

GONZALO FERRER

Skolkovo Institute of Science and Technology ✉ g.ferrer@skoltech.ru
Center for AI Technology 🏠 [Webpage](#)
30 Bolshoy bl., office A5-3023 🌐 [Google Scholar](#)
Moscow, Russia 121205 📄 [ResearchGate](#)

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RESEARCH INTERESTS

Robotics, Path Planning, Robot Navigation in Dynamic env., Human Motion Prediction, Localization, Mapping, SLAM, Sensor Fusion.

EDUCATION

- 2015 PhD with honors in AUTOMATION, VISION AND ROBOTICS,
Universitat Politècnica de Catalunya, UPC, Barcelona, Spain
Thesis: “Social robot navigation in urban dynamic environments”
Advisor: Prof. ALBERTO SANFELIU
Finalist of the **Georges Giraltd PhD Award** in robotics
- 2011 Master Degree in AUTOMATION AND ROBOTICS
Universitat Politècnica de Catalunya UPC, Barcelona, Spain
Master thesis: “Analysis and prediction of human motion trajectories in urban environments” | Advisor: Prof. ALBERTO SANFELIU
- 2009 Engineer Degree in TELECOMMUNICATIONS
Universitat Politècnica de Catalunya, UPC-ETSETB, Barcelona, Spain

ACADEMIC POSITIONS

PRESENT	ASSISTANT PROFESSOR
2018	Head of the Mobile Robotics Lab. Skoltech, Moscow, Russia.
APRIL 2017	INTERMITTENT LECTURER
JAN 2017	University of Michigan, Ann Arbor, MI, US.
2017	RESEARCH FELLOW
2015	University of Michigan, Ann Arbor, MI, US.
2015	PHD STUDENT AND RESEARCH ASSISTANT
2010	Institut de Robòtica i Informàtica Industrial, CSIC-UPC, Barcelona, Spain.
DEC 2009	RESEARCH ASSISTANT INTERN
SEP 2009	Institut de Robòtica i Informàtica Industrial, CSIC-UPC, Barcelona, Spain.

TEACHING

- 2021-2022 (T2) Planning Algorithms in AI. [Course material](#). [Video lectures](#)
MSc Data Science, Skoltech.
- 2020-2021 (T4) Planning Algorithms in AI.
MSc Data Science, Skoltech.
- 2020-2021 (T3) Perception in Robotics. [Course material](#). [Video lectures](#)
MSc Data Science, Skoltech.
- 2019-2020 (T3) Perception in Robotics. [Course material](#)
MSc Data Science, Skoltech.
- 2018-2019 (T2) Perception in Robotics
MSc Data Science, Skoltech.
- Winter 2017 EECS568 Probabilistic robotics: methods and algorithms.
University of Michigan Graduate course on the Robotics program.

RESEARCH PROJECTS

- 2021-2022 **Vehicle Motion Prediction**. Principal Investigator.
Sber Robotics, Sber Autonomotive Tech. and Skoltech *industrial* project.
- 2020-2021 **3D Portraits**. Principal Investigator, Co-PI Prof. Evgeny Burnaev
Samsung AI center in Moscow and Skoltech *industrial* project.
- 2019-2023 **Human Motion Prediction and Perception in Social Environments**. Principal Investigator.
Sber Robotics and Skoltech *Industrial* project.
- 2019-2020 **3D SLAM and Point Cloud Alignment**. Principal Investigator, Co-PI Prof. Evgeny Burnaev
Samsung AI center in Moscow and Skoltech *Industrial* project.
- 2015-2016 **NGV: Next Generation Vehicle**. Researcher. 🏠
Industrial project between University of Michigan and Ford Motor Co.
- 2011-2014 **RobTaskCoop**: Human Robot cooperation in urban areas. Research Assistant.
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National research project
- 2009-2012 **CONSOLIDER-INGENIO**: Multimodal interaction in pattern recognition and computer vision. Research Assistant. 🏠
National research project
- 2009-2010 **URUS**: Ubiquitous networking robotics in urban settings. Research Assistant.
🏠
European research project

LIST OF PUBLICATIONS

Refereed Journal Articles

- [J6] AI Boyko, IV Oseledets, G Ferrer. TT-QI: Faster Value Iteration in Tensor Train Format for Stochastic Optimal Control. *Computational Mathematics and Mathematical Physics* 61.5: 836-846, 2021.
- [J6] M. Faizullin, A. Kornilova, A. Akhmetyanov, G. Ferrer. Twist-n-Sync: Software Clock Synchronization with Microseconds Accuracy Using MEMS-Gyroscopes. *Sensors* 21(1):68, 2021.
- [J5] G. Ferrer and A. Sanfeliu. Anticipative Kinodynamic Planning: Robot Navigation in Urban and Dynamic Environments. *Autonomous Robots* 2019.
- [J4] M. Nemitz, M. Sayed, J. Mamish, G. Ferrer, L. Teng, R. McKenzie, A. Hero, E. Olson, A. Stokes. HoverBots: Precise Locomotion Using Robots That Are Designed for Manufacturability *Frontiers in Robotics and AI*, Vol. 4, 2017.
- [J3] G. Ferrer, A. Garrell, F. Herrero, and A. Sanfeliu. Robot social-aware navigation framework to accompany people walking side-by-side. *Autonomous Robots*, pp. 1-19, 2016.
- [J2] G. Ferrer, and A. Sanfeliu. Bayesian human motion intentionality prediction in urban environments. *Pattern Recognition Letters* 44:134-140, 2014.
- [J1] E. Trulls, A. Corominas Murtra, J. Pérez-Ibarz, G. Ferrer, D. Vasquez, J.M. Mirats Tur and A. Sanfeliu. Autonomous navigation for mobile service robots in urban pedestrian environments. *Journal of Field Robotics* 28(3): 329-354, 2011.

