



CURRICULUM VITAE

GIUSEPPE CARLO MARANO

September 9th, 2022

Contents

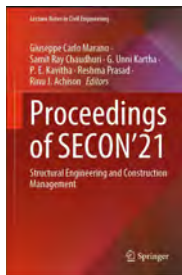
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G.C. Marano Curriculum Vitae

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1 Summary

Structural engineers, internationally recognized for his researches and expertise in the field of structural optimization in new or existing building or bridges and in identification and characterization of bridges and structures and seismic protection. His international experience is quite large, as he has been Visiting assistant professor in Cambridge (2002), associate professor in 2011 at Politecnico di Bari, visiting Professor in *Loughborough University* (2012) and at *Hunan University* (China) in 2014. He has been research fellow at the **SIBERC** (Sustainable and Innovative Bridge Engineering Research Center) at the **Fuzhou University** (China) since 2014; in the same university he had been full Professor in Structural Design from 2015 to 2018. From 2018 is full professor in structural Design at **Politecnico di Torino** (**QS Ranking by Subject 2022: "Civil and Structural Engineering" #31 world - #9 europe**), where he is also vice director of the **Department of Structural, Environmental and Geotechnical Engineering**. He is also member and founder of the interdepartmental centre for Artificial Intelligence (**AI@polito**), and director of **ARTISTE** (ARTificial Intelligence in STructural Engineering).



He participated in several European project funded research projects as a COST Action **TU1406** “European standardization of quality specifications for roadway bridge” (Italian delegate) or the Rice Project **ADDOPTML** (Italian PI) to support a network to create and test an holistic machine learning aided optimum design-manufacturing process of civil structures by developing strong synergies among a multi-disciplinary team of academic experts and SME. He also organised some recent events dealing with structural optimization in civil engineering as co-chair of **OPTARC2019** – 1st International Conference on Optimization Driven Architectural Design and the **Eurasian Opensees Days (EOS2022)**.

Chair of the Italy/Chinese **Summer/Winter Schools of Structural Morphology** since 2016 (five editions) he has been also keynote speaker and co-chair in some recent conferences as expert of Machine Learning applications in civil and structural engineering, such as at the *International Conference on Structural Engineering and Construction Management* (**SECON'21**) and **SECON'22** (India), or at the **IWSS2020** (workshop for Shell and Spatial Structures) and the **CINPAR2021** (*International Conference on Pathology and Construction Rehabilitation*) (Portugal). He has been invited to lecturing at the 2021 online course “New Trends in Structural Health Monitoring” at the Zhejiang University (P.R. China). His recent research is focused on the use of Artificial Intelligence methodology to the structural retrofitting of existing building and bridges, as well as applied to new construction methodology such as 3D printing. Giuseppe Carlo MARANO co-authored more than 170 journal papers and about 300 conference and book contributions, received 2500 citations for an h-index of 31. He is currently involved in analysis and retrofitting projects validation by ASPI (Italian Highway Company) as representative of the *Italian Council for Transportation and Sustainability* and is almost from two years he is involved in a national arrangement for new codes for existing bridges.

2 Personal Information

first name Giuseppe
middle name Carlo
family name Marano
place of birth
date of birth
nationality
Current occupation

Telephone
☎

✉ E-mail:

☎ Skype:

Orcid ID:

🌐 LinkedIn:

📘 Facebook:

publications:

citations:

h-index:


Scopus author ID:

Researchgate:

3 Education

1997-2000



 **Ph.D - Università di Firenze, Firenze, Italy**

Doctorate in Structural Engineering
Final theses title: "Optimal design of base isolation devices for building seismic protection";
supervisor Prof. P. Spinelli

1987-1993



 **Master - Politecnico di Bari, Bari, Italy**

Master in Civil Engineering (five years course), with honors (*cum laude*)
Final theses title: "Optimal design of plane arches";
supervisor Prof. A. Vitone

1985-1986



 **Italian Navy Academy, Livorno, Italy**

Standard courses in military academy: GPA: 3.70/4.00

1980-1985



Di Cagno Abrescia high school institute Bari, Italy

Scientific high school degree, with honour , GPA: 60/60

4 Work Experience

4.1 Academic Positions



2000 Politecnico di Bari, Bari (Italy)

Post-doctorate fellowship in random vibration of nonlinear structures, Department of Civil and Architecture Science



2001–2002 Politecnico di Bari, Bari Italy

Research fellow: research project “Prospects and extension of load path and STM model: from the reinforced concrete structural design to the masonry diagnosis and structural evaluation”



2002–2012 Politecnico di Bari, Bari, Italy

Assistant Professor Structural Design
II Faculty of Engineering, Taranto, Italy

2009/2011: Member of the board of directors - Politecnico di Bari

2009/2012: Member of the ILO2 (Industrial Liaison Office) committee - Politecnico di Bari;

