

Curriculum Vitae

SHORT BIOGRAPHY

Prof. Luca Patanè was born on February 15, 1978 in Catania (Italy). He graduated in Computer Science Engineering from the University of Catania in 2001. In 2004, he obtained his PhD in Automation and Electronic Engineering, discussing a thesis entitled: "Bio-inspired robots: from Sensing toward Perception". From May 2005 to 2017 he was a research fellow at the University of Catania, with the research program: "Bio-inspired architecture for the control of motion systems". He is currently an Associate Professor of Automatic Control Systems at the Department of Engineering of the University of Messina (UniMe), Italy. His research activities focus on bio-inspired robotics, adaptation and learning in dynamical systems, insect-inspired cognitive algorithms, system identification and development of soft sensors, neural networks and learning systems, and transfer learning techniques for modelling nonlinear systems. He has been and still is actively involved in several research projects: "Office of the Naval Research" project (2003-2004) "A CNN-based hybrid locomotion controller", EU project SPARK I and II, "Spatial-temporal Patterns for Action-oriented perception in Roving robots" (2004-2011) and EMICAB "Embodied Motion Intelligence for Cognitive, Autonomous Robots" (2010-2013), PNRR cascade projects FAIRGROUND "artiFicial And bio-insplred netwoRked intelliGence foR cOnstrained aUtoNomous Devices" (2024-2025) and AI4SER "Artificial intelligence for speech emotion recognition" (2024-2025), the PRIN 2023 SENS-BC project "Green SENSing systems based on Bacterial Cellulose (2023-2026). He is the principal investigator for the collaboration agreement between UNIME and CNR line 2.13: "Creation of interpretable models based on Machine learning techniques for predicting the aggregate capacity of electric vehicles for supporting the needs of the electricity grid". He is an IEEE Senior Member and Associate editor of ISA Transactions, Frontiers in Neurorobotics and section board member for MDPI Electronics. He has published more than 190 articles in scientific journals and conference proceedings and several chapters in books in the field of control and bio-robotics. He has contributed to the organisation of several conferences as a program committee member, including: ECCTD 2017, NDES 2018, CHAOS 2021, CNNA 2021, AUTOMATICA.IT 2023 and 2024, ICCAD 2025. He served as a reviewer for several journals: IEEE Trans. On Circuits and Systems, IEEE Trans. on Cybernetics, Nature Machine Intelligence, ISA Transaction, International Journal of Circuits Theory and Applications, Soft Computing and Automation Journal, Information Science, Bioinspiration & Biomimetics, Journal of Intelligent & Robotic Systems.

ORCID: <https://orcid.org/0000-0002-5488-9365>

EDUCATION

- **PhD in electronics and Automatic Control Systems**, Univ. of Catania, 2005, defending the final dissertation entitled " Bio-inspired Robots: from Sensing toward Perception"
- **MD cum laude in Computer Science Engineering**, Univ. of Catania, 2001

POSITIONS

- Associate Professor (**PA**) in Control and System Theory, Univ. di Messina, 2024
- Tenure-track **Assistant professor** in Control and System Theory, Univ. of Messina, 2021
- **Researcher** in Control and System Theory, Univ. of Messina, 2019-2021
- **PostDoc** in Control and System Theory, title: "Embodied Motion Intelligence for Cognitive Robots", Univ. of Catania, 2011-2017
- **PostDoc** in Control and System Theory, title: "Innovative bio-inspired strategies for the control of locomotion systems", Univ. of Catania, 2005-2011

SCIENTIFIC ACTIVITY

- Luca Patanè coauthored more than **190 scientific publications**. **52 papers** published in international journals are currently indexed on Scopus. He coauthored **3 books**.

INDEXES	SCOPUS	Google Scholar
Number of publications	193	226
citations	1421	1969
H-index	19	23

- **Scientific interests**
 - nonlinear systems modelling and control;
 - system identification and soft sensor development;
 - neural networks and learning systems;
 - interpretable models;
 - transfer learning
 - bio-robotics;
 - legged locomotion;
 - insect-inspired control systems.

