

Title: Internet of Things for Renewable Energy Systems

Contacts: Hadi Kanaan, Samer Lahoud

Collaboration: Université Paris-Saclay

Location: ESIB, Campus des Sciences et Technologies, Mar Roukos

Education required: Ph.D. in Electrical Engineering

Knowledge: power electronics, modeling and simulation, mathematical optimization, machine learning and communication protocols (considered a plus)

Duration: 6 months (can be extended to one year)

Start date: preferably before September 2021

Context and Tasks:

The Faculty of Engineering ESIB of Saint Joseph University of Beirut is seeking to recruit a highly motivated candidate for a post-doc position to work on the models and applications of the Internet of Things in power-electronics-based distributed power systems. The selected candidate will work with a dynamic team at the research laboratory of ESIB. The work is done in collaboration with Université Paris-Saclay in France.

The research project consists of designing a new family of intelligent power converters. Such power electronics devices are designed in a way to continuously measure their operating parameters and transmit them using standard communication interfaces. A cloud controller receives the parameters and applies Machine Learning in order to compute the optimal operating point of all interconnected devices. Intelligent power converters are typically useful when computing the optimal repartition of the power in presence of heterogenous renewable energy sources on distributed electric grids.

The project involves multidisciplinary works mainly in the power electronics field, control theory, and electronics, but also in the Internet of Things and Machine Learning.

The post-doc candidate will be responsible of the following tasks:

- Reviewing the state-of-the art for using IoT in renewable energy systems.
- Identifying the challenges in optimizing the performance of static converters in distributed renewable energy systems.
- Designing an architecture for using IoT and AI for optimizing the performance of static converters in distributed renewable energy systems.
- Analyze the requirements of the architecture.
- Preparing and submitting a paper that presents the major scientific achievements.

In order to apply, please send your application to Pr. Hadi Kanaan hadi.kanaan@usj.edu.lb and Dr. Samer Lahoud samer.lahoud@usj.edu.lb including:

- Your CV
- A motivation letter
- One of your published articles
- The name of one reference