

## HEC Liège invites applications for a full-time assistant position in Operations Research

The Operations Department of HEC Liège - Management School of the University of Liège is looking for an **assistant in Management Sciences, with a specialization in Operations Research** (optimization, algorithmics, decision support). The assistant position consists of a PhD research and supervising exercise sessions.

The PhD is co-supervised by Professors Jérôme De Boeck and Bernard Fortz. The proposed topic considers the use of mathematical optimization techniques together with machine learning for the electricity supply chain with a particular focus on the Unit Commitment problem (UC). The UC consists of determining the planning of power generators in order to meet a given demand and minimizing cost. Power generators have a large variety of technical constraints. Determining when to use a given power generator and what quantity of electricity to produce is not as trivial as turning an on/off switch due to these technical constraints. This problem has been widely studied in the literature with mathematical optimization techniques but little work has been done for the UC with machine learning. In the context of energy transition and the increasing use of renewable energies, the UC becomes a more challenging problem leading to several modelization and computational challenges when using mathematical optimization techniques. The technical constraints of power generators do not vary over time, only the demand in electricity and the weather conditions change on a daily basis and will influence the planning of energy production. The research will build over this observation. The aim is to use machine learning methods to learn how the planning of generators is influenced by the parameters changing on a daily basis in order to improve state-of-the-art mathematical optimization methods used for the UC. The applicant is free to propose another topic of research in accordance to the objectives of HEC Liège and can be discussed with the supervisors before submitting an application.

The supervision of exercise session will be in the field of operations research and given in English with a maximum workload of 300 h/year.

**Job description:** The appointee is expected to

- carry out research work leading to a doctoral thesis in management sciences, with a specialization in operations research at HEC Liège under the supervision of Prof. Jérôme De Boeck and Bernard Fortz;
- complete the doctoral training successfully (<http://www.edtgestion.hec.ulg.ac.be/>);
- be involved in the scientific and teaching activities of the research team QuantOM (Quantitative methods and Operations Management - <http://www.quantom.hec.ulg.ac.be/>) within the strategic field “Business Analytics and Supply Chain Management” ([https://www.hec.uliege.be/cms/c\\_8321276/en/hec-business-analytics-supply-chain-management](https://www.hec.uliege.be/cms/c_8321276/en/hec-business-analytics-supply-chain-management));

**Your profile:**

- You have a master's degree (120 credits) or an academic equivalent degree ([https://www.enseignement.uliege.be/cms/c\\_9096635/en/doctorate](https://www.enseignement.uliege.be/cms/c_9096635/en/doctorate)) by the 1<sup>st</sup> of October 2024 in

one of the following or related fields: mathematics, informatics, quantitative methods in management, operations research,...

- You are interested in fundamental and applied research questions in operations research, optimization and machine learning, with a strong focus on algorithmics;
- Having programming skills in Python, Julia, C++, Java or other languages and a keen interest in programming is a plus;
- Languages: English (fluent – spoken and written), French is not required but would facilitate the daily life in the department.

**Contract:** Full-time fellowship for a period of 2 years starting on October 1, 2024, renewable 2 times 2 years for a total duration of 6 years. The monthly net salary is around 2,500€.

### **Application package:**

Interested candidates should take a first contact with the supervisors Jérôme De Boeck and Bernard Fortz to discuss the research topic ([jerome.deboeck@uliege.be](mailto:jerome.deboeck@uliege.be)) before sending their motivation letter, curriculum vitae, and transcripts of undergraduate and graduate degrees by email to Prof. Jérôme De Boeck ([jerome.deboeck@uliege.be](mailto:jerome.deboeck@uliege.be)). Candidates will be considered until the position is filled.

### **More information about HEC Liège:**

HEC Liège is the Management School of the University of Liège (ULiège). The University is an active partner of a network of over 900 universities promoting the exchange of students, researchers, and skills. As one of its faculties, HEC Liège is one of the leading Belgian management schools hosting graduate and postgraduate study programmes. The School counts 110 full-time faculty members and researchers and about 3,500 students, and promotes an empowering pedagogy leading students to play a proactive part in their education.

HEC Liège's commitment to and ongoing investment in quality improvement has been recognized through the international Accreditations **AACSB** and **EQUIS** (delivered by **EFMD**).

HEC Liège emphasizes the human dimension of its work environment, the regional anchoring of its community service missions, the managerial relevance of its teaching and its applied research projects, let alone its fruitful inter-faculty partnerships.

HEC Liège upholds respect, tolerance, congeniality, diversity, and social responsibility. It is committed to the well-being of its members and to environmental protection.

Last but not least, HEC Liège's modern and expanding campus within a city renowned for its friendliness and hospitality makes it a great place to live and work.

A description of the HEC Liège work environment can be found at [https://www.hec.uliege.be/cms/c\\_8475866/en/hec-hec-liege-is-hiring](https://www.hec.uliege.be/cms/c_8475866/en/hec-hec-liege-is-hiring).

HEC Liège is located in Liège, Belgium's third largest city, and the largest agglomeration of the French speaking Walloon region. At the heart of Europe, Liège is the third inland port of Europe and the seventh freight airport in Europe. Recognized for its quality of life and its rich historical heritage, Liège is ideally situated within the Meuse-Rhin Euregio, 30 km from Maastricht (the Netherlands) and 60 km from Aachen (Germany). It is less than 1.5 hours away from Cologne, 2.5 hours from Paris, and 4 hours from London by high-speed train (TGV) starting from the magnificent train station designed by the renowned architect Santiago Calatrava.