INSTITUTIONAL DIDACTIC ACTIVITY

- 2024-2025 **Elementi di sistemi automatici** for the Tecnologie elettriche elettroniche ART. 13 course at the Department of Engineering of the University of Messina (12 hours)
- 2024-2025 **Modelling and control systems** at the Bachelor degree in Biomedical Engineering at the Department of Engineering of the University of Messina (9CFU)
- 2024-2025 **Industrial Automation and Robotics (Mod B)** at the Master degree in Engineering and Computer Science at the Department of Engineering of the University of Messina (6CFU)
- 2024-2025 **Basi della Robotica** for the CdL Medicina e Chirurgia a Indirizzo Biotecnologico course at the Department of MEDICINA CLINICA E SPERIMENTALE (12.5 hours)
- 2023-2024 **Elementi di sistemi automatici** for the Tecnologie elettriche elettroniche ART. 13 course at the Department of Engineering of the University of Messina (12 hours)
- 2023-2024 **Modelling and control systems** at the Bachelor degree in Biomedical Engineering at the Department of Engineering of the University of Messina (9CFU)
- 2023-2024 **Industrial Automation and Robotics (Mod B)** at the Master degree in Engineering and Computer Science at the Department of Engineering of the University of Messina (6CFU)
- 2022-2023 **Modelling and control systems** at the Bachelor degree in Biomedical Engineering at the Department of Engineering of the University of Messina (9CFU)
- 2022-2023 **Industrial Automation and Robotics (Mod B)** at the Master degree in Engineering and Computer Science at the Department of Engineering of the University of Messina (6CFU)
- 2021-2022 **Bio-inspired control systems applied to robotics** at PhD course in Bioengineering Applied to Medical Sciences of the University of Messina (6 hours)
- 2021-2022 **Automatic Control** at the Bachelor degree in Ingegneria Elettronica ed informatica at the Department of Engineering of the University of Messina (6CFU)
- 2021-2022 **Industrial Automation and Robotics (Mod B)** at the Master degree in Engineering and Computer Science at the Department of Engineering of the University of Messina (9CFU)
- 2020-2021 **Industrial Automation and Robotics (Mod B)** at the Master degree in Engineering and Computer Science at the Department of Engineering of the University of Messina (9CFU)
- 2019-2020 **Industrial Automation and Robotics (Mod B)** at the Master degree in Engineering and Computer Science at the Department of Engineering of the University of Messina (9CFU)
- 2018-2019 **System Theory (M-Z)** at the Bachelor degree in Ingegneria Informatica at the Department of Electric, Electronics and Automation Engineering of the University of Catania (6CFU)

OTHER DIDACTIC ACTIVITY

- From February 2025 to ongoing he is involved in the orientation activities aimed at high schools in the **project Consapevolmente** (title: "TecnologicaMente: l'ingegneria al servizio di un mondo sempre più smart" 10 hours)
- From February 2024 to May 2024 he was involved in the orientation activities aimed at high schools in the **project Consapevolmente** (title: "TecnologicaMente: l'ingegneria al servizio di un mondo sempre più smart" 12 hours)
- From February 2023 to May 2023 he was involved in the orientation activities aimed at high schools in the **project Consapevolmente** (title: " Dall'Internet delle Cose alla Robotica: le nuove frontiere dell'Industria 4.0" 10 hours)

- From February 2020 to May 2023 he was involved in the orientation activities aimed at high schools in **Percorsi per le competenze trasversali e per l'orientamento (PCTO)** (title: "Tecnologie e Applicazioni delle Scienze dell'Informazione" 15 hours)
- From April to May 2021 he was invited as a **guest lecturer** to hold a series of lectures entitled **"Biorobotics and control of intelligent bio inspired systems"** at the Nanjing University of Aeronautics and Astronautics (NUAA), China
- June 2021 **Lecturer at the Metaheuristic summer school MESS 2020 +1** 15-18 June 2021, Catania, Italy, with a seminar entitled: **"Insect brain models: from locomotion to perception"**
- November 2020 **Lecturer at the Embodied AI & Neurobotics Lab**, SDU Biorobotics, Mærsk Mc-Kinney Møller Institute, University of Southern Denmark, Odense, Denmark, with a seminar entitled: **Insect brain inspired computational architectures**
- August 2008 **Lecturer at the Summer School on NON-LINEAR DYNAMICS AND ROBOTS: FROM NEURONS TO COGNITION**, Madrid (Spain), with a seminar entitled: **"Rovers and legged robots: architectures and bio-inspired control algorithms"**

STITUTIONAL ROLES

- Since May 2023 he is the **scientific coordinator of the Automation and Robotic laboratory** at the Department of Engineering of the University of Messina;
- Since 2023 he is a **Senior member of IEEE**;
- Since 2020 he is **member of the Professor Board of the PhD Course** in Bioengineering Applied to Medical Sciences, University of Messina;
- Since 2020 he is an elected member of the **Commissione Paritetica** docent student at the Department of Engineering of the University of Messina
- In 2021 he served as a member of the **Commission for the final exams of the PhD degree** in Engineering Science at the University of Southern Denmark, Faculty of Engineering.
- In 2020-2024 he served as a member of the **Commission for the final exams of the PhD course** in Ingegneria dei Sistemi, Energetica, Informatica e delle Telecomunicazioni 32° -33°-34°-35° , Università degli studi di Catania.
- Since 2021 he is a **member** of the Consorzio Interuniversitario Nazionale per l'Informatica (**CINI**).
- Since 2023 he is a **member** of the Consorzio nazionale interuniversitario per le telecomunicazioni (**CNIT**).
- Since 2019 he is a **member** of the Società Italiana Docenti e Ricercatori di Automatica (**SIDRA**).

