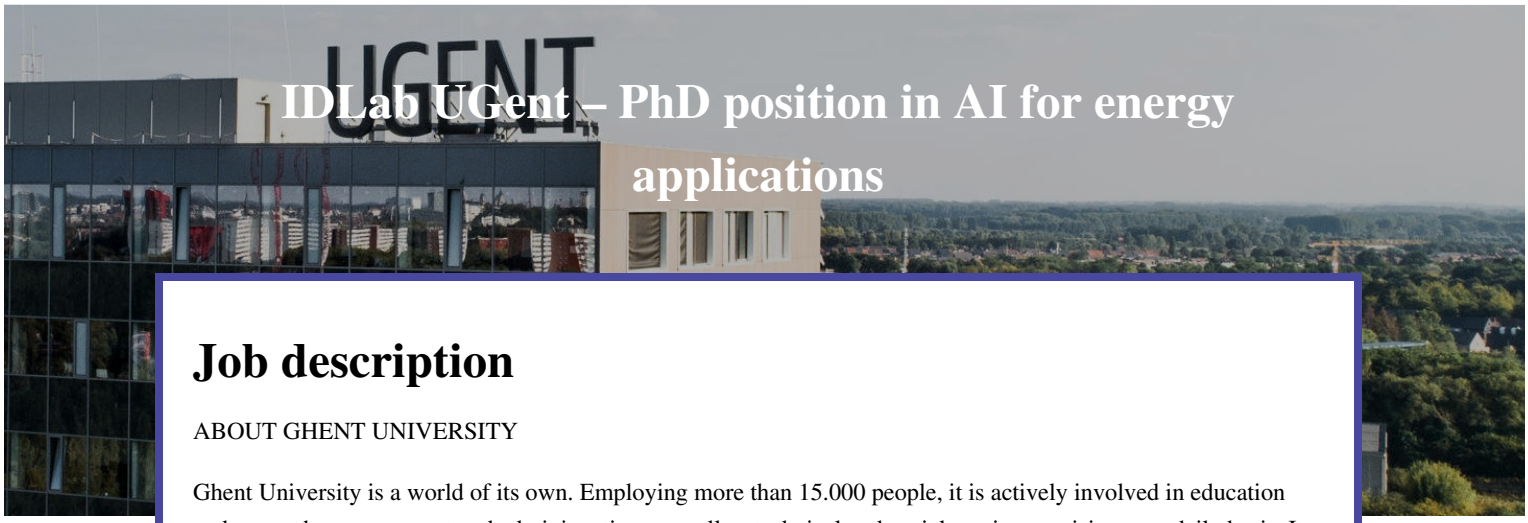
IDLab
INTERNET & DATA LAB



IDLab UGent – PhD position in AI for energy applications

Job description

ABOUT GHENT UNIVERSITY

Ghent University is a world of its own. Employing more than 15.000 people, it is actively involved in education and research, management and administration, as well as technical and social service provision on a daily basis. It is one of the largest, most exciting employers in the area and offers great career opportunities.

With its 11 faculties and more than 85 departments offering state-of-the-art study programmes grounded in research in a wide range of academic fields, Ghent University is a logical choice for its staff and students.

Job description

The "AI for Energy" team (AI4E), led by prof. Chris Develder and prof. Bert Claessens at the Internet and Data Lab (IDLab) at Ghent University - imec is looking for a qualified and motivated candidate to pursue a Ph.D. in artificial intelligence for energy applications. Our AI4E team has as a mission to research, develop and incubate data-driven (decision making) technology supporting decarbonization of our society, through co-creation with industry & research partners. Today's energy system is still going through a transition that mostly is driven by the increasing introduction of renewable energy sources (RES), both in large-scale installations (wind farms, solar) as well as distributed over large number of small-scale assets (e.g., rooftop PV). This calls for an increasing adaptivity, especially in terms of flexibly controlling power consumption of various assets (e.g., batteries, heat pumps, electric vehicle chargers). The research at AI4E is centered around (1) data-efficient control of flexible assets, (2) scaling up aggregated control of large volumes of such assets, and (3) predictive support tools for grid operators. Our approach across these 3 research lines is to adopt fit-for-purpose and holistic solutions, which typically involve data-driven AI approaches, relying on neural networks, reinforcement learning, graph neural networks, etc.

