

# Franco Terranova

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## EDUCATION

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**Université de Lorraine & INRIA**, Nancy, France 10/2023 — 10/2026

*Ph.D. in Computer Science* - RESIST Team / SuperviZ Project (France 2030)

*Thesis Title:* Reinforcement Learning-Based Approaches for Automated Security Analysis of Networked Systems

- Development of Deep RL agents for discovering cyber-attack paths through sequential vulnerability selection
- Creation of a simulation environment for DRL agents utilizing real-world vulnerabilities
- Integration of Graph Neural Networks and Language Models for embedding environment representations

**University of Pisa**, Pisa, Italy

09/2021 — 09/2023

*Master's Degree in Artificial Intelligence and Data Engineering*

Final Grade: (110/110) cum laude

*Thesis Title:* Self-driving Telescopes - Reinforcement Learning for Planning Astronomical Observations

**University of Pisa**, Pisa, Italy

09/2018 — 07/2021

*Bachelor's Degree in Computer Engineering*

Final Grade: (110/110) cum laude

*Thesis Title:* Artificial Intelligence for Emotion Recognition using Data Gathered from a Wearable Sensor Network

## EXPERIENCE

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**University of Waterloo**

Waterloo, Canada

*Visiting Researcher* - Cheriton School of Computer Science

06/2024 — 07/2024 / 11/2024 — 12/2024

- A competitive MARL-based game for assessing the security of virtualized environments
- Development of a simulation environment representing a virtualized network for training MARL agents

**Fermi National Accelerator Laboratory**

Chicago, Illinois

*Master Degree Thesis Researcher* - Deep Skies Lab

05/2023 — 08/2023

Project: Self-driving Telescopes - Reinforcement Learning for Planning Astronomical Observations

- Applying Deep RL for automating telescope pointing using an offline dataset as the environment
- Developing a framework for training Deep RL agents based on custom input datasets wrapped as environments

**European Space Agency**

Köln, Germany

*AI/ML Engineer Intern* - Spaceship EAC Team

11/2022 - 04/2023

Project: Deep Learning techniques for the detection of Spaceflight Associated Neuro-ocular Syndrome (SANS)

- Detecting SANS through a classification task using CNNs
- CNN-based object detection for optic disc location
- Federated learning architecture for distributed training of CNNs for the classification task

**Fermi National Accelerator Laboratory**

Chicago, Illinois

*Summer Intern* - GlidenWMS Project

07/2022 — 09/2022

Project: Flexible Pilot Jobs Framework for Distributed High Throughput Computing

- Machine learning techniques for job/site matching in the workload manager
- Design of a flexible, modular, and customizable structure for worker node software

## OTHER PROJECTS

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**Internet of Things for a Smart Regolith Transportation System**

Golden, Colorado

*Over The Dusty Moon Challenge 2023* - Colorado School of Mines / Lockheed Martin

Team Website - 12/2022 — 06/2023

- IoT network for monitoring regolith transportation integrated into the proposed solution
- CNN-based object detection for rock identification as obstacles
- Project management and website development

**Cyber-Attack Response with Graph Neural Networks and Language Models**

Milan, Italy

*European Union Defense Innovation Scheme Hackaton 2024*

05/2024 — 06/2024

- LM-based solution for generating embeddings from software vulnerability descriptions
- GNN-based solution for attack classification using graphs of vulnerability embeddings

## TEACHING & TUTORIALS

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<b>Data Science</b>	IDMC (Nancy, France) - 03/2025
<b>Méthodes et Outils pour l'Analyse du Comportement Humain</b>	IDMC, Nancy (France) - 01/2025
<b>Symbolic Artificial Intelligence</b>	IDMC (Nancy, France) - 01/2025
<b>Tutorial on Deep Reinforcement Learning</b>	DeepLorIA Network (Nancy, France) - 11/2024
<b>Tutorial on Deep Reinforcement Learning</b>	European Agent Systems Summer School (Dublin, Ireland) - 08/2024
<b>Introduction to Reinforcement Learning</b>	Fermilab Cross-lab AI Meetings (Chicago, Illinois) - 07/2023

## RESEARCH

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### Conference papers

- Terranova, F., Lahmadi, A. & Chrisment, I. (2024). "Leveraging Deep Reinforcement Learning for Cyber-Attack Paths Prediction: Formulation, Generalization, and Evaluation," in Proceedings of the 27th International Symposium on Research in Attacks, Intrusions and Defenses (RAID'24).
- Terranova, F., Voetberg, M., Nord, B. & Pagul, A. (2023). "Self-Driving Telescopes: Autonomous Scheduling of Astronomical Observation Campaigns with Offline Reinforcement Learning," in Proceedings of the Machine Learning and the Physical Sciences Workshop, 37th Conference on Neural Information Processing Systems (NeurIPS).
- Ritter, S., Terranova, F., Stern, C., Tuohy, E., Cowley, A., Drescher, J. & Sznitman, R. (2023). "Federated Learning for Space Medicine Research and its application for Spaceflight Associated Neuro-ocular Syndrome (SANS)", in Proceedings of the International Astronautical Congress 2023, Baku, Azerbaijan, Oct 2023.
- Ritter, S., Terranova, F., Stern, C., Tuohy, E., Cowley, A., Drescher, J. & Sznitman, R. (2023). "An Artificial Intelligence Method for Autonomous Monitoring of the Retina for Medical Applications in Space and Extreme Environments", in Proceedings of the International Astronautical Congress 2023, Baku, Azerbaijan, Oct 2023.

**Reviewing:** Reviewing papers for the AAAI Multi-Agent AI in the Real World Workshop (2024), the Computational and Structural Biotechnology Journal (2024), and "Session thèse" contributions of RESSI (2025)

**Supervision:** Supervisor of IDMC Master's Degree Students for the project "Automated Mapping of Vulnerabilities to MITRE ATT&CK Techniques Using Natural Language Processing" (2025)

## EXTRA

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**Mentoring:** Mentee for the Université de Lorraine Mentorship Program (2024), LeadTheFuture Mentorship Program for Italian Students (2023), Young ISSNAF Mentoring Program for Students (2023), and Space Generation Advisory Council (SGAC) Summer Mentorship Program

**Organizational Roles:** Founder and Organizer of the DeepLorIA network within the LORIA laboratory (2024), President of Students for the Exploration and Development of Space (SEDS) federation at the University of Pisa (2023)

**Memberships:** Member of the AI Doctoral Academy (since 2023), IEEE, IEEE Computer Society, IEEE Computational Intelligence Society & IEEE Communications Society Member (since 2024), ACM, and ACM SIGAI Member (since 2024)

**Social Engagement:** Scrutineer for the European Elections for Italian citizens residing in Nancy, France (2024), European Space Agency's Booth Staff at the Festival Yggdrasil, Eurexpo Lyon, showcasing VR/AR solutions to the public (2023)

## REFERENCES

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### Prof. Abdelkader Lahmadi

Ph.D. Supervisor - *Associate Professor, Université de Lorraine, Nancy, France* - abdelkader.lahmadi@loria.fr

### Prof. Isabelle Chrisment

Ph.D. Supervisor - *Professor, Université de Lorraine, Nancy, France* - isabelle.chrisment@loria.fr

### Prof. Brian D. Nord

Master Thesis Co-Supervisor - *Scientist, Fermi National Accelerator Laboratory, Chicago, Illinois* - nord@fnal.gov

### Prof. Mario G.C.A. Cimino

Master Thesis Supervisor - *Professor, University of Pisa, Pisa, Italy* - mario.cimino@unipi.it