Postdoctoral Researcher in Explainable AI for Multimodal Visual Computing

Despite the success of deep learning in various tasks, its limiting factor is that its theoretical understanding remains underdeveloped, which in turn translates into a lack of principled methods to design efficient deep-neural-network architectures. This postdoctoral opening focuses on research around explainable artificial intelligence (XAI). Specifically, the research revolves around the theoretical foundations of deep learning, using concepts from signal processing, source/channel coding and information theory, and the design of interpretable deep neural networks, including the compression and pruning of such networks. The domain of application is multimodal visual computing: specifically, the processing and analysis of data from diverse imaging modalities (e.g., image, video, time-of-flight and radar Imaging) with applications in entertainment (Virtual/Augmented Reality, Holoportation), and industry 4.0 (non-destructive testing, anomaly detection).

The position is within the Big Data team (homepages.vub.ac.be/~ndeligia/) at the Department of Electronics and Informatics (www.etruvub.be) at Vrije Universiteit Brussel, Belgium, which specializes on signal processing, machine learning, and information theory for big data acquisition, mining, processing and analysis. The team is affiliated with imec, an international R&D and innovation hub in nano-electronics and digital technologies (www.imec-int.com/).

The successful candidate will complement the existing team of several researchers working on fundamental and industrial research projects. The key responsibilities are:

- Contributing to the design and development of novel theory and algorithms for explainable deep learning with application in multimodal visual computing;
- Contributing to the design and development of experiments for the validation and fine-tuning of the algorithms;
- Contributing to the preparation of scientific publications and patents;
- Guidance and supervision of junior researchers.

We are especially interested in candidates with the following profile:

- A PhD degree focusing on machine learning, signal processing, computer vision, or information theory;
- An excellent academic record with publications in top-tier scientific journals and conference proceedings;
- Fluency in statistical learning and representation learning, including deep neural networks, matrix factorization, sparse coding, generative models;
- Fluency in state-of-the-art machine learning tools (Tensorflow, Pandas, Caffe);
- Fluency in English and excellent scientific writing skills;
- Experience with high-dimensional data, including image/video data, 3D video data, multimodal visual data (radar imaging, hyperspectral imaging).

We are offering a two-year position, extendable further subject to performance, including a competitive salary and benefits. The successful candidate will work in an international scientific environment driven by excellence in fundamental research. The position provides a great opportunity to the researcher to work in close collaboration with established companies in the domains of aerospace, manufacturing, surveillance and security.

Interested candidates can send: (i) a detailed curriculum vitae; (ii) a motivation letter related to the position’s profile; (iii) electronic copies of three key scientific publications; and (iv) the names of two potential referees by April 10, 2019 to the following contact person:

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