



# One Open Postdoc (PhD) Position in Computational Control and Optimization

## University of Freiburg, Germany

The University of Freiburg looks for an experienced researcher in the field of computational control and optimization. The researcher shall take a leading role in the development of embedded optimization algorithms for nonlinear model predictive control and supervise a team of PhD students and student assistants.

### BACKGROUND

The position will be involved in two newly established research programs on optimization-based control in Germany that are funded by the DFG and by the Federal Ministry for Economic Affairs and Energy, respectively. The overall aim of the two projects in Freiburg is to develop methods and open-source software for nonlinear model predictive control, and to help to apply these methods to real-world systems that are in operation at the project partners (novel types of emission reduced combustion engines in Aachen and medium sized wind turbines in Northern Germany, respectively). The position is of pay level E13 and initially for three years, with the possibility of a prolongation by another three years. The researcher will become a full time member of the Systems Control and Optimization Laboratory, led by Prof. Dr. Moritz Diehl, which is embedded into Freiburg University's young and growing Faculty of Engineering as well as its Faculty of Mathematics and Physics. The laboratory is involved in teaching for master programs in embedded and micro-systems engineering, renewable energy engineering and management, computer science, and mathematics, and the position offers the possibility to train the student supervision and teaching skills (e.g. for 2-4 hours per week).

Depending on the background, interests and qualification level, the researcher can work towards a habilitation (or, in special cases, a PhD) in engineering, computer science or numerical mathematics, and prepare her-/himself for a high level research career in academia or industry. The current research focus of the Systems Control and Optimization Laboratory is in the area of algorithms for numerical optimal control and for embedded optimization in the milli- and microsecond range and applications to renewable energy systems. The researcher can cooperate with a vibrant team of five internal and four closely interacting external PhD students, one postdoc, and a number of master and job students, and build on a successful track record in open-source software development including the existing tools CasADi and ACADO. The team's current software development plan is to create a new fully modular software library for embedded nonlinear optimal control, together with some other teams, and the activities of the experienced researcher are expected to play an important role in this effort. The city of Freiburg is one of the sunniest cities in Germany and is surrounded by the black forest, and offers ample opportunities for outdoor activities during lunch breaks, evenings or weekends to team members.

### CANDIDATE PROFILE

Ideal candidates have a PhD degree in one of the following disciplines or a related field: control engineering, numerical mathematics, or computer science. Exceptionally strong candidates with a master, but without a PhD, or candidates with a habilitation are also encouraged to apply. The researcher should have a good background or interest in mathematical optimization, numerical mathematics, dynamic system simulation, and programming (MATLAB, C/C++, Python, Julia, ...), as well as a desire to contribute to the collaborative development of open-source software for numerical optimal control and the success of real-world experiments. Proficiency in English is a requirement. The position adheres to the European policy of balanced ethnicity, age and gender. Both men and women are encouraged to apply.

### APPLICATION

To apply, send an email to [diehl@imtek.uni-freiburg.de](mailto:diehl@imtek.uni-freiburg.de) with CC to [christine.paasch@imtek.uni-freiburg.de](mailto:christine.paasch@imtek.uni-freiburg.de). Subject of your email should be: "Application to SYSCOP Postdoc Position". Please include:

- an academic CV and a PDF of your diplomas and transcript of course work and grades, and a list of publications
- names of at least two referees (incl. phone numbers and email addresses)

**Please send your application as soon as possible, and latest on November 18, 2016.**

More information on the team and its activities can be found at <http://syscop.de/>