Refereed Conference Articles

- [C19] Y. Kapushev, A. Kishkun, G. Ferrer and E. Burnaev. Random Fourier Features based SLAM. In *Proceedings of the IEEE International Conference on Intelligent Robots and Systems (IROS)*, to appear 2021.
- [C18] A. Postnikov, A. Gamayunov, and G. Ferrer. CovarianceNet: Conditional Generative Model for Correct Covariance. Prediction in Human Motion Prediction. In *Proceedings of the IEEE International Conference on Intelligent Robots and Systems (IROS)*, to appear 2021.
- [C17] MA. Kornilova and G. Ferrer. Be your own Benchmark: No-Reference Trajectory Metric on Registered Point Clouds. In *European Conference on Mobile Robotics (ECMR)*, 2021.
- [C16] M. Faizullin and G. Ferrer. Best Axes Composition: Multiple Gyroscopes IMU Sensor Fusion to Reduce Systematic Error. In *European Conference on Mobile Robotics (ECMR)*, 2021.
- [C15] A. Boyko, M. Matrosov, I. Oseledets, D. Tsetserukou and G. Ferrer. TT-TSDF: Memory-Efficient TSDF with Low-Rank Tensor Train Decomposition. In *Proceedings of the IEEE International Conference on Intelligent Robots and Systems (IROS)*, 2020.
- [C14] A. Postnikov, A. Gamayunov, and G. Ferrer. HSFM-SigmaNN: Combining a Feedforward Motion Prediction Network and Covariance Prediction. *Workshop in the International Conference on Robotics and Automation (ICRA)*, 2020.
- [C13] G. Ferrer. Eigen-Factors: Plane Estimation for Multi-Frame and Time-Continuous Point Cloud Alignment. In *Proceedings of the IEEE International Conference on Intelligent Robots and Systems (IROS)*, 2019.
- [C12] D. Mehta, G. Ferrer and E. Olson. Backprop-MPDM: Faster risk-aware policy evaluation through efficient gradient optimization. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, 2018.
- [C11] X. Wang, R. Marcotte, G. Ferrer and E. Olson. AprilSAM: Real-time Smoothing and Mapping. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, 2018.
- [C10] E. Repiso, G. Ferrer and A. Sanfeliu. On-line adaptive side-by-side human robot companion in dynamic urban environments. In *Proceedings of the IEEE International Conference on Intelligent Robots and Systems (IROS)*, pp. 872-877, 2017.

- [C9] D. Mehta, G. Ferrer and E. Olson. Fast discovery of influential outcomes for risk-aware MPDM. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, pp. 6210-6216, Singapore, 2017.
- [C8] D. Mehta, G. Ferrer and E. Olson. Autonomous Navigation in Dynamic Social Environments using Multi-Policy Decision Making. In *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pp. 1190-1197, Korea, 2016.
- [C7] G. Ferrer and A. Sanfeliu. Multi-Objective Cost-to-Go Functions on Robot Navigation in Dynamic Environments. In *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pp. 3824-3829, Hamburg, Germany, 2015.
- [C6] I. Huerta, G. Ferrer, F. Herrero, A. Prati and A. Sanfeliu. Multimodal feedback fusion of laser, image and temporal information. In *International Conference on Distributed Smart Cameras*, pp. 25:1-25:6, Venice, Italy, 2014.
- [C5] G. Ferrer and A. Sanfeliu. Proactive Kinodynamic Planning using the Extended Social Force Model and Human Motion Prediction in Urban Environments. In *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pp. 1730-1735, Chicago, USA, 2014.
- [C4] G. Ferrer and A. Sanfeliu. Behavior Estimation for a Complete Framework for Human Motion Prediction in Crowded Environments. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, pp. 5940-5945. Hong Kong, China, 2014.
- [C3] G. Ferrer, A. Garrell, and A. Sanfeliu. Robot companion: A social-force based approach with human awareness-navigation in crowded environments. In *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pp. 1688-1694. Tokyo, Japan, 2013.
- [C2] G. Ferrer, A. Garrell, and A. Sanfeliu. Social-Awareness Robot Navigation in Urban Environments. In *European Conference on Mobile Robotics, (ECMR)*, pp. 331-336, Barcelona, Spain, 2013.
- [C1] G. Ferrer, and A. Sanfeliu. Comparative analysis of human motion trajectory prediction using minimum variance curvature. In *6th ACM/IEEE International Conference on Human-Robot Interaction (HRI)*, pp. 135-136, Lausanne, Switzerland, 2011.

Book Chapters

- [B1] G. Ferrer, A. Garrell, M. Villamizar, I. Huerta, and A. Sanfeliu. Robot interactive learning through human assistance. In *Multimodal Interaction in Image and Video Applications*, pp. 185-203, Springer, 2013.

PROGRAMMING

LANGUAGES: C++, C, Python

TOOLS: Linux, Ubuntu, ROS, LCM, subversion, git, Latex, [mrob](#)