

Postdoctoral Fellowship- AI4DG Project

Decentralized Control of Distributed Generation in Medium/Low Voltage Networks

Context and Objectives:

The “artificial intelligence for distribution grids” (AI4DG) project is a French-German collaboration between academic and industrial partners – Univ. Grenoble Alpes, University of Bielefeld, ATOS WorldGrid and Stadtwerke Versmold. The project aims at investigating control strategies for distributed generation at the low voltage level, relying on edge computing and the implementation of artificial intelligence techniques. The scope of the project is then to control distributed resources ‘behind the meter’, at the end user side, while guarantying secure and efficient operation at the distribution network level. The implemented solutions will be deployed on an actual demonstrator with controllable energy storage systems (ESS) installed at the consumer side.

The AI4DG teams are looking for a postdoctoral fellow in the field of power system control. The successful candidate will be in charge of developing decentralized control schemes for a fleet of ESS at the distribution level. A specific attention will be attached to the local objectives of end users and global objectives of the distribution system operator. Conventional optimization-based approaches will be implemented before investigating the possibility to integrate adaptive controller based on artificial intelligence. To that end, the candidate will work closely with the computer science teams while providing simulation environments to emulate the power system and ESS operations, providing clean data to the colleagues and comparing operational results of all control implementations.

Required education and skills:

- Applicants should hold a PhD and have an established publication record in a relevant field - Electrical Engineering or Computer Science with specialization in power systems analysis and optimization, distributed energy resources and ESS modelling and operation.
- Good understanding in constrained optimization methods and mathematical problems with equilibrium constraints - convex optimization (LP, QP), mixed integer programming, heuristics, among others.
- Simulation/modelling and development tools - MATLAB, Python, Java, C, etc.; Mathematical Language Programming and experience in optimization solvers would be a plus - GAMS, Julia, YALMIP, CPLEX, GUROBI, GLPK, among others.
- Knowledge and prior experience in artificial intelligence and data analysis – supervised and reinforcement learning would be relevant to the project.
- Strong analytical and communication skills in an international environment (fluent English is mandatory), ability to present clearly and concisely to French and German academic and industrial partners. Capacity to lead meetings if ever needed on dedicated tasks.

Appointment Terms:

The successful candidate will be enrolled for a full-time 18 months postdoctoral fellowship, hosted at the Electrical Engineering Laboratory of Grenoble (G2Elab) and the Informatics Laboratory of Grenoble (LIG), France. Expected gross salary ranging from 2.4k€/month to 2.9k€/month based on experience.

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