Guillaume SARTORETTI, PhD

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Education & Training

July 2019 - Current	**Tenure Track Assistant Professor of Robotics**, Department of Mechanical Engineering, National University of Singapore, Singapore.
June 2016 - June 2019	**Postdoctoral Fellow**, **with Manufacturing Futures Initiative Fellowship (2018 – 2019),** Robotics Institute, Carnegie Mellon University, USA. Project Title: *Distributed Learning for large-scale multi-robot path planning in complex environments.* | Advisor: Prof. Howie Choset.
April 2016	**PhD in Robotics, Control and Intelligent Systems, EPFL, Switzerland.** Title: *Control of Agent Swarms in Random Environments* | Advisor: Prof. Max-Olivier Hongler.
March 2012	**Master of Science in Mathematics and Computer Science, University of Geneva, Switzerland.**
June 2010	**Bachelor of Science in Mathematics and Computer Science, University of Geneva, Switzerland.**

Teaching Experience during Tenure Track

2025 - Current	**Robot Programming**, RB2301, (RMI UG, 2nd year)	10-75 students	latest rating: **4.8/5**
2023 - Current	**Machine learning in robotics**, ME5418, (MSc Robotics)	80-150 students	latest rating: **4.6/5**
2022 - Current	**Deep learning for robotics**, ME5406, (MSc ME)	50-100 students	latest rating: **4.5/5**
2021 - 2023	**Machine Vision**, ME5405 (MSc ME)	95-150 students	latest rating: **4.8/5**
2020 - 2025	**Microprocessor applications**, ME3241, (ME UG, 3rd year)	15-70 students	latest rating: **4.4/5**

Student Supervision (7 graduated PhD & 2 graduated MEng)

2021 - 2025	**WANG Yutong, PhD**	*Learning Scalable Policies for Cooperative and Mixed MAS*
2021 - 2025	**HE Chengyang, PhD**	*Team-Inspired Representation Learning for Decentralized Multi-Robot Coordination*
2021 - 2025	**ZHANG Yifeng, PhD**	*Distributed Reinforcement Learning for Decentralized Traffic Management in Urban Environments*
2020 - 2025	**Pamela WANG, SUTD-NUS joint PhD**	*Guided Cooperation for Multi-Agent Teams*
2021 - 2024	**CAO Yuhong, PhD**	*Context-Aware Learning for Autonomous Robotic Deployments in Unknown Environments*
2020 - 2024	**DAI Weiheng, PhD**	*Distribution and Cooperation in Multi-Agent Systems via Reinforcement Learning*
2020 - 2024	**SUN Ge, PhD**	*Legged Robot Locomotion: Bio-Inspired Approaches to Environmental Adaptation and Interaction*
2022 - 2024	**Maxime DE MONTLEBERT, MEng**	*Active SLAM for Decentralized and Disconnected MAS*
2021 - 2023	**YANG Tianze, MEng**	*Deep Reinforcement Learning in Multi-Agent Path Finding*

Research Grants & Funds (since joining NUS: S$10.4M total | S$8M as PI)

