LUCA CASTRI

PhD Student in
AI and Robotics
University of Lincoln, UK

🌐 lcastri.github.io   ✉ lucacastri94@gmail.com

🔗 /in/luca-castri/   ⌨ github.com/lcastri

📍 Lincoln, UK   📞 +39 3341011284|+44 07763735768

SUMMARY

I am a Robotic and AI scientist specialised in Causal Inference applied to Robotics. My research focuses on exploiting causal inference to advance intelligent mobile robotics in dynamic interaction settings, enabling robots to improve prediction, decision-making, and overall autonomy in human-shared environments.

Research interests: Causal Inference - Causal Robotics

SKILLS

Robotics & AI:	ROS, Gazebo, Docker, Keras, Tensorflow, Scikit-learn
Computer Science:	Python, C++, Java, SQL, JavaScript, HTML, LaTeX, git
Languages:	Italian (native) - English (fluent)

ACADEMIC EXPERIENCE

Apr/2024 – Nov/2024 — **Causal Discovery for Time-Series Data** — *University of Padua*
- Lecture in the Artificial Intelligence course of the Computer Science program

Jan/2024- Jun/2024 — **MSc Student Supervisor** — *University of Lincoln*
- Thesis: "Learning hierarchical tasks for human-robot on-demand co-production"

Apr/2023 — **Causal Discovery** — *University of Padua*
- Lecture in the Artificial Intelligence course of the Computer Science program

Jan/2023 – Jul/2023 — **Team member of LCASTOR RoboCup team** — *University of Lincoln*
- 2023 RoboCup@Home Open Platform League – Responsible for the "Person Following" task
- Technical tools – libraries – sensors: `ROS, Docker, Python, C++` – Bayes People Tracker – Velodyne VLP-16

Oct/2021 – Jun/2022 — **Associate Demonstrator (Workshop assistant)** — *University of Lincoln*
- Advanced Artificial Intelligence (Autumn term)
- Autonomous and Mobile Robotics (Spring term)

PROFESSIONAL EXPERIENCE

Jan/2020 – Jun/2021 — **Software Specialist** — *Metapack Engineering*
- Designed, developed, and validated HMI and PLC systems
- Developed communication protocols (motors, cameras, printers, PLCs)
- Supported test and start-up procedures
- Acquired skills: Collaborative coding using `GitHub - Python - C++`
- Main fields: Food and beverages – Pharmaceutical

Apr/2019 – Dec/2019 — **Test Engineer** — *Ferrari (via Amaris)*
- Analysed logic and HMI requirements, legal constraints, and edge cases
- Contributed to ECU design and validation
- Key Areas: ADAS (ACC, Blind Spot Detection, Park Assist) – Event Data Record (AirBag) – Infotainment

EDUCATION

Jul/2021 - present — **PhD in AI and Robotics** — *University of Lincoln*
- Supervisors: Nicola Bellotto and Marc Hanheide
- Responsible for the "Causal Reasoning for Safe HRSI" task of the European H2020 DARKO project
- Research focuses on enhancing robot understanding of its surroundings through causal inference to improve autonomy in dynamic, human-populated environments
- Active participation in review and integration meetings
- Main research topics: Causality, Robotics, Human-Robot Spatial Interaction (HRSI)

Oct/2016 - Jan/2019 — **Master of Science – Control Engineering (Mark: 110/110)** — *La Sapienza University of Rome*
- Relevant modules: Robotics, Process Automation, Multivariable systems, Control system.
- Thesis: "*Autonomous car driving systems: new control strategy*" – Supervisors: Gianluca Pepe, Antonio Carcaterra

Sep/2013 - Oct/2016 — **Bachelor of Science – Information and Control Engineering (Mark: 101/110)** — *La Sapienza University of Rome*
- Relevant modules: Systems Theory, Automation, Telecommunications, Electronics.
- Thesis: "*Modeling and Control of Robot KUKA LWR4+ in Simulink / VRML*" – Supervisor: Alessandro De Luca

HONORS

Oct/2016 - Jan/2019 — **Percorso d'Eccellenza (Honors Program) - Master's Degree** — *La Sapienza University of Rome*
Graduated in 2 years with an average grade > 28/30

PUBLICATIONS

Causality-enhanced Decision-Making for Autonomous Mobile Robots in Dynamic Environments
L. Castri, G. Beraldo and N. Bellotto. (2025)
under-review

 https://github.com/lcastri/PeopleFlow

Hierarchical System to Predict Human Motion and Intentions for Efficient and Safe Human-Robot Interaction in Industrial Environments
A. Rudenko, Y. Zhu, T. Rodrigues de Almeida, T. Schreiter, **L. Castri**, N. Bellotto, T. Linder, N. Vaskevicius, L. Palmieri, M. Magnusson, A. J. Lilienthal. (2025)
German Robotics Conference (GRC)

