

Guillaume SARTORETTI

Assistant Professor, National University of Singapore, Mechanical Engineering Dpt. (2019-)

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Born in Geneva (Switzerland). Nationality: Swiss.

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Education

June 2018 – June 2019	Manufacturing Futures Initiative (MFI) Postdoctoral Fellow, Robotics Institute, CMU <u>Project Title:</u> <i>Distributed Learning for large-scale multi-robot path planning in complex environments.</i> <u>Advisor:</u> Prof. Howie Choset.
June 2016 – June 2018	Postdoctoral Fellow, Robotics Institute, Carnegie Mellon University <u>Advisor:</u> Prof. Howie Choset.
April 2016	PhD in <i>Robotics, Control and Intelligent Systems</i>, EPFL, Switzerland <u>Title:</u> <i>Control of Agent Swarms in Random Environments</i> <u>Advisor:</u> Prof. Max-Olivier Hongler.
March 2012	Master of Science in Mathematics and Computer Science, University of Geneva.
June 2010	Bachelor of Science in Mathematics and Computer Science, University of Geneva.

Professional and Teaching Experience

2014 - 2016	Guest Lecturer, EPFL (CH) <ul style="list-style-type: none">▪ “<i>Vibrational Systems</i>”, EPFL, course MICRO-300,▪ “<i>A guided tour for engineers in applied stochastic modeling</i>”, EPFL, course MICRO-541.
2012 - 2016	Teaching assistant Laboratory of Microengineering for Manufacturing (LPM), EPFL (CH) & Laboratoire de Systèmes Robotiques (LSRO), EPFL (CH) <ul style="list-style-type: none">▪ “<i>Vibrational Systems</i>”, EPFL, course MICRO-300,▪ “<i>Practical Works in Manufacturing and Robotics</i>”, EPFL, course MICRO-442,▪ “<i>Micro-informatics</i>”, EPFL, course MICRO-315,▪ “<i>A guided tour for engineers in applied stochastic modeling</i>”, EPFL, course MICRO-541.
2009 - 2012	Education and teaching assistant, University of Geneva (CH).

Mentoring

2016-2019	Advised more than <u>15 undergraduates and graduate students</u> in various research groups (multi-agent search, multi-agent path planning, bio-inspired locomotion, reinforcement learning applied to locomotion and distributed assembly).
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2017-2019	Mentored <u>2 teams of 4 undergraduate students</u> on multi-agent path planning for an industrial project focused on the deployment of multiple AGVs in factory environments.
	<u>Semester Projects</u>
2015-2016	Astrid Petitjean, <i>Optimal dynamic component matching in flexible assembly lines.</i>
2015-2016	Fabien Crépon, <i>Optimal hedging stocks for random flexible production flows.</i>
2013-2014	Fabianna Mantuano, <i>Study of local versus global optimization in production flows.</i>

Grants and Awards

2018-2019	Manufacturing Futures Initiative (MFI) Postdoctoral Fellowship. <u>Project Title:</u> <i>Distributed Learning for large-scale multi-robot path planning in complex environments.</i> <u>Advisor:</u> Prof. Howie Choset.
2018-2019	Research Award from the Pittsburgh Supercomputing Center (PSC) in the form of 4'000 hours of GPU computation time.
2018-2019	Extreme Science and Engineering Discovery Environment (XSEDE) Startup grant in the form of 2'500 additional hours of GPU computation at the PSC.

Invited Lectures, Seminars and Colloquia

06/11/2019	Case Western Reserve University, Invited Seminar, Mechanical & Aerospace Eng. Dpt.
09/19/2018	Invited Seminar at the National Robotics Engineering Center (NREC).
08/09/2018	Tufts University, Invited Seminar, Computer Science Department.
01/28/2016	EPFL, Informal private presentation, DISAL laboratory.
09/29/2015	Drexel University, Private presentation, SAS and GRASP laboratories.

Other Academic Activities

2018 - Current	Reviewer for the <i>Science Robotics</i> journal (ScienceMag).
2018	Session chair at the Int. Symp. on Distributed Autonomous Robotic Systems (DARS).
2017 - Current	Reviewer for the <i>Robotics and Automation Letters</i> journal (IEEE).
2017	Reviewer for the Robotics Institute Summer Scholar (RISS) Admission Committee.
2015	Session chair at the <i>Inter. Symposium on Swarm Behavior and Bio-Inspired Robotics.</i>
2014 - Current	Reviewer for various conferences (ICRA, IROS, WAFR, AAMAS, ECC, ACC).
2013	Session chair at the <i>International Conference on Agents and Artificial Intelligence.</i>

Publications: Thesis and Refereed Book Chapters

2016	PhD Thesis: G. Sartoretti and M.-O. Hongler. <i>Control of Agent Swarms in Random Environments.</i> EPFL, Lausanne (CH).
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Book Chapters

- 2013 **G. Sartoretti** and M.-O. Hongler. Soft control of self-organized locally interacting Brownian planar agents. *Lecture Notes in Computer Science*, pages 45-52. Springer.
- 2012 **G. Sartoretti**, J.-L. Falcone, B. Chopard, and M. J. Gander. Decentralized method for traffic monitoring. *Lecture Notes in Computer Science*, pages 464-473. Springer.

