Armand Jordana

Postdoctoral researcher at LAAS-CNRS

aj2988@nyu.edu
Github
Linkedin
Google scholar

Research experience

Postdoctoral researcher — **Toulouse, France**
Gepetto team, LAAS-CNRS — *Since 09/2025*

Postdoctoral researcher — **NY, USA**
Department of Electrical and Computer Engineering, New York University (NYU) — *01/2025-09/2025*

Research Assistant — **NY, USA**
Department of Electrical and Computer Engineering, New York University — *09/2020-01/2025*

Education

PhD — **NY, USA**
Department of Electrical and Computer Engineering, New York University — *09/2020-01/2025*
Thesis: Reasoning About Perception Uncertainty in Nonlinear Model Predictive Control.
PhD degree awarded on January 27, 2025.

- Under the supervision of Professor Ludovic Righetti (NYU) and Dr. Justin Carpentier (INRIA Paris).
- Main location: NYU.
- Regular research stays (1–2 months per year) at INRIA Paris.

Student at ENS Paris-Saclay — **Cachan, France**
Department of Mathematics — *09/2017–08/2020*
One of France's most selective Grandes Écoles, part of Université Paris-Saclay (ranked top 15 worldwide in mathematics).

Master of Science in Data Science with Honors — **Cachan, France**
MVA, ENS Paris-Saclay — *09/2017–08/2019*

Bachelor of Science in Applied Mathematics with Honors — **Cachan, France**
Department of Mathematics — *09/2014–08/2017*

- *ENS Paris-Saclay*, Cachan, France (09/2016–08/2017)
- Classes Préparatoires, *Lycée Masséna*, Nice, France (09/2014–08/2016)

Award

Best poster award — **Yokohama, Japan**
For the paper *Structure-Exploiting Sequential Quadratic Programming for MPC* [J2] — *05/2024*
Workshop on Advancements in Trajectory Optimization and MPC for Legged Systems, 2nd Edition.

Publications

Journal articles

[J1] **Jordana, Armand**, Kleff, Sébastien, Haffemayer, Arthur, Ortiz-Haro, Joaquim, Carpentier, Justin, Mansard, Nicolas, and Righetti, Ludovic. "Infinite-Horizon Value Function Approximation for Model Predictive Control". In: *IEEE Robotics and Automation Letters* (2025), pp. 7563–7570. doi: 10.1109/LRA.2025.3577875.

[J2] **Jordana*, Armand**, Kleff*, Sébastien, Meduri*, Avadesh, Carpentier, Justin, Mansard, Nicolas, and Righetti, Ludovic. "Structure-Exploiting Sequential Quadratic Programming for Model-Predictive Control". In: *IEEE Transactions on Robotics* (2025), pp. 4960–4974. doi: 10.1109/TRO.2025.3595674.

[J3] **Jordana, Armand**, Hammoud, Bilal, Carpentier, Justin, and Righetti, Ludovic. "Stagewise newton method for dynamic game control with imperfect state observation". In: *IEEE Control Systems Letters* (2022). doi: 10.1109/LCSYS.2022.3184657.

[J4] Yates, Christian A, George, Adam**, Jordana, Armand**, Smith, Cameron A, Duncan, Andrew B, and Zygalakis, Konstantinos C. "The blending region hybrid framework for the simulation of stochastic reaction–diffusion processes". In: *Journal of the Royal Society Interface* (2020). doi: 10.1098/rsif.2020.0563.

Journal articles under review

[JR1] **Jordana, Armand**, Zhang, Jianghan, Amigo, Joseph, and Righetti, Ludovic. "An Introduction to Zero-Order Optimization Techniques for Robotics". In: *Submitted to IJRR* (2025). doi: 10.48550/arXiv.2506.22087.

[JR2] Kleff, Sébastien**, Jordana, Armand**, Mansard, Nicolas, and Righetti, Ludovic. "Force Feedback in Model Predictive Control: A Soft Contact Approach". In: *Submitted to IEEE TRO* (2024). preprint. URL: https://hal.science/hal-04572399.

Peer-reviewed conference papers

[C1] Haffemayer, Arthur**, Jordana, Armand**, Matteis, Ludovic de, Wojciechowski, Krzysztof, Lamiraux, Florent, and Mansard, Nicolas. "Collision Avoidance in Model Predictive Control using Velocity Damper". In: *IEEE International Conference on Robotics and Automation (ICRA)*. 2025. URL: https://laas.hal.science/hal-04707324.