CONFERENCE SPEAKER

- Speaker at the **IEEE Conference METROXRINE**, title: **"Boat Detection and classification using infrared and visual data to improve safety in port areas"**, St Albans, UK, October 21-23, 2024
- Speaker at the Conferenza Italiana di Automatica (**Automatica.IT**), title: **"Symbolic regression for industrial applications: an NN-based approach"**, Bolzano, Italy, September, 2024

- Speaker at the **Workshop “La nuova frontiera della sicurezza portuale”** (ISYPORT), title of the contribution: **“Riconoscimento di imbarcazioni in ingresso ed uscita dal porto tramite camera ad infrarossi”**, Augusta, Italy, May 27th, 2024
- Speaker at the **IEEE Conference METROXRINE**, title of the contribution: **“ Model-agnostic Soft Sensor interpretability”**, Milan, Italy, October 25-27, 2023
- Speaker at the **IEEE Conference METROXRINE**, title of the contribution: **“ Blood Glucose Regulation in Type 1 Diabetes Through Optimized Nonlinear Control Strategies”**, Milan, Italy, October 25-27, 2023
- Speaker at the **IEEE Conference METROSEA**, title of the contribution: **“Boat Monitoring and Classification System utilizing infrared and visual data streams for port safety enhancement”**, La Valletta, Malta, October 4-6, 2023
- Speaker at the **IEEE Conference METROSEA**, title of the contribution: **“Model transferability for wave height prediction”**, La Valletta, Malta, October 4-6, 2023
- Speaker at the 12th International Conference on Biomimetic and Biohybrid Systems (**Living Machines**), title of the Contribution: **“ Driving hexapods through insect brain”**, Genova, Italy, July, 2023
- Speaker at the 4a Conferenza Italiana di Robotica e Macchine Intelligenti (**IRIM**), title of the contribution: **“Unsupervised learning of quadruped robot balance”**, Rome, Italy, October, 2022
- Speaker at the Conferenza Italiana di Automatica (**Automatica.IT**), title of the Contribution: **“ Motor Maps for attitude control in the Mini Cheetah quadruped robot”**, Cagliari, Italy, September, 2022
- Speaker at the International Joint Conference on Neural Networks (**IJCNN**), title of the Contribution: **“ Ground reaction force estimation in a quadruped robot via liquid state networks”**, Padova, Italy, July, 2022
- Speaker at the Conferenza Italiana di Automatica (**Automatica.IT**), title of the Contribution: **“ Role of static and dynamic coupling in chaos synchronization”**, Virtual conference, September, 2020
- Speaker at the **Machine Learning Day 2** title of the Contribution: **“ Algoritmi di Learning per la Diagnostica e la BioRobotica”**, Catania, Italy, December, 13 2019
- Speaker at the the Conferenza Italiana di Automatica (**Automatica.IT**), title of the Contribution: **“PWL-shaped oscillators for adaptive locomotion control in Biorobotics”** Ancona, Italy, September, 11-13 2019
- Speaker at the Workshop sulla Robotica nella Etna Valley e dintorni (**Etnarobot 2017**), title of the Contribution: **“Comportamenti proto-cognitivi in robot bio-ispirati”** Catania, Italy, November, 21 2017
- Speaker at the International Conference on Neural Networks (**IJCNN 2015**), title of the Contribution: **“A Mushroom Bodies inspired spiking network for classification and sequence learning”**, Killarney, Ireland, July, 13-17 2015
- Poster presentation at the International Conference on Neural Networks (**IJCNN 2015**), title of the Contribution: **“Fly-inspired sensory feedback in a reaction -diffusion neural system for locomotion control in a hexapod robot”**, Killarney, Ireland, July, 13-17 2015
- Speaker at the **Biologically-inspired Robotics Workshop** title of the Contribution: **“MB-inspired model for sequence learning”**, Odense, Denmark, May, 27-30 2015
- Speaker at the Workshop/Conference on Biomimetic & Biohybrid Systems (**Living Machine 2014**), title of the Contribution: **“Motor learning and body size within an insect brain computational model”**, Milan, Italy, July-August, 29-1 2014

- Speaker at the International Conference on Neural Networks (**IJCNN 2013**), title of the Contribution: **“A spiking network for spatial memory formation: towards a fly-inspired Ellipsoid Body model”**, Dallas, USA, August, 4-9 2013
- Speaker at the 4th International Conference on Intelligent Robotics and Applications (**ICIRA 2011**), title of the Contribution: **“Software/Hardware issues in modelling insect brain architecture”**, Aachen, Germany, December, 6-8 2011
- Speaker at the 21th Italian Workshop on Neural Networks (**WIRN 2011**), title of the Contribution: **“Decision making processes in the fruit fly: a computational model”**, Salerno, Italy, June, 3-5 2011
- Speaker at the International Conference on Microthecology for the New Millennium (**SPIE 2011**), title of the Contribution: **“An insect brain inspired neural model for object representation and expectation”**, Praga, Hungary, April, 18-21 2011
- Speaker at the International Conference on Neural Networks (**IJCNN 2010**), title of the Contribution: **“Insect inspired unsupervised learning for tactic and phobic behavior enhancement in a hybrid robot”**, Barcelona, Spain, July, 18-23 2010
- Speaker at the International Conference on Microthecology for the New Millennium (**SPIE 2009**), title of the Contribution: **“STDP-based behaviour learning on the Tribot robot”**, Dresda, Germany, May, 4-6 2009
- Speaker at the Summer School on Non-Linear Dynamics and Robots: From Neurons to Cognition, title of the Contribution: **“Rovers and legged robots: architectures and bio-inspired control algorithms”**, Grand Madrid, Spain, August, 4-8 2008
- Invited Speaker at the International Conference on Microthecology for the New Millennium on Bioengineered and Bioinspired Systems (**SPIE 2007**), title of the Contribution: **“Adaptive bio-inspired landmark identification for navigation control”**, Grand Canaria, Spain, May, 2-4 2007
- Speaker at the International Conference on Microthecology for the New Millennium on Bioengineered and Bioinspired Systems (**SPIE 2007**), title of the Contribution: **“STDP with adaptive synaptic delay for robot navigation control”**, Grand Canaria, Spain, May, 2-4 2007
- Live Demo at the **IST Exhibition 2006**, title of the Contribution: **“Spatial Temporal Patterns for Action Oriented Perception in Roving Robots”**, Helsinki, Finland, November, 21-23 2006
- Speaker at the Workshop on **Bio-inspired Cooperative and Adaptive Behaviours in Robots**, title of the Contribution: **“A cockroach-inspired hexapod robot: performance enhancement through dynamic simulation”**, Rome, Italy, October, 1 2006
- Speaker at the 8th International IFAC Symposium on Robot Control (**SYROCO 2006**), title of the Contribution: **“Learning high-level sensors from reflexes via spiking networks in roving robots”**, Bologna, Italy, September, 6-8 2006
- Speaker at the 10th IEEE International Conference on Cellular Neural Networks and their Applications (**CNNA2006**), title of the Contribution: **“An autonomous mini-hexapod robot controlled through a CNN-based CPG VLSI chip”**, Istanbul, Turkey, August, 28-30 2006
- Speaker at the IEEE International Symposium on Circuits and Systems (**ISCAS 2006**), title of the Contribution: **“Towards autonomous adaptive behavior in a bio-inspired CNN-controlled robot”**, Island of Kos, Greece, May, 21-24 2006

