

Pierre Haessig, [www.pierreh.eu](http://www.pierreh.eu)

CentraleSupélec  
Avenue de la Boulaie — CS 47601  
35576 Cesson-Sévigné Cedex, France

[pierre.haessig@centralesupelec.fr](mailto:pierre.haessig@centralesupelec.fr)  
office phone: +33 2 99 84 45 76  
cell phone: +33 6 81 17 12 06

## Assistant professor in Electrical Engineering & Control

---

### Research Experience

---

2014–  
present

**Assistant professor** of Electrical Engineering & Control at *CentraleSupélec*, Rennes campus, in the Automatic Control group of *IETR*.

Core research topics: analysis, sizing and optimal control of energy systems under uncertainty (e.g. solar and wind power production).

2011–2014

**PhD research** at the SATIE CNRS laboratory, *ENS Rennes*, France

“Sizing and optimal control of an energy storage associated with wind power generation”

2011,  
4 months

**Master thesis** at L2S, *Supélec*, Gif-sur-Yvette, France

“Characterizing the uncertainty of wind power generation”

2009,  
7 months

**Research internship** at ISN, *MIT*, Cambridge, USA

“Real-time simulation of power electronics circuits”

---

### Teaching

---

#### Teaching topics

- **Electrical engineering**: Power systems, power electronics
- **Control theory & System modeling**: Simulink, Modelica
- **Scientific computing** (occasionally)

#### Teaching experience

2014–  
present

**Assistant professor** of Electrical Engineering & Control at *CentraleSupélec*, Rennes campus. 200–250 hours/year.

2014–present: teaching the 1<sup>st</sup> year electrical energy course (AC power, magnetic circuits, transformers, DC machines).

2016–present: creating and teaching a 33-hour course on the *Modelica* multiphysics modeling language, with a focus on model structuring and collaborative engineering (version control with Git), and a short introduction to bond graphs. Online assignment: <http://éole.net/courses/modelica/>.

2019–present: cocreating and teaching (with Nabil Sadou) a 2<sup>nd</sup> year “engineering challenge term” on Microgrids and Renewable Energies, which includes an optimization project.

2020: teaching a 15-hour Power Systems course.

---

## Curriculum in Electrical Engineering & Control

---

- 2011–2014 | **PhD** on Energy Storage Sizing and Management for Wind Power, with the electric utility EDF, R&D department, and the SATIE CNRS laboratory at ENS Rennes, Rennes, France.
- 2007–2011 | **Normalien** in the Electrical Engineering & Control dpt. of ENS Cachan, Paris, France. (ENS Cachan is one of the French leading schools preparing for research and teaching careers).
- 2011: **Master degree** in Control & Signal Processing at Supélec.
- 2010: **Agrégation** in Applied Physics.  
Ranked first in this highly competitive test which is required by the French Education Ministry for teaching high school and undergraduate students.

---

## Communication & Computing Skills

---

### Scientific computing & data analysis

*I'm interested in open source tools for reproducible scientific computing.* GitHub: [pierre-haessig](#)

- **Scientific computing:** almost daily practice since 2011, often with [Jupyter](#) notebooks. Mostly Python, with more and more Julia; a bit of Matlab.
- **Statistics:** time series analysis with Python (pandas, statsmodels); past experience with R.
- **Optimization:** stochastic dynamic programming (created [stodynprog](#)), convex optimization tools ([JuMP](#)).

### Graphics & Publishing

- **Vector graphics & Image editing:** Inkscape, Gimp.
- **Document authoring:** LaTeX, Office suites (Microsoft's and LibreOffice), Markdown (slides with [Marpit](#)), Sphinx (e.g. for online course assignments).
- **CMS/LMS:** Wordpress, Moodle (e.g. quizzes authoring).
- **Web design:** HTML, CSS, SVG, with Javascript animations (Phaser).

### Languages

- **English:** fluent. 9 months of scientific internship in the USA. TOEFL: 110/120, TOEIC: 990/990 in 2008.
- **German:** basic skills. Years of study, several visits and some weeks of immersion in Germany, but lack of recent practice.

---

## Research Projects & Publications

---

### Fresh projects

- Optimization of energy systems by automatic differentiation of Julia code, with a grant from [GdR SEEDS](#), in collaboration with Benoit Delinchant, G2Elab (2021)
- Simplified control model of multi-energy systems from physical description in Modelica, PhD of Joy El Feghali (2020–2022)
- Optimal microgrid sizing considering uncertainty and grid architecture, planned PhD of Elsi El Sayegh (2021–2023)

## Energy storage and renewable energies (2011–present)

Work on the sizing and management of an energy storage connected with renewable power generation (wind, solar).

