europass Curriculum vitae

PERSONAL INFORMATION

Danilo Menegatti

ORCID 0000-0001-9090-0050

SHORT BIO

Danilo Menegatti was born in 1997 and is a Ph.D. student in Automatic Control, Bioengineering and Operations Research at the Department of Computer, Control, and Management Engineering "Antonio Ruberti" (DIAG) of the University of Rome "La Sapienza" where he received his master degree in Control Engineering in 2020. His main research activities involve intelligent systems, distributed learning and reinforcement learning.

EDUCATION

2020 – Present

PhD Student in Automatic Control, Bioengineering and Operations Research

La Sapienza, University of Rome

Automatic Control curriculum, Supervisor: Antonio Pietrabissa

PhD Schools:

- SIDRA 2022 PhD Summer School, Prof. Francesco Bullo, Bertinoro 2022;
- European Summer School on Learning in Games, Markets, and Online Decision Making, La Sapienza, University of Rome, 2021;
- SIDRA 2021 PhD Summer School, Prof. Giacomo Como, Fabio Fagnani, Antonio Bicchi, Alessandro De Luca, Bruno Siciliano, Cosimo Della Santina, Stanislao Grazioso, Bertinoro, 2021;
- Numerical Methods for Optimal Control, Prof. Mario Zanon, IMT School of Advanced Studies, On-line, 2021;
- Model Predictive Control, Prof. Alberto Bemporad, IMT School of Advanced Studies, On-line, 2021;
- Learning-Based Predictive Control, Prof. Melanie Zeilinger, Lorenzo Fagiano, Lukas Hewing, ETH Zurich, On-line 2021.

2019 – 2020

Master of Science in Control Engineering

La Sapienza, University of Rome

110 cum laude/110

Master completed in 1 year and 175 days (30 Jan 2019 - 22 Jul 2020)

6 laudes in single exams

Thesis: "Model Predictive Control for Satellite Formation Flying with Collision Avoidance", Supervisor: Prof. Antonio Pietrabissa

2015 – 2018

Bachelor of Science in Ingegneria Clinica

La Sapienza, University of Rome

110 cum laude/110

Bachelor completed in 3 years (Nov 2015 - Nov 2018)

10 laudes in single exams

Thesis: "Electroresponsive Hydrogels for Biomedical Applications"

Original research thesis at Centro di ricerca per le Nanotecnologie applicate all'Ingegneria della Sapienza (CNIS), La Sapienza, Superviros: Prof. Giovanni De Bellis

2010 – 2015

Diploma Scientifico

Liceo Scientifico Statale Antonio Meucci

100 cum laude/100

The only *cum laude* student of the institute

Thesis: "Speed"

RESEARCH AND WORK EXPERIENCE

Research Fellowship

2022 **Bando per la Ricerca di Ateneo, Progetti Piccoli**

winner of the grant "Intelligent Control Systems: Analysis, Design, and Applications", La Sapienza, University of Rome, D.R.n.1418/2022, Prot. n. 39677, 26/04/2022

2022 **Bando per la Ricerca di Ateneo, Progetti per Avvio alla Ricerca**

winner of the grant "Federated Consensus-Based Networked Systems: Analysis, Design and Applications", La Sapienza, University of Rome, D.R.n.1418/2022, Prot. n. 39677, 26/04/2022

2021 **Bando per la Ricerca di Ateneo, Progetti per Avvio alla Ricerca**

winner of the grant "DeepMPC: Combining Model Predictive Control with Neural Networks", La Sapienza, University of Rome, D.R.n.1258/2021, Prot. n. 36805, 07/05/2021

Research Projects

2023 **Technical Scientific Consultant**

Winner of the work tender "Contributo al raffinamento del progetto, allo sviluppo e all'implementazione di metodologoie di Synthetic Data Generation, Explainble AI e altre metodologie correlate, nell'ambito del progetto CADUCEO" - Procedura n.39/2023, Prot. n. 2148 Rep. n. 224 del 08/05/2023

2023 – Present **Researcher in the HE NANCY project**

NANCY - aN Artificial iNtelligent aided unified Network for seCure BeYond 5G long term evolution, Horizon Europe, Digital, Industry and Space, Grant Agreement ID: 101096456 - Total funding of 5.999.789,00€

- The project aims at the development of an architecture for Beyond 5G networks (B5G) that enables secure and intelligent resource management, flexible networking, and orchestration through AI and blockchain;
- Personal reseach activities related to the design of dynamic network reconfiguration and resource management systems to maximise network resilience and energy efficiency.

