europass Curriculum vitae

PERSONAL INFORMATION Andrea Wrona

SHORT BIO

Andrea Wrona was born in 1996 and he graduated with honors in Computer and Control Engineering (B.Sc.) in October 2018 and in Control Engineering (M.Sc.) in October 2020 from the University of Rome "La Sapienza." During his master's studies, he was recognized as the best student of the entire 2018-2020 cohort and was awarded the Diploma of Excellence. In January 2024, he earned the Ph.D. title in Control, Bioengineering, and Operations Research, with a *Ottimo* rating. Currently, he is a Postdoctoral Researcher at the same institution. He has actively contributed to seven research projects funded either by the European Union (EU) or the European Space Agency (ESA). He is currently leading two Work Packages (WP) in scientific research projects: the first WP belongs to a Horizon Europe project funded by the European Commission, where his procurement activities have successfully secured about €1 million in funding for Sapienza University, and the second one from an Italian project funded by the Ministero delle Imprese e del Made in Italy (MIMIT, ex MISE). In 2024, he was nominated as best reviewer of the year by the journal Control Engineering Practice, edited by Elsevier. Since 2021, he has served as assistant lecturer in 6 Automatica-related exams and has co-advised 12 B.Sc. and 3 M.Sc. final theses.

His research interests include control of terrestrial and satellite telecommunication networks, as well as data-driven control, with emphasis on Deep Reinforcement Learning strategies.

CURRENT POSITIONS

Mar 2024 – Present

PostDoc Researcher in Automatic Control, SSD ING-INF/04

Institution: University of Rome "La Sapienza"

Main Research Interests: Intelligent control applied to data routing in satellite communication systems.

2020 – Present

Project Manager and Researcher

Company: Consorzio per la Ricerca nell'Automatica e nelle Telecomunicazioni (CRAT), a **no-profit research organization** participated by the University of Rome "La Sapienza" (www.crat.eu)

Personal Responsibilities:

- Researcher in projects funded by either ESA or the European Commission.
- Work Package & Task Leader in one research project (SHIELD).
- Procurement and writing of several project proposals.
- Author and editor of several technical project deliverables.

RESEARCH AND WORK EXPERIENCE

Managerial and Research Activities - University of Rome "La Sapienza" and CRAT

December 2024 – Present

WP Leader and Task Leader in SHIELD

Strategic Health Initiatives for Effective Disease Progression (SHIELD). Project granted by the EU Commission under the call HORIZON-HLTH-2024-STAYHLTH-01-05-two-stage, grant agreement No. 101156751, **total funding 6 mln€, funding for Sapienza 953 k€**.

Leader of the WP entitled *AI Models for risk stratification and slow disease progression* and of the technical Task entitled *Implementation of Risk Stratification and Disease Progression Monitoring Tool*. Promoter and writer of the winning two-stage proposal. The overall goal of the SHIELD project is the design of AI and control algorithms for slow disease progression and improved quality of life for patients with diabetes or cardiovascular diseases.

October 2023 – Present

Researcher in PANTSAT

Path Awareness TechNiques for Transport Protocols over SATellite. Project funded by the European Space Agency (ESA), proposal No. DTI/BID/027/023 in response to AO/1-11201/22/NL/EG – RE-ISSUE, **total funding 800 k€, funding for Sapienza 170 k€**.

Design of routing control algorithms for traffic steering in single-layer and multi-layer satellite communication networks.

January 2023 – Present

Researcher in NANCY

An Artificial Intelligent Aided Unified Network for Secure Beyond 5G Long Term Evolution (NANCY). Project granted by the EU Commission under the call HORIZON-JU-SNS-2022-STREAM-A-01-06, grant agreement No. 101096456, **total funding 6 mln€, funding for Sapienza 243 k€**.

Design of AI algorithms for autonomous anomaly detection and self-healing in beyond 5G terrestrial networks.

July 2022 – Present

WP Leader and Researcher in CADUCEO

Italian project (No. 264 F/180025/01-05/X43) funded by Ministero delle Imprese e del Made in Italy (MIMIT), **total funding 5 mln€, funding for Sapienza 547 k€.**

Leader of the WP titled *Experimental Artificial Intelligence (AI) functionalities*, whose aim is to study and develop AI-based decision support systems related to the early detection and classification of diseases linked to three clinical case studies:

1. Eosinophilic esophagitis, chronic immune-mediated disease of the esophagus;
2. Inflammatory bowel disease (IBD), such as Crohn's disease, ulcerative colitis and Inflammatory Bowel Disease (IBD). These are the family of diseases affecting the intestinal tract, triggered by abnormal immune responses;
3. Portal hypertension, a liver disease characterized by high pressure in the portal vein, often caused by cirrhosis of the liver.

