



PhD Position in Cooperative Perception & Multiterminal AI for Autonomous Vehicles

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).”

Why cooperative perception?

State-of-the-art autonomous vehicles can miss a critical obstacle when their camera is blinded by sun glare, or their LiDAR beam is blocked by a truck. To reach level-4/5 autonomy, we need teamwork: nearby vehicles, drones, and roadside units must co-perceive their environment, sharing and fusing complementary sensor views in real time. Yet raw video and point-cloud streams are massive, wireless links are unreliable, and safety demands that information be both timely and trustworthy.

IONIAN tackles this bottleneck head-on. We will reinvent generative cooperative vision and semantic compression methods so fleets of intelligent machines can perceive the world robustly, efficiently, and in a trustworthy manner—even when individual sensors fail or are occluded.

Position Overview

As a doctoral researcher, you will forge a **novel framework for cooperative perception** by disrupting today’s most vibrant research threads in AI:


- Generative Diffusion & 3D/4D Scene Synthesis: Re-design diffusion and NeRF-style models so multiple agents jointly reconstruct a scene.
- 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.
- Real-World Validation: Deploy and benchmark your algorithms on our autonomous vehicle, mobile robots, and UAV testbeds.

You will:

- Publish in CVPR/ICCV/ECCV, NeurIPS/ICLR, INFOCOM/ISIT and leading IEEE journals.
- Collaborate with top EU labs and industry partners.
- Mentor Master’s students and assist in graduate teaching.

Required Qualifications:

- Master’s degree in Electrical Engineering, (Applied) Computer Science, Applied Mathematics, or related field.
- Solid grounding in machine learning, computer vision, signal processing and/or information theory.

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- Hands-on experience with deep learning (PyTorch/TensorFlow/JAX).
 - Interest in: deep learning for compression, diffusion models, cooperative perception or 3D vision.
 - Strong programming skills; analytical rigour; excellent English.

Nice-to-Haves

- Publications in top-tier venues.
- Prior work on cooperative perception, generative AI, or compression algorithms.
- Experience with robotics, UAVs or autonomous vehicles.

Offer:

- Fully funded four-year PhD (annual renewal upon positive evaluation) at ETRO, Vrije Universiteit Brussel (VUB).
- Competitive salary, hospital insurance, transport coverage, and generous leave.
- Daily collaboration with an international team of experts in information theory, computer vision, and autonomous vehicles.
- Access to state-of-the-art sensing platforms and the imec ecosystem.
- Support for conference travel, specialised training, and broad networking.

Workplace: VUB Etterbeek campus, Pleinlaan 2, 1050 Brussels, Belgium.

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 signal processing, AI, computer vision, NLP, electronics, and computing. We are a 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

Combine the following into one PDF and email it to nikos.deligiannis@vub.be:

- Cover Letter (1–2 pages) – motivation and fit.
- Curriculum Vitae – education, publications, skills.
- Academic Transcripts – BSc & MSc.
- Research Statement (optional if covered in the cover letter).
- References – contact details of 2–3 referees.

Start Date: 1 September 2025 (or as soon as possible thereafter).

More on the ERC IONIAN project: <https://shorturl.at/dTG0q>

Join us to redefine how machines see, communicate and decide—together.