The **French-German Research Institute of Saint-Louis (ISL)** situated in the border triangle of Germany, France and Switzerland is an internationally renowned research institute belonging to a global industrial and economic network.
The spectrum of our core activities comprises a variety of topics: aerodynamics, energetic and advanced materials, lasers and electromagnetic technologies, protection, security and situational awareness. Our activities are related to both basic and applied research.

ISL is offering a **PhD Position**

Research field: image processing, computer vision, edge AI

Multi-modal visual target detection and tracking on embedded system

Context

In the frame of innovative guided projectile, new algorithms have to be developed for vision-based terminal guidance. In such applications, the use of multi-modal information visiblethermal, is a prospective research direction to overcome low illumination and reduced visibility conditions (fog, smokes) while keeping details that are present in visible images. This study aims at coupling the properties of an IR thermal camera to a high resolution visible camera to propose new robust algorithms for the detection and tracking of targets in aerial images.

Project

The objective of this PhD is to develop and test new AI-based image processing algorithms, combining machine learning techniques and object tracking methods. Strong constraints will have to be addressed given the trajectory and the motion speed of the cameras in such applications: multi-scale aspect, changing appearance of targets, partial or full occlusion, sensor noise and limited computation time. Also the resulting algorithms will have to be compatible with real-time processing on a size, weight and power (SWaP) constrained embedded platform. The PhD student will have to create and manage a collection of object signatures using innovative multimodal image sources and acquisition tools.

A drone equipped with a dual vision sensor module will be available for image sequence acquisitions as well as an access to a dedicated proving ground for field tests.

Framework

This PhD work will be carried out at the "Guidance Navigation and Control" group (GNC) at ISL, in collaboration with the "Institut de Recherche en Informatique, Mathématiques, Automatique et Signal" (IRIMAS) at the "université de Haute Alsace" (UHA). Interested candidates are encouraged to apply for this position enclosing a detailed CV and a motivation letter.

UNIVERSITÉ HAUTE-ALSACE

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