

## Amirreza Razmjoo Fard

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**European Candidate Eligibility in Switzerland:** In accordance with Article 21(3) of the Foreign Nationals and Integration Act (formerly AuG), as a non-European graduate who studied in Switzerland, I am eligible for European-level consideration—i.e., the usual priority restrictions are waived—for a period of at least six months following my defense. For further details, please contact me or Mr. Philippe Ory (EPFL) at [philippe.ory@epfl.ch](mailto:philippe.ory@epfl.ch) or +41 21 693 5051.

## RESEARCH INTERESTS

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Contact-rich Manipulation, Generative Models for Motion Planning, Sampling-based motion planning, Task and Motion Planning,

## EDUCATION

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**École Polytechnique Fédérale de Lausanne (EPFL),** Jan. 2021 — present  
Lausanne, Switzerland  
Doctor of Philosophy, EDEE program  
**Thesis Topic:** Feasibility Guided Exploration and Adaptation for Constrained Robotic Manipulation  
**Keywords:** Contact-rich Manipulation, Sampling-based MPC, Products of Experts, Generative Models  
**Supervisor:** Dr. Sylvain Calinon

**Sharif University of Technology,** Sep. 2018 — Sep. 2020  
Tehran, Iran  
Master of Science in Mechanical Engineering  
**GPA:** 18.85/20 (4.0/4.0)  
**Thesis Title:** Teaching to Point at Different Objects as an Interactive Gesture to a Robot by Learning from Demonstration  
**Supervisors:** Prof. Ali Meghdari, Dr. Alireza Taheri

**University of Tehran** (with honors), Sep. 2014 — Sep. 2018  
Tehran, Iran  
Bachelor of Science in Mechanical Engineering  
**GPA:** 18.83/20 (3.95/4.0)  
**Thesis Title:** Development of a Health-Monitoring Device for Activity Recognition and Fall Detection  
**Supervisors:** Dr. Sadighi, Dr. Zakerzadeh

## EXPERIENCE

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**Honda Research Institute GmbH,** Offenbach, Germany  
*Research Intern* Oct. 2024 — Mar. 2025

- Designed a local failure recovery system for a robot, enabling it to autonomously avoid previous failures without requiring additional classification, skill segmentation, or high-level planning.
- Developed **Composition of Conditional Diffusion Policies (CCDP)**, a method that dynamically adjusts the sampling process at runtime by restricting specific regions, allowing the system to explore alternative possibilities and improve failure avoidance.
- **Research Keywords:** Diffusion Policies, Composition of Conditional Diffusion Models, Sampling Guidance, Failure Recovery

**Idiap Research Institute** Martigny, Switzerland  
*Research Assistant* Jan. 2021 — Present

- Developed efficient methods for robotic systems to **handle constraints** while **interacting with dynamic environments**. Designed a **robust manifold** to enable seamless **physical human-robot interaction** and leveraged the concept of **products of experts** to enhance the sampling efficiency of **sampling-based planning methods**. Applied these techniques to tasks such as **non-prehensile manipulation**, **obstacle avoidance**, and more.
- **Research Keywords:** Optimal Control, Underactuated System, Task Representation, Geometry-aware Control, Products of Experts, Generative Models

**CEDRA (Center of Excellence in Design, Robotics, and Automation)** Tehran, Iran  
*Research Assistant* Sep. 2018 — Sep. 2020

- We demonstrated how to combine features with non-linear relationships observed in various coordinate systems using **products of experts** which improved the performance and generalizability of **learning from demonstration** techniques. Additionally, we developed a ROS-based control system for two social robots, Arash2 & Armin, to support my research and simplify operation for non-experts.
- **Keywords:** Learning from Demonstration, Products of Experts, Social Robots, ROS, Linux.

**NODET (National Organization for Development of Exceptional Talents)**

Tehran, Iran

Research Assistant

Feb. 2019 — Sep. 2019

- Under the guidance of Prof. Hoda Mohammadzade and as a member of the FallArm team, I designed and implemented an innovative fall detection system by leveraging dynamic haar-cascade features.
- **Research Keywords:** Fall Detection in Videos, Computer Vision, and Image Processing

**CAST (Center of Advanced Systems and Technologies)**

Tehran, Iran

Undergraduate Research Assistant

Sep. 2017 — Sep. 2018

- Member of Dynamic portfolio.
- **Keywords:** Mechanical Design, Component Selection

**Festo**

Tehran, Iran

Vocational Trainee

Jun. 2017 — Sep. 2017

- I gained comprehensive knowledge of hydraulic-based systems, encompassing an understanding of the principles behind hydraulic systems, reading schematics, and mastering the intricacies of valve selection to optimize system performance across a range of industries and applications.

**AWARDS****Outstanding Paper Finalist at RSS**

2024

For the paper *Configuration Space Distance Fields for Manipulation Planning***Admission Offer**

2018

Excellent student M.Sc. admission offer to Sharif University of Technology.

**Summa cum laude**

2018

Achieved the top rank among 121 students upon graduating from the University of Tehran.

**Dean's list**

2015-2018

Ranked among the top 10 individuals of the year in that particular program.

**F.O.E prize**

2015, 2017

Recipient of the award given to the top three students of the year.

**The Foundation of the University of Tehran Scholarship**

2016-2017

**Ranked 256 (top 0.2%)**

2014

Among more than 220,000 people in the nationwide university entrance exam.