[C2] Dhédin, Victor, Ravi, Adithya Kumar Chinnakkonda**, Jordana, Armand**, Zhu, Huaijiang, Meduri, Avadesh, Righetti, Ludovic, Schölkopf, Bernhard, and Khadiv, Majid. "Diffusion-based learning of contact plans for agile locomotion". In: *2024 IEEE-RAS 23rd International Conference on Humanoid Robots (Humanoids)*. IEEE. 2024, pp. 637–644. doi: 10.1109/Humanoids58906.2024.10769875.

[C3] Haffemayer, Arthur**, Jordana, Armand**, Fourmy, Médéric, Wojciechowski, Krzysztof, Lamiraux, Florent, and Mansard, Nicolas. "Model predictive control under hard collision avoidance constraint for a robotic arm". In: *International Conference on Ubiquitous Robots (UR)*. 2024. doi: 10.1109/UR61395.2024.10597485.

[C4] **Jordana, Armand**, Meduri, Avadesh, Arlaud, Etienne, Carpentier, Justin, and Righetti, Ludovic. "Risk-Sensitive Extended Kalman Filter". In: *IEEE International Conference on Robotics and Automation (ICRA)*. 2024. doi: 10.1109/ICRA57147.2024.10611266.

[C5] **Jordana***, **Armand**, Kleff*, Sébastien, Carpentier, Justin, Mansard, Nicolas, and Righetti, Ludovic. "Force feedback model-predictive control via online estimation". In: *IEEE International Conference on Robotics and Automation (ICRA)*. 2024. doi: 10.1109/ICRA57147.2024.10611156.

[C6] Meduri, Avadesh, Zhu, Huaijiang**, Jordana, Armand**, and Righetti, Ludovic. "MPC with Sensor-Based Online Cost Adaptation". In: *2023 IEEE International Conference on Robotics and Automation (ICRA)*. IEEE. 2023, pp. 996–1002. doi: 10.1109/ICRA48891.2023.10161280.

[C7] Hammoud, Bilal**, Jordana, Armand**, and Righetti, Ludovic. "irisc: Iterative risk sensitive control for nonlinear systems with imperfect observations". In: *American Control Conference (ACC)*. IEEE. 2022, pp. 3550–3557. doi: 10.23919/ACC53348.2022.9867200.

Peer-reviewed short papers and abstracts

[S1] Wang, Hao**, Jordana, Armand**, Righetti, Ludovic, and Bansal, Somil. "Safe and Performant Deployment of Autonomous Systems via Model Predictive Control and Hamilton-Jacobi Reachability Analysis". In: *Workshop on Reliable Robotic at Robotics Science and Systems (RSS)* (2025). doi: 10.48550/arXiv.2506.23346.

[S2] Zhang, Jianghan**, Jordana, Armand**, and Righetti, Ludovic. "Accelerated gradient descent for high frequency Model Predictive Control". In: *Late breaking result at International Conference on Ubiquitous Robots (UR)* (2024). doi: 10.48550/arXiv.2409.18327.

Preprints

[P1] Han, Wenyu, Feng, Chen, Wu, Haoran, Gao, Alexander**, Jordana, Armand**, Liu, Dong, Pinto, Lerrel, and Righetti, Ludovic. "Simultaneous Navigation and Construction Benchmarking Environments". In: *arXiv preprint arXiv:2103.16732* (2021). doi: 10.48550/arXiv.2103.16732.

[P2] **Jordana, Armand**, Carpentier, Justin, and Righetti, Ludovic. "Learning dynamical systems from noisy sensor measurements using multiple shooting". In: *arXiv preprint arXiv:2106.11712* (2021). doi: 10.48550/arXiv.2106.11712.

* denotes equal contribution.

Communications

Talks at international conferences

International Conference on Robotics and Automation (ICRA) — **Yokohama, Japan**
Risk-Sensitive Extended Kalman Filter [C4] — *05/2024*

Conference on Decision and Control (CDC) — **Cancún, Mexico**
Stagewise newton method for dynamic game control with imperfect state observation [J3] — *12/2022*

Invited talks at universities

Technical University Berlin — **Berlin, Germany**
Organized by the Learning and Intelligent Systems research lab — *06/2025*
Title: Reasoning about uncertainty for the estimation and control of robotic systems

INRIA Rennes — **Rennes, France**
Organized by the RAINBOW team — *01/2025*
Title: Reasoning about uncertainty for the estimation and control of robotic systems

IDIAP — **Martigny, Switzerland**
Organized by the Robot Learning & Interaction group — *01/2025*
Title: Reasoning about uncertainty for the estimation and control of robotic systems

University of Pennsylvania — **Philadelphia, USA**
Organized by the DAIR team — *08/2024*
Title: Reasoning about uncertainty for the estimation and control of robotic systems

