

## PhD Position in AI-based Compression and Information Theory for Multi-Agent Perception

We invite applications for a fully funded PhD position within the prestigious European Research Council (ERC) Consolidator Grant “Reinventing Multiterminal Coding for Intelligent Machines (IONIAN).” As data volumes captured by intelligent machines (such as video and point cloud signals) surge, traditional storage and communication approaches struggle to keep pace. IONIAN disrupts compression and communication systems for autonomous vehicles, smart transportation systems, and unmanned aerial vehicles by creating a groundbreaking framework underpinned by interpretable and explainable AI.

### Position Overview

You will pioneer network information theory concepts and their real-world deployment in autonomous systems such as ground and aerial vehicles, and mobile robots. This includes:

- Formulate and solve long-standing multiterminal information theory problems using modern machine learning techniques.
- Design and analyze multiterminal data compression and communication architectures for cooperative autonomous machines.
- Design semantic-aware compression & network information theory: Derive new rate-(task-)distortion-reliability bounds, design adaptive codecs that prioritise safety-critical bits, and close the loop between information theory and AI models for cooperative perception.
- Publish research findings at top-tier conferences and journals.

### Required Qualifications:

- Master’s degree (or equivalent) in Electrical Engineering, Computer Science, Applied Mathematics, or a related field.
- Solid foundation in information theory, signal processing, or communications.
- Good knowledge of machine learning techniques, ideally deep learning.
- Strong programming skills in Python, MATLAB, or C++, including deep learning frameworks (e.g., PyTorch).
- Aptitude for analytical thinking, problem-solving, and mathematical rigor.
- Basic experience with experimental or simulation-based research.
- Excellent verbal and written communication in English.
- Strong team spirit and capacity to work both independently and collaboratively.

### Nice-to-Haves

- Prior experience with multiterminal source coding, network information theory, or distributed optimization.
- Record of publications in reputable conferences or journals.

- Interest in robotics, autonomous vehicles, or embedded systems.
- Familiarity with explainable AI or interpretable AI techniques.

**Offer:**

A fully funded PhD position (4 years typically in Belgium) renewed annually following positive evaluations. You will join an inspiring, dynamic, international team of researchers, post-docs, and professors at ETRO, part of the Vrije Universiteit Brussel (VUB). You will work closely with leading experts in information theory, signal processing, and computer vision and collaborate with partners across Europe and beyond. You will grow professionally through presenting at major conferences, receiving specialized training, and building a global network in academia and industry. We offer an attractive remuneration package that includes a competitive salary, holiday pay, hospital insurance, public transport coverage, and generous annual leave. The principal place of work is the VUB campus (Etterbeek) at Pleinlaan 2, 1050 Brussel.

**About ETRO-VUB:**

ETRO, the Department of Electronics and Informatics (<http://www.etrovub.be/>) of the Vrije Universiteit Brussel (VUB), performs fundamental and applied research in Micro- & Optoelectronics, multidimensional signal processing, and audiovisual computing. We are a core member of imec, the world-leading research and innovation hub in nano-electronics and digital technologies. English is our primary working language, and we foster a welcoming, multicultural environment.

**Application Procedure**

Please compile and submit the following documents into a single PDF:

- Cover Letter (1-2 pages): Describe your motivation, relevant background, and how your interests align with the position.
- Curriculum Vitae: Highlight academic qualifications, publications, work experience, and technical skills.
- Academic Transcripts from previous degrees.
- Research Statement (optional if covered in the cover letter): Outline past research experiences and future research interests.
- References: Contact details of 2–3 referees who can attest to your academic or professional capabilities.

**Application Deadline:** April 30, 2026.

**Contact Information:**

For more information, please contact Prof. Dr. Ir. Nikos Deligiannis, Email: [nikos.deligiannis@vub.be](mailto:nikos.deligiannis@vub.be)

**Start Date:** From June 1, 2026, to September 1, 2026.

You may also find additional details about the ERC IONIAN project at <https://shorturl.at/dTG0q> and about ETRO at <https://www.etrovub.be>