2023 **Technical Scientific Consultant**

Winner of the work tender "Simulazione di algoritmi di federated learning basati sulla teoria del consenso per applicazioni medicali" - Procedura n.53/2022, Prot. n. 4714 Rep. n. 404 del 06/12/2022

2023 **Technical Scientific Consultant**

Winner of the work tender "attività di Contributo al progetto di metodologie di Synthetic Data Generation, Explainable AI e altre metodologie correlate, nell'ambito del progetto CADUCEO" - Procedura n.57/2022, Prot. n. 4718 Rep. n. 408 del 06/12/2022

2022 **Technical Scientific Consultant**

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Winner of the work tender "attività di Contributo alla ricerca di metodologie di Explainable AI e Synthethic Data Generation nell'ambito del progetto CADUCEO" - Procedura n.29/2022, Prot. n. 1789 Rep. n. 188 del 17/05/2022

2022 – Present

Researcher in the PON FESR CADUCEO project

CADUCEO - Cloud plAtform for intelligent prevention and Diagnosis sUpported by artifiCial intelligEnce solutiOns, PON FESR 2014-2020 "Imprese e competitività", settore applicativo "Scienze della Vita" - Total funding of 1.7 million euros

- The project aims at the development of a decision support system for the prevention, diagnosis and prognosis of eosinophilic esophagitis, inflammatory bowel disease, portal hypertension;
- Coordination of the work package "OR3 - AI (Artificial Intelligence) Layer" responsible for the design and development of the decision support system AI-tools;
- Coordinator of the work package "OR4 - Experimental AI functionalities" responsible for the implementation and testing of the decision support system AI-tools;
- Personal reseach activities related to the coordination of the research group as well as the design, development and implementation of Explainable AI, Synthetic Data Generation, and Federated Learning techniques.

2022 – Present

Researcher in the ESA HydRON-hyDEMO project

HydRON Demonstrator System Phase A/B1

- The project aims at the development of a high-throughput optical network for broadband in space, as part of ESA's ScyLight programme for secure and laser comunication technology;
- Personal research activities focused on the design and development of traffic steering and resource management algorithms for seamless integration of space and ground communications.

2021

Technical Scientific Consultant

Winner of the work tender "Supporto al progetto e all'implementazione di algoritmi Model Predictive Control in cui il modello del sistema da controllare sia basati sui dati, con riferimento a vari campi applicativi (per esempio, Future Internet/reti 5G, sistemi satellitari, eHealth, trasporti, energia)" - Procedura n.5/Incarico di Lavoro/2021, Prot. n. 674 Rep. n. 63 del 10/03/2021

2021 – Present

Researcher in the POR FESR FedMedAI project

FedMedAI - Elaborazione di dati clinici con metodologie di intelligenza artificiale per strutture sanitarie federate nel rispetto del GDPR, POR FESR Lazio 2014-2020 (Azione 1.2.1), Prot. n. A0375-2020-36491, CUP: B85F21001370008, 23/10/2020 - Total funding of 149.965,20€

- The project aims to build a distributed learning platform for the development of Artificial Intelligence (AI) systems for biomedical. The distributed learning aspect will enable a group (or "federation") of healthcare facilities to collaborate in the implementation of AI without clinical data exchange;
- Personal research activities focused on the design and development of distributed learning consensus-based algorithms to enable a GDPR compliant federation collaboration.

2021 – Present

Researcher in the Allena-Mente project

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A joint action with the pediatric hospital "Bambino Gesù" and the Istituto Superiore di Sanità (ISS) - Total funding of 300.000,00€

- The project aims at the development of a set of serious games tailored for the rehabilitation of pediatric patients with cognitive disorders;
- Personal research activities focused on the coordination of the research group for the design and development of the suite of serious games and of the data analytics solutions of the project to enable patient profiling and decision support.