LIRMM-CNRS — **Montpellier, France**
Organized by the IDH team — *06/2024*
Title: Reasoning about uncertainty for the estimation and control of robotic systems

LAAS-CNRS — **Toulouse, France**
Organized by the Gepetto team — *06/2024*
Title: Reasoning about uncertainty for the estimation and control of robotic systems

INRIA Paris — **Paris, France**
Organized by the DYOGENE team — *09/2022*
Title: Stagewise Newton Method for Dynamic Game Control with Imperfect State Observation

Talks at workshops and local events

Journées Nationales de la Recherche en Robotique (JNRR) — **Rennes, France**
French National Days of Research in Robotics — *09/2025*
Title: Handling Contact and Constraints in MPC for Legged Robots.

Risk Aware Decision Making Workshop — **New York, USA**
At Robotics: Science and Systems — *06/2022*
Title: Stagewise newton method for dynamic game control with imperfect state observation [J3].

Teaching

Teaching assistant — **NYU**
Class on Robotic Manipulation and Locomotion — *01/2025-05/2025*
- Weekly robotic lab session with students.
- Grading of assignments.

Teaching assistant — **NYU**
Class on Reinforcement Learning and Optimal Control for Robotics — *09/2024-12/2024*
- Conception of new projects and class material.
- Grading of assignments.
- **Invited lecturer** for the class on nonconvex optimization.

Teaching assistant — **NYU**
Class on Reinforcement Learning and Optimal Control for Robotics — *09/2022-12/2022*
- Grading of assignments and office hours.

Lecturer — **NYU**
Machine Learning summer course for high school students — *07/2020-08/2020*

- Conception of new class material.
- Main lecturer for 3 two-week sessions.

Supervision

Jianghan Zhang **NYU**
B.Sc. student *06/2023-09/2025*
- Jianghan Zhang worked on first order methods for optimal control and published a Late Breaking Results Session Paper at the 2024 21st International Conference on Ubiquitous Robots (UR) [S2].

Omkar Sawant **NYU**
M.Sc. student *09/2022-05/2023*
- Omkar Sawant worked on state estimation for quadrupeds.

Joshua Reimonenq **NYU**
M.Sc. student *09/2022-05/2023*
- Joshua Reimonenq worked on Kalman filtering.

Arthur Haffemayer **NYU**
PhD student *07/2024-08/2024*
- Arthur Haffemayer (PhD student from LAAS, Toulouse) visited NYU for one month and worked under my supervision. This stay led to a peer-reviewed conference paper at ICRA 2025 [C1].

Software

Main developer
mim_solvers library, efficient numerical optimal control solvers based on [J2] *Since 2023*
https://github.com/machines-in-motion/mim_solvers
- 64 GitHub stars.
- Available on Conda.

Collaboration

LAAS-CNRS **Toulouse, France**
Regular exchanges with Nicolas Mansard and Arthur Haffemayer. *Since 2023*
- Led to two peer-reviewed conference papers [C1, C3].

Technical University of Munich **Munich, Germany**
Regular interactions with Professor Majid Khadiv. *2024*
- Led to a peer-reviewed conference paper [C2].

Stanford University **Stanford, USA**
Regular meetings with Professor Somil Bansal and Hao Wang. *Since 2025*
- Led to a workshop paper at RSS 2025 Workshop on Reliable Robotics [S1].

Community Service

Reviewer *Since 2023*
IEEE Transactions on Robotics (T-RO)

Reviewer *Since 2024*
IEEE Robotics and Automation Letters (RA-L)

Reviewer *2024*
Foundations of Computational Mathematics (FoCM)

Outreach

Les cordées de la réussite **Cachan, France**
A French outreach program for middle and high school students. *11/2017*

Research Internships

Learning models for optimal control in Robotics **NY, USA**
New York University *01/10/2019-31/08/2020*
Under the supervision of Ludovic Righetti.
- This internship resulted in a preprint [P2].

Towards dynamic motions on complex robots **Paris, France**
INRIA Paris *15/04/2019-15/2019*
Under the supervision of Justin Carpentier, Ivan Laptev and Josef Sivic.

Hybrid simulation of reaction-diffusion system **Edinburgh, UK**
University of Edinburgh *15/04/2018-31/07/2018*
Under the supervision of Kostantinos Zygalakis.
- This internship resulted in a journal paper [J4].

Evaluating balance with anomaly detection **Cachan, France**
CMLA *01/01/2017-30/06/2017*
Under the supervision of Nicolas Vayatis and Ioannis Bargiotas.