Alberta Longhini

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Postdoctoral Researcher @ Stanford University
Interactive Perception and Robot Learning Lab

RESEARCH STATEMENT

My research focuses on advancing Physical AI by integrating structured world models and multimodal perception to enable robots to perform complex tasks in unstructured, dynamic environments. I am particularly interested in leveraging the interplay between perception and modeling to learn representations of physical properties of real-world objects, embedding physics-based priors into learning systems, and exploring generative and hybrid approaches to improve the generalization and sample efficiency of current Physical AI. My vision is to develop intelligent robotic systems capable of long-horizon autonomy and robust assistive capabilities to support humans in real-world scenarios.

Interests: Robot Manipulation · Interactive Perception · World Models · Representation Learning

Ph.D. THESIS

- *Adapting to Variations in Textile Properties for Robotic Manipulation* — Defended: May 8, 2025
  KTH Royal Institute of Technology (Robotic Perception and Learning) — *Stockholm, Sweden*
  · Developed a model-based framework for textile manipulation that couples interactive perception, property-aware dynamics, and closed-loop control.
  · Introduced a robotics-relevant textile taxonomy and interaction-driven characterization for systematic classification.
  · Proposed elastic property identification to adapt learned dynamics across unseen material parameters.
  · Enabled closed-loop manipulation under occlusion via RGB-supervised 3D tracking, reducing convergence time by ∼85%.
  · Demonstrated adaptive folding with model-based closed-loop manipuation using RGB-D state estimation and online replanning across diverse real textiles.

SELECTED PUBLICATIONS

The symbol † denotes shared first authorship. C and J* denote conference and journal publications, respectively.*

[C1] Alberta Longhini, Michael C Welle, Ioanna Mitsioni, and Danica Kragic. *Textile taxonomy and classification using pulling and twisting*. In: 2021 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS). IEEE. 2021, pp. 7564–7571 [pdf]

[C2] Alberta Longhini†, Marco Moletta†, Alfredo Reichlin, Michael C Welle, David Held, Zackory Erickson, and Danica Kragic. *EDO-Net: Learning Elastic Properties of Deformable Objects from Graph Dynamics*. In: 2023 IEEE International Conference on Robotics and Automation (ICRA). 2023 [pdf]

[C3] Alberta Longhini †, Marcel Büsching †, Bardienus Pieter Duisterhof, Jens Lundell, Jeffrey Ichnowski, Mårten Björkman, and Danica Kragic. *Cloth-Splatting: 3D Cloth State Estimation from RGB Supervision*. In: 8th Annual Conference on Robot Learning (CoRL) [pdf] [website]

[C4] Irene Garcia-Camacho, Alberta Longhini, Michael C Welle, Guillem Alenyà, Danica Kragic, and Júlia Borràs. *Standardization of cloth objects and its relevance in robotic manipulation*. In: 2023 IEEE International Conference on Robotics and Automation (ICRA). 2024 [pdf] [website]

[J1] Alberta Longhini, Michael C Welle, Zackory Erickson, and Danica Kragic. *AdaFold: Adapting Folding Trajectories of Cloths via Feedback-loop Manipulation*. In: IEEE Robotics and Automation Letters, 2024 [pdf] [website]

[J2] Alberta Longhini, Yufei Wang, Irene Garcia-Camacho, David Blanco-Mulero, Marco Moletta, Michael Welle, Guillem Alenyà, Hang Yin, Zackory Erickson, David Held, et al. *Unfolding the Literature: A Review of Robotic Cloth Manipulation*. In: Annual Review of Control, Robotics, and Autonomous Systems, 2024 [pdf]

EDUCATION

- Postdoctoral Fellow, *Stanford University* — 2026–Present
  Interactive Perception and Robot Learning (IPRL) Lab — *USA*
- Research Intern, *NAVER Labs Europe* — 2025
  Spatial Intelligence Team — *France*
- Ph.D. Computer Science, *KTH Royal Institute of Technology* — 2021–2025
  Robotic Perception and Learning (RPL) Lab — *Sweden*

- Visiting Researcher, *Carnegie Mellon University* — 2023
  Robotic Caregiving and Human Interaction Lab — *USA*
- M.Sc. Automation Engineering, *University of Padua* — 2018–2021
  Italy
- B.Sc. Information Engineering, *University of Padua* — 2018–2021
  Italy

INVITED TALKS and OUTREACH

- *Need laundry folded? Don't ask a robot* — 2025
  Knowable Magazine, Kaia Glickman.
- *Adapting to Variations in Textile Properties for Robotic Manipulation* — 2024
  Robotic Caregiving and Human Interaction Lab, Carnegie Mellon University.
- *Generalization of Manipulation Skills for Home Robots by Ignoring and Adapting* — 2024
  Workshop on Lifelong Learning for Home Robots, 8-th Annual Conference on Robot Learning (CoRL).
- *Towards General Manipulation of Deformables* — 2024
  IEEE Final Year PhD student Seminars

HONORS, DISTINCTIONS and FUNDING

- "RSS Pioneer" Award — 2025
  Selected as top early-career researchers in robotics.
- The Wallenberg Foundation Postdoctoral Fellowship Program at Stanford — 2025
  Selected as outstanding researcher to perform research at Stanford.
- "Best Research Intern" Award — 2025
  Selected as best research inter at NAVER Labs Europe.
- "Mille e una lode" Award — 2017
  Awarded a selective scholarship by the University of Padova to excellent students in each degree programme.

PROFESSIONAL SERVICE

RESEARCH COMMUNITY SERVICE

- PhD Representative - Member of the EECS PhD school council. — 2023-2025

ORGANIZATIONAL ROLES

- Challenge: LeHome Challenge: 1st Simulation-Driven Competition on Deformable Object Manipulation (ICRA) — 2026
- Workshop: RSS Pioneers (RSS) — 2026
- Workshop: Generative Digital Twins for Real2Sim and Sim2Real Transfer in Robotics (ICRA) — 2026
- Workshop: Learning to Simulate Robot Worlds (CoRL) — 2025
- Workshop: Beyond Rigid Worlds: Representing and Interacting with Non-Rigid Objects (CoRL) — 2025
- Workshop: Structured World Models for Robotic Manipulation (RSS) — 2025
- Fifth workshop on Representing and Manipulating Deformable Objects (ICRA) — 2025
- Fourth workshop on Representing and Manipulating Deformable Objects (ICRA) — 2024

REVIEWER

- IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) — 2021-Present
- IEEE International Conference on Robotics and Automation (ICRA) — 2022-Present
- IEEE Robotics and Automation Letters (RA-L) — 2024-Present
- IEEE Transactions on Robotics (TRO) — 2024-Present
- Conference on Robot Learning (CoRL) — 2024-Present
- Robotics: Science and Systems (RSS) — 2025-Present

REFERENCES

- Danica Kragic, *KTH Royal Institute of Technology, Sweden* — dani@kth.se
- Zackory Erickson, *Carnegie Mellon University, USA* — zackory@cmu.edu
- Jens Lundell, *University of Turku, Norway* — jens.lundell@utu.fi
- Seungsu Kim, *NAVER Labs Europe, France* — seungsu.kim@naverlabs.com