Other experience

2023 **International Students Tutor**

Winner of the work tender "N. 4 incarichi di lavoro autonomo per supporto agli studenti internazionali per favorire l'integrazione nell'ambito del corso di laurea magistrale in Control Engineering" - Procedura n.35/2023, Prot. n. 2152 del 08/05/2023

2022 – Present **Research Joint Venture with Technip Energies N. V.**

Technip Energies N.V. is a leading engineering and technology company for the energy industry and chemical sector. Personal activities related to the research and development of an AI-based solution for the optimization, improvement of safety and of quality of industrial processes

2022 **International Students Tutor**

Winner of the work tender "Supporto ai servizi di accoglienza ed integrazione degli studenti internazionali, e eventuale sviluppo di software e applicativi di supporto, per quanto riguarda il CdS di Control Engineering" - Procedura n.45/2022, Prot. n. 3932 Rep. n. 335 del 19/10/2022

2021 – Present **Researcher for CRAT**

Consorzio per la Ricerca nell'Automatica e nelle Telecomunicazioni (CRAT), a no-profit research consortium participated by La Sapienza, University of Rome, Politecnico di Bari, University of Sannio and the companies Thales Alenia Space Italia and TopNetwork (www.crat.eu)

Personal activities related to:

- Procurement and drafting of several project proposals for Horizon Europe Programme, European Innovation Council, Fondo IPCEI - Importanti Progetti di Comune Interesse Europeo, Piano Nazionale Ripresa e Resilienza (PNRR), Progetti di Rilevante Interesse Nazionale (PRIN), Programma Operativo Nazionale (PON), Programma Operativo Regionale (POR);
- Researcher in several funded projects mainly in the fields of ICT, Personalized Medicine, Space and Industry 4.0;
- Team leader, Work-Package leader and task leader and manager in several funded research projects;
- Author and Editor of technical projects deliverables detailed at the end of the publication list.

2011 – 2014 **Writer for APRILIA EVENTI**

Advertised more than 1k events in and around Rome, 500k+ yearly website views at www.apriliaeventi.blogspot.com

2011 – 2013 **Social Media Manager at @ATMOTORI**

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Designed strategies for interacting with followers, like real-time race commentary and quizzes about car parts, then copied by car manufacturers. Reached 3k+ followers in 2013

2008 – Present **Mosaicist**

After learning the job by doing, many collaborations followed. The most distinctive work is "La Leggenda di Danae", at Domus Danae, www.domusdanae.it

REVIEWER EXPERIENCE

2023 **The 31st Mediterranean Conference on Control and Automation, MED2023**

Proceedings published in IEEE Xplore, DOI: 10.1109/MED59994.2023

2023 **IEEE Conference on Decision and Control, CDC2023**

2022 **2023 American Control Conference, ACC2023**

Proceedings published in IEEE Xplore, DOI: 10.23919/ACC55779.2023

2022 – Present **IEEE Transactions on Automation Science and Engineering (T-ASE)**

Publisher: Institute of Electrial and Electronics Engineers, ISSN: 15455955, H-Index: 93

2022 – Present **Electronics Letters**

Publisher: John Wiley & Sons Inc., ISSN: 00135194, 1350911X, H-Index: 150

2022 **The 30th Mediterranean Conference on Control and Automation, MED2022**

Proceedings published in IEEE Xplore, DOI: 10.1109/MED54222.2022

2022 **European Conference on Networks and Communications & 6G Summit, 2022 EuCNC & 6G Summit**

Proocedings published in IEEE Xplore, DOI: 10.1109/EuCNC/6GSummit54941.2022

2021 – Present **International Journal of Control, Automation and Systems (IJCAS)**

Publisher: Institute of Control, Robotics and Systems, ISSN: 15986446, 20054092, H-Index: 59

2021 – Present **Control Engineering Practice**

Publisher: Elsevier Ltd., ISSN: 09670661, H-Index: 125

TEACHING

Assistant Lecturer

2023 – Present **Intelligent and Hybrid Control**

Master in Control Engineering, La Sapienza, University of Rome. Course code: 10606939, ECTS: 6

