:

- Excellent Master's degree in engineering, computer science, or mathematics (or a related field), with a focus on robot vision and control, image processing, or machine learning
- Solid mathematical and physics background, distinct analytical skills
- Very good programming (Python, C++) and computer (Linux, Windows) skills
- Excellent cooperation and communication skills
- You enjoy working within a diverse team in an international and interdisciplinary environment
- Very good English, both spoken and written. German language skills are not necessary but a plus
- High motivation and work ethics
- No prior biological experience is required, but curiosity about biological questions, collaborating closely with experimentalists, and working with real-world data
- You share our passion for teaching computers how to see, have done some previous research in this field (e.g., internships, research papers, etc.), and want to make an impact in a societally relevant application.

In your application, please include a statement of research interest, CV, copies of exams, degrees and grades (transcript of records), a copy of your Master thesis (or a draft thereof), published articles or other relevant material such as letter(s) of recommendation (if applicable).

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! This HDS-LEE PhD position will be located at Forschungszentrum Jülich with strong links to RWTH Aachen. We offer ideal conditions for you to complete your doctoral degree:

- Outstanding scientific and technical infrastructures
- Working in an international and interdisciplinary environment at one of Europe's largest research institutes
- Continuous scientific mentoring by your scientific advisors and opportunity to mentor students
- Unique HDS-LEE graduate school program (including data science courses, soft skill courses and annual retreats): <https://www.hds-lee.de/about/>
- A qualification that is highly valued in industry
- 30 days of annual leave and flexible working arrangements, including partial remote work.
- Further development of your personal strengths, e.g. via a comprehensive training program; a structured program of continuing education and networking opportunities specifically for doctoral researchers via JuDocS, the Jülich Center for Doctoral Researchers and Supervisors: <https://www.fz-juelich.de/judocs>

Targeted services for international employees, e.g. through our International Advisory Service

The position is limited to three years, with a possible one-year extension. Pay is in line with 75% of pay group 13 of the Collective Agreement for the Public Service (TVöD-Bund) and additionally 60 % of a monthly salary as special payment („Christmas bonus“). The monthly salaries in euro can be found on the BMI website: <https://go.fzj.de/bmi.tvoed.entgelt>

Further information on doctoral degrees at Forschungszentrum Jülich (including its various branch offices) is available at <https://www.fz-juelich.de/en/careers/phd>

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>

About Jülich and the surrounding area: Forschungszentrum Jülich is one of the largest research centers in Europe, with excellent scientific equipment including one of the fastest supercomputers in the world. We are 7600 people located on a green campus offering an international and interdisciplinary working environment. Jülich is close to the border between Belgium, the Netherlands and Germany, and near the cultural centers Aachen, Bonn, Cologne, and Düsseldorf. The quality of life is exceptionally high and the atmosphere is both tolerant and inclusive. For an overview, please see 'Facts, Figures, People' (

<https://www.fz-juelich.de/en/about-us/people/board-of-directors-and-organization/facts-figures>)