

Professional experience

Since April 2016 : Researcher-Engineer

Place : SoftBank Robotics Europe, Paris, France

Team : Innovation Software (Protolab)

Manager : Edouard Lagrue

Thematics : Grasping, Sound Event Recognition, Skeleton Detection, Autonomous Speech Recognition

2014-2016 : Post-doctoral researcher (16 months)

Place : BSC, Barcelone, Spain

Team : Social Simulation group

Supervisor : Xavier Rubio Campillo

Thematics : Multi-agents modelisations for historical simulations

Funding : ERC Advanced Grant

2013-2014 : Post-doctoral fellowship (16 months)

Place : NTNU, Trondheim, Norway

Team : CRAB Lab (Complex, Robust, Adaptive, Bio-inspired solutions)

Supervisor : Pauline Haddow

Thematics : Learning of cooperation within swarm robotics

Funding : ABCDE project from ERCIM

2009-2013 : Ph.D.

Team : Learning and optimization Team (TAO,LRI,Inria Saclay)

Subject : Evolutionary robotics for online adaptation of a robotic swarm

Thematics : Evolutionary robotics and swarm robotics

Funding : Research grant by the french ministry of research

Education

2009-2013 : PhD thesis

Place and Time : 1st of March 2013 at Université Paris-Sud

Team : Learning and optimization Team (TAO,LRI,Inria Saclay)

Subject : Evolutionary robotics for online adaptation of a robotic swarm

Jury :

<i>Supervisor</i> :	Nicolas BREDECHE	-	ISIR/CNRS, UPMC
<i>Reviewers</i> :	A.E. EIBEN	-	VU Amsterdam, Netherlands
	Guillaume BESLON	-	LIRIS/CNRS/INRIA, INSA de Lyon
<i>Examinators</i> :	Stéphane DONCIEUX	-	ISIR/CNRS, UPMC
	Marc SCHOENAUER	-	INRIA Saclay IdF
	Philippe TARROUX	-	LIMSI/CNRS, Université Paris-Sud

2009 : Engineering Diploma

Engineering school : INSA Rennes

Subject : Electronic and embedded programming

International equivalent diploma : MSc Electronic and embedded programming

Research activity

Synthesis

Type	Quantity
International journal	4
Book chapter	1
International conference	10
Workshop and short articles	8
ArXiv Journal	1

Seminars

Journée Évolutionnaire Thématique (JET) (2011,2015); Seminar IDI at NTNU, Norway (2013); Seminar MAIA, Loria, Nancy (2014); Seminar IRI at UPC, Barcelona (2014); Seminar Robotics Lab at UChile, Santiago, Chili (2014); MeSoDiSy workshop, Laubusch (2015); MeSoDiSy workshop, Ghent (2016)

Member of Programs Comities

DevLeann 2012, Gecco 2012, EA 2013, Gecco (2013-2015), ALife 2014, EvoApps (2015-2018), ECAL 2015, EvoROBOT (2017-2018)

Reviewer for Conferences and Journals

Journals : Evolutionary Intelligence, Robotics And Autonomous Systems, ACM Transactions in Autonomous Adaptive Systems, Adaptive Behaviours, Artificial Life, IEEE Transactions on Cognitive and Developmental Systems

Conferences : SAB 2010, Gecco 2011

Participation in scientific project

L2TOR (H2020 Project, 2016-2018) : This project aims to design the software of a tutor supporting young children through the learning of a second language. This project evaluate the relevance of a robot in this context.

Website : <http://www.l2tor.eu/>

EPNet (ERC Advanced Grants, 2014-2018) : This project studies the co-evolution of culture and trade within the roman empire. An original approach is developed based on multi-agent modelisation tools.

Website : <http://www.roman-ep.net/epnet/>

Symbion (FP7 Integrated Project, 2008-2013) : This project focused on the adaptation of multi-robot organisms to their environment. Along this line of thought the following issues have been explored : swarm intelligence, modular robotic, evolutionary adaptation.

Website : <http://www.symbion.eu/tiki-index.php>

Diffusion

ViensVoirMonTaf (2016-2018) : The goal of the ViensVoirMonTaf association is to allow young students to discover the job they dream of. It aims at providing more opportunities to the youth without network. We welcomed two young students during one week.

