

Postdoc in Differentiable Simulation for Learning based Control

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Department of Computer Science

Faculty of Science

University of Copenhagen

The Department of Computer Science invites applications for a unique two-year postdoctoral position with possibility for further extension. The successful candidate will engage in developing innovative biomechanical models and simulation techniques, integrating these with machine learning. This exciting opportunity focuses on two key challenges. The first is to create a differentiable simulation method for viscoelastic endoscopic cavities, enhancing the understanding and predictive modeling of body cavities explored by endoscopes. This involves designing biomechanical simulation methods that accurately mimic tissue behavior and their interaction with medical devices. The second significant challenge is the development of an Eulerian-on-Lagrangian (EoL) simulation method for endoscope-tissue interactions. This requires novel approaches to modeling the complex dynamics of endoscope navigation within tissue, including bending, twisting, and contact dynamics, as well as incorporating tendon-based actuation systems. The role demands a strong foundation in mechanical engineering, computational simulation, and a keen interest in applying machine learning techniques to solve these complex and critical medical challenges.

The successful candidate for this postdoctoral position will be joining a multidisciplinary and collaborative team at Department of Computer Science, renowned for its cutting-edge research in medical imaging and simulation technologies. This team is comprised of experts in various fields, creating a rich environment for innovation and interdisciplinary learning. The team operates in a highly collaborative environment, encouraging the exchange of ideas and expertise. Regular meetings and workshops are conducted to discuss progress, challenges, and strategies, ensuring a cohesive and focused approach to the project goals. Senior members of the team, including leading researchers and professors, provide mentorship and guidance. They are committed to nurturing the next generation of scientists, offering support in both research and career development. The team is part of a wider network of researchers and professionals, both within and outside the institution. This global network provides opportunities for academic and industrial collaborations within France, Germany and Spain, sharing best practices, and staying abreast of the latest developments in the scope of the project. The team is driven by a shared goal to make significant contributions to the field of medical simulations and patient care. There is a strong emphasis on creating practical, innovative solutions that can be translated into real-world applications.

The candidate will be expected to contribute significantly to the research objectives, demonstrating both technical expertise and collaborative skills. Key performance expectations include:

[Research at the Core] The ultimate goal is to make a significant contribution to the field of medical simulation and patient care. This includes producing impactful research outputs, such as publications in high-quality journals, and potentially developing technologies or methodologies that can be applied in real-world settings.

[Career Growth] While contributing to the project, the candidate is also expected to focus on their professional growth, taking advantage of mentorship opportunities, networking, and other resources provided by the institution.

[Collaboration is Central] Given the interdisciplinary nature of the team, the candidate must excel in collaborative environments. This includes actively participating in team discussions, sharing knowledge and expertise, and contributing to a positive and productive team dynamic.

[Communication in Focus] The candidate must be able to clearly and effectively present research findings to both technical and non-technical audiences, including writing high-quality research papers and presenting at conferences.

Qualifications:

- PhD in a relevant field such as Biomedical Engineering, Computer Science, Mechanical Engineering, Applied math, Robotics or similar.
- Strong foundation in biomechanical modeling, simulation, and/or machine learning.
- Experience with numerical optimization algorithms.
- Proficiency in scientific computing programming.

The postdoc's duties will include research within numerical physics simulation. The post may also include performance of other duties.

Further information on the Department is linked at <http://www.science.ku.dk/english/about-the-faculty/organisation/>. Inquiries about the position can be made to professor Kenny Erleben, kenny@di.ku.dk.

The position is open from 1st of June 2024 or as soon as possible thereafter.

The University wishes our staff to reflect the diversity of society and thus welcomes applications from all qualified candidates regardless of personal background.

Terms of employment

The position is covered by the Memorandum on Job Structure for Academic Staff.

Terms of appointment and payment accord to the agreement between the Ministry of Finance and The Danish Confederation of Professional Associations on Academics in the State.

Negotiation for salary supplement is possible.

The application, in English, must be submitted electronically by clicking APPLY NOW below.

Please include

- Curriculum vitae
- Diplomas (Master and PhD degree or equivalent)
- Research plan – description of current and future research plans
- Complete publication list
- Separate reprints of 3 particularly relevant papers

The deadline for applications is 25th of February 2024, 23:59 GMT +1.

After the expiry of the deadline for applications, the authorized recruitment manager selects applicants for assessment on the advice of the Interview Committee.

You can read about the recruitment process at <http://employment.ku.dk/faculty/recruitment-process/>.

Interviews will be held beduring week 13 and 14..

Application due

2/25/2024

Start date

6/1/2024

Category

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<http://di.ku.dk/>


Contact

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