January 2022 – Present

Researcher in HyDEMO

HydRON-Demonstration System (DS) PHASE A/B1"in following shortened in HyDEMO. Contract 1550007580, **total funding 1 mln€, funding for Sapienza 100 k€**.

Development of DRL-based control algorithms for the switching problem in satellite optical communication networks, in the framework of site diversity with a geostationary satellite.

November 2020 – October 2023

Researcher in VADUS

Virtual Access and Digitalization for Unreachable Sites (VADUS). IAP-5G for L'ART Thematic Call: Cultural Heritage. ESA Contract 4000132720/20/NL/AF, **total funding 785 k€, funding for Sapienza 48 k€**.

Design of Multi-RAT algorithms based on optimal control, Q-Learning and DRL for the network selection and resource allocation in heterogeneous networks with mobile VR/AR applications rebuilding cultural sites not open to visitors.

November 2020 – January 2022

Researcher in ARIES

Advanced multi-Rat Integrated multi-sensors solution for Emergency prevention, detection and response operationS (ARIES). IAP 5G for L'ART Feasibility Study in response to the ITT ESA AO10064 - Law Enforcement and Emergency Response - Area L'Aquila/the Abruzzo Region. ESA Contract 4000133127/20/NL/AF, **total funding 200 k€, funding for Sapienza 60 k€**.

Development of Multi-RAT algorithms based on optimal control for the communication between ground sensors and drone-based access points for forest fires' monitoring and early intervention strategies.

October 2024 – Present

Project Responsible under the “Avvio alla Ricerca” Program

Awarded €2,000 in funding under the “Avvio alla Ricerca” program, an initiative by Sapienza University to support early-stage research projects for young researchers and studies of significant scientific and technological interest. Project topic: decision-making algorithms for routing strategies in satellite networks.

Other Work experience

2019 – 2021

Writer for Close–Up Engineering

Scientific dissemination activities on mathematics, physics, and engineering, with more than 30 articles written on various blogs belonging to the online magazine “Close-Up Engineering”.

PROJECT PROCUREMENT

2024

SHIELD Proposal Procurement and Preparation

Secured about €1 million in funding for Sapienza University by procuring a solid consortium with clinical, SSH and technical partners, and by preparing the winning two-stage proposal entitled *SHIELD*, within the Horizon Europe Work Programme.

December 2020 – Present

Consortium Building and Proposal Writing

Extensive experience in consortium building and proposal writing for Horizon Europe and European Space Agency (ESA) projects, with a strong track record in securing research funding and fostering international collaborations.

March 2021 – Present

Participation to EU Info Days and Brokerage Events

Contacts with leading companies and universities in the fields of health, telecommunications, transport, energy and agriculture for the formation of consortia which have the ultimate goal of submitting project proposals to the European Commission under various funding programs.

June 2023, Paris

Participation to the 2023 Horizon Europe Health & SSH Brokerage event

Face to face meetings with companies, universities, research and technology organizations, public sector, NGOs, hospitals, and patients associations over research topics from the Horizon Europe Cluster 1 (Health) Workprogramme, in order to connect with potential partners for submitting project proposals.

TEACHING

Assistant Lecturer, University of Rome “La Sapienza”

February 2021 – Present

Fondamenti di Automatica

Bachelor’s Degree in Electrical Engineering

September 2022 – July 2023

Fondamenti di Automatica

Bachelor’s Degree in Electronic and Communication Engineering

September 2022 – Present

Modellistica e Simulazione

Bachelor’s Degree in Computer and Control Engineering

June 2021 – Present

Sistemi di Controllo

Bachelor’s Degree in Computer and Control Engineering

September 2021 – Present

Control of Communications and Energy Networks

Master in Control Engineering. Seminars on intelligent data-driven control.

February 2022 – Present

Control of Autonomous Multi-Agent Systems

Master in Control Engineering. Seminars on intelligent control for Markov Games.

Tutoring, University of Rome "La Sapienza"

March 2021 – Present

Assistant Supervisor

Co-Advisor of 12 B.Sc. and 3 M.Sc. final theses, and assistant supervisor of 3 Student Honors Program's related activities.

2022 Winner of the call n. 45/2022 "Servizi di accoglienza e integrazione degli studenti internazionali, e loro preselezione. Sviluppo di applicativi di supporto per il CdS in Control Engineering a favore del Dipartimento di Ingegneria Informatica, Automatica e Gestionale -Antonio Ruberti- dell'Università degli Studi di Roma "La Sapienza".

2023 Winner of the call n. 35/2023 "Supporto agli studenti internazionali per favorirne l'integrazione nell'ambito del corso di laurea magistrale in Control Engineering. a favore del Dipartimento di Ingegneria Informatica, Automatica e Gestionale -Antonio Ruberti- dell'Università degli Studi di Roma "La Sapienza".