2005/2007: ERASMUS project delegate at the 2nd Faculty of Engineering in Taranto;

2007/2012: Member of Committee “Province of Taranto funds for Visiting Professor and research fellowships” at the 2nd Faculty of Engineering in Taranto, Politecnico di Bari;

2007/2009: Member of Committee for department library journals selection at the DIASS (Department of Innovative and Environmental Engineering;

2009/2011: Member of Committee “Proposal for the new Strategic University Program”, Politecnico di Bari;

2009/2011: Member of Committee “New rules for Spin-off companies”







2011/2018: Scientific responsible of seismic projects technical evaluation

Province of Taranto as Politecnico di Bari delegate (by specific agreement);



2002 Cambridge University, Cambridge, UK

Visiting assistant professor, Department of Engineering supported by an Italian National Research Council (CNR) grant

- 2012–2018 **Politecnico di Bari, Bari Italy**
Associate professor in Structural Design
2010/2014: Member of ILO2 committee (Industrial Liaison Office) of Politecnico di Bari;
2011/2020: Member of the board of directors (delegated by Politecnico di Bari) of University Spin Off “TandA TECNOLOGIA ed AMBIENTE SRL”;
2011/2020: Member of the board of directors (delegated by Politecnico di Bari) of University Spin Off “AESEI s.r.l.”;
2009/2013: Delegate by Politecnico di Bari to the **AlmaLaurea Interuniversity Consortium**, a system centered on students and graduates at all stages of their educational history: guidance, learning, work. A synergy at the service of universities, companies and institutions, with our annual and thematic reports, CV database, placement and intermediation services.
- 
- 2012 **Loughborough University, Loughborough, UK**
Visiting professor
- 
- 2013 **Hunan University, Hunan P.R.China**
Visiting professor
- 
- 2015 **SIBERC, (Sustainable and Innovative Bridge Engineering Research Center), Fuzhou University, Fuzhou, Fujian Province P.R. China**
Research fellow
- 
- 2015–2018 **Faculty of Civil Engineering, Fuzhou University, Fuzhou, Fujian Province, P.R. China**
Full Professor in Structural Design
- 
- 2018–2022 **Politecnico di Torino, Torino, Italy**
Full Professor in Structural Design
Vice director, Department of Structural, Building and Geo-technical Engineering **DISEG**
Director, 2nd level Master for safety assessment of transport infrastructures (MARVEL)
- 

Member *ChinaRoom*, a PoliTo committee whose goal is to strengthen the collaboration with Chinese universities and with scholars all over the world that are dealing with the study of Chinese urbanization and industrialization processes and their impacts worldwide.

Member and founder *AI-H@PoliTo*, an inter-department center, internationally-recognized center of excellence in Learning and Intelligent Systems. It merges existing competences across departments, promoting the growth of young talents and injecting ML and AI in a wide range of applications distributed across all departments of Politecnico di Torino.

4.1.1 Main Academic roles

2009/2011	Member of the board of directors - Politecnico di Bari;
2009/2012	Member of the ILO2 (Industrial Liaison Office) committee - Politecnico di Bari;
2012/today	Scientific responsible of seismic projects technical evaluation – Province of Taranto as Politecnico di Bari delegate (by specific agreement);
2014/2015	President of “Structural and geotechnical committee” – Province of Bari Association of Engineers
2014/2019	Member of Management Committee as Italian delegate in the international project COST Action TU1406 - Quality specifications for roadway bridges, standardization at a European level (BridgeSpec.);
2015/2020	Member of the “Scientific Academy of Apulia”;
2015/today	Member of the scientific and teaching committee in the 2nd Level Master EuroProject “Advanced Structural design according Eurocodes”, Università la Sapienza, Roma;
2016/2020	member (Foreign Expert) del SAFEA – State Administration of Foreign Experts Affair of the P.R. China.
2018/today	Member of the Interdepartmental Centre of Research SISCON (Structural Safety of infrastructures)
2019/today	Deputy Director, Department of Structural, Geotechnical and Building Engineering, Politecnico di Torino
2020/today	Founder and Director of 2nd level Master MARVEL – Structural management of infrastructures in transport network, Politecnico di Torino
2020/today	Founder and member of the Interdepartmental Centre for Industrial and Engineering Application of the Artificial Intelligence AI@PoliTo (responsible for AI application in civil engineering)

4.2 Selected non-academic experiences

1995/1996	Navy Officer (lieutenant) in the Italian Navy (civil service);
1996/1997	Engineering (concrete technology) at the Calcestruzzi S.P.A. (today Italcementi Group – Italian leader in concrete production) as expert in concrete production and technology
1999/2002	Consultant on structural analysis and design for ECOFORMA srlc - European projects (for urban suitable requalification) “HOME” and “Cradle to Cradle”

