



Paderborn University is a high-performance and internationally oriented university with approximately 20,000 students. Within interdisciplinary teams, we design forward-looking research, innovative teaching and the active transfer of knowledge into society. As an important research and cooperation partner, the university also shapes regional development strategies. We offer our more than 2,300 employees in research, teaching, technology and administration a lively, family-friendly, equal opportunity environment, a lean management structure and diverse opportunities.

In the faculty of Electrical Engineering, Computer Science and Mathematics, the **Encrypted Control Junior Research Group** within the Automatic Control Group is looking for

2 Research Assistants

(pay scale 13 TV-L)

Both positions are to be filled as soon as possible. Each position is a full-time qualification position to support a PhD-project in the field of encrypted control. The initial contract is for three years. An extension to finish the PhD is possible in accordance with the rules of the WissZeitVG.

The freshly established Encrypted Control Junior Research Group is funded by the Emmy Noether Program of the German Research Foundation (DFG). The group develops secure control schemes for networked control systems such as smart grids, intelligent transportation systems, or robot swarms. The emphasis lies on encrypted controllers that are capable of computing encrypted control actions based on encrypted system information without intermediate decryptions. To design this novel and promising type of networked controllers, methods from control and optimization are combined with cryptographic tools such as homomorphic encryption, secret sharing and multi-party computation. The multidisciplinary approach is currently unique in Germany and internationally at the forefront of research.

Encrypted control is a young but emerging field of research. Current realizations can be seen as proofs of concept based on various simplifications. The offered positions focus on the systematic design of future encrypted control schemes that are more practical, more flexible, and more efficient than state-of-the-art approaches. Achieving this goal requires clever formulations of the underlying control problems, realistic specifications of threat models, and sophisticated methods from cryptography. The two candidates will work collaboratively on the project with an individual emphasis on control respectively encryption.

We expect the prospective candidates to conduct innovative research on the specified topic, aiming at publications on leading international journals and conferences. We further expect the candidates to support our teaching activities by 2 – 4 hours per week. In exchange, we offer a creative, inspiring, and international research environment, highly relevant projects, and professional support.

Your profile at a glance:

- Master's degree in electrical engineering, applied mathematics, computer science, or a comparable subject with very good grades from a top university
- Strong background in either optimization-based control, numerical optimization, or cryptography (especially homomorphic encryption and multi-party computation)
- Good programming skills (especially Matlab, Python, C, or VHDL)
- Good English skills (German is appreciated but not necessarily required)
- Publications at reputable venues from the mentioned fields are a plus

Applications from women are particularly welcome and, in case of equal qualifications and experience, will receive preferential treatment according to state law (LGG). Qualified disabled people (in the sense of the German social law SGB IX) are also encouraged to apply. The positions are full positions but part-time employment is, in principle, possible.

Please send your application, including a cover letter, your CV, scanned certificates, a list of publications (if applicable), and the contact data of two references, by e-mail with a single attachment to moritz.schulze.darup@upb.de until **August 15th 2019** mentioning the **reference number 3860**.

Informal inquiries should also be directed to the above e-mail address.

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