**SKILLS**

- **Research Topics:** Product of Experts, Generative Models, Optimal Control, Learning from Demonstrations, (physical-) Human-Robot Interaction, Contact-rich Manipulation, Impedance/Admittance Control,
- **Programming:** Python, MATLAB, ROS, L<sup>A</sup>T<sub>E</sub>X, Linux, C++ (Basics)
- **Softwares (libraries):** Mujoco, Pytorch, IsaacGym, Mujoco, Pybullet, Pinocchio, Crocoddyl, CasADi
- **Languages:** English (Professional Working Proficiency), Azerbaijani (Native), Persian (Native)

**Related Courses****Legged Robots, EPFL**

Prof. Auke Ijspeert

**Keywords:** Humanoid Modeling, Reinforcement Learning (RL), Central Pattern Generator (CPG)**Projects:** 1- Developed control strategies for the Atlas robot's walking gait using divergent term modulation. 2- Designed and implemented a CPG-RL framework enabling a dog robot to perform varied behaviors (walking, running, etc.).**Score:** 5.5/6

**Model Predictive Control, ETH**

Prof. Melanie Zeilinger, Dr. Andrea Carron

**Keywords:** Optimal Control Basics, Feasibility and Stability in Receding Horizon Systems, Robust MPC**Project:** Developed a temperature control system for a vaccine storage unit.**Score:** 6/6**REFERENCES**

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**Dr. Sylvain Calinon**

Senior Researcher at Idiap Research Institute, Head of RLI Group

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Telephone: (office) +41 27 721 77 61

**Dr. Michael Gienger**

Chief Scientist at Honda Research Institute

E-mail: Michael.Gienger@honda-ri.de

**Dr. T. S. Lembono**

Applied Scientist at Amazon

E-mail: tlembono@amazon.de

**Teng Xue**

Research Assistant at the Idiap Research Institute

E-mail: teng.xue@idiap.ch

**SELECTED PUBLICATIONS**

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- A. Razmjoo, T.Xue, S. Shetty and S. Calinon, **Sampling-Based Constrained Motion Planning with Products of Experts**, IJRR (Conditional Acceptance), 2025
- T. Xue, A. Razmjoo, Y. Zhang and S. Calinon, **Unifying Robot Optimization: Monte Carlo Tree Search with Tensor Factorization**, Under review, 2025
- Y. Zhang, T. Xue, A. Razmjoo, and S. Calinon, **Goal Decomposition and Temporal Distance Learning for Reactive Task and Motion Planning**, under review, 2025.
- A. Razmjoo, S. Calinon, M. Gienger, and F. Zhang, **CCDP: Composition of Conditional Diffusion Policies with Guided Sampling**, IROS, 2025.
- T.Xue, A. Razmjoo, S. Shetty and S. Calinon, **Robust Contact-rich Manipulation through Implicit Motor Adaptation**, IJRR, 2025
- O. Beker, N. Gürtler, J. Shi, A. Geist, A. Razmjoo, G. Martius, and S. Calinon, **A Smooth Analytical Formulation of Collision Detection and Rigid Body Dynamics With Contact**, IROS, 2025.
- T. Xue, A. Razmjoo, and S. Calinon, **Robust Manipulation Primitive Learning via Domain Contraction**, CoRL, 2024.
- Y. Zhang, A. Razmjoo, and S. Calinon, **Learn2Decompose: Learning Problem Decomposition for Efficient Task and Motion Planning**, arxiv, 2024.
- T. Xue, A. Razmjoo, S. Shetty, and S. Calinon, **Logic-Geometric learning and Control Using Graph of Tensor Networks**, *RSS-Workshop*, 2024.
- O. Beker, A. Razmjoo, A. Zamir, and S. Calinon, **VIMEX: Exemplar-Based Visual Memory for Robotic Task Description**, under review, 2024
- Y. Zhang, T. Xue, A. Razmjoo, **Logic Dynamic Movement Primitives for Long-horizon Manipulation Tasks in Dynamic Environments**, *RA-L*, 2024
- T.Xue, A. Razmjoo, S. Shetty and S. Calinon, **Logic-Skill Programming: An Optimization-based Approach to Sequential Skill Planning**, *RSS*, 2024
- Y.Li, X. Chi, A. Razmjoo, S. Calinon, **Configuration Space Distance Fields for Manipulation Planning**, *RSS*, 2024, (**Best Paper Finalist**)
- T. Xue, A. Razmjoo, and S. Calinon, **D-LGP: Dynamic Logic-Geometric Program for Combined Task and Motion Planning**, *ICRA*, 2024.

- Y. Li, Y. Zhang, A. Razmjoo, and S. Calinon. **Learning Robot Geometry as Distance Fields: Applications to Whole-body Manipulation.**, *ICRA*, 2024.
- A. Razmjoo, T. Brecej, K. Savevska, A. Ude, T. Petrič, and S. Calinon, **Optimal Latent Manifold for Reliable Physical Interaction: A Sit-to-Stand Assistance Application**, 6th Ergonomic Physical Human-Robot Collaboration: Harnessing Advancements in Robot Learning workshop, *IROS*, 2023.
- A. Razmjoo, T. Brecej, K. Savevska, A. Ude, T. Petric, and S. Calinon, **Learning Joint Space Reference Manifold for Reliable Physical Assistance**, *IROS*, 2023.
- B. Ti, A. Razmjoo, Y. Gao, J. Zhao, S. Calinon, **A Geometric Optimal Control Approach for Imitation and Generalization of Manipulation Skills**, *Robotics and Autonomous Systems (RAS)*, 2023.
- A. Razmjoo, T. S. Lembono, S. Calinon, **Optimal Control Combining Emulation and Imitation to Acquire Physical Assistance Skills**, *ICAR*, 2021.