In this PhD position, you will build on our expertise in reinforcement learning for flexibility exploitation, and design of AI-based energy management algorithms to coordinate individual and combinations of

flexible loads. These algorithms should cater for large asset portfolios, balancing local objectives with (multi-)market incentives. The algorithms should maximally be self-learning, uncertainty-aware, explainable, and explicitly respect key operational constraints including user comfort, grid limits, and asset degradation (e.g., battery wear).

The offered position entails the following:

· You are granted PhD position to work on fundamental and applied research projects (4 years), likely in cooperation with external partners (academic and/or industrial).

· You work on AI (i.e., analytics, modeling, machine learning) for energy applications, mostly focusing on reinforcement learning (RL), where you will consider innovative extensions (e.g., new neural network architectures) of state-of-the-art solutions. You may also consider hybrid solutions such as combinations of

optimization-based MPC with data-driven RL methods.

· You use the aforementioned AI techniques to research scalable/distributed solutions to control large pools of flexible assets, but will also benchmark them against MPC-based baselines (e.g., with perfect foresight, as an upper bound).

· You define innovative use cases for such flexibility exploitation, based on in-depth study of the various recent and upcoming energy markets (imbalance, intraday, frequency reserve), e.g., to assess if and how participation across them can be valuably exploited (cf. value stacking)

· You work in a challenging, creative and constructive environment.

· You get the unique opportunity to participate in research projects (on a national and/or European scale) and to cooperate with major ICT-oriented companies

· You publish and present results both at international conferences and in scientific journals.

- You will at times assist in educational tasks of the research group (e.g., lab supervision).

Your profile

We are looking for candidates with the following qualifications and skills.

· You hold (or will hold, at the time of joining our team) an M.Sc. degree relevant to the position (i.e., with a focus on *computer science*) with first class performance as demonstrated through outstanding grades, M.Sc. thesis results and/or publications.

· You have a strong background in AI (machine learning, neural networks, reinforcement learning), including the hands-on programming skills (e.g. familiarity with PyTorch is recommended).

· You have experience in software development (e.g., student projects or master thesis with an important software development component), with solid knowledge of Python. Experience with R is a plus.

· You have a solid knowledge of data analysis, machine learning, optimization techniques (e.g., ILP, heuristics), basic distributed software concepts.

· You have basic notions of modern power systems and energy markets (optional, but strongly recommended).s

· You have strong analytical skills, you are well organized, you are an excellent communicator, a team player.

· You have a strong sense of responsibility and are also able to autonomously plan and perform research tasks. You respect the predetermined milestones in research projects.

· Your English is fluent, both in speaking and writing.

· Both young graduates and candidates with a short (industrial) experience are welcome.

Our offer

· We offer a full-time position as a doctoral fellow, consisting of an initial period of 12 months, which, after a positive evaluation, will be extended to a total maximum of 48 months.

· The fellowship amount is 100% of the net salary of an AAP member in equal family circumstances. The individual fellowship amount is determined by Ghent University's Department of Personnel and Organization based on family status and seniority. A grant that meets the conditions and criteria of the regulations for doctoral fellowships is considered free of personal income tax. Click here for more information about our salary scales.

· All Ghent University staff members enjoy a number of benefits, such as a wide range of training and education opportunities, 36 days of holiday leave (on an annual basis for a full-time job) supplemented by annual fixed bridge days, bicycle allowance and eco vouchers. Click here for a complete overview of all the staff benefits (in Dutch).

Interested?

For more information, you can contact chris.develder@ugent.be, with as subject *Application: PhD in AI for Energy 2026*.

You can apply via https://jobs.idlab.ugent.be/en/ph-d-position-in-ai-for-energy-applications

https://idlab.ugent.be