- Speaker at the **CogSys II**, title of the Contribution: **“Spatial Temporal Patterns for Action Oriented Perception in Roving Robots”**, Nijmegen, Holland, April, 11-12 2006
- Speaker at the first IEEE/RAS-EMBS International conference on Biomedical Robotics and Biomechanics (**Biorob 2006**), title of the Contribution: **“Weak Chaos Control for Action-Oriented Perception: Real Time Implementation via FPGA”**, Pisa, Italy, February, 20-22 2006
- Poster presentation at the Inaugural EUCognition meeting (**euCognition**), title of the Contribution: **“SPARK Spatial-temporal Patterns for Action-oriented perception in Roving robots”**, Nice, France, February, 16-17 2006
- Speaker at the 44th IEEE Conference on Decision and Control (**CDC 2005**), title of the Contribution: **“A cricket-inspired neural network for feedforward compensation and multisensory integration”**, Seville, Spain, December, 12-15 2005
- Speaker at the International Symposium on Nonlinear Theory and its Applications (**NOLTA 2005**), title of the Contribution: **“Learning efference in CNNs for perception-based navigation control”**, Belgium, October, 18-21 2005
- Speaker at the 10th International Conference on Emerging Technologies and Factory Automation (**ETFA 2005**), title of the Contribution: **“A new simulation tool for action-oriented perception systems”**, Catania, Italy, September, 19-22 2005
- Keynote Speaker at the Int. Symposium on Microtechnologies for the new Millennium (**SPIE 2005**) on Bioengineered and Bioinspired Systems title of the Contribution: **“A bio-inspired auditory perception model for amplitude frequency clustering”**, Seville, Spain, May, 9-11 2005
- Speaker at the 1st Italian Convention on Safety & Environment in Process Industry (**CISAP-1**), title of the Contribution: **“Soft Computing methodologies and techniques for risk assessment”**, Palermo, Italy, November, 28-30 2004
- Speaker at the **Cognitive Systems Kickoff**, title of the Contribution: **“Spatial Temporal Patterns for Action Oriented Perception in Roving Robots”**, Bled, Slovenia, October, 28-30 2004
- Speaker at the IEEE International Symposium on Circuit and Systems (**ISCAS 2004**), title of the Contribution: **“Chaotic sequences in ACO algorithms”**, Vancouver, Canada, May, 23-26 2004
- Speaker at the 6th International Conference on Climbing and Walking Robots (**CLAWAR 2003**), title of the Contribution: **“A CNN Approach for Controlling a Roving Robot”**, Catania, Italy, September, 17-19 2003
- Speaker at the 7th IEEE International Workshop on Cellular Neural Networks and their Applications (**CNNA2002**), title of the Contribution: **“CNN based central pattern generators with sensory feedback”**, Frankfurt, Germany, July, 22-24 2002
- Speaker at the IEEE International Symposium on Industrial Electronics (**ISIE 2002**), title of the Contribution: **“Hexapod locomotion control through a CNN based decentralized system”**, L’Aquila, Italy, July, 8-11 2002