– Intelligent Control System design and applications

2022 – Present **Controlli Automatici**

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Bachelor in Computer and Automation Engineering, La Sapienza, University of Rome. Course code: 1021946, ECTS: 9

– Control theory application to biological systems

2022 – Present

Fondamenti di Automatica

Bachelor in Ingegneria Clinica, La Sapienza, University of Rome. Course code: 1015384, ECTS: 9

2022 – Present

Control of Autonomous Multi-Agent Systems

Master in Control Engineering, La Sapienza, University of Rome. Course code: 1041427, ECTS: 6

– Decentralised Federated Learning
– Consensus-based Federated Learning
– Multi-Agent Reinforcement Learning

2021 – Present

Control of Communication and Energy Networks

Master in Control Engineering, La Sapienza, University of Rome. Course code: 1041429, ECTS: 6

– Artificial Intelligence
– Explainable Artificial Intelligence (XAI)
– Federated Learning

Tutoring

2023

Tutoring Activites

Winner of award allowances for tutoring activities "Bando 6/2022 per il conferimento di n. 121 assegni di vario importo per lo svolgimento di attività di tutorato, didattico-integrative, propedeutiche e di recupero ex-lege n. 170/2003" - Procedura n.6/2022, Prot. n. 1582 del 27/10/2022.

Tutoring activities for the course "Fondamenti di Automatica II", Bachelor in Information Engineering, La Sapienza, University of Rome. Course code: 10596366, ECTS: 6

2021 – Present

Co-Advisor of Bachelor and Master theses in the fields of Control Systems, Biological Systems, Artificial Intelligence

– 4 Master Theses in Control Engineering, La Sapienza, University of Rome, Programme Code: 29933
– 2 Bachelor Theses and 1 Student Honor Programme in Ingegneria Informatica e Automatica, La Sapienza, University of Rome, Programme code: 31810
– 23 Bachelor Theses in Ingegneria Clinica, La Sapienza, University of Rome, Programme code: 30838

CONFERENCES

2023

Special Session Organizer and Chair

Special session "Intelligent Systems and Learning methods in Control and Decision Support Systems", **31st Mediterranean Conference on Control and Automation**, MED 2023

SCHOLARSHIPS AND CERTIFICATES

2015 – 2018

Bonus Studenti Meritevoli, La Sapienza, University of Rome

2014 – 2017

Scholarship "Fondazione Centenario", BPER

2015

Albo Nazionale delle Eccellenze, Indire/Miur

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2015 First Certificate, Cambridge English

2013 Grade 8, Graded Examination in Spoken English, Trinity

2013 Grade 4, Graded Examination in Music Performance, Trinity

2011 Corso Interazionale di Musica per Ragazzi, Pollica (SA)

PUBLICATIONS

Journal and Conference Papers

[1] **Danilo Menegatti**, Alessandro Giuseppi, Sabato Manfredi, and Antonio Pietrabissa. A discrete-time multi-hop consensus protocol for decentralized federated learning. **IEEE Access**, 10:80613-80623, **2023**.

[2] **Danilo Menegatti**, Alessandro Giuseppi, Francesco Delli Priscoli, Antonio Pietrabissa, Alessandro Di Giorgio, Federico Baldisseri, Mattia Mattioni, Salvatore Monaco, Leonardo Lanari, Martina Panfili, and Vincenzo Suraci. CADUCEO: A Platform to Support Federated Healthcare Facilities through Artificial Intelligence. **Healthcare**, 11(15), 2199, August **2023**.

[3] **Danilo Menegatti**, Sabato Manfredi, Antonio Pietrabissa, and Alessandro Giuseppi. Discrete-time average consensus for hierarchical distributed federated learning in the edge intelligence setting. In 2023 **31st Mediterranean Conference on Control and Automation (MED)**, IEEE, **2023**.

[4] **Danilo Menegatti**, Emanuele Ciccarelli, and Michele Viscione. Vertically-advised federated learning for multi-strategic stock prediction via alternative data. In 2023 **31st Mediterranean Conference on Control and Automation (MED)**, IEEE, **2023**.

