PhD position on Photonic neuromorphic computing

UGent/imec - Photonics Research Group
Sint-Pietersnieuwstraat 41, B-9000 Gent, Belgium
http://photonics.intec.ugent.be/

We are looking for highly motivated PhD candidates with a background in photonics and an interest in machine learning to do research into photonics reservoir computing, an exciting new paradigm of photonics information processing.

Reservoir computing is a methodology from the field of machine learning and neural networks, which has been used successfully in several pattern classification problems, like speech and image recognition. However, so far it has been mainly used in a software implementation, which limits its speed and power efficiency. Thanks to our recent work (Vandoorne et al., Nature Communications 5 3541, 2014) we have shown that photonics could provide an excellent platform for such a hardware implementation.

In the context of the European project Phresco (together with a.o. IBM) we now want to scale this approach up from a lab prototype with a small number of nodes to a bigger system which can tackle more complex, real-life problems. E.g., we have already shown that such a reservoir can clean up dirty telecom signals with NRZ formats, and we now want to extend this to more complex coherent modulation schemes.

We offer you the opportunity to perform cutting-edge, blue-sky reseach, in a challenging, motivating environment, working within a multidisciplinary team consisting of both photonics people and computer scientists. A willingness to tackle challenges coming from these multidisciplinary collaborations is a must.

Application:

Apply by filling in the **application form**.

More information:

Prof. Peter Bienstman (Peter.Bienstman@UGent.be)

About Photonics Research Group

The Photonics Research Group (about 85 people) is associated with IMEC, and is part of the Department of Information Technology of Ghent University. The group

is headed by Prof. R. Baets and has been active in photonics device research for many years. The other professors in the group are P. Bienstman, W. Bogaerts, B. Kuyken, N. Le Thomas, G. Morthier, G. Roelkens and D. Van Thourhout. The main applications under study are silicon nanophotonics, heterogeneous integration, optical interconnect, WDM optical communication, silicon photonics biosensors and photonic integrated circuits for biomedical applications in the near-infrared and mid-infrared wavelength range. More in particular, the silicon nanophotonics work focuses on the design and fabrication of SOI-based photonic devices using standard lithographic techniques compatible with CMOS-processing. The group is also strongly involved in the development of heterogeneous technologies, whereby the silicon photonics platform is combined with other materials such as III-V semiconductors for efficient sources, nanocrystals and polymers.

The Photonics Research Group has been coordinating the network of excellence ePIXnet and is involved in a number of EU-projects, including the FP7 projects ActPhast, PLAT4M, Cando, and Pocket and the H2020 projects TOPHIT, TeraBoard, PIX4Life, MIRPHAB and Phresco. Furthermore, the group is partner of the Center for Nano- and Biophotonics of Ghent University and the group has been awarded three ERC Independent Researcher Starting Grants and one ERC Advanced Investigator Grant.

INTEC Department of Information Technology

Sint-Pietersnieuwstraat 41, 9000 Gent, Belgium

http://photonics.intec.ugent.be