Postdoctoral researcher in systems & control – fuel cells M/F (F/H)

HIRING DATE 01/09/2026   **LOCATION** 75006 PARIS, ÎLE-DE-FRANCE 75006
SCHOOL MINES Paris - PSL

WORKING ENVIRONMENT AND CONTEXT

Notre établissement fait partie de l'Université PSL. Située au cœur de Paris, celle-ci fait dialoguer tous les domaines du savoir, de l'innovation et de la création. Classée parmi les 50 premières universités mondiales, elle forme au plus près de la recherche des chercheurs, artistes, ingénieurs, entrepreneurs ou dirigeants conscients de leur responsabilité sociale, individuelle et collective.

HOSTING STRUCTURE

ARMINES, founded in 1967, is France's leading player in contract research, working closely with the École des Mines de Paris. It conducts public and private research projects in collaboration with industrial partners in France and abroad.

 MINES Paris, a member of PSL University, trains generalist engineers through innovative teaching methods combining engineering sciences and humanities, with a strong focus on research.

TEACHING MISSION

Your environment:

As part of the EU HORIZON-JU-CLEANH2-2025 project MARINER, CAS is recruiting a postdoctoral researcher for a duration of 18 months. The MARINER project, funded under the Horizon Europe Clean Hydrogen Partnership, aims to develop and validate a **1 MW modular PEM fuel cell system** for maritime applications, paving the way for scalable zero-emission propulsion solutions. Within this framework, this post-doctoral position **focuses on designing advanced State-of-Health (SoH) monitoring and control strategies** to ensure durability, reliability, and safety under harsh marine conditions.

Your challenges and responsibilities:

The position involves designing and validating advanced monitoring and control strategies for multi-stack PEM fuel cell systems. The work will combine **physical measurements** (voltage, pressure, temperature, flow) with **data-driven analytics** such as signal processing and anomaly detection to estimate the state of health of the system. Particular attention will be given to developing **model-based observers** for critical variables like membrane humidity, which cannot be measured directly.

Building on these insights, the researcher will implement **SoH-aware control strategies** to extend system lifetime and optimize performance. This includes adaptive cooling and humidity management, dynamic pressure and flow control for air and hydrogen loops, and improved hydrogen recirculation and purge strategies to enhance efficiency and autonomy. The developed algorithms will be validated under realistic maritime conditions and accelerated stress tests (AST), using Hardware-in-the-Loop (HiL) platforms of the project. Finally, the postdoc will contribute to the **open-source dissemination** of models and control algorithms through the VirtualFCS platform, ensuring broad impact and adoption.

RESEARCH MISSION

SKILLS

The main skills required for this post are:

·   Knowledge and skills:

-        PhD in Control Engineering, Applied Mathematics, or related fields (with strong background in nonlinear systems, estimation and control).

-        Experience in model-based and data-driven approaches (e.g. observers, data science for diagnosis).

-        Skill in real-time control implementation and familiarity with Hardware-in-the-Loop testing environments.

-        Knowledge of fuel cell systems or electrochemical energy system is a plus.

-        Proficiency in Python for simulation and algorithm development.

·   Soft skills:

-        Problem-solving

-        Critical thinking

-        Adaptability

ARMINES is committed to supporting and promoting equality, diversity and inclusion through an open and transparent recruitment process. ARMINES is also committed to promoting the professional integration and career development of people with disabilities.

NON DISCRIMINATION, OUVERTURE ET TRANSPARENCE

Notre établissement, comme l'ensemble de l'Université PSL, s'engage à soutenir et promouvoir l'égalité, la diversité et l'inclusion au sein de ses communautés. Nous encourageons les candidatures issues de profils variés, que nous veillerons à sélectionner via un processus de recrutement ouvert et transparent.

CONTACT

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OTHER INFORMATION

Recherche principal : **Mathématiques** Recherche secondaire : **Mathématiques appliquées**

Wage : **De 35676.0 à 37572.0 € (Euros) par an**

Durée du contrat18 mois

Université PSL (Paris Sciences & Lettres)