G.C. Marano Curriculum Vitae

1999/2001	Structural consultant for new building design and seismic retrofitting of existing ones (17) for social housing in Fondo Gesù district, Municipality of Crotone;
2006/today	Consultant for structural analysis and design of prefabricated Steel/concrete elements - Metal.Ri snc (Bari);
2011	Designated by the Province of Bari for the assessment of seismic vulnerability of two bridges;
2015	Structural consultant of ARCA Capitanata (Social Housing Office in Province of Foggia) for two base isolated building (45 apartments);
2016	Structural inspector for final testing - seismic retrofitting of Foggia main hospital (Ospedali riuniti di Foggia)
2016	Structural designer for the evaluation of seismic vulnerability assessment of a RAI (Italian Broadcast Corporation)
2017	Structural designer, work manager and safety coordination (in progress) for seismic retrofitting of Bari Airport passenger terminal
2018/today	Structural safety evaluation of existing bridges and tunnels - Italian Highway Company
2020	structural designer - bridge for internal planes connections - AdP

5 Scientific Activity

5.1 Scholarship and Grants

- | | |
|------|---|
| 1999 | Scholarship (Socrates/Erasmus program) for the free participation to the intensive course “Probabilistic Approach to Structural Design and Application to Eurocodes”, University of Firenze (IT); |
| 2000 | One year scholarship for the “Signal Analysis specialization school”, Università degli Studi di Bari (funded by Telespazio SpA); |
| 2002 | Scholarship to participate to the NATO ARW congress “Stochastic systems: from randomness to Complexity”, Erice (Italia); |
| 2002 | CNR (Italian National Research Council) Scholarship for 6 months of research at the Cambridge University (UK); |
| 2000 | Post-Doc Scholarship Design Institute (Currently DICAR) of Architecture Faculty - Politecnico di Bari; |
| 2003 | Grant (in the budget of the province of Taranto) supported by 2nd Faculty of Engineering (Taranto) of Politecnico di Bari to develop research activities with the Cambridge University (UK) 10.000,00€; |
| 2007 | Grant (in the budget of the province of Taranto) supported by 2nd Faculty of Engineering (Taranto) of Politecnico di Bari to co-founding a research fellow; |
| 2007 | Grant (in the budget of the province of Taranto) supported by 2nd Faculty of Engineering (Taranto) of Politecnico di Bari to co-founding participation to International Conference ECOMMASS08; |
| 2010 | Grant supported by of Politecnico di Bari to co-founding a research fellow; |
| 2016 | Starting Grant for research activities at t Fuzhou University (1.500.000,00 Yuan) founded by Fuzhou University (Fuzhou, China) |

5.2 Tutoring and supervising

As I believe that a key aspects of research and teaching is the supervising of master and PhD student, it has been a primary part of my engagement with the academic job in all the universities where I have worked since today. At the *Second Faculty of Engineering of Taranto* (from 2002 to 2012) I personally supervised more than 114 degree and master’s degree theses. As associate professor (2012/2013) I tutored more than 25 theses in Building Engineering and Architecture. At the Faculty of Architecture, I personally coordinated several final degree design laboratories (9 months for 18 credits for a group of students) and co-tutored other 5 groups. At **Fuzhou Universities** I tutored than 5 students in their final master degree, and I’ve been tutoring several master students at **Politecnico di Torino** sice 2019.

