

PROPOSITION DE POST-DOCTORAT

Intitulé : Human-Multi-Robot Interactions with Mixed-Initiative Decision-Making

Référence : **PDOC-DTIS-2024-06**

(à rappeler dans toute correspondance)

Début du contrat : 10/2024

Date limite de candidature :

Durée : 12 mois, éventuellement renouvelable une fois - Salaire brut : environ 38 k€ annuel (assurance médicale incluse)

Mots clés

Robotique, systèmes autonomes, interaction homme-robot, initiative mixte

Profil et compétences recherchées

Docteur en robotique, systèmes multi-agents, ou interaction homme-machine

Présentation du projet post-doctoral, contexte et objectif

Autonomous Systems have the capability to interpret their environment, select courses of actions that will lead to fulfilling some objectives, and adapt these actions (or objectives) to the current situation. Recent advances in Artificial Intelligence (especially in machine learning and automated decision-making) have paved the way to the deployment of such autonomous systems, yet in relatively controlled environments (e.g., autonomous transport, delivery, aircrafts). Whatever the application, autonomous systems will always interact with one or multiple human operators, would they be a “driver” within a vehicle, or an operator that manages the overall system, “supervising” its behavior.

When dealing with one human interacting with a single autonomous system, the degree of interaction between has been formalized in the Human Factors literature for several decades [Endsley, 1988]. Adaptive or adjustable autonomy are key concepts developed in the literature to reason about the interactions between an autonomous agent and its operator, in which the “degree” described before can be adjusted during the mission depending on the context [Goodrich & Schultz, 2008; Mostafa et al., 2019]. In the Human Factors and Human-Computer Interaction research communities, this adjustable interaction between human operators and artificial agents has been tackled as “Human-Agent Teaming”, or “Human-Autonomy Teaming” [Chen & Barnes, 2014]. From an AI perspective, adjustable autonomy is referred as *mixed-initiative planning* [Ai-Chang et al., 2004].

We can notice that these concepts have not been really applied to one (or possibly several) human operators interacting with a team of (possibly heterogeneous) autonomous robots. The objective of this research project specifically aims at developing and evaluating interactions between autonomous multi-robot systems and human operators that are part of the multi-agent team on the field. The work conducted in this project will consider the use-case of the CoHoMa challenge, a robotic challenge organized by the French Army, in which several operators have to deploy a team of 6 to 8 robots (aerial and ground) to observe the surrounding, detect threats, and protect the operators’ basement. The work developed during the post-doctoral research will then be applied and tested on the field on the robotic platforms of the ONERA team.

Collaborations extérieures

Equipe ICARE/CoHoMa (ENAC, ISAE)

Laboratoire d’accueil à l’ONERA

Département : Traitement de l’information et Systèmes

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