

# Alberta Longhini

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Division of Robotics, Perception, and Learning (RPL)

KTH Royal Institute of Technology, Stockholm, Sweden

## RESEARCH STATEMENT

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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

## SELECTED PUBLICATIONS

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- [S1] 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 [\[pdf\]](#)
- [S2] Alberta Longhini<sup>†</sup>, Marco Moletta<sup>†</sup>, 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 [\[pdf\]](#)
- [S3] 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 [\[pdf\]](#) [\[website\]](#)
- [S4] Alberta Longhini<sup>†</sup>, Marcel Büsching<sup>†</sup>, 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) [\[pdf\]](#) [\[website\]](#)

Note: The symbol <sup>†</sup> denotes shared first-authorship.

## EXPERIENCE

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- |   |                     |
|---|---------------------|
| • Research Intern<br>NAVER Labs Europe                    | 2025-Now<br>France  |
| • Ph.D. Candidate<br>KTH Royal Institute of Technology    | 2021-2025<br>Sweden |
| • Teaching Assistant<br>KTH Royal Institute of Technology | 2021–2025<br>Sweden |
| • Visiting Researcher<br>Carnegie Mellon University       | 2023<br>USA         |

## EDUCATION

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- |  |           |
|--|-----------|
| • Ph.D. Computer Science<br>Division of Robotic Perception and Learning (RPL), KTH Royal Institute of Technology, Sweden <ul style="list-style-type: none"><li>• Thesis Title: Adapting to Variations in Textile Properties for Robotic Manipulation.</li><li>• Supervisors: Prof. Danica Kragic, Michael C. Welle, Jens Lundell</li></ul> | 2021–2025 |
| • Degree Project Abroad<br>Division of Robotic Perception and Learning (RPL), KTH Royal Institute of Technology, Sweden <ul style="list-style-type: none"><li>• Scholarship: Erasmus Mundus.</li></ul>   | fall 2020 |
| • M.Sc. Automation Engineering<br>Department of Information Engineering (DEI), University of Padua, Italy <ul style="list-style-type: none"><li>• Thesis Title: Fabric Material Classification by Combining Force Sensing and Vision.</li><li>• Supervisors: Prof. Alessandro Chiuso, Prof. Danica Kragic.</li></ul>                       | 2018–2021 |

- International Studies fall 2017  
*Facultat Informàtica de Barcelona (FIB), Universitat Politècnica de Catalunya (UPC), Spain*
  - *Scholarship: Erasmus Mundus.*
- B.Sc. Information Engineering 2015–2018  
*Department of Information Engineering (DEI), University of Padua, Italy*
  - *Thesis Title: Experimental and computational applications of semantic networks.*
  - *Supervisor: Prof. Leonardo Badia.*

## PUBLICATIONS

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*Note: The symbol <sup>†</sup> denotes shared first-authorship.*

### PEER-REVIEWED CONFERENCE PAPERS (6)

- [C6] Alberta Longhini <sup>†</sup>, Marcel Büsching <sup>†</sup>, 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) [\[pdf\]](#) [\[website\]](#)
- [C5] 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 [\[pdf\]](#) [\[website\]](#)
- [C4] Alberta Longhini<sup>†</sup>, Marco Moletta<sup>†</sup>, 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, Marco Moletta, Alfredo Reichlin, Michael C Welle, Alexander Kravberg, Yufei Wang, David Held, Zackory Erickson, and Danica Kragic. *Elastic Context: Encoding Elasticity for Data-driven Models of Textiles*. In: 2023 IEEE International Conference on Robotics and Automation (ICRA). 2023 [\[pdf\]](#)
- [C2] 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 [\[pdf\]](#)
- [C1] Alberta Longhini, Michele Perbellini, Stefano Gottardi, Shenglun Yi, Hao Liu, and Mattia Zorzi. *Learning the tuned liquid damper dynamics by means of a robust EKF*. in: 2021 American Control Conference (ACC). IEEE. 2021, pp. 60–65 [\[pdf\]](#)

### JOURNAL ARTICLES (2)

- [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 [\[pdf\]](#)
- [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 [\[pdf\]](#) [\[website\]](#)