RESEARCH PROJECTS

- **Principal investigator** of the **collaboration agreement** between UNIME and CNR line 2.13: Creation of interpretable models based on Machine learning techniques for predicting the aggregate capacity of electric vehicles for supporting the needs of the electricity grid. Budget: 100 k€ (July 2024-December 2025).
- **Member of the Messina Research unit** within the **collaboration agreement** between UNIME and CNR line 2.10: Creation of non-integer and AI-based order models for cells and aggregate storage systems subjected to hybrid charge/discharge profiles for dispatching services. Budget: 100 k€ (July 2024-December 2025).
- **Member of the Messina Research unit** within the **collaboration agreement** between UNIME and ENEA: " Implementazione ed integrazione della Matrice Dinamica delle opzioni e del Tool di supporto ai progettisti". Budget: 49 k€ (April 2024-September 2025).
- **Member of the Messina Research unit** within the **PNRR Cascade Project**: " Predizione tramite Apprendimento automatico per la Sicurezza e Sostenibilità dei Porti" (**PASSPORT**) within the program RAISE – Robotics and AI for Socio-economic Empowerment, Budget: 340 k€ (January 2025-September 2025).
- **Member of the Messina Research unit** within the **PNRR Cascade Project**: " artiFicial And bio-insplred netwoRked intelliGence foR cOnstrained aUtoNomous Devices" (**FAIRGROUND**) within the program "Future artificial intelligence research", Budget: 250 k€ (April 2024-September 2025).
- **Member of the Messina Research unit** within the **PNRR Cascade Project**: " Artificial intelligence for speech emotion recognition"(**AI4SER**), within the program "RESearch and innovation on future Telecommunications systems and networks to make Italy more smART", tematica 14 "telecomunicazioni del futuro" Budget: 130 k€ (April 2024-September 2025).
- **Member of the Messina Research unit** within the **PNRR Cascade Project**: " secuRE inTegration middlewaRe fOr cpS in the comPutE ConTinum" (**RETROSPECT**) within the program "Future artificial intelligence research", Budget: 324 k€ (April 2024-September 2025).
- **Member of the Messina Research unit** within the **PRIN 2023** project " Green SENSing systems based on Bacterial Cellulose (**SENS-BC**)" which involved: CNR (Rome), University of Catania, University of Messina (October 2023-September 2025).
- **Member of the Management Support Team** (MST), co-head of technical management and scientific research activities related to the **European project EMICAB**, funded within the Seventh Framework Programme, Information Society Technologies, Cognitive Systems, STREP, 2010-2013 "Embodied Motion Intelligence for Cognitive, Autonomous Robots". From 23-02-2011 to 09-09-2014
- **WP Leader** in the funded **European Research Project SPARK II** within the Seventh Framework Programme, Information Society Technologies, Cognitive Systems, STREP, 2008-2011 "Spatial-temporal Patterns for Action-oriented perception in Roving robots II: an insect brain computational model". Work Package title: " Model integration" and "System integration and prototype setup" from 01-10-2004 to 26-10-2007

- **WP Leader** in the funded **European Research Project SPARK** within the Sixth Framework Programme, Information Society Technologies, Cognitive Systems, STREP, 2004-2007 "Spatial-temporal Patterns for Action-oriented perception in Roving robots". Work Package title: "System integration and prototype setup" from 01-10-2004 to 26-10-2007
- **Member of the Technical-Scientific Committee** of the **Solaria Project:**" Enhancement and dissemination of solar energy conversion technologies" POR Sicily 2000-2006 Axis III Measure 3.02 Project n° 1999.IT.16.1.PO.011/3.02/7.2.4/620 from 02-23-2007 to 10-18-2007
- **Member of the Catania Research Unit** within the **PRIN 2005** project "Nonlinear networks dynamics: analysis and applications" which involved other units: University of Siena, University of Florence, Polytechnic of Turin, Polytechnic of Milan.
from 15-01-2006 to 15-01-2008
- **Member of the Catania Research unit** within the **PRIN 2003** project "Strategies Bio-Inspired Innovations for the Control of Movement Systems" which involved: University of Rome La Sapienza, Catholic University of Rome, University of L'Aquila, Polytechnic of Bari.
- **Member of the Catania Research unit** within the **project "Office of the Naval Research"** 2003-2004 "A CNN-based hybrid locomotion controller". Other partners: prof. M.G. Velarde, director of the Pluridisciplinar Institute, Universidad Complutense de Madrid, and prof. J Ayers, director of the Marine Science Lab, NorthEastern University, Boston.
from 01-06-2003 to 01-06-2004
- **Member of the Catania Research Unit** within the **MIUR ISR1 research project** 2000-2004 "Development of innovative methodologies for forecasting, mitigating and controlling risks deriving from chemical and oil industrial activities". Other partners: University of Palermo, University of Messina.
From 01-11-2001 to 01-02-2004

SUPERVISION ACTIVITY

- **Assegni di ricerca:**

- 2024-2025 Tutor for Marco Calapristi Assegnista di ricerca at the Department of Engineering, University of Messina (IT) – topic: Modellistica di sensori basati su cellulosa batterica, under the project “Green SENSing systems based on Bacterial Cellulose (SENSBC)”

