

## PhD Researcher in task-oriented sensing, compression, and communication

We are seeking a highly motivated and talented individual to join our research team as a PhD student in the exciting field of **task-oriented sensing, compression, and communication**. Task-oriented **sensing and compression** refers to a new paradigm in data acquisition and compression, where sensors and signal processing pipelines are designed, optimized, and deployed specifically to fulfill predefined tasks or objectives. Unlike traditional sensing approaches focusing on capturing raw data without specific context or purpose, task-oriented sensing systems are tailored to collect information relevant to particular tasks. Moreover, **semantic communication** is anticipated to be a cornerstone of next-generation AI-based communication systems. Central to this evolution is the capacity for semantic compression, wherein data (including images, videos, and radar and LiDar signals) equivalent in meaning to the transmitted ones can be reconstructed at the receiving end without necessarily recovering the transmitted sequence of bits. This approach holds promise for revolutionizing various domains, including environmental and infrastructure monitoring, healthcare, and autonomous systems.

The position is available within [the team of Prof. Nikos Deligiannis](#) at the Department of Electronics and Informatics ([www.etrovub.be](http://www.etrovub.be)) at **Vrije Universiteit Brussel, Belgium**, which specializes in interpretable and explainable machine learning, signal processing, and federated learning for computer vision and data processing. The team is affiliated with imec, an international R&D and innovation hub in nanoelectronics and digital technologies ([www.imec-int.com/](http://www.imec-int.com/)).

### Responsibilities:

- Conduct research to advance the state-of-the-art in task-oriented sensing, compression, and communication.
- Collaborate with interdisciplinary teams to apply research findings to real-world problems.
- Publish at top-tier journals and conferences.
- Prepare a doctoral dissertation and support in teaching.

### Profile and requirements:

- An MSc degree focusing on computer science, electrical engineering, mathematics or related field;
- Bachelor's or Master's degree in computer science, engineering, or a related field.
- Strong background in artificial intelligence, machine learning, and/or computer vision.
- Experience with one or more programming languages such as Python, C++, or Java.
- Familiarity with deep learning frameworks (e.g., TensorFlow, PyTorch) is desirable.
- Excellent analytical and problem-solving skills.
- Effective communication skills and ability to work both independently and collaboratively.

### What we offer:

- A fully funded PhD position;
- A competitive salary and benefits,
- An international scientific environment driven by excellence in research,
- Opportunities for travelling to conferences and research visits to international partner research groups.

Interested candidates can send via email: (i) a detailed curriculum vitae; (ii) a motivation letter related to the position's profile; (iii) academic transcripts (undergraduate and graduate), and (iv) the names of two potential referees by **May 27, 2024** to the following contact person:

### **Prof. Dr. Nikos Deligiannis**

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