### PEER-REVIEWED WORKSHOP PAPERS (3)

- [W3] Alberta Longhini, Marcel Büsching, Bardienus Pieter Duisterhof, Jeffrey Ichnowski, Mårten Björkman, and Danica Kragic. *Distilling Semantic Features for 3D Cloth Representations from Vision Foundation Models*. In: ICRA 2024 Workshop on 3D Visual Representations for Robot Manipulation [\[pdf\]](#)
- [W2] Robert Gieselmann, Alberta Longhini, Alfredo Reichlin, Danica Kragic, and Florian T. Pokorny. *DLO@Scale - A Large-Scale Meta Dataset for Learning Non-Rigid Object Pushing Dynamics*. In: Workshop on Physical Reasoning and Inductive Biases for the Real World, NeurIPS, 2021 [\[pdf\]](#) [\[website\]](#)
- [W1] Alberta Longhini, Marco Moletta, Michael C Welle, Ioanna Mitsioni, and Danica Kragic. *Perceiving and Handling Textiles: a Robotics Perspective*. In: Workshop on Representing and Manipulating Deformable Objects, ICRA, 2021 [\[pdf\]](#)

## PREPRINTS (1)

- [P1] Santiago Bou Betran, Alberta Longhini, Miguel Vasco, Yuchong Zhang, and Danica Kragic. *FLAME: A Federated Learning Benchmark for Robotic Manipulation*. In: arXiv preprint arXiv:2503.01729, 2025 [\[pdf\]](#)

## INVITED TALKS

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- *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 AND DISTINCTIONS

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- “RSS Pioneer” Award 2025  
*Selected as top early-career researchers in robotics.*
- “Mille e una lode” Award 2017  
*Awarded a selective scholarship by the University of Padova to excellent students in each degree programme.*

## GRANTS AND FUNDS

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- The Wallenberg Foundation Postdoctoral Fellowship Program at Stanford 2025
- Jubilee travel grant at KTH, providing 20000 SEK (~ 2000\$) to attend ICRA 2024
- Erasmus Scholarship Recipient for KTH Royal Institute of Technology, Sweden 2020
- Erasmus Scholarship Recipient for Universitat Politècnica de Catalunya (UPC), Spain 2017

## TEACHING AND SUPERVISION

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### COURSES

- Introduction to Robotics 2022–2024  
*School of Electrical Engineering and Computer Science* *KTH Royal Institute of Technology*
- Image Analysis and Computer Vision 2021–2023  
*School of Electrical Engineering and Computer Science* *KTH Royal Institute of Technology*

### M.SC. STUDENTS

- Andrea Ritossa, “*Sample-efficient Imitation Learning for Deformable Object Manipulation Using Diffusion Models*” 2025  
M.Sc. Computer Science, *KTH Royal Institute of Technology*
- Noel Johansson, “*Benchmarking Sentence-Transformers for Duplicate Bug Detection on Novel Dataset*” 2024  
M.Sc. Computer Science, *KTH Royal Institute of Technology*
- Mark Bergrahm, “*Explanation methods on a partially trained model*” 2024  
M.Sc. Computer Science, *KTH Royal Institute of Technology*

### RESEARCH ENGINEERS

- Santiago Bou Betran, “*FLAME: A Federated Learning Benchmark for Robotic Manipulation*” 2025  
*KTH Royal Institute of Technology*

## PROFESSIONAL SERVICE

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### RESEARCH COMMUNITY SERVICE

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

### ORGANIZATIONAL ROLES

- Workshop on 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-Now
• IEEE International Conference on Robotics and Automation (ICRA)	2022-Now
• IEEE Robotics and Automation Letters (RA-L)	2024-Now
• IEEE Transactions on Robotics (TRO)	2024-Now
• Conference on Robot Learning (CoRL)	2024-Now
• Robotics: Science and Systems (RSS)	2025-Now

## PROGRAMMING LANGUAGES

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• Python	<i>Proficient</i>
• PyTorch	<i>Proficient</i>
• ROS1-ROS2	<i>Proficient</i>
• C++	<i>Competent</i>

## REFERENCES

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• Danica Kragic, <i>KTH Royal Institute of Technology, Sweden</i>	dani@kth.se
• Zackory Erickson, <i>Carnegie Mellon University, USA</i>	zackory@cmu.edu
• Jense Lundell, <i>KTH Royal Institute of Technology, Sweden</i>	jelundel@kth.se
• Michael C. Welle, <i>KTH Royal Institute of Technology, Sweden</i>	mwelle@kth.se