- I. Kordonis, A. C. Charalampidis, and **P. Haessig**, “Optimal Control of MDPs over a Long Operation-Dependent Time Horizon and Application to Battery Energy Storage Systems,” tech. rep., 2019. submitted to IEEE Transactions on Automatic Control.[ [bib](#) ]
- **P. Haessig**, J. J. Prince Agbodjan, R. Bourdais, and H. Guéguen, “Energy management with uncertain inputs: which algorithms ? Open source benchmark based on a solar home,” in *SGE 2018, Nancy, France*, July 2018. in French.[ [bib](#) ]
- **P. Haessig**, B. Multon, and H. Ben Ahmed, “Effect of the timestep on the simulation of a wind-storage system,” in *SGE 2016, Grenoble, France*, June 2016. in French.[ [bib](#) ]
- **P. Haessig**, B. Multon, and H. Ben Ahmed, “Energy Storage Control with Aging Limitation,” in *IEEE PowerTech 2015 Conference, Eindhoven, the Netherlands*, June 2015.[ [bib](#) | [DOI](#) | [http](#) ]
- **P. Haessig**, *Dimensionnement & gestion d'un stockage d'énergie pour l'atténuation des incertitudes de production éolienne*. PhD thesis, ENS Cachan, July 2014.[ [bib](#) | [http](#) ]
- **P. Haessig**, T. Kovaltchouk, B. Multon, H. Ben Ahmed, and S. Lascaud, “Computing an Optimal Control Policy for an Energy Storage,” in *6th European Conference on Python in Science (EuroSciPy 2013), Brussels, Belgium*, pp. 51–58, Aug. 2013.[ [bib](#) | [http](#) ]
- **P. Haessig**, B. Multon, H. Ben Ahmed, S. Lascaud, and L. Jamy, “Aging-aware NaS battery model in a stochastic wind-storage simulation framework,” in *IEEE PowerTech 2013 Conference, Grenoble, France*, June 2013.[ [bib](#) | [DOI](#) | [http](#) ]
- **P. Haessig**, B. Multon, H. Ben Ahmed, S. Lascaud, and P. Bondon, “Energy storage sizing for wind power: impact of the autocorrelation of day-ahead forecast errors,” *Wind Energy*, vol. 18, pp. 43–57, Jan. 2015. published online Oct 2013.[ [bib](#) | [DOI](#) | [http](#) ]

## Resilient energy management (2017–2021)

PhD thesis of Jesse James Arthur Prince Agbodjan.

- J.-J. Prince Agbodjan, **P. Haessig**, R. Bourdais, and H. Guéguen, “Stochastic modelled grid outage effect on home Energy Management,” in *2020 IEEE Conference on Control Technology and Applications (CCTA)*, pp. 1080–1085, Aug 2020.[ [bib](#) | [DOI](#) ]
- J.-J. Prince Agbodjan, **P. Haessig**, R. Bourdais, and H. Guéguen, “Resilience in energy management system: A study case,” *IFAC-PapersOnLine*, vol. 52, no. 4, pp. 395 – 400, 2019. IFAC Workshop on Control of Smart Grid and Renewable Energy Systems CSGRES 2019.[ [bib](#) | [DOI](#) | [http](#) ]

## Voltage control of distribution grids (2015–2016)

Collaboration with Marjorie Cosson on the stability of “Q(U) voltage control” schemes on distribution grids.

- M. Cosson, H. Guéguen, **P. Haessig**, D. Dumur, C. Stoica Maniu, V. Gabrion, and G. Malarange, “Stability Criterion for Voltage Stability - Study of Distributed Generators,” in *IFAC and CIGRE/CIREN Workshop on Control of Transmission and Distribution Smart Grids (CTDSG'16), Prague, Czech Republic*, Oct. 2016.[ [bib](#) | [http](#) ]

## Real-time simulation of Power Electronics (2009–2011)

Research I did before PhD. This project has since become a company, [Typhoon HIL, Inc.](#), which produces Hardware-in-the-Loop emulators of power electronics converters.

- M. Kinsky, D. Majstorovic, **P. Haessig**, J. Poon, N. Celanovic, I. Celanovic, and S. Devadas, “High-speed real-time digital emulation for hardware-in-the-loop testing of power electronics: A new paradigm in the field of electronic design automation (EDA) for power electronics systems,” in *PCIM 2011, Nuremberg, Germany*, May 2011.[ [bib](#) | [http](#) ]