- **PhD:**

- 2023-ongoing PhD Co-Tutor for Antonino Maio student for the XXXIX cycle at the **PhD course in Ingegneria**, University of Messina (IT) – topic: **Neural-based techniques or modelling and control**
- 2023- ongoing PhD Co-Tutor Francesca Sapuppo PhD student for the XXXVIII cycle at the **PhD course in Ingegneria Industriale e dell'informazione**, University of Messina (IT) – topic: **New Methodologies and Applications for Data-Driven Identification and Model Predictive Control**
- 2022- 2025 PhD Co-Tutor Iqra Shafeeq Mughal PhD student for the XXXVII cycle at the **PhD course in Systems, Energy, Information Technology and Telecommunications Engineering**, University of Catania (IT) – topic: **Nonlinear control techniques for biological and industrial processes**
- 2021- 2025 PhD Co-Tutor Alessia Li Noce PhD student for the XXXVI cycle at the **PhD course in Systems, Energy, Information Technology and Telecommunications Engineering**, University of Catania (IT) – topic: **Neural solution for control in legged robots**
- 2020-2023 PhD Co-Tutor Salvatore Taffara PhD student for the XXXV cycle at the **PhD course in Systems, Energy, Information Technology and Telecommunications Engineering**, University of Catania (IT) – topic: **Neuro-inspired legged robots in unstructured terrains: from locomotion to data-driven exploration**

- **Research grant:**

- 2024 (5 months) Tutor for Gabriele Rinaldi Borsista di ricerca at the Department of Engineering, University of Messina (IT) – topic: **Elaborazione e analisi dati per lo sviluppo di modelli relativi ad applicazioni vehicle-to-grid.**

- **Master and Bachelor degree theses:**

- Title: **“Radar micro-doppler signature classification through machine learning algorithms”**, Supervisor: prof. E. Cardillo, L. Patanè, Candidate: Cristian Cusmà Piccione, **Master degree in Ingegneria Elettronica per l'industria**, University of Messina, Date: July 2023.
- Title: **“Metodi data-driven e tecniche multi-resolution per l'identificazione di processi industriali”**, Supervisor: prof. L. Patanè, Candidate: Alessandro Trovatello, **Batchelor degree in Ingegneria Elettronica e informatica**, University of Messina, Date: July 2023.
- Title: **“Predizione della capacità aggregata per applicazioni Vehicle-to-Grid (V2G)”**, Supervisor: prof. L. Patanè, Candidate: Carmelo Salamone, **Batchelor degree in Ingegneria Elettronica e informatica**, University of Messina, Date: October 2023.
- Title: **“Symbolic Regression Networks for Dynamical System Identification”**, Supervisor: prof. L. Patanè, M.G. Xibilia, Candidate: Marco Calapristi, **Master degree in Engineering and Computer Science**, University of Messina, Date: December 2023.

- Title: **“Interpretable Models for Industrial Processes”**, Supervisor: proff. R. Caponetto, L. Patanè, M.G. Xibilia, Candidate: Giuseppa Scipilliti, **Master degree in Automation Engineering and Control of Complex Systems**, University of Catania, Date: April 2023.
- Title: **“Interpretability analysis in deep networks for image classification”**, Supervisor: prof. L. Patanè, Candidate: Antonino Maio, **Master degree in Engineering and Computer Science**, University of Messina, Date: October 2023.
- Title: **“Modelli di stima della lunghezza del passo tramite dati inerziali”**, Supervisor: prof. L. Patanè, Candidate: Andrea Aliberti, **Batchelor degree in Ingegneria Elettronica e informatica**, University of Messina, Date: December 2022.
- Title: **“Analisi e predizione di serie temporali in ambito marino tramite tecniche di deep learning”**, Supervisor: prof. L. Patanè, Candidate: Luciano Canduci, **Batchelor degree in Ingegneria Elettronica e informatica**, University of Messina, Date: October 2022.
- Title: **“Port traffic control through the use of Artificial Intelligence”**, Supervisor: proff. R. Caponetto, L. Patanè, M.G. Xibilia, Candidate: Emanuele Manfrè, **Master degree in Automation Engineering and Control of Complex Systems**, University of Catania, Date: October 2022.
- Title: **“Evaluation and comparison of different timeseries databases for SCADA application at CERN”**, Supervisor: prof. L. Patanè, prof. F. Longo, Candidate: Alberto Pimpo, **Master degree in Engineering and Computer Science**, University of Messina, Date: October 2022.
- Title: **“Tecniche di fusione multisensoriali per una stima robusta e accurata della velocità di un veicolo a guida autonoma”**, Relatore: prof. L. Patanè, prof Francesco Longo; Candidato: Angelo Zagami, **Batchelor degree in Ingegneria Elettronica e informatica**, University of Messina, Date: October 2021.
- Title: **“Tecniche di deep learning per la classificazione e la rilevazione di imbarcazioni tramite immagini”**, Supervisor: prof. L. Patanè, M.G. Xibilia Candidate: Lorenzo Mondo, **Batchelor degree in Ingegneria Elettronica e informatica**, University of Messina, Date: March 2022.
- Title: **“Sviluppo di un sistema real-time di rilevazione di coni tramite immagini per applicazioni alla guida autonoma”**, Supervisor: prof. L. Patanè, Candidate: Gabriella Giachinta, **Batchelor degree in Ingegneria Elettronica e informatica**, University of Messina, Date: July 2022.
- Title: **“Applicazione delle tecniche DMD e SINDy per la creazione di modelli di ordine ridotto”**, Supervisor: prof. L. Patanè, Candidate: Antonino Biancuzzo, **Batchelor degree in Ingegneria Elettronica e informatica**, University of Messina, Date: July 2022.
- Title: **“Sistemi di controllo d’assetto di un nanosatellite CUBESAT”**, Supervisor: proff. L. Patanè, M.G. Xibilia, Candidate: Piercosimo Gazzara, **Batchelor degree in Ingegneria Elettronica e informatica**, University of Messina, Date: July 2021.
- Title: **“Transferability of CNN-based dynamic models”**, Supervisor: proff. R. Caponetto, L. Patanè, M.G. Xibilia, Candidate: Alfio Caruso, **Master degree in Automation Engineering and Control of Complex Systems**, University of Catania, Date: October 2021.
- Title: **“Liquid State Networks: Architectures and New Applications to Quadrupedal Robot-Environment Interaction”**, Supervisor: proff. P. Arena, L. Patanè, P. Manoonpong, Candidate: Maria

