LightOn

We bring Light to AI

Job offer (posted 10 April 2020)

3-year PhD studentship in

Inverse Problems and Optical Computing

NB: strict eligibility and mobility rules

As part of the newly EU-funded ITN project "Post-Digital", LightOn has an opening for a fully-funded 3 year PhD studentship to join its R&D team, at the crossroads between Computer Science and Physics.

Environment LightOn is a young « deep tech » startup company developing a disruptive optical co-processor technology called Optical Processing Unit (OPU) for the needs of Artificial Intelligence computations. Our OPUs offer unmatched computing capabilities on very large data, at low power consumption. We have made our technology accessible through the cloud to the Artificial Intelligence community at large. LightOn's fast-growing team is young and international, and shares the same passion for cutting-edge technology. Our offices are located in the heart of Paris.

Research topic: The goal of this 3 year PhD position is to theoretically, numerically and experimentally investigate how optimization techniques can be used in the design of hybrid computing pipelines, including a number of photonic building blocks ("photonic cores"). In particular, the optimized networks will be used to solve large-scale physics-based inverse problems in science and engineering - for instance in medical imaging (e.g. ultrasound), or simulation problems. The candidate will first investigate how LigthOn's current range of photonics co-processors can be integrated within task-specific networks. In a second stage, the candidate will develop a computational framework for the optimization of electro-optical systems. Finally, optimized systems will be built and evaluated on experimental data. This project will be part of LightOn's internal THEIA project, aiming at the automated design of hybrid computing architectures, including combinations of LightOn's photonic cores and traditional silicon chips.

In the framework of the ITN Post-Digital network, this project involves collaborations and 3-month secondments with two research groups led by:

- Daniel Brunner (Université Bourgogne Franche-Comté / FEMTO-ST Besançon), who will be the academic supervisor - The candidate will be registered as a PhD student at UBFC.
- Pieter Bienstman (IMEC, Leuven, Belgium).

The supervisor at LightOn will be Laurent Daudet, CTO - currently on leave from his position of professor of physics at Université de Paris.

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Profile

- The candidate must be familiar with Computational Physics, Inverse Problems and Optimization Techniques, with some knowledge of Machine Learning.

- Strong programming skills are a must, including Python and its scientific stack Numpy/Scipy. Knowledge of Pytorch/Tensorflow, C/C++ or CUDA would be a plus, together with a past contribution to collaborative software projects.

- A general background in physics. Familiarity with optical design or emerging photonic technologies (freeform optics, nanophotonics, etc ...) would be a plus.

- Master's degree - or equivalent degree just prior to a PhD, see eligibility rules below - in Computer Science, Machine learning, Physics (including optics) or Engineering, with a proven interest in interdisciplinary research.

- Ability to work and communicate in English. French would be a plus but is not required,

- Strong organisational, project management and networking skills. In particular, the recruited candidate will take part in all consortium meetings of the EU ITN Post-Digital project, and will coordinate LightOn's deliverables in the project.

Mobility and Eligibility rules: due to the EU funding source, the following rules will be strictly enforced

Eligibility
Applicants must be (at the first day of their employment contract) in the first four years (full-time equivalent research experience) of their research career and have not been awarded a doctoral degree. This research experience is measured from the date when they obtain the degree, which formally entitles them to embark on a doctorate (either in the country in which the degree was obtained or in the country in which the researcher is recruited, even if a doctorate was never started or envisaged). Research Experience is measured to the first day of the employment contract of the researcher.

Mobility
At the time of commencing their employment (at the first day of their employment contract) researchers must not have resided or carried out their main activity (work, studies, etc.) in France for more than 12 months in the 3 years immediately prior to their recruitment. Short stays, such as holidays, are not taken into account.

Compensation: Monthly allowance and relocation costs according to EU Marie Skłodowska-Curie rules.

Application: Position to be filled no later than Sept 1st, 2020.

Send your application with a CV to jobs@lighton.io with [Post-Digital PhD] in the subject line. Short-listed applicants will be asked to provide references.

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