[5] **Danilo Menegatti**, Filippo Betello, and Alessandro Giuseppi. Deep image inpaiting to support endoscopic procedures. In 2023 **31st Mediterranean Conference on Control and Automation (MED)**, IEEE, **2023**.

[6] Federico Baldisseri, Edoardo Montecchiani, Arturo Maiani, **Danilo Menegatti**, Alessandro Giuseppi, Antonio Pietrabissa, Vincenzo Fogliati, and Francesco Delli Priscoli. Behavioural cloning for serious games in support of pediatric neurorehabilitation. In 2023 **31st Mediterranean Conference on Control and Automation (MED)**, IEEE, **2023**.

[7] **Danilo Menegatti**, Alessandro Giuseppi, Emanuele De Santis, Sabato Manfredi, and Antonio Pietrabissa. Intelligent Systems and learning methods in control and decision support systems. In 2023 **31st Mediterranean Conference on Control and Automation (MED)**, IEEE, **2023**.

[8] Alessandro Giuseppi, Leonardo Pio Lo Porto, and **Danilo Menegatti**. Landslide Susceptability Prediction from Satellite Data through an Intelligent System based on Deep Learning. In 2023 **31st Mediterranean Conference on Control and Automation (MED)**, IEEE, **2023**.

[9] Francesco Sciancalepore, Francesco Fabozzi, Giulia Albino, Giada del Baldo, Valentina di Ruscio, Beatrice Laus, **Danilo Menegatti**, Roberto Premuselli, Domittila Elena Secco, Alberto E. Tozzi, Eleonora Lacorte, Nicola Vanacore, Andrea Carai, Angela Mastronuzzi, and AllenaMente Study Group. Frequency and characterization of cognitive impairments in patients diagnosed with paediatric Central Nervous System tumours: a systematic review. **Frontiers in Oncology**, 13:1198521, May **2023**.

[10] Alessandro Giuseppi, Sabato Manfredi, **Danilo Menegatti**, Cecilia Poli, and Antonio Pietrabissa. Decentralised federated learning for hospital networks with application to COVID-19 detection. **IEEE Access**, 10:92681–92691, **2022**.

[11] **Danilo Menegatti**, Alessandro Giuseppi, and Antonio Pietrabissa. Model predictive control for collision-free spacecraft formation with artificial potential functions. In 2022 **30th Mediterranean Conference on Control and Automation (MED)**. IEEE, **2022**.

[12] Alessandro Giuseppi, Sabato Manfredi, **Danilo Menegatti**, Antonio Pietrabissa, and Cecilia Poli. Decentralized federated learning for nonintrusive load monitoring in smart energy communities. In 2022 **30th Mediterranean Conference on Control and Automation (MED)**. IEEE, **2022**.

[13] Alessandro Giuseppi, Lucrezia Della Torre, **Danilo Menegatti**, Francesco Delli Priscoli, Antonio Pietrabissa, and Cecilia Poli. An adaptive model averaging procedure for federated learning (AdaFed). **Journal of Advances in Information Technology**, 13(6), **2022**.

[14] Alessandro Giuseppi, Lucrezia Della Torre, **Danilo Menegatti**, and Antonio Pietrabissa. AdaFed: Performance-based adaptive federated learning. In 2021 The **5th International Conference on Advances in Artificial Intelligence (ICAAI)**. ACM, November **2021**.

[15] Federico Baldisseri, Arturo Maiani, Edoardo Montecchiani, Francesco Delli Priscoli, Alessandro Giuseppi, **Danilo Menegatti**, and Vincenzo Fogliati. An integrated music and artificial intelligence system in support of pediatric neurorehabilitation. **Healthcare**, 10(10):2014, October **2022**.

[16] Francesco Sciancalepore, Leonardo Tariciotti, Giulia Remoli, **Danilo Menegatti**, Andrea Carai, Giuseppe Petruzzellis, Kiersten P. Miller, Francesco Delli Priscoli, Alessandro Giuseppi, Roberto Premuselli, Alberto E. Tozzi, Angela Mastronuzzi, Nicola Vanacore, Eleonora Lacorte, and Allena-Mente Study Group. Computerbased cognitive training in children with primary brain tumours: A systematic review. **Cancers**, 14(16):3879, August **2022**.