Member of EA association (2015-2016) : The Evolution Artificielle (EA) aims to promote the development of a french community around evolutionary algorithms. This promotion is done thanks to the creation of a summer school, a conference and a thematic day.

Researcher's night (2013) : One evening per year where the work done in labs is presented to the general public. I have supervise the realisation of demonstration aimed to explain the principles of swarm robotics

Science fest (Fête de la science) (2009-2012) : One or two days per year when the research subjects of french lab are presented to a general audience. I created a real robot demonstration to explain the principles of evolutionary robotics.

Short stays

ETRI, Séoul (2015) : Stay to present of the Pandora software at ETRI (Seoul, Korea) in the team of Professor Chang-Won Ahn, 1 week.

LORIA, Nancy (2014) : Research stay in relation to the ERCIM funding at LORIA (Nancy, France), in the team "MACHINE INTELLIGENTE AUTONOME" of Prof. François Charpillet, 1 week.

UPC, Barcelona (2014) : Research stay in relation to the ERCIM funding at the University Polytechnic of Catalonia (Barcelonne, Espagne), in the team "Perception and Action under Uncertainty" of Prof. Juan Andrade Cetto, 2 weeks.

Vrije Universiteit, Amsterdam (2011) : Research stay in relation to the European project Symbion at the Free University of Amsterdam (The Netherlands) in the team "Computational Intelligence Group" of Prof. A.E. Eiben (Faculty of Exact Sciences), 1 month.

Bristol Robotics Lab, University of West England (2010) : Research stay in relation to the European project Symbion in the team of Alan Winfield at the Bristol Robotics Laboratory, Univ. of West England (U.K.), 1 month.

Mobility

Barcelona Supercomputing Center, Barcelone (2014) : Post-doctoral Contract, 2 ans.

Norwegian University of Science and Technology, Trondheim (2013-2014) : Post-doctoral Contract, 14 mois.

Aalto University School of Science and Technology, Helsinki(2009) : Master degrees studies in the context of the Erasmus program, 4 months.

Rewards and fundings

Post-doctoral grant of the ABCDE project from the ERCIM program to finance my post-doc, 2013-2014.

French education ministry grant to fund my Ph.D., 2009-2012.

Travel Funding for Research Exchanges by the Aware project to promote cooperation between European researchers. 15th of March 2012 - 15th of April 2012.

Website : <http://www.aware-project.eu/>

Researcher of the week award by the aware project to publicise the work done by researchers under the FP7 : FET Proactive Initiative : Self-Awareness in Autonomic Systems (Awareness). October 2011.

Technical development

Pandora : I took part to the development of the multi-agent simulation framework Pandora. This is done in collaboration with Xavier Rubio.

Roborobo : I worked on the programming of a robotic simulator in collaboration with Nicolas Bredeche. This simulator is used today in multiple research teams located in Paris, Amsterdam and Trondheim

ChIRP : I am now collaborating to the realization of a swarm robotic platform. This collaboration is done through practical aspects (programming of libraries, 3D modelisation) and the supervision of students

Supervision of student

Axel Lefrant, "Detection of humans gesture based on 2D camera information", Engineer, Supervision, since February 2018.

Simon Carrignon, "Cognitive agents for the modelisation of the Roman empire", Ph.D., Co-supervision with Xavier Rubio, between February 2015 and April 2016. 3 publications

Filip Fossum, "Use of pheromones in a robotic swarm", Master's degree, Co-supervision with Pauline Haddow, 2013-2014. 1 publication.

Christian Berg Skjetne, "Automation of road traffic", Master's degree, Co-supervision with Pauline Haddow, 2013-2014. 1 publication.

Andreas Hagen, "Evolution of altruistic behaviours", Master's degree, Co-supervision with Pauline Haddow, 2013-2014.

Magnus Ulstein et Erik Samuelsson, "Control architectures for swarms of satellites", Master's degree, Co-supervision with Pauline Haddow, 2013-2014.

Edouard Bertin, "Simulation of pheromones for robotic swarm", Technical School, Full supervision, 2013-2014.

Guillaume Gavrel, "Local communication thanks to infra-red signals", Technical School, Full supervision, 2013-2014.

Robin Taillandier, "Design of a general purpose extension for ChIRP", Technical School, Full supervision, 2013-2014.

