Alberta Longhini

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Division of Robotics, Perception, and Learning (RPL)
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RESEARCH STATEMENT

My research lies at the intersection between robotics and machine learning. In particular, I focus on robotic perception and manipulation of deformable objects. Currently, I'm interested in learning world models from robotic interaction and sensing, where my focus is on encoding physical propertied of deformable objects into a latent representation.

Keywords: Deformable Object Manipulation · Representation Learning

SELECTED PUBLICATIONS

[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, 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]

[S3] 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]

Note: The symbol [†] denotes shared first-authorship.

EXPERIENCE

- Teaching Assistant — 2021–now
  KTH Royal Institute of Technology — *Sweden*
- Ph.D. Candidate — 2021–now
  KTH Royal Institute of Technology — *Sweden*
- Visiting Researcher — 2023–now
  Carnegie Mellon University — *USA*

EDUCATION

- Ph.D. Computer Science — 2021–now
  Division of Robotic Perception and Learning (RPL), KTH Royal Institute of Technology, Sweden
  · *Supervisors*: Prof. Danica Kragic, Michael C. Welle, Jens Lundell
- Degree Project Abroad — fall 2020
  Division of Robotic Perception and Learning (RPL), KTH Royal Institute of Technology, Sweden
  · *Scholarship*: Erasmus Mundus.
- M.Sc. Automation Engineering — 2018–2021
  Department of Information Engineering (DEI), University of Padua, Italy
  · *Thesis Title*: Fabric Material Classification by Combining Force Sensing and Vision.
  · *Supervisor*: Prof. Alessandro Chiuso, Michael C. Welle, Ioanna Mitsioni.
- International Studies — fall 2017
  Facultat Informatica de Barcelona (FIB), Universitat Politecnica 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

Note: The symbol † denotes shared first-authorship.

PEER-REVIEWED CONFERENCE PAPERS (4)

[C4] 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, 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]

PEER-REVIEWED WORKSHOP PAPERS/EXTENDED ABSTRACTS (1)

WORKSHOP (2)

[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]

[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]

HONORS AND DISTINCTIONS

- "Mille e una lode" Award 2017
  Awarded a scholarship by the University of Padova which offers 1,000 merit-based awards to excellent students in each degree programme.

TEACHING

COURSES

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

PROFESSIONAL SERVICE

REVIEWER

- IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2021-2022
- IEEE International Conference on Robotics and Automation (ICRA)) 2022
- IEEE International Conference on Robotics and Automation (ICRA) – RMDO Workshop 2021

REFERENCES

- Danica Kragic, *KTH Royal Institute of Technology, Sweden* dani@kth.se
- Michael C. Welle, *KTH Royal Institute of Technology, Sweden* mwelle@kth.se
- Zackory Erickson, *Carnegie Mellon University, USA* zerickso@andrew.cmu.edu
- Jense Lundell, *KTH Royal Institute of Technology, Sweden* jelundel@kth.se