2026 - 2029	**NUS Robotic Seed Grant** Title: *Imitation-Biased Reinforcement Learning for Human-Level Cooking Skill Acquisition* | Role: **PI** (Lead PI: Asst. Prof. Liu Xingyu (NUS ECE))	Amount: S$ 250k
2026 - 2029	**Collaborative Research Project, ST Engineering** Title: *Hierarchical Cooperation and Competition Learning for Swarm Defense Scenarios* | Role: **Sole PI**	Amount: S$ 1.5M
2025 - 2028	**Funded Research Project, T-Lab@NUS and DSO** Title: *Cooperative Multi-Agent Learning Powered by Generative and Foundation Models* | Role: **PI** (Lead PI: Mr. William Leong (T-Lab@NUS))	Amount: S$ 500k
2025 - 2026	**DSO Drone Challenge, T-Lab@NUS** Title: *Deep RL-based Multi-UAV Target Search in Low-Rise Urban Environments* | Role: **Sole PI**	Amount: S$ 360k
2025 - 2027	**Collaborative Research Project, ST Engineering UIS** Title: *Autonomous Multi-Agent Vessel Tugboating* | Role: **Sole PI**	Amount: S$ 620k
2025 - 2026	**Seed Research Project, T-Lab@NUS** Title: *Soft Arm on a Quadruped Robot in Search-and-Rescue Operations*| Role: **Co-PI** (PI: Prof. Cecilia Laschi (NUS ME))	Amount: S$ 150k
2023 - 2026	**MOE Academic Research Fund (AcRF) Tier 1 FRC Research Grant** Title: *Scalable Whole-Body Control for Legged Mobile Manipulation*| Role: **Sole PI**	Amount: S$ 250k
2023 - 2025	**Amazon Research Award - unrestricted gift** Title: *Distributed Learning for Human-Aware Multi-Agent Pathfinding*| Role: **Sole PI**	Amount: S$ 108k (US$ 80k)
2022 - 2025	**Funded Research Project, T-Lab@NUS and DSO** Title: *Decentralized Search of Evasive Agents.* | Role: **PI** (Lead PI: Dr. Rodney Teo (T-Lab@NUS))	Amount: S$ 260k
2022 - 2025	**Maritime Transformation Programme White Space Funding** Title: *Robotic Systems for Securing/Un-securing of Containers in Vessels.* | Role: **Lead PI** since 01/2024 (initial Lead PI: Prof. G. Chirikjian (NUS ME))	Amount: S$ 4.8M
2021 - 2026	**Project 3, Work Package 4 of "Cisco-NUS Corporate Laboratory"** Title: *Scalable, Decentralized Urban Traffic Management for Autonomous Vehicles.* | Role: **Co-I** (Lead PI: Prof. Biplab Sidkar (NUS ECE))	Amount: S$ 780k
2021 - 2022	**Seed Research Project, T-Lab@NUS** Title: *Learning Based Approaches for Advanced Multi-Agent Search Problems* | Role: **Lead PI**	Amount: S$ 60k
2021 - 2024	**MOE Academic Research Fund (AcRF) Tier 1 FRC Research Grant** Title: *Comms-Based AI Methods for Multi-Robot Dec. Cooperation* | Role: **Sole PI**	Amount: S$ 226,5k
2020 - 2022	**Work Package 3 of "Urban Traffic Flow Smoothening Models"** Title: *Traffic Light Control for Optimal Traffic Flow*| Role: **Co-PI** (Lead PI: A/Prof. Kien Ming Ng (NUS ECE))	Amount: S$ 432k
2020 - 2021	**Seed Research Project, T-Lab@NUS** Title: *Scalable Decentralized Multi-Robot Search via Distributed RL*| Role: **Lead PI**	Amount: S$ 60k
2018 - 2019	**Manufacturing Futures Initiative (MFI) Postdoctoral Fellowship**	Amount: US$ 70k

Prizes & Awards

2025	**Best Paper Award Finalist**	IEEE International Symposium on Multi-Robot & Multi-Agent Systems (MRS 2025) | *Details in the publication list below*
2025	**Best Student Paper Award & Best Paper Award on Multi-Robot Systems**	IEEE International Conference on Robotics and Automation (ICRA 2025) | *Details in the publication list below*
2023	**Outstanding Early Career Award**	NUS College of Design and Engineering (CDE)
2022	**Amazon Research Award (ARA)**	*Details in grants and funded projects above*
2022	**Best Student Paper Award**	International Symposium on Distributed Autonomous Robotic Systems (DARS 2022) | *Details in the publication list below.*
2022	**Best Paper Award**	IEEE International Conference on Unmanned Systems (ICUS)
2021	**Best Paper Award**	International Symposium on Distributed Autonomous Robotic Systems (DARS 2021)
2020	**First place at the 1st round & Fourth place overall**	NeurIPS 2020 "Flatland" Competition (RL category), organized by the Swiss and German national railway companies (SBB & DB)

Academic Activities

2026	**Area Chair**	Robotics: Science and Systems (RSS 2026).
26/01/2026	**Workshop Organizer**	AAAI 2026: Intl. Workshop on Multi-Agent Path Finding
13/05/2024	**Workshop Organizer**	ICRA 2024: Full Day Tutorial on Ergodic Planning
2023 - Current	**Associate Editor**	Intl. Journal of Robotics Research, SAGE (IJRR, Scopus Top 1%)
2022 - Current	**Section Editor**	*Multiple Mobile Robot Systems* Chapter, Encyclopedia of Robotics, Springer
2022 - Current	**Associate Editor**	IEEE International Conference on Robotic and Automation (ICRA): *Robot Autonomy for Mobility and Manipulation* (2026) *Learning* (2024-2025) *Mechanism, Design, and Control* (2022-2023)
2021 - Current	**Program Committee Member (PC)**	International Conference on AI (IJCAI), AAAI Conference on AI, European Conference on AI (ECAI), Computer Vision and Pattern Recognition Conference (CVPR), European Conference on Computer Vision (ECCV)
2021	**Associate Editor**	Intl. Symp. on Multi-Robot and Multi-Agent Systems (MRS)
2020 - Current	**Associate Editor**	IEEE Robotics and Automation Letters in the *Multiple and Distributed Systems* area (RA-L, Scopus Top 10%)
2019 - 2023	**Guest Editor**	Topical collection on *Distributed Mobile Robotic Systems,* SNAS
2019 - Current	**Reviewer**	Journals: *Science Robotics* (ScienceMag), JAAMAS (Springer), *SICOMP* (Sage), *Robotics and Automation Letters* (RA-L, IEEE) International conferences on robotics and AI: RSS, ICRA, IROS, WAFR, AAMAS, ECC, ACC, CASE