AWARDS AND MENTIONS

2024

Outstanding Reviewer Award, Control Engineering Practice

Selected as one of the ten 'Outstanding Reviewers' of the journal for 2024. This award is made based on a number of factors including number of reviews completed, speed of review, and quality.

2024

Young CRITIS Award

Grant for the best young researcher paper on critical infrastructure protection, CRITIS Conference, Rome September 18-20, 2024. The paper is titled *A Cooperative Feature Removal Mechanism for Cell Outage Detection in Wireless Telecommunication Networks*.

2021

Award "Eccellent Graduate"

Award received from "Fondazione Roma Sapienza" and promoted by "NoiSapienza Associazione Alumni", as the best student from the M.Sc. in Control Engineering that graduated in the academic year 2019/2020.

2020

Student Honor Programme

"Percorso di Eccellenza" for the M.Sc. in Control Engineering of the University of Rome "La Sapienza".

2018

Student Honor Programme

"Percorso di Eccellenza" for the M.Sc. in Control Engineering of the University of Rome "La Sapienza".

EDUCATIONAL BACKGROUND

2020–2023

PhD in Automatic Control, Bio-engineering and Operations Research

University of Rome "La Sapienza"

Curriculum: Automatic Control

Supervisor: Prof. Alessandro Di Giorgio

Research Topics:

– Quality of Service and Quality of Experience satisfaction in terrestrial communication networks.
– Multi-Agent and distributed systems for site diversity and path control in satellite communication systems operated through GEO and LEO satellites.
– Deep Reinforcement Learning.

PhD Schools:

– SIDRA 2022 PhD Summer School, July 2022, Bertinoro (FC). Held by Prof. Andrea Serrani and Francesco Bullo;
– La scrittura tecnico–scientifica, February 2022, Rome (RM). Held by Prof. Emilio Matricciani;
– SIDRA 2021 PhD Summer School, July 2021, Bertinoro (FC). Held by Prof. Giacomo Como, Fabio Fagnani, Antonio Bicchi, Alessandro De Luca, Bruno Siciliano, Cosimo Della Santina, Stanislao Grazioso;
– EECI Multi-Agent Distributed Optimization and Learning over Wireless Networks, June 2021. Held remotely by Prof. Luca Schenato and Ruggero Carli, Università di Padova.
– Numerical Methods for Optimal Control, May 2021. Held remotely by Prof. Mario Zanon, IMT School of Advanced Studies;
– Model Predictive Control, April 2021. Held remotely by Prof. Alberto Bemporad, IMT School of Advanced Studies.

Conferences:

– Limassol (CYPRUS), The 31st Mediterranean Conference on Control and Automation (MED2023), June 26-29, 2023.

2018–2020 ## Master of Science in Control Engineering

University of Rome “La Sapienza”

110 cum laude/110

Average grade of 29.91/30, 13 exams, 3 laudes. Admitted to the Student Honor Programme and winner of the Award “Excellent Graduate”.

TESP Robotics

In May, 2019, winner of the internal selection and admission to the Summer School organized by the Tohoku University in Sendai, Japan. Active participation to the Space Robotics Laboratory, working on a project involving autonomous navigation through obstacles of a wheeled mobile robot.

Trieste NEXT

Participation to the scientific research festival “Trieste NEXT”, held in Trieste, Italy. Three visits to industrial and medical companies in the Friuli Venezia Giulia region and eleven conferences about Artificial Intelligence and Big Data.

2015–2018 ## Bachelor of Science in Computer and Control Engineering

University of Rome “La Sapienza”

110 cum laude/110

Average grade 29.33/30, 9 laudes. Admitted to the Student Honor Program, reserved for the most deserving students.

2010–2015 ## Liceo Classico Diploma

Liceo Scientifico–Classico Giuseppe Stampacchia, Tricase (LE)

100/100

Participation to Latin and ancient Greek *certamina* at local and national level and also to mathematical and physical contests, qualifying at the national final of the Mathematical Games at the Bocconi University (Milan).

EDITORIAL EXPERIENCE IN JOURNALS AND CONFERENCES

Reviewer

April 2022 – Present **Control Engineering Practice**

December 2024–Present **IEEE Transactions on Automation Science and Engineering (TASE-E)**

October 2024–Present **IEEE Robotics and Automation Letters (RA-L)**

September 2024 – Present **Control System Letters (L-CSS)**

October 2022 **American Control Conference - San Diego 2023**

December 2023 **European Control Conference - Stockholm 2024**

October 2024 **American Control Conference - Denver 2025**

Conference Speaker

June 2023 **Mediterranean Control Conference 2023, Limassol, Cyprus**

Presenter and author of 3 scientific papers.

June 2024 **European Control Conference 2024, Stockholm, Sweden**

Presenter and author of 1 scientific paper.

July 2025 **American Control Conference 2025, Denver, Colorado, United States of America**

Chair-to-be of the Regular Session *Optimal Control I*, and presenter-to-be of 1 scientific paper within the same session.