- Francesca Pia Cusumano, **Master degree in Automation Engineering and Control of Complex Systems**, University of Catania, Date: July 2021.
- Title: “**Insect Brain Inspired Neural Networks As Soft Sensors in Legged Robots**”, Supervisor: prof. P. Arena, L. Patanè, P. Manoonpong, Candidate: Lorenzo Emmanuele Meli, **Master degree in Automation Engineering and Control of Complex Systems**, University of Catania, Date: July 2021.
 - Title: “**Recurrent neural networks for identification of nonlinear dynamic systems**”, Supervisor: prof. L. Patanè, prof. M.G. Xibilia, Candidate: Paolo Zanghi, **Master degree in Engineering and Computer Science**, University of Messina, Date: June 2020.
- **University projects:**
- Since June 2020 he is a **member of the advisory board** for the Project formula SAE competition, **Zancle e-Drive**, for the theme related to system modelling and control.

EDITORIAL ACTIVITY

- Since 2024 he is an **Associate editor** for the ISA Transaction journal
- Since 2023 he is an **Associate editor** for the Frontiers in Neurorobotics journal
- Since 2023 he is an Editorial Board Member as a **Review editor** for the Frontiers in Control Engineering
- Since 2023 he is an Editorial Board Member in Electronics MDPI as a **Section Board Member**
- 2025 - on going he is serving as **Workshop organizer** for the International Joint Conference of Neural Networks (IJCNN) 2025, title of the workshop: “ **First International Workshop on artiFicial And bio-inspired netwoRked intelliGence foR cOnstrained aUtoNomous Devices (FAIRGROUND)**”.
- 2023 - on going he is serving as **Guest editor** for the journal Robotics MDPI in the Special Issue on “**Neural Network Applications in Robot Control**”.
- 2023 - on going he is serving as **Guest editor** for the journal Electronics MDPI in the Special Issue on “**Nonlinear System Identification and Soft Sensor Design**”.
- 2023 he served as **Special session Organizer** for the IEEE 30th International Conference on Electronics, Circuits and Systems (ICECS) 4-7 December 2023 Istanbul, Turkey, Title: “ **Hypercomplex Neural Networks for circuits and systems: state of the art, future trends, and applications**”.
- 2022-2023 he was a **Topic editor** for the Frontiers in Neurorobotics journal in the Research topic “ **Focus on the Methods: Neural Algorithms for Bio-Inspired Robotics**”.
- 2019-2023 he was an Editorial Board Member as a **Review editor** for the Frontiers in Neurorobotics journal
- 2022-2023 he served as **Track Chair** for the Special Session on “**Soft Sensors for Industry 4.0**” at the IEEE International Conference on Metrology for Extended Reality, Artificial Intelligence and Neural Engineering (MetroXRINE)
- 2021 he served as **Guest editor** for the IEEE Instrumentation & Measurement Magazine in the Special Issue on “**Bio-mimetic architectures: Sensing and Control**”.
- 2020 he served as **Guest editor** for the journal Sensors, MDPI in the Special Issue on “**Sensors, Motor Coordination, and High-level Cognition in Bio-inspired Robotics**”
- 2020 he served as **Guest editor** for the journal Applied Sciences MDPI in the Special Issue on “**Recent Development and Challenges of Soft sensors design**”.

Scientific/organizing committees:

- 2025 **Program Committee** Member of the Workshop Automatica.it Perugia, Italy
- 2025 **Program Committee** (TPC) member of the 3rd International Conference on Computer Technology and Information Science (CTIS2025)
- 2025 **Program Committee** (TPC) member of the 3rd In conf on AI and Human-computer interaction (ArtInHCI2025)
- 2024-25 **Program Committee** Member of the IEEE/IFAC/DBLP International Conference on Control, Automation and Diagnosis (ICCAD 2025) which will be held on May 7-9, 2025, in Istanbul - Turkey.
- 2024 **Program Committee** Member of the Workshop Automatica.it Bolzano, Italy
- 2023 **Program Committee** Member of the IEEE International Conference on Metrology for Extended Reality, Artificial Intelligence and Neural Engineering (MetroXRINE), St Albans, UK.
- 2023 **Program Committee** Member of the Workshop Automatica.it Catania, Italy
- 2021 **Scientific Committee** Member of the 17th IEEE International Workshop on Cellular Nanoscale Networks and their Applications (CNNA 2021) Catania, Italy
- 2021 **Local organizing Committee** Member of the 6th IFAC Hybrid Conference on Analysis and Control of Chaotic Systems (CHAOS 2021) Catania, Italy
- 2018 International **Program Committee** Member of the Nonlinear Dynamics of Electronic Conference Systems (NDES 2018) Acireale, Italy
- 2017 International **Program Committee** Member of the European Conference on Circuit Theory and Design (ECCTD 2017) Catania, Italy
- 2013 International **Program Committee** Member of the Workshop on Unconventional Approaches to Robotics, Automation and Control (UARACIN), at International Conference on Robotics and Automation (ICRA) 2013, Karlsruhe, Germany
- 2013 International **Program Committee** Member of the 12th European Conference on Artificial Life (ECAL 2013) Taormina, Italy
- 2003 International **Program Committee** Member of the 6th International Conference on Climbing and Walking Robots (CLAWAR 2003), Catania, Italy.

