

Fabrizia Auletta

Work experience

- March 2022 - present **Researcher**, Sant'Anna School of Advanced Studies, Pisa, Italy.
Neuro-Robotic Rouch Lab, the Biorobotics Institute
Scientific supervisor: Prof Calogero M. Oddo
Research topics: Biorobotics, Artificial sense of touch, Machine intelligence, Computer vision
- April 2020 - **PhD student (Cotutelle)**, Macquarie University, Sydney, NSW, Australia.
February 2022 Department of Psychology, Faculty of Medicine, Health and Human Sciences
Supervisor: Prof Michael J. Richardson
Research topics: Complex joint dynamics, behavioural dynamics, Human-AI interactions, Supervised machine learning, Artificial neural networks, Explainable AI
- October 2018 - **PhD student (Cotutelle)**, University of Bristol, United Kingdom.
March 2022 School of Computer Science, Electrical and Electronic Engineering, and Engineering Maths
Supervisor: Prof Mario di Bernardo
Research topics: Multiagent systems, Nonlinear dynamics and control, Agent-Based Systems, Biologically-Inspired Agents, Autonomous agents
Additional responsibilities: teaching assistance, advising students' thesis
- April 2021 **Intern**, *Senmag Robotics*, Bristol, United Kingdom.
Supervisor: Gareth Barnaby - CTO and project lead
Responsibilities: Market research, Market identification, Website development
- February 2020 - **Teaching support assistant**, University of Bristol, United Kingdom.
June 2020 School of Computer Science, Electrical and Electronic Engineering, and Engineering Maths
Subject: Control theory (Masters level)
Responsibilities: Supervisor to the students' activities, Help in exam questions marking, Office hours, Delivery of tutorial lessons

Education

- 9 November 2022 **(Cotutelle) PhD degree in Psychology**, Macquarie University, Sydney, NSW, Australia.
Final thesis: Identifying and modelling decision making and collective behaviour in multi-agent human and artificial systems
- 27 September 2022 **(Cotutelle) PhD degree in Engineering Mathematics**, University of Bristol, United Kingdom.
Final thesis: Identifying and modelling decision making and collective behaviour in multi-agent human and artificial systems
- 23 May 2018 **Laurea Magistrale in Automation Engineering**, University of Naples Federico II, Italy.
Department of Electrical Engineering and Information Technology
Final mark: 110/110 cum laude

Final thesis: Analysis and control of Painlevé phenomenon in mechanical systems with friction

Tools: Matlab/Simulink Stateflow

Advisors: Prof Mario di Bernardo (University of Naples), Prof John Hogan (University of Bristol)

23 September 2014 **Laurea Triennale In Electronic Engineering**, University of Naples Federico II, Italy.
Department of Electrical Engineering and Information Technology

Final mark: 99/110

Final thesis: Project and development of a circuit for the square root calculus with Newton's iterative method

Tools: Quartus II, Modelsim

Advisor: Prof Ettore Napoli (University of Naples)

Licenses and certifications

May 2021 **SETsquared Partnership IKEEP Programme Intrapreneurial Project Placement Experience Award.**

- Completed a 70 hour project placement with an organisation
- Worked in an interdisciplinary team of four members
- Achieved the pre-agreed deliverables

April 2021 **SETsquared Partnership IKEEP Programme Intrapreneurial Training Award.**

- Committed 8+ hours completing the IKEEP Intrapreneurial training workshops like problem solving, innovation management and team working

April 2020 **Bristol Plus Award.**

- Participated in an extra-curricular award scheme to develop my skills in employability

Nov. 2019 **"Innovation and Enterprise" course completion**, Provided by Bristol Futures.

Research visits

September 2017 - **Visiting student**, University of Bristol, United Kingdom.

January 2018 School of Computer Science, Electrical and Electronic Engineering, and Engineering Maths

Supervisor: Prof John Hogan

- Created a Matlab / Simulink Stateflow-based realistic simulation of a mechanical system showing the onset of the Painlevé paradox
- Conducted a parametric analysis to understand the influence of the configuration and initial conditions of the system on the onset of the Painlevé paradox
- Defined the project requirements for the controller to be applied to the system.

Awarded grants

January 2023 **IMEROS 4.0**, awarded by RoboIT tech incubation program.

