Call for Masters student for Internship

Topic: Control for robots with communication and destination objectives
Supervised by: Vineeth VARMA and Constantin Morarescu
Duration: 6 months*****
Laboratory: CRAN-ENSEM, Université de Lorraine, Nancy.
Stipend: 500 € per month

Qualifications: Motivated Master student pursuing degree in telecommunications, signal processing or automatic control, Matlab skills, proficiency in written and spoken English.

Subject areas: Wireless communication, optimization, multi-agent dynamics.

Research topic and relevance

Recently many applications have emerged in which robots, or automated vehicles performing tasks that have multiple objectives, tied to wireless communication. The general framework of this internship topic is to study trajectory planning problems for robots with multiple objectives. The robot has a communication objective, for example, to download a file from a nearby access point (like a wifi hotspot, base station etc.), and also reach a certain destination point (the destination objective). The general problem of interest is to design distributed control for multiple agents (robots) who have individual destinations and must exchange some information amongst each other (by wireless communication).

The intern will work on the two robot case, where the robots must exchange some information and then travel to their respective destinations. However, the first robot may not know the information on the destination objective of the second robot (and vice-versa). This results in each robot trying to approach each other (common utility), while also simultaneously trying to move to their destination (individual utility). Tools from optimization, multi-agent consensus and game theory will be used to develop a solution that must be implemented in Matlab (simulation). Further extensions of this work to the multi-agent case will be done as part of a PhD*****.

Master students who are interested in applying for this internship offer can do so by directly contacting Dr. Vineeth VARMA (at vineeth.satheeskumar-varma@univ-lorraine.fr) or Dr. Constantin Morarescu (at constantin.morarescu@univ-lorraine.fr).

*Based on the performance the candidate could be offered an opportunity to pursue a PhD at CRAN on the same topic.