TECHNISCHE UNIVERSITÄT DARMSTADT

Technische Universität Darmstadt | Karolinenplatz 5 | 64289 Darmstadt

To whom it may concern

Reference Letter for Konstantin Preußer

To whom it may concern,

Mr. Preußer was employed in my department from February 1st, 2022, to June 30th, 2023, as a research assistant with 40 hours per month for the BMBF project "AlgoRes: Algorithmic Resilience of Decentral Autonomy".

The AlgoRes research project was focused on investigating algorithms for the control of large-scale power grids and analyzing the vulnerability of these algorithms to high-impact, low-probability events (HILP) and cyber-attacks. The project's outcome was a set of new algorithmic tools for the robustness analysis of the underlying control logic of power systems with an emphasis on intentionally generated contingencies due to adversarial attacks on the grid's infrastructure.

In this context, Mr. Preußer developed and implemented a software tool to assist distribution system operators in planning and implementing control and communication schemes for smart power grids. Its objective was to achieve grid resilience in the face of the increasing number of distributed energy resources (DER) and the future mass adoption of electric vehicles. The software incorporates state-of-the-art algorithms developed in the AlgoRes project that verify the feasibility of the power grid for various scenarios of renewable energy generation and electric vehicle charging patterns and simultaneously calculate optimal control laws for the DERs. Mr. Preußer also investigated how cyber-attacks on the communication infrastructure affect the power grid's feasibility. Mr. Preußer utilized a range of programming languages and frameworks, including MATLAB, Python, JavaScript, and Electron, to meet the constraints of existing code and reduce processing times. The software project was organized and maintained using Git.

Mr. Preußer has completed his work to our highest satisfaction. He was able to familiarize himself quickly with new technologies and drive the development forward. Mr. Preußer presented his results convincingly in meetings with the research project's industrial partners. Moreover, Mr. Preußer was flexible when taking on various tasks, for which we are very grateful.

Mr. Preußer is leaving us at his own request. We wish him all the best for his future career.

Best regards,

Florian Steinke

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Datum
10.05.2023