Publications: Refereed Journal Papers

- 2019 **G. Sartoretti**, W. Paivine, Y. Shi, Y. Wu, H. Choset. Distributed learning of decentralized control policies for articulated mobile robots. *IEEE Transactions in Robotics*.
- 2018 **G. Sartoretti**, J. Kerr, Y. Shi, G. Wagner, T. K. S. Kumar, S. Koenig, H. Choset. PRIMAL: Pathfinding via Reinforcement and Imitation Multi-Agent Learning. *IEEE Robotics and Automation Letters*, 4(3):2378-2385.
- 2016 **G. Sartoretti**. Leader-based versus soft control of multi-agent swarms. *Artificial Life and Robotics*, 21(3):302-307.
- 2016 **G. Sartoretti** and M.-O. Hongler. Interacting Brownian swarms: Analytical results. *Entropy*, 18, 27.
- 2014 **G. Sartoretti**, M.-O. Hongler, M. Elias de Oliveira, and F. Mondada. Decentralized self-selection of swarm trajectories: From dynamical system theory to robotic implementation. *Swarm Intelligence*, vol. 8(no. 4):329-351.
- 2013 **G. Sartoretti** and M.-O. Hongler. Self-organized mixed canonical-dissipative dynamics for Brownian planar agents. *Cybernetics and Physics*, vol. 2(no.1):41-46.
- 2013 B. Barbieri, **G. Sartoretti**, J.-L. Falcone, B. Chopard, and M. J. Gander. Traffic prediction based on a local exchange of information. *Journal of Cellular Automata*, 8(5-6):429-441.

Publications: Refereed Conference Papers

- 2019 B. Chong, Y. Ozkan Aydin, **G. Sartoretti**, J. Rieser, C. Gong, H. Xing, H. Choset, and D. Goldman. A hierarchical geometric framework to design locomotive gaits for highly articulated robots. *Proceedings of Robotics: Science and Systems (RSS) 2019*.
- 2019 S. Shaw, **G. Sartoretti**, J. Olkin, W. Paivine, and H. Choset. Workspace CPG with body pose control for stable, directed vision during omni-directional locomotion. *International Conference on Robotics and Automation (ICRA) 2019*.
- 2018 **G. Sartoretti**, Y. Wu, W. Paivine, T. K. Satish Kumar, S. Koenig, and H. Choset. Distributed reinforcement learning for multi-robot decentralized collective construction. *International Symposium on Distributed Autonomous Robotic Systems (DARS), 2018*.
- 2018 B. Chong, Y. Ozkan Aydin, C. Gong, **G. Sartoretti**, Y. Wu, J. Rieser, H. Xing, J. Rankin, K. Michel, A. Nieceza, J. Hutchinson, D. Goldman, and H. Choset. Coordination of back bending and leg movements for quadrupedal locomotion. *RSS 2018*.
- 2018 **G. Sartoretti**, Y. Shi, W. Paivine, M. Travers, and H. Choset. Distributed learning for the decentralized control of articulated mobile robots. *ICRA 2018*, pages 3789-3794.

2018	G. Sartoretti , S. Shaw, K. Lam, N. Fan, M. Travers, and H. Choset. Central pattern generator with inertial feedback for stable locomotion and climbing in unstructured terrain. <i>ICRA 2018</i> , pages 5769-5775.
2018	F. Ruscelli, G. Sartoretti , J. Nan, Z. Feng, M. Travers, and H. Choset. Proprioceptive-inertial autonomous locomotion for articulated robots. <i>ICRA 2018</i> , pages 3436-3441.
2016	G. Sartoretti , S. Shaw, and M. Ani Hsieh. Distributed planar manipulation in fluidic environments. <i>ICRA 2016</i> , pages 5322-5327.
2015	G. Sartoretti . Leader-based versus soft control of multi-agent swarms. <i>SWARM 2015 - International Symposium on Swarm Behavior and Bio-Inspired Robotics</i> .
2014	G. Sartoretti , M.-O. Hongler, and R. Filliger. The estimation problem and heterogenous swarms of autonomous agents. <i>SMTDA 2014 - Stochastic Modeling Techniques and Data Analysis International Conference</i> , volume 1.
2013	G. Sartoretti and M.-O. Hongler. Self-organized mixed canonic-dissipative dynamics for Brownian planar agents. <i>EUROCAST 2013 - International Conference on Computer Aided Systems Theory</i> , volume 1, pages 45-52.
2013	G. Sartoretti and M.-O. Hongler. Soft control of swarms: Analytical approach. <i>ICAART 2013 - Proceedings of the 5th International Conference on Agents and Artificial Intelligence</i> , volume 1, pages 147-153.
2012	G. Sartoretti , J.-L. Falcone, B. Chopard, M. J. Gander. Decentralized method for traffic monitoring. <i>ACRI 2012: Cellular Automata for Research and Industry</i> , Vol. 1, pp. 464-73.

Languages

<i>French</i>	mother tongue	<i>Spanish</i>	oral comprehension
<i>English</i>	fluent	<i>Hungarian</i>	weak oral comprehension
<i>German</i>	good knowledge		

References for Guillaume Sartoretti

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Professor Max-Olivier Hongler

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