PATENTS

2024 **First inventor of the Patent request no. 102024000030096 for industrial invention**

Title Metodo per addestrare un classificatore binario per rilevare la presenza di anomalie di funzionamento in una rete di telecomunicazioni, e relativo metodo per rilevare la presenza di anomalie nella rete di telecomunicazioni.

CERTIFICATIONS AND QUALIFICATIONS

2021 **Professional Computer Engineer Qualification**

"Abilitazione all'esercizio della professione di Ingegnere dell'Informazione - Sezione A", issued by "Ordine degli Ingegneri di Roma"

2017 **CLAD: Certificate LabVIEW Associate Developer**

Certification obtained by National Instruments after attending a dedicated course at the University of Rome "La Sapienza".

PERSONAL SKILLS

Mother tongue Italian

Languages In–depth knowledge of English language, both in written and in oral form. Participation to two summer schools in Liverpool and Birmingham, in 2012 and 2013, respectively. Basic knowledge of the Spanish language.

Computer skills
– in–depth knowledge of Windows, Unix–like and Mac OS
– advanced expertise with Microsoft Office programs
– MATLAB, Python, LabVIEW expert
– some experience with C, C++, Java

Organizational / managerial skills
Promoter and organizer of face-to-face meetings and online calls with industrial and non–industrial partners to channeling strategies on research projects funded either by the European Space Agency or the European Commission.

Driving license
A1, B.

Attitudes
Accurate, precise, with a remarkable ability in problem solving and strong attitude to team–working.

PUBLICATIONS

[1] **Wrona, A.**, De Santis, E., Priscoli, F.D. and Lavacca, F.G., 2023, June. An intelligent ground station selection algorithm in satellite optical communications via deep learning. In 2023 31st Mediterranean Conference on Control and Automation (MED) (pp. 493-499). IEEE.

[2] Baldisseri, F., **Wrona, A.**, Menegatti, D., Pietrabissa, A., Battilotti, S., Califano, C., Cristofaro, A., Di Giamberardino, P., Facchinei, F., Palagi, L. and Giuseppi, A., 2023, September. Deep neural network regression to assist non-invasive diagnosis of portal hypertension. In Healthcare (Vol. 11, No. 18, p. 2603). MDPI.

[3] Tantucci, A., **Wrona, A**. and Pietrabissa, A., 2023, June. Precise orbit determination on leo satellite using pseudorange and pseudorange-rate measurements. In 2023 31st Mediterranean Conference on Control and Automation (MED) (pp. 341-347). IEEE.

[4] Giuseppi, A., Porto, L.P.L., **Wrona, A.** and Menegatti, D., 2023, June. Landslide Susceptibility Prediction from Satellite Data through an Intelligent System based on Deep Learning. In 2023 31st Mediterranean Conference on Control and Automation (MED) (pp. 513-520). IEEE.

[5] **Wrona, A.** and Tantucci, A., 2024. Artificial intelligence-based data path control in low Earth orbit satellites-driven optical communications. International Journal of Satellite Communications and Networking.

[6] Atanasious, M.M., Becchetti, V., Baldisseri, F., Menegatti, D. and **Wrona, A.**, 2024, June. Deep Reinforcement Learning Control of Type-1 Diabetes with Cross-Patient Generalization. In 2024 32nd Mediterranean Conference on Control and Automation (MED) (pp. 221-226). IEEE.

[7] Baldisseri, F., Menegatti, D., and **Wrona, A.**, "Deep Deterministic Policy Gradient Control of Type 1 Diabetes," 2024 European Control Conference (ECC), Stockholm, Sweden, 2024, pp. 868-873.

[8] Menegatti, D., **Wrona, A.**, Di Paola, A., Gentile, S., and Giuseppi, A. (2024, August). Deep Reinforcement Learning Platooning Control of Non-Cooperative Autonomous Vehicles in a Mixed Traffic Environment. In 2024 IEEE 20th International Conference on Automation Science and Engineering (CASE) (pp. 108-113). IEEE.

[9] **Wrona, A.**, Gentile, S., De Santis, E., Giuseppi, A., Pietrabissa, A., and Delli Priscoli, F. (2025, *to appear*). A Cooperative Feature Removal Mechanism for Cell Outage Detection in Wireless Telecommunication Networks. In Lecture Notes in Computer Science, Volume 15549. Presented at 2024 CRITIS Conference.

[10] Di Paola, A., Gentile, S., and **Wrona, A.** (2025, *to appear*). Some Results in Minimum–Time Optimal Control of Dynamical Flow Networks. In 2025 American Control Conference.

[11] **Wrona, A.** (2024). Data-driven control of terrestrial and satellite communication networks. Ph.D. Thesis, Sapienza University of Rome.