

Postdoctoral position offer:

Diagnostics and prognostics of electrolyzers coupled to wind farms

Publication date:	24.04.2018
Application deadline:	30.05.2018
Contract type :	Contrat à durée déterminée (CDD), full-time
Contract duration:	10 months
Contract start date:	01 September 2018
Laboratory:	FEMTO-ST, UMR CNRS 6174, Belfort (France) FCLAB, FR CNRS 3539, Belfort (France)
Supervisors and contacts:	Dr. Robin ROCHE +33 (0)3 84 58 34 79 robin.roche@ubfc.fr Dr. Nadia YOUSFI STEINER +33 (0)3 84 58 36 67 nadia.steiner@ubfc.fr
Salary:	2000 € per month (net income, including social security)

Context

The position is funded through the HAEOLUS project from the H2020 – FCH JU2 program. HAEOLUS aims to study the value of coupling hydrogen storage to wind farms in different use cases. This four-year project will run until 2021 and bring together academic and industrial partners from Norway, Italy, Spain and France. These partners are SINTEF, Tecnalia, Uni. del Sannio, Varanger Kraft Wind, KES, and UBFC. HAEOLUS aims to study the value of coupling hydrogen storage to wind farms in different use cases.

Université Bourgogne Franche-Comté (UBFC, www.ubfc.fr) is a public institution regrouping several high education and research entities in the Bourgogne Franche-Comté region in France. UBFC's research unit on fuel cells and hydrogen, FCLAB (www.fclab.fr), is one of the leading research institutes in this field at the European

level, with significant experience in collaborative projects, and state-of-the-art experimental facilities. Finally, FEMTO-ST (www.femto-st.fr) is one of the largest French laboratories in the field of engineering sciences, with approximately 900 members of UBFC. The recruited postdoctoral researcher will be employed by UBFC and will be affiliated to FCLAB and FEMTO-ST.

Job description

Within the framework of the HAEOLUS project, the postdoctoral researcher will be expected to carry out the following tasks:

- Design diagnostics and prognostics algorithms for PEM electrolyzers and fuel cells,
- Implement and validate their operation in simulation,
- Assist partners in integrating the algorithms with the control system for validation in the on-site experiment,
- Use experimental data to tune and further improve the operation of the algorithms,
- Report and communicate on research activities,
- Lead efforts in the writing of deliverables,
- Participate in project meetings and conference calls,
- Participate in dissemination activities, for example through scientific publications in selected journals and participations in workshops and conferences.

Keywords

Electrolyzer, degradation, diagnostics, prognostics, fault-tolerant control, wind farm, fuel cell.

Position requirements

Essential skills:

- Ph.D. degree in electrical engineering, automation/control, electrochemistry, applied mathematics, data-mining, artificial intelligence, or a closely related field.
- Strong background in scientific computing (Matlab preferred).
- Proficiency in scientific writing.
- Good written and oral communication skills in English.

Desired skills:

- Experience with fuel cells, electrolyzers or other electrochemical devices.
- Experience with diagnostics and prognostics techniques.
- Skills in French are a plus, but not mandatory.

Application instructions

Applicants are requested to send the following documents to the following email addresses: robin.roche@ubfc.fr and nadia.steiner@ubfc.fr

- A detailed CV, including a list of publications,
- A cover letter,
- Recommendation letters.

For more information, applicants can contact R. Roche and N. Yousfi-Steiner using the above email addresses.

Related references

M. Ibrahim, N. Steiner, S. Jemei, and D. Hissel. "Wavelet-based approach for online fuel cell remaining useful lifetime prediction." *IEEE Transactions on Industrial Electronics* 63.8 (2016): 5057-5068.

M. Jouin, R. Gouriveau, D. Hissel, M.C. Péra, and N. Zerhouni. "Degradations analysis and aging modeling for health assessment and prognostics of PEMFC." *Reliability Engineering & System Safety* 148 (2016): 78-95.

B. Li, R. Roche, D. Paire, and A. Miraoui. "Sizing of a stand-alone microgrid considering electric power, cooling/heating, hydrogen loads and hydrogen storage degradation." *Applied Energy* 205 (2017): 1244-1259.