[17] Angela Mastronuzzi, Domitilla Elena Secco, Beatrice Laus, Andrea Carai, Alberto Tozzi, Roberto Premuselli, Francesco Dellipriscoli, Antonio Pietrabissa, Alessandro Giuseppi, **Danilo Menegatti**, Eloisa Rizzotto, Giacomo Garone, Francesco Sciancalepore, Eleonora Lacorte, Leonardo Tariciotti, Giulia Remoli, Nicola Vanacore, and Umberto Raucci. Cognitive deficits in childrens with brain tumours: A project to create a software for cognitive training. **Journal of the Neurological Sciences**, 429:118451, October **2021**.

Submitted Journal and Conference Papers

[18] **Danilo Menegatti**, Andrea Wrona, and Alessandro Giuseppi. Deep Reinforcement Learning Platooning Control of Non-Cooperative Autonomous Vehicles in a Mixed Traffic Environment In 2023 **American Control Conference (ACC)**, under review.

[19] Andrea Wrona, and **Danilo Menegatti**. Energy-Efficient Power and Resolution Control for Mobile Augmented Reality Applications: A Reinforcement Learning based approach. In 2023 **American Control Conference (ACC)**, under review.

[20] Andrea Wrona, Francesco Liberati, **Danilo Menegatti**, Federico Baldisseri, Alessandro Giuseppi, Francesco Delli Priscoli, Roberto Beraldi, Silvia Bonomi, and Marilena Vendittelli. An Intelligent Deep Reinforcement Learning Framework for Medical Image Classification. In **IEEE Access**, under review.

[21] Federico Baldisseri, Andrea Wrona, **Danilo Menegatti**, Antonio Pietrabissa, Stefano Battilotti, Claudio Califano, Andrea Cristofaro, Paolo Di Giamberardino, Francisco Facchinei, Laura Palagi, Alessandro Giuseppi, and Francesco Delli Priscoli. Deep Neural Network Regression to Assist Non-invasive Diagnosis of Portal Hypertension. In **Healthcare**, under review.

[22] Alessandro Giuseppi, **Danilo Menegatti**, and Antonio Pietrabissa. Stability of noncooperative load balancing with time-varying latency. In 2023 **IEEE Conference on Decision and Control (CDC)**, accepted for publication.

[23] **Danilo Menegatti**, Alessandro Giuseppi, and Antonio Pietrabissa. Distributed marl with limited sensing for robot navigation problem. In 2023 **22nd IFAC World Congress (IFAC)**, accepted for publication.

[24] **Danilo Menegatti**, Sabato Manfredi, Antonio Pietrabissa, Cecilia Poli, and Alessandro Giuseppi. Hierarchical federated learning for edge intelligence through average consensus. In 2023 **22nd IFAC World Congress (IFAC)**, accepted for publication.

List of the Most Relevant Projects Deliverables

PON FESR CADUCEO

D3.2 AI Layer intermediate design

Editor and Author of the deliverable that has the goal of finalising both the functional architecture of the AI framework and the overall Proof-of-Concept.

PON FESR CADUCEO

D4.1 Experimental AI Functionalities: first release

Editor and Author of the deliverable that has the goal of reporting a preliminary version of the demonstrator of the project.

PON FESR CADUCEO

D3.1 AI Layer functional architecture and methods

Editor and Author of the deliverable that has the goal of defining the functional architecture of the AI framework, as well as the overall Proof-of-Concept.

PERSONAL SKILLS

Mother tongue: Italian

Other languages

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C1	C1	C1	C1	C1
Spanish	B2	B2	A2	A2	A2

Levels: A1 and A2: Basic user – B1 and B2: Independent user – C1 and C2: Proficient user
Common European Framework of Reference for Languages

DIGITAL SKILLS

- Matlab, Simulink
- Keras, Tensorflow, PyTorch, Python, C
- Excellent knowledge of Windows and Microsoft Office Suite

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