DARKO-Nav: Hierarchical Risk- and Context-aware Robot Navigation in Complex Intralogistic Environments
E. Stracca, A. Rudenko, L. Palmieri, P. Salaris, **L. Castri**, N. Mazzi, V. Rakcevic, N. Vaskevicius, T. Linder, N. Bellotto, T. Schreiter, Y. Zhu, M. Castellano-Quero, O. Napolitano, E. Stefanini, L. Heuer, M. Magnusson, A. Swikir and A. Lilienthal (2025).
European Robotics Forum (ERF)

CAnDOIT: Causal Discovery with Observational and Interventional Data from Time-Series
L. Castri, S. Mghames, M. Hanheide and N. Bellotto. (2024)
Advanced Intelligent Systems

 https://github.com/lcastri/causalflow

neuROSym: Deployment and Evaluation of a ROS-based Neuro-Symbolic Model for Human Motion Prediction
S. Mghames, **L. Castri**, M. Hanheide and N. Bellotto. (2024)
Proceedings of IEEE International Conference on Cybernetics and Intelligent Systems (CIS)
and IEEE Conference on Robotics, Automation and Mechatronics (RAM)

 https://github.com/sariahmghames/neuROSym

Experimental Evaluation of ROS-Causal in Real-World Human-Robot Spatial Interaction Scenarios
L. Castri, G. Beraldo, S. Mghames, M. Hanheide and N. Bellotto. (2024)
Proceedings of IEEE International Conference on Robot and Human Interactive Communication (RO-MAN)

 https://lcastri.github.io/roscausal

ROS-Causal: A ROS-based Causal Analysis Framework for Human-Robot Interaction Applications
L. Castri, G. Beraldo, S. Mghames, M. Hanheide and N. Bellotto. (2024)
Causal-HRI Workshop, ACM/IEEE International Conference on Human-Robot Interaction (HRI)

 https://lcastri.github.io/roscausal

Efficient Causal Discovery for Robotics Applications
L. Castri, S. Mghames and N. Bellotto. (2023)
Proceedings of Italian Conference on Robotics and Intelligent Machines (I-RIM 3D)

Qualitative Prediction of Multi-Agent Spatial Interactions
S. Mghames, **L. Castri**, M. Hanheide and N. Bellotto. (2023)
Proceedings of IEEE International Conference on Robot and Human Interactive Communication (RO-MAN)

A Neuro-Symbolic Approach for Enhanced Human Motion Prediction
S. Mghames, **L. Castri**, M. Hanheide and N. Bellotto. (2023)
Proceedings of International Joint Conference on Neural Networks (IJCNN).

Enhancing Causal Discovery from Robot Sensor Data in Dynamic Scenarios
L. Castri, S. Mghames, M. Hanheide and N. Bellotto. (2023)
Proceedings of Conference on Causal Learning and Reasoning (CLeaR)

 https://github.com/lcastri/fpcmci

From Continual Learning to Causal Discovery in Robotics
L. Castri, S. Mghames and N. Bellotto. (2023)
AAAI Bridge Program "Continual Causality"

Causal Discovery of Dynamic Models for Predicting Human Spatial Interactions
L. Castri, S. Mghames, M. Hanheide and N. Bellotto. (2022)
Proceedings of International Conference on Social Robotics (ICSR)

From Human Perception and Action Recognition to Causal Understanding of Human-Robot Interaction in Industrial Environments
S. Ghidoni, M. Terreran, D. Evangelista, E. Menegatti, C. Eitzinger, E. Villagrossi, N. Pedrocchi, N. Castaman, M. Malecha, S. Mghames, **L. Castri**, M. Hanheide and N. Bellotto. (2022)
Convegno Nazionale CINI sull'Intelligenza Artificiale (Ital-IA)

INVITED TALKS

Causal Inference for Intelligent Mobile Robots in Dynamic Interaction Settings
Oxford Robotics Institute, University of Oxford (Jun 2025)

Enhancing Human-Robot Spatial Interaction through Causal Inference
University of Padua (Oct 2023)

EVENTS PARTICIPATION

Conference Reviewer: *CLeaR - ICRA - IROS*

Workshop Reviewer: *ICRA Long-term Human Motion Prediction*

Attended courses: *Advanced Course on AI (ACAI2021)*