Nicholas Cartocci

Research assistant

🌐 https://nicholas-cartocci.carrd.co/

@ nicholas.cartocci@unipg.it

Interests

Nicholas Cartocci's current interests include Fault Diagnosis, Robotics, Machine Learning (ML), Deep Learning (DL), Artificial Intelligence (AI), Unmanned Aerial Vehicles (UAVs), Electric Vehicles (EVs) and Autonomous Vehicles (AVs).

Experience

05/2021 - Present	**University of Perugia, Department of Engineering** Research assistant "assegno di ricerca" in the project: "Development and validation of algorithms for the perception, localization, navigation, control and security of electric autonomous vehicles"
05/2020 - 05/2021	**University of Perugia, Department of Engineering** Research assistant "assegno di ricerca" in the project: "Development of tools for the elaboration of time series and video streams with application to the precision farming"
04/2020 - 05/2020	**University of Perugia, Department of Engineering** Research contract for the project: "Models and algorithms for detection and classification of anomalies and faults in time series and signals"
2014-2020	**Nital (iRobot), Canon, TomTom, Alcatel, Bayer** Technical consultant for third parties in the sectors of: smart sensors, smart home, computers, wearable technology, cell phones, and crop science
2016-2020	**Editanet S.r.l.** Delegate for the supervision of public tenders for third parties
2016-2017	**Casio** Technical consultant and demonstrator for the provinces of Arezzo, Florence and Siena regarding video projectors, smart cameras and HQ cameras
2012-2013	**Sacchi Giuseppe S.p.A. - Arezzo branch** Technical consultant and seller in the following sectors: electrical distribution, lighting, electrical and electronic components, wiring, industrial automation, and special systems (e.g. photovoltaic)

Education

2020	**Professional title of Engineer** Information Engineer	MIUR
2017-2019	Master's degree with vote 110/110 cum laude **Computer Science and Robotics Engineering**	University of Perugia
2013-2016	Bachelor's degree with vote 107/110 **Computer Science and Electronics Engineering**	University of Perugia
2007-2012	**High school** Specializing in Electronics, Information Technology and Telecommunications	ITIS "Galileo Galilei" Arezzo

Thesis

Master	*Data-Driven Residuals and Bayesian Filtering for Robust Aircraft Fault Isolation* Supervisors: Professor M. L. Fravolini & Professor M. R. Napolitano Examiner: Professor A. Moschitta	Link
Bachelor	*Design and Assembly of a UAV below 300 grams with a fixed budget* Supervisor: Professor P. Valigi	Link

Publications

Accepted	Cartocci N., Napolitano M. R., Costante G., Valigi P., Fravolini M. L., "*Aircraft Robust Data-Driven Multiple Sensor Fault Diagnosis Based on Optimality Criteria*", Mechanical Systems and Signal Processing.
Accepted	Cartocci N., Crocetti F., Costante G., Valigi P., Fravolini M. L., "*Robust Multiple Fault Isolation Based on Partial-Orthogonality Criteria*", International Journal of Control, Automation and Systems.
2022	Cartocci N., Monarca A., Costante G., Fravolini M. L., Dogan K. M., Yucelen T., "*Linear Control of a Nonlinear Aerospace System via Extended Dynamic Mode Decomposition*", AIAA 2022-2046. AIAA Scitech 2022 Forum. January 2022, DOI.
2021	Cartocci N., Crocetti F., Costante G., Valigi P., Napolitano M. R., Fravolini M. L., "*Data-Driven Sensor Fault Isolation Based on Nonlinear Additive Models and Local Fault Sensitivity*", 2021 20th International Conference on Advanced Robotics (ICAR), 2021, pp. 750-756, DOI.
2021	Cartocci N., Napolitano M. R., Costante G., Valigi P., Crocetti F., Fravolini M. L., "*A Robust Data-Driven Fault Diagnosis scheme based on Recursive Dempster-Shafer Combination Rule*", 2021 29th Mediterranean Conference on Control and Automation (MED), 2021, pp. 1070-1075, DOI.
2021	Cartocci N., Fravolini M. L., Napolitano M. R., Costante G., "*A Comprehensive Case Study of Data-Driven Methods for Robust Aircraft Sensor Fault Isolation*", Sensors 2021, 21, 1645, DOI.
2021	Fravolini M. L., Cartocci N., Dogan K. M., Yucelen T., "*A Safe Learning Model Reference Adaptive Controller for Uncertain Aircrafts Models*", AIAA 2021-0532. AIAA Scitech 2021 Forum. January 2021, DOI.
2020	Cartocci N., Napolitano M. R., Costante G., Valigi P., Crocetti F., Fravolini M. L., "*PCA Methods and Evidence Based Filtering for Robust Aircraft Sensor Fault Diagnosis*", 2020 28th Mediterranean Conference on Control and Automation (MED), Saint-Raphaël, France, 2020, pp. 550-555, DOI.
2020	Fravolini M. L., Cartocci N., Dogan K. M., Yucelen T., "*Quantification of Tolerable Parametric and Dynamic Uncertainty for Robust MRAC Systems*", AIAA 2020-1338. AIAA Scitech 2020 Forum. January 2020, DOI.

Projects

2020 -2021	Agrobot: autonomous robots to support economic growth and environmental sustainability of Umbria's agriculture The AGROBOT project aims to realize and validate an autonomous robot to support innovative agricultural approaches on fields located in hilly areas belonging to small farms. It is based on state-of-the-art methods for perception, control and navigation. Project funded by Umbria Region PSR program 2014-2020.

Reviews

Journal:	Automatica, IEEE Robotics and Automation Letters (RA-L)
Conference:	2022 European Control Conference (ECC), 2021 American Control Conference (ACC)

Scholarship

12/2018 - 03/2019	*Data-Driven Residuals and Bayesian Filtering for Robust Aircraft Sensor Fault Isolation applied to Tecnan P92 aircraft* 500h Research project at Benjamin M. Statler College of Engineering and Mineral Resources, West Virginia University under the supervision of Professor Napolitano
10/2018 - 12/2018	*Implementation and comparison of data-based sensor fault isolation techniques for aircraft systems* 350h Internship project at Benjamin M. Statler College of Engineering and Mineral Resources, West Virginia University

Seminars

08/02/2021 - 12/02/2021	From Data to Decisions: the Scenario Approach (with Applications to Systems, Control and Machine Learning) 21h
	EECI 2021 International Graduate School on Control, instructors Professor M.C. Campi and Professor S. Garatti

Technological knowledge

Base	Computer Hardware, Adobe Photoshop, Apache Giraph, Apache Hadoop, Apache Spark, Java, JavaScript, MySQL, Node-RED, NoSQL databases (Riak, MongoDB, Cassandra, Neo4j), OpenDayLight, OpenStack, Programmable Logic Controller (PLC), Python, PyTorch, Robot Operating System (ROS), Simulink, and LaTeX
Advanced	MATLAB, Linux, MacOS, Microsoft Office, and Microsoft Windows

Languages

Italian	Native language
English	Advanced