

AIT Austrian Institute of Technology, the Austrian research institute with European format which focuses on the key infrastructure issues of the future, is looking to strengthen its team with the immediate appointment of a

Master Thesis “Mathematical Models of PV Generation Systems for Reliability assessment of Distribution Grids with high share of PV Systems”

While the renewable energy sources are regarded as cost-effective, their power outputs are largely dependent on external natural random resources such as solar irradiation and temperature. Therefore, they behave quite differently from the conventional generators. However, some mathematical models were developed to consider the different components of PV systems, regarding this fluctuating nature, and several failure modes with various effects on the entire system performance. But they are only for small sized systems, in order to allow long period simulations and analysis.

New mathematical models are needed, addressing the stochastic behaviour of the PV systems, and in the meantime, characterizes more precisely the performance of the different system components. In this thesis a new mathematical model will be developed for a PV system which can be used in assessing the reliability of electric distribution grids with a high share of PV systems. Moreover this model has to meet the simulation requirements of electricity grids with different shares of PV systems and different operation states and different time resolutions.

Work description:

- Surveying the state-of-the-art and existing research activities
- Defining a use case
- Identify the most suitable solution for the given use-case
- Creating a different versions of the model
- Validation of different versions of the model

Qualifications:

- Attending a technical master degree program in Electrical Engineering, Computer Science, Mathematics or similar
- Good statistical background
- Knowledge with Python, R, Java and Matlab
- Good English skills, working language are both English and German
- Experience with simulation methods (e.g Monte Carlo simulation, PowerFactory)

We are pleased to invite interested persons who wish to contribute their knowledge and their ideas to the field of applied research. Please attach meaningful application documents, including certificates and photos.

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