Haavard Schei, "Robotic swarms for the detection of borders", Master's degree, Co-supervision with Pauline Haddow, End of 2013. 1 publication.

Anders Rye, "Impact of communication on the performance of robotic swarms", Master's degree, Co-supervision with Pauline Haddow, End of 2013. 1 publication.

Antoine Sylvain, "Evolutionary Adaptation and the Emergence of Speciation in a Population of Autonomous Robots", Master's degree, Co-supervision with Nicolas Bredeche, 2012.

Teaching activity

My teachings are focused on programming, artificial life and artificial intelligence for robotic. Please find bellow the name of the courses along with the level of the students.

Name	Level	Hours	Year	Type
C Programming	1st Year	80h	2009-2011	Practical Course
Functional programming	3rd year	23h	2011-2012	Practical Course
Architecture of Computers	Teachers	15h	2011-2012	Practical Course
ALife	2nd year	30h	2012-2013	Lecture and Practical Course
Robotic	4th year	78h	2010-2012	Lecture and Practical Course
A.I. for robotic	3rd year	44h	2009-2010	Lecture
A.I. for video games	4th year	14h	2011-2012	Practical Course
Sub-symbolic A.I.	4th year	25h	2013-2014	Lecture and Practical Course

For most of my teachings I have create my teaching materials. The teaching in Sub-symbolic A.I. was done in english.

Publications

International journal

- T. Belpaeme, P. Vogt, R. van den Berghe, K. Bergmann, T. Göksun, M. de Haas, J. Kanero, J. Kennedy, A. C. Küntay, O. Oudgenoeg-Paz, F. Papadopulos, T. Schodde, J. Verhagen, C. D. Wallbridge, B. Willemsen, J. de Wit, V. Geckin, L. Hoffmann, S. Kopp, E. Kraemer, E. Maus, J.-M. Montanier, C. Franc, A. K. Pandey. Guidelines for designing social robots as second language tutors. *International Journal of Social Robotics*, 2017.
- H. Hamann, Y. Khaluf, J. Botev, M. Divband Soorati, E. Ferrante, O. Kosak, J.-M. Montanier, S. Mostaghim, R. Redpath, J. Timmis, F. Veenstra, M. Wahby, A. Zamuda. Hybrid Societies : Challenges and Perspectives in the Design of Collective Behavior in Self-organizing Systems. *Frontiers in Robotics and AI*. Volume 3, 2016.
- N. Bredeche, J.-M. Montanier, W. Liu, A. FT. Winfield. Environment-driven Distributed Evolutionary Adaptation in a Population of Autonomous Robotic Agents. *Mathematical and Computer Modelling of Dynamical Systems (MCMDS)*, Volume 18, Issue 1, pages 290-299, 2012.

Book chapter

- J-M Montanier, N. Bredeche. Embedded Evolutionary Robotics : The (1+1)-Restart-Online Adaptation Algorithm. In : *New Horizons in Evolutionary Robotics*. Springer Series : Studies in Computational Intelligence, pages 155-169, 2011.

International conference

- X. Rubio-Campillo, J. M. Montanier, G. Rull, J. M. B. Lorenzo, J. M. Díaz, J. P. González, and J. R. Rodríguez. The ecology of Roman trade. Reconstructing provincial connectivity with similarity measures. *Journal of Archaeological Science*, 92, 37-47. 2018.

