



L'**Institut franco-allemand de recherches de Saint-Louis (ISL)** est le pionnier de la coopération franco-allemande dans le domaine de la défense et de la sécurité. La mission de l'ISL est d'apporter des innovations technologiques aux forces de défense et de sécurité. Les recherches s'effectuent dans des disciplines multiples et à des niveaux de maturité variant entre la recherche fondamentale et le développement de prototypes préindustriels, intégrables dans des équipements opérationnels.

Proposition de Stage

Domaine de recherche : Robotic, Communication, Autonomous control

Return to Radio: Autonomous control of a ground robot to recover the data link in adverse environment

Contexte

In the field of ground and aerial unmanned systems, the Advanced Visionics and Processing group (AVP) has developed several robotic platforms, notably on the group. We are now expanding our field of applications thanks to the collaboration of unmanned aerial vehicles. The team successfully participated to the CoHoma 2 challenge and secured the second place [1-2]. For this challenge, we developed a remote control mode for our ground platform Aurochs [3], where the robot is controlled by a human operator located in an armored vehicle. We have experienced numerous communication issues due to the heavy vegetation encountered, forcing the armored vehicle to approach the Aurochs, hence going closer the danger. We aim at triggering an automated return to home function in the event of a communication loss between the pilot and the Aurochs.

[1]
<https://www.defense.gouv.fr/terre/actualites/challenge-cohoma-re-tex-2e-edition>

[2]
<https://www.youtube.com/watch?v=aq-iwJunoS0>

[3]
<https://www.isl.eu/documents/flyers/FR/isl-STAMINA-UGV-Aurochs-FR-nm.pdf>

Description du sujet de stage

The Aurochs is remotely operated by a pilot and it also estimates and records its trajectory to be able to rewind it if needed. At the moment this function on demand and we would like to trigger it in the event of a communication loss between the Aurochs and the pilot. This implies to:

- monitor the radio link between the pilot and the Aurochs using the API of the military radio on board
- design the command part to start the rewind of the trajectory
- evaluate the quality of the recovered link to stop once the quality enough or when the pilot starts giving commands again.

The function could also be triggered by the pilot if needed.

The internship will include some field trials depending on the maturity of the solution proposed at our testing facility.

Notions in C++ are needed
Notions in API behavior, image processing and radio communications are welcome.

Niveau : Master

Durée : 6 months

Superviseur : Martin Rebert

Modalité de dépôt de candidature :

Le/La candidat(e) est prié(e) d'envoyer un CV (détaillant le cursus universitaire) et une lettre de motivation.
martin.rebert@isl.eu

Institut franco-allemand de recherches de Saint-Louis (ISL)

Martin Rebert + AVP
5 rue du Général Cassagnou – 68301 Saint-Louis – France – Tél : +33 (0)3 89 69

