



# Exail Robotics Belgium – AI Scientist – Sonar Signal Processing & Machine Learning

We are looking for a highly motivated AI Scientist to join an innovative research project focused on physics-informed machine learning for underwater acoustic imaging.

You will contribute to the development of next-generation AI models for sonar signal analysis, combining state-of-the-art machine learning with deep expertise in signal processing and physical modelling.

The project focuses on automatically detecting and classifying mine-like objects on the seafloor using high-resolution Synthetic Aperture Sonar (SAS) imagery. The goal is to support mine countermeasure operations by reducing operator workload and improving detection reliability in complex and noisy underwater environments.

The work includes collaboration with research institutions and focuses on bridging applied research and operational deployment.

## About Exail Robotics Belgium

Exail is a leading industrial player in high-tech solutions for civil and defence applications. The Belgian division develops advanced underwater robotic systems designed to detect, identify, and neutralize naval mines. Our technologies make mine countermeasure operations safer, faster, and more reliable than traditional approaches.

## Your role

- Design and implement advanced signal and image processing algorithms for sonar data
- Develop, train, and optimize machine learning models for detection and classification tasks
- Work with Synthetic Aperture Sonar (SAS) datasets, including real and synthetic data
- Evaluate model performance under realistic, noisy, and constrained operational conditions
- Contribute to experimental validation, benchmarking, and performance analysis
- Collaborate closely with domain experts and academic partners

## Your profile

### *Required qualifications*

- MSc or PhD in Applied Mathematics, Physics, Engineering, or a related field
- Strong interest in AI and signal processing (e.g. time-frequency analysis, filtering, spectral methods)
- Experience with machine learning frameworks (preferably PyTorch) and strong Python programming skills
- Analytical mindset with a research-oriented approach
- Motivation to develop robust systems used in real-world operational environments

*Nice to have*

- Experience with acoustic signal processing or coherent sensing systems (e.g. radar, sonar, medical imaging)
- Knowledge of physics-informed neural networks or complex-valued neural networks
- Familiarity with explainable AI techniques

**What we offer**

- Competitive salary
- Electric company car with charging card
- Group insurance
- Hospitalization insurance with outpatient medical and dental coverage
- Meal vouchers
- Mobile phone subscription
- 12 additional RTT days (full-time employment)
- 40 remote working days per year
- Modern and comfortable working environment
- Training and career development opportunities
- A stable employer with long-term vision

**Apply today**

Join Exail Robotics Belgium as an AI Scientist and help develop next-generation underwater AI technologies for mission-critical maritime applications.

<https://www.exail.com/>