- K. S. N. Ripon, E. Jakobsen, C. Tannum and J. M. Montanier. Assessing the effect of self-assembly ports in evolutionary swarm robotics. In Computational Intelligence (SSCI), 2016 IEEE Symposium Series on (pp. 1-8).
- J.-M. Montanier and X. Rubio-Campillo. Reinforcement learning for decision making in agent-based models. Accepted at the Computer Applications and Quantitative Methods in Archaeology (CAA) conference 2016.
- S. Carrignon, J.-M. Montanier, J. Michaud and X. Rubio-Campillo. Impact of cultural network topology on economic dynamics. Accepted at the Computer Applications and Quantitative Methods in Archaeology (CAA) conference 2016.
- S. Carrignon, J.-M. Montanier and X. Rubio-Campillo. Modeling the Co-evolution of Trade and Culture in Past Societies. In Proc. of 2015 Winter Simulation Conference, pages 3949-3960, 2015.
- F. Fossum, J.-M. Montanier and P. C. Haddow. Repellent Pheromones for Effective Swarm Robot Search in Unknown Environments. In IEEE Symposium on Swarm Intelligence (SIS), pages 1-8, 2014.
- J.-M. Montanier and P. C. Haddow. Adaptive Self-assembly in Swarm robotics through Environmental Bias. In IEEE International Conference on Evolvable Systems (ICES), pages 187-194, 2014.
- C. Skjetne, P. C. Haddow, A. Rye, H. Schei and J.-M. Montanier. The ChIRP Robot : a Versatile Swarm Robot Platform. In Proc. of The 2nd International Conference on Robot Intelligence Technology and Applications (RITA 2013), RITA, pages 71-82, 2014.
- J.-M. Montanier, N. Bredeche. Evolution of Altruism and Spatial Dispersion : an Artificial Evolutionary Ecology Approach. In Advances in Artificial Life, ECAL, vol. 12, pages 260-267, 2013.
- J.-M. Montanier, N. Bredeche. Surviving the Tragedy of Commons : Emergence of Altruism in a Population of Evolving Autonomous Agents. Proceedings of the European Conference on Artificial Life (ECAL'11), pages 550-557, Paris, France, 2011.
- A. Kono, J.-M. Montanier, S. Takano, N. Bredeche, M. Schoenauer, M. Sebag, E. Suzuki. On-board Evolutionary Algorithm and Off-line Rule Discovery for Column Formation in Swarm Robotics. Proceedings of the 2011 IEEE/WIC/ACM International Conference on Intelligent Agent Technology (IAT 2011), pages 220-227, Lyon, France, 2011.
- N. Bredeche, J.-M. Montanier. Environment-driven Embodied Evolution in a Population of Autonomous Agents. Proceedings of the 11th International Conference on Parallel Problem Solving From Nature (PPSN XI), Part II, LNCS 6239, pages 290-299, Krakow, Poland, 2010.

Workshop articles and short articles

- N. Bredeche, J.-M. Montanier, and S. Carrignon. Benefits of proportionate selection in embodied evolution : a case study with behavioural specialization. Proceedings of the Genetic and Evolutionary Computation Conference Companion. ACM, 2017.
- N. Bredeche, J.-M. Montanier. From Self-adaptive Collective Robotics to Artificial Evolutionary Ecology (and back). Positioning article for the collective behaviours and social dynamics workshop at ECAL 2013.
- C. Skjetne, P. C. Haddow, A. Rye, H. Schei and J.-M. Montanier. The ChIRP, a Cheap Interchangeable Robotic Platform for Swarm Robotics : presentation and applications. Workshop Evolution of Physical Systems at ECAL 2013.
See the publication at RITA for the latest version.
- J.-M. Montanier, N. Bredeche. Altruistic Cooperation and Spatial Dispersion : an Artificial Evolutionary Ecology Approach. Proc. of the ACM GECCO 2013. pp 33-34 (poster), 2013.
See the publication at ECAL for the complete version.

- N. Bredeche, J-M. Montanier. Environment-driven Open-ended Evolution with a Population of Autonomous Robots. Evolution of Physical Systems, ALIFE XIII Workshop, online proceedings, pp7-14, 2012.
- J-M. Montanier, N. Bredeche. Emergence of Altruism in Open-ended Evolution in a Population of Autonomous Agents. Proceedings of ACM Genetic and Evolutionary Conference (GECCO 2011), pages 25-26, Dublin, Ireland, 2011.
- N. Bredeche, J-M. Montanier, S. Carrignon. Evolutionary adaptation of a population of robots : benefits and issues of the evo-devo approach. An answer to Y. Jin and Y. Meng :Evolutionary Developmental Robotics – The Next Step to Go, Newsletter of the Autonomous Mental Development Technical Committee. 8(2) : 8-9
- J.-M. Montanier, N. Bredeche. Embedded Evolutionary Robotics : The (1+1)-Restart-Online Adaptation Algorithm. Proceedings of IROS 2009 Workshop on Exploring new horizons in Evolutionary Design of Robots, pages 37-43, St. Louis, USA, 2009.

Journal Arxiv

- N. Bredeche, J.M. Montanier, B. Weel, E. Haasdijk. Roborobo ! a Fast Robot Simulator for Swarm and Collective Robotics. CoRR abs/1304.2888