He serves as **Referee** for for the several international Journal, indexed by WoS and Scopus, including Nature Machine Intelligence, IEEE Trans. on Robotics, IEEE Robotics and Automation Letter, IEEE Trans. on Industrial Electronics, IEEE Trans. on Industrial Informatics, Instrumentation & Measurement Magazine, Computers in Industry, Sensors MDPI, Chaos, Solitons & Fractals, IEEE Trans on Cybernetics, Journal of Process Control, Information science, Nonlinear dynamics, IEEE Transactions on Instrumentation & Measurement, Chemometrics and Intelligent Laboratory Systems, Ocean Engineering, ISA Transactions.

PROFESSIONAL ACTIVITY

- Collaboration contract with the University of Catania as an expert on the topic: "Bio-inspired methodologies and systems for locomotion and perception" from 03-10-2017 to 02-08-2018
- Collaboration contract with the University of Catania as an expert on topics of "Embodied motion intelligence and autonomous robots" within the project European EMICAB, STREP, 2010-2013. from 15-05-2012 to 31-12-2016

- Collaboration for carrying out research activities with PMI Innovaciones Microelectrónicas s.l., Seville (ANAFOCUS) for "the development of architectures for the realization, on microprocessors analogical, nonlinear dynamic systems for perception", in the context of the transfer technology of the results obtained in the European project SPARKII STREP, 2008-2011
from 01-01-2011 to 28-12-2011
- As part of the research agreement between the University of Catania and the partners industrialists (Euroconsult srl, Sirio Servizi, Gesind and Comunicando) of the MISURA research project P.O.R. Sicily 2000-2006 AXIS III Measure 3.14, Sub-Action B "Promotion and support to regional system for research and innovation". Project no 1999.IT.16.1.PO.011/3.14/5.2.13/0079 title: "ISEMIHA, Integrated System for the Emergency's Management in Industrial and in Harbor Areas", the undersigned has carried out research on following two distinct topics: a) modeling of the spatio-temporal diffusion processes of pollutants in industrial areas of the Priolo-Melilli-Augusta area for the planning and control of emergencies; b) creation of a robot for navigation in industrial environments subject to high temperatures. The robot produced was supplied to companies for field applications.
from 10-01-2008 to 30-06-2008
- Contract as expert teacher in the field of post-qualification professional courses, on the topic: "Control systems for the modulation and biological effects of electromagnetic waves", duration 80 hours, held at ISIS Polytechnic of the Sea "Duca degli Abruzzi", Catania.
from 01-01-2008 to 01-06-2008
- Contract as expert teacher within the project "I.N.F.O.A. – Information, training e apprenticeship" – POR code: 1999.IT.16.1.PO.011.4.0.5.7.4.5.0010, entrusted to the C.I.A.P.I. (Center Intercompany Integrated Professional Training) of Palermo, for a total of 40 hours
from 01-11-2007 to 20-12-2007
- Research collaboration with PMI Analogic Computers Ltd, Budapest (ANALOGIC), for "the development of analog/digital systems for sensory perception e for the control of mobile robots", in the context of the technological transfer of the results obtained in SPARK STREP European project, 2004-2007
from 10-01-2007 to 01-10-2007
- Collaboration contract with the University of Catania as a designer software/hardware for the creation of a prototype of a hexapod robot equipped with a system bio-inspired for locomotion control.
from 10-01-2005 to 31-03-2005
- Participation in the activities envisaged by the Research Collaboration Agreements stipulated between the University of Catania and Edinform S.p.A as part of an agreement on "Training of a researcher in the digital circuit electronic sector with specialization in embedded software programming" .
from 03-01-2005 to 04-04-2005
- Collaboration contract with the University of Catania as a designer software/hardware within the European research project FP4-ESPRIT 4 DICTAM contract IST No. – 1999-19007. The activity included the use of integrated analog circuits on chip, in which dynamic nonlinear networks were implemented, typically used for image filtering and for the generation and real-time control of complex dynamics applied for locomotion control in bio-inspired robots
from 10-03-2002 to 01-07-2002

LIST OF PUBLICATIONS (find the complete list at https://scholar.google.com/citations?user=TpMB_eoAAAAJ)

According to law 679/2016 of the Regulation of the European Parliament of 27th April 2016, I hereby express my consent to process and use my data provided in this CV.

Messina, 13th February 2025

Prof. Luca Patanè

A handwritten signature in black ink, appearing to read "Luca Patanè". The signature is written in a cursive style with a long horizontal stroke at the end.