Invited Keynotes, Lectures, & Seminars

12/02/2026	**Biorobotics Lab, EPFL,** Lausanne, CH	Invited Seminar
18/07/2024	**Computational Robotics Lab, ETHZ,** Zürich, CH	Invited Seminar
17/07/2024	**Robotics Systems Lab, ETHZ,** Zürich, CH	Invited Seminar
16/06/2025	**CMU Robotics Institute,** Pittsburgh, USA | Host: Asst. Prof. Jiaoyang Li	Special Seminar
12/06/2025	**CVPR 2025 Workshop on Multi-Agent Embodied Intelligent Systems**	Keynote Speaker
30/05/2025	**Multi-Robot Systems Lab, Stanford University**, Palo Alto, USA	Invited Seminar
23/05/2025	**ICRA 2025 Workshop on Multi-Agent Robotic Construction**	Keynote Speaker
27/11/2024	**Qingbiao LI's Research Group, University of Macau**, Macau, CN	Invited Seminar
14/10/2024	**IROS 2024 Workshop on Multi-Robot Path Planning**	Keynote Speaker
25/06/2024	**AI Seminar Series, ST Engineering**, Singapore, SG	Keynote Speaker
07/05/2024	**AAMAS 2024 Workshop on Optimization and Learning in MAS**	Keynote Speaker
22/02/2024	**Caltech Special Seminar**, Pasadena, USA | Host: Prof. Soon-Jo Chung.	Special Seminar
20/02/2024	**Multi-Robot Systems Lab, Stanford University**, Palo Alto, USA	Invited Seminar
19/02/2024	**Daltorio Lab, CASE Western Reserve University**, Cleveland, USA	Invited Seminar
16/02/2024	**GRASP Seminar, University of Pennsylvania**, Philadelphia, USA | Host: Prof. M. Ani Hsieh | Link: https://www.youtube.com/watch?v=61RKzhRy0yE	Special Seminar (fully funded)
09/02/2024	**ARCS Lab, CMU**, Pittsburgh, USA	Invited Seminar
02/02/2024	**Computational Robotics Lab, ETHZ**, Zürich, CH	Invited Seminar
01/02/2024	**Biorobotics Lab, EPFL**, Lausanne, CH	Invited Seminar
27/09/2023	**Algorithmic Alignment Group, MIT**, Cambridge, USA	Invited Seminar
25/09/2023	**SUTD Workshop on Robotic Perception**, Singapore, SG	Speaker
20/09/2023	**ArmaSuisse Workshop on Swarm Intelligence**	Speaker
08/06/2023	**Prorok Laboratory, Cambridge University**, Cambridge, UK	Invited Seminar
29/05/2023	**ICRA 2023 Workshop on Multi-Robot Learning**	Panelist
14/02/2023	**AAAI 2023 Workshop on Multi-Agent Pathfinding (MAPF)**	Keynote Speaker
17/10/2022	**Machine Learning & Its Applications Intl. Workshop, NUS-IMS**, Singapore, SG	Invited Seminar
20/05/2022	**Amazon Robotics,** Boston, USA	Invited Seminar
27/09/2021	**ETHZ Autonomy Talk (virtual)** | Link: https://youtu.be/2Jts4uFbbBM	Invited Seminar
02/12/2019	**Temasek Laboratory, NUS**, Singapore, SG	Invited Seminar
11/06/2019	**Mechanical & Aerospace Eng. Dpt., Case Western Reserve University**, Cleveland, USA	Invited Seminar
19/09/2018	**National Robotics Engineering Center (NREC),** Pittsburgh, USA	Invited Seminar
09/08/2018	**Computer Science Department, Tufts University,** Boston, USA	Invited Seminar
29/09/2015	**SAS and GRASP laboratories. Drexel University**, Philadelphia, USA	Invited Seminar

