Coopération multi-robot : enjeux et défis scientifiques

Olivier Simonin*[1,2]

[1]INRIA Grenoble Rhône-Alpes, équipe CHROMA – L'Institut National de Recherche en Informatique et e n Automatique (INRIA) – olivier.simonin@inria.fr, France
[2]INSA de Lyon – Université de Lyon – France

Résumé

Résumé: La capacité de coopération entre plusieurs robots mobiles est ou sera nécessaire dans plusieurs domaines d'application : la surveillance d'un espace terrestre ou aérien, le transport de charges lourdes, la coordination multi-véhiculaire (milieu urbain, transport), l'exploration et la cartographie de vastes environnements, etc. Je préciserai dans cet exposé les différentes problématiques sous-jacentes à la prise de décision collaborative et au contrôle de tels systèmes (aspects architectures). Je soulignerai les défis actuels liés au passage à l'échelle, qui concernent les aspects décisionnels (algorithmiques), les communications et la robustesse. Ces différentes questions seront illustrées au travers d'exemples de systèmes multi-robots réels : transport collaboratif, cartographie multi-robot – retour sur le défi Carotte -, et coordination multi-véhiculaire. **Bio:** *Olivier Simonin received his B.Sc., M.Sc. and PhD in Computer Science in 1995, 1997 and 2001 respectively, from Université Montpellier II and LIRMM Laboratory, France. From 2002 to 2006 he was an Associate Professor of Computer Science at UTBM "Université de Technologie de Belfort-Montbeliard" (France) and a member of the SeT laboratory (Systems and Transport) in the multiagent team (ICAP). In 2006, he joined the LORIA Laboratory in Nancy as a member of the* INRIA project-team MaIA (Autonomous and Intelligent Machines) and, in 2007, became Associate Professor at Université de Lorraine (Nancy 1). In 2010, he completed his habilitation (French HDR diploma) from Nancy 1 University. *In 2013, he became full Professor at INSA Lyon and CITI-Inria Lab., joining the team Dynamid. In 2015, he created the INRIA team CHROMA* (Cooperative and Human-aware Robots in Dynamic Environments), merging some members of Dynamid and Inria eMotion teams. *His main research topics are i) decentralized decision making in distributed autonomous robots and multi-agent systems, ii) bio-inspired algorithms for problem solving and iii) study of self-organized properties in collective systems (swarm robotics, spatial computing, reactive MAS). His main application domains are mobile robotics, autonomous vehicles and intelligent environements. Since 2002, he has published 10 articles in international journals and books and about 30 international conference long papers (as in AAMAS, IROS, ICRA, ECAI, SAB, etc.). He has co-supervized 7 PhD. students (three are in progress) and many Master students. He was the initiator of two european PHC project with Czech Rep. (J. Faigl 2014-15) and Slovenia (D. Matko 2006-09) and an active member of several international and national projects (e.g. "InTraDe" european project, STIC-Asie "Scout", ANR "Pherotaxis", REI-DGA "Susie", "Smaart"). In 2012 he has won the French ANR Robotics challenge "Carotte" as a member of the "Cartomatic" team and coordinator of the Maia partner.*

*Intervenant