Topic of the thesis: Frugal deep learning for railway environment perception in trains

Starting date: between October and December 2023

Duration of the contract: 3 years

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Short description of the topic:

The railway infrastructure of rural lines is often outdated and requires constant vigilance. This surveillance is mainly carried out by agents who travel along the tracks. However, manual inspection and surveillance are subjective, costly, and pose safety issues for the inspectors. The "Train Lèger Innovant" project led by the SNCF involving several industrial partners (X, Thales, etc.) and "Nouvelle Signalisation Ferroviaire Frugale" project leaded by Thales-GTS focus on designing innovative systems for trains such as the monitoring of the railway infrastructure (rails, ballasts, track surroundings, etc.). In this context, the main goal of this PhD thesis is to automate the surveillance of the environment of railway tracks using data collected from different onboard, geolocalized and time stamped data from various sensors (images, sound, radar, LiDAR, etc.)
For more details, please see the attached file.

Expected profile:

•	A Master or engineering degree in the following fields: computer science, data science, applied mathematics, or computer vision
•	A solid background in deep learning and image/video processing
•	A good understanding of machine learning theory and techniques
•	Skills and experience in programming (Python/C++ and frameworks such as Pytorch/Tensorflow)
•	Good communication skills (spoken/written English)

How to apply:

Send a CV, a motivation letter, university transcripts, and two reference letters, as attachments of an email with "Application for Ferrocampus PhD position" as subject
to sylvain.marchand@univ-lr.fr, petra.gomez@univ-lr.fr and olfa.ben.ahmed@univ-poitiers.fr.