Selected Publications: Peer-Reviewed Journal Papers

2026	Y. Zhang, Y. Liu, P. Gong, P. Li, M. Fan, and **G. Sartoretti**. Unicorn: A Universal and Collaborative Reinforcement Learning Approach Towards Generalizable Network-Wide Traffic Signal Control. *IEEE Transactions on Intelligent Transportation Systems (T-ITS).*
2026	T. Duhan, C. He, and **G. Sartoretti**. P3GASUS: Pre-Planned Path Execution Graphs for Multi-Agent Systems at Ultra-Large Scale. *IEEE Robotics and Automation Letters (RA-L).*
2025	C. He, T. Duhan, P. Tulsyan, P. Kim, and **G. Sartoretti**. Social behavior as a key to learning-based multi-agent pathfinding dilemmas. *Artificial Intelligence*, Elsevier.
2025	Y. Zhang, H. Goel, P. Li, M. Damani, S. Chinchali, and **G. Sartoretti**. CoordLight: Learning Decentralized Coordination for Network-Wide Traffic Signal Control. *IEEE Transactions on Intelligent Transportation Systems (T-ITS).*
2024	J. Liang, Y. Cao, Y. Ma, H. Zhao, and **G. Sartoretti**. HDPlanner: Advancing Autonomous Deployments in Unknown Environments Through Hierarchical Decision Networks. *IEEE Robotics and Automation Letters, 10(1):256-263.*
2024	Y. Cao, R. Zhao, Y. Wang, B. Xiang, and **G. Sartoretti**. Deep Reinforcement Learning-based Large-scale Robot Exploration. *IEEE Robotics and Automation Letters, 9(5):4631-4638.*
2023	Y. Wang, Y. Wang, and **G. Sartoretti**. Full Communication Memory Networks for Team-Level Cooperation Learning. *Autonomous Agents and Multi-Agent Systems (JAAMAS).*
2022	Y. Wang, M. Damani, P. Wang, Y. Cao, and **G. Sartoretti**. Distributed Reinforcement Learning for Robot Teams: A Review. *Current Robotics Reports*, Springer, 3(4):239-257.
2021	*M*. Damani, Z. Luo, E. Wenzel, and **G. Sartoretti**. PRIMAL$_2$: Pathfinding via Reinforcement and Multiagent Imitation Learning - Lifelong. *IEEE RA-L*, 6(2):2666-2673.

Selected Publications: Peer-Reviewed Conference Papers

2026	C. He, X. Liu, G. Sznaier Camps, J. Bruno, **G. Sartoretti**, and M. Schwager. Demystifying Robot Diffusion Policies: Action Memorization and a Simple Lookup Table Alternative. ***Accepted for presentation*** *at ICLR 2026* | **28.2% acceptance rate**
2025	X. Zhang, Y. Wang, and **G. Sartoretti**. COMPASS: Cooperative Multi-Agent Persistent Monitoring using Spatio-Temporal Attention Network. *IEEE International Symposium on Multi-Robot & Multi-Agent Systems (MRS 2025).* | **Best Paper Award Finalist**
2025	C. He, G. Sznaier Camps, X. Liu, M. Schwager, and **G. Sartoretti**. Latent Theory of Mind: A Decentralized Diffusion Architecture for Cooperative Manipulation. *Oral presentation at the Conference on Robot Learning (CoRL 2025).* | **5.7% acceptance rate for oral talk**
2025	P. Li*, H. Li*, G. Sun, J. Cheng, X. Yang, G. Bellegarda, M. Shafiee, Y. Cao, A. Ijspeert, and **G. Sartoretti**. SATA: Safe and Adaptive Torque-Based Locomotion Policies Inspired by Animal Learning. *Robotics: Science and Systems (RSS 2025).* | **27.4% acceptance rate**
2025	H. Jiang*, Y. Wang*, R. Veerapaneni, T. Duhan, **G. Sartoretti**, and Jiayoang Li. Deploying Ten Thousand Robots: Scalable Imitation Learning for Lifelong Multi-Agent Path Finding. ICRA 2025. | **37.8% acceptance rate | Best Student Paper Award** & **Best Paper Award on Multi-Robot Systems**
2024	Y. Wang, Y. Cao, J. Chiun, S. Koley, M. Pham, and **G. Sartoretti**. ViPER: Visibility-based Pursuit-Evasion via Reinforcement Learning. *CoRL 2024.* | **39.3% acceptance rate**
2023	J. Liang, Z. Wang, Y. Cao, J. Chiun, M. Zhang, and **G. Sartoretti**. Context-Aware Deep RL for Autonomous Robotic Navigation in Unknown Area. *CoRL 2023.* | **40.0% acceptance rate**
2022	Y. Cao, Z. Sun, and **G. Sartoretti**. DAN: Decentralized Attention-based Neural Network for the MinMax Multiple Traveling Salesman Problem. *International Symposium on Distributed Autonomous Robotics Systems (DARS 2022).* | **Best Student Paper Award**