November 2022 **RObot-assisted Gross pathology Examination of solid TumoRs**, awarded by Italian Ministry of Health, PNRR M6/C2_CALL 2022.

October 2019 **International Macquarie University Research Excellence Scholarship Scheme**, awarded by Macquarie University for the PhD in Psychology (CRICOS 064239C) under a joint degree program with University of Bristol.

October 2018 **Macquarie Cotutelle (Industrial and International Leverage Fund) Award**, awarded by the University of Bristol for the PhD in Engineering Mathematics under a joint degree program with Macquarie University.

July 2017 **Borsa di studio per l'internazionalizzazione dei corsi di studio**, awarded by Corso di Studi Ingegneria dell'Automazione used for the research visit at the University of Bristol to carry out the master project.

Participation to international scientific conferences

- September 2021 Oral presentation of the scientific paper [2] at the 6th IFAC Hybrid Conference on Analysis and Control of Chaotic System, Catania, Italy
- May 2021 Oral presentation at the SIAM Conference on Applications of Dynamical Systems (DS21), held on-line, of the research [3] as part of the mini-symposium "Herding and Swarming of Multi-Agent Systems: Theory and Applications"
- July 2019 Poster presentation at the Joint Action Meeting VIII (JAM VIII), Genoa, Italy, of the research on "Comparing different approaches to solve herding tasks in multi-agent systems"

Additional activities and experiences

- March-April 2021 Attendee at the Reinforcement Learning Virtual School (RLVS) by the Artificial and Natural Intelligence Institute of Toulouse
- June 2019 Attendee at the 14th SICC International Tutorial Workshop on "Modelling, Analysis, and Control of Complex Networks and Cyber-Physical Systems", Ischia, Italy
- June 2019 Volunteer at European Control Conference 2019 (ECC19), Naples, Italy
- June 2019 Volunteer at University of Bristol Open Days to represent postgraduate research in Engineering Mathematics
- October 2018 - Reviewer for peer-reviewed international journals:
present - IEEE Transactions on Circuits and Systems I: Regular Papers
- IEEE Control Systems Letters
- IEEE Transactions on Control of Network Systems
- February 2017 Attendee at the workshop "Modelling, simulation, and control of collective behaviour" by prof Maurizio Porfiri (NYU Tandon School of Engineering) at University of Naples Federico II, Naples, Italy
- May 2016 Participant in the "one-day Agile experience" by Ericsson R&D Centre, Pagani, Italy

Publications

- [1] Francesco De Lellis, **Fabrizia Auletta**, Giovanni Russo, and Mario diBernardo. "An Application of Control- Tutored Reinforcement Learning to the Herding Problem". In Proc. of the 17th International Workshop on Cellular Nanoscale Networks and their Applications (CNNA) (pp. 1-4). IEEE. 2021
- [2] **Fabrizia Auletta**, Mario di Bernardo, and Michael J. Richardson. "Human-inspired strategies to solve complex joint tasks in multi agent systems". In Proc. of the 6th IFAC Hybrid Conference on Analysis and Control of Chaotic Systems (CHAOS), IFAC-PapersOnLine, 54(17), 105-110. 2021
- [3] **Fabrizia Auletta**, Davide Fiore, Michael J. Richardson, and Mario diBernardo. "Herding stochastic autonomous agents via local control rules and online global target selection strategies". Autonomous Robots, 1-13. 2022
- [4] **Fabrizia Auletta**, Rachel W. Kallen, Mario di Bernardo, and Michael J. Richardson. "Predicting and Understanding Human Action Decisions during Skillful Joint-Action via Machine Learning and Explainable-AI". Scientific Reports, 13.1: 4992. 2023

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Languages

Italian	Proficient	<i>Native speaker</i>
English	Advanced	<i>Academic IELTS certificate released by British Council Rome on May 2018</i>

Tools and Technologies

Programming languages	Matlab, Python, C++, C#, Verilog
Application software	Simulink, Stateflow, Unity3D, Gazebo, Microwind, Quartus II, ModelSim, PSpice, Festo Automation Suite
Operating systems used	Windows, ROS
Hardware for testing	Multimeter, Oscilloscope, Spectrum Analyser

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