

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 - February 2022 **PhD student (Cotutelle)**, Macquarie University, Sydney, NSW, Australia.
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 - March 2022 **PhD student (Cotutelle)**, University of Bristol, United Kingdom.
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 - June 2020 **Teaching support assistant**, University of Bristol, United Kingdom.
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

April 2024 **Augmented-RObotic Gross Examination for solid tumoRs**, awarded by Italian Ministry of Health, PNRR M6/C2_CALL 2023.

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

October 2022 Attendee at 4-day Full Immersion Training on Technology Transfer in Life Science by Human Technopole, Netval and IUSS Pavia

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] F. De Lellis, **Fabrizia Auletta**, G. Russo, and M. di Bernardo. "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] **F. Auletta**, M. di Bernardo, and M. 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] **F. Auletta**, D. Fiore, M. J. Richardson, and M. di Bernardo. "Herding stochastic autonomous agents via local control rules and online global target selection strategies". Autonomous Robots, 1-13. 2022

- [4] **F. Auletta**, G. Patil, R. W. Kallen, M. di Bernardo, and M. J. Richardson. “Modeling and Understanding Future Action Decisions of Players during Online Gaming”. In Proc. of the 10th International Conference on Human-Agent Interaction, 324-326. 2022
- [5] **F. Auletta**, R. W. Kallen, M. di Bernardo, and M. J. Richardson. “Predicting and Understanding Human Action Decisions during Skillful Joint-Action via Machine Learning and Explainable-AI”. Scientific Reports, 13.1: 4992. 2023
- [6] A. S. Hassan, A. M. Khalil, **F. Auletta**, M. Filosa, D. Camboni, A. Mencias, C. M. Oddo. “Contamination Detection Using a Deep Convolutional Neural Network with Safe Machine—Environment Interaction”. Electronics, 12(20), 4260. 2023

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- May 2021 **SETsquared Partnership IKEEP Programme Intrapreneurial Project Placement Experience Award.**
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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	Python, Matlab, Labview, 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