5.2.1 PhD students

G.C. Marano Curriculum Vitae

<i>Andrea Pollio</i>	(co supervisor) Environmental engineering doctorate school, Technical University of Bari XV2ndl cycle, "Modelling of a flexible marine riser behaviour in presence of slug flow regime", co-tutor
<i>Sara Sgobba</i>	Environmental engineering doctorate school, Technical University of Bari, XXI cycle, "Stochastic seismic spectra"; Actually Senior researcher at the Italcementi group (Italian leader in cement production)
<i>Emiliano Morrone</i>	Environmental engineering doctorate school, Technical University of Bari, XXI cycle, "Fuzzy uncertain for structural analysis"; Actually Staff at the technical office at Province of Taranto
<i>Giuseppe Quaranta</i>	(co-supervisor), Structural engineering doctorate school (XX2ndl cycle), Sapienza University of Rome , "Optimal sensors placement and soft computing based identification methods for structural monitoring", Actually Assistant Professor at Università Sapienza di Roma
<i>Jennifer Avakian</i>	Environmental engineering doctorate school, Technical University of Bari, XXIV cycle, "Evolutive algorithms in structural engineering optimization and identification";
<i>Fabrizio Palmisano</i>	Environmental engineering doctorate school, Technical University of Bari, XXIV cycle, "Landslide structural vulnerability of masonry buildings.";
<i>Andrea Giannico</i>	Environmental engineering doctorate school, Technical University of Bari, XXIX cycle, "Fuzzy probabilistic analysis of the comfort perceived by pedestrians exposed to traffic-induced vibrations on bridge structures "
<i>Fuina Silvana</i>	PhD course in "Biodiversity, agriculture and environment", university of Bari Aldo Moro (XXX ciclo)- Department of Sciences Agro-Environmental and Territorial (DISAAT). Thesis title: Structural Innovation in constructions for protected crops: analysis and testing of roofing materials and "Tensegrities"structures.
<i>Angelamaria Abrescia</i>	Technical University of Bari, DEI , PhD course in Electronic and Electrotechnic engineering, "Energy harvesting from random vibrations using piezoelectric devices"
<i>Congiu Eleonora</i>	PhD course in Civil Engineering and Architecture, Università di Cagliari (XXX2nd ciclo), Department of Civil Engineering and Architecture
<i>Raffaele Cucuzza</i>	(in progress) PhD course in Civil Engineering and Architecture, Politecnico di Torino (XXX5th ciclo), Department of Structural, Building and Environmental Engineering
<i>Marco Martino Rosso</i>	(in progress)PhD course in Civil Engineering and Architecture, Politecnico di Torino (XXX6th ciclo), Department of Structural, Building and Environmental Engineering
<i>Antonio Pio Sberna</i>	(in progress)PhD course in Civil Engineering and Architecture, Politecnico di Torino (XXX6th ciclo), Department of Structural, Building and Environmental Engineering

<i>BeiBei Xiong</i>	(in progress) PhD course in Civil Engineering and Architecture, Politecnico di Torino (XXX2nd ciclo), Department of Structural, Building and Environmental Engineering
<i>Jonathan Melchiorre</i>	(in progress) PhD course in Artificial Intelligence, Politecnico di Torino (XXX7th ciclo), Department of Structural, Building and Environmental Engineering
<i>Rebecca Asso</i>	(in progress) PhD course in Civil Engineering and Architecture, Politecnico di Torino (XXX7th ciclo), Department of Structural, Building and Environmental Engineering

5.2.2 Research fellowship tutoring

2006	Research fellow Supervisor, Arch. Maria Giovanna dell'Aglio, "Architectonic and structural planning for buildings subject to seismic risk", Technical University of Bari;
2007	Research fellow Supervisor, CEng Giuseppe Palombella, "Bridge seismic isolation", Technical University of Bari;
2009	Research fellow Supervisor "Innovative methods for lifetime estimation of reinforced concrete structures subjected to chloride penetration and vulnerability analysis of strategic facilities", <i>Dr Sara Sgobba</i> , Technical University of Bari
2010	Research fellow Supervisor, CEng. Floriana Petrone, "New mixed concrete/steel reticular beams, ", Technical University of Bari".
2010	Research fellow Supervisor "Advanced soft computing based techniques to structural dynamic monitoring ", <i>Dr Giuseppe Quaranta</i> , Technical University of Bari;
2011	Research fellow Supervisor, "Advanced techniques for monitoring and structural diagnostics", Technical University of Bari, <i>Dr. Giuseppe Quaranta</i> ;
2015	Research fellow Supervisor "Reliability evaluation and structural safety in the presence of uncertainties", Technical University of Bari, <i>Dr. Alessandra Fiore</i>
2018	Research fellow Supervisor "STM models for masonry safety evaluation", Technical University of Bari, <i>Dr. Fabrizio Palmisano</i>
2020	Research fellow Supervisor "Structural safety of concrete structures", Technical University of Torino, <i>Dr. Costanza Anerdi</i>

5.3 Visiting

2002	Visiting assistant professor, Cambridge University (UK) - (6 months);
2012	Adjunct Professor, Loughborough University (UK) - (2 months);
2014	Visiting Professor, Hunan University, Changsha, Hunan Province (China)- (1 month);
2015	Research Fellow, SIBERC, Fuzhou University, Fujian (China); (1 month);
2016	Visiting Professor- Faculty of Civil Engineering, Fuzhou University, Fuzhou, Fujian Province, China- (2 months);

5.4 Scientific membership

2009/today	Member of FIB (CEP-FIP, Fédération Internationale du Béton - International Federation for Structural Concrete), Committee 8 “Durability” and Committee 5, task 5.13;
2015/2020	Member of “Apulian academy of science”;
2016/2020	Member of SAFEA (State Administration of Foreign Experts Affairs) of P.R. China , entity responsible for the certification of foreign experts for working in china and for the organization of foreign trainings for Chinese professionals and technicians;
2017/today	Member of the SINEDRIO - “Association of Italians academics in China”

5.5 Price and awards

1997	Special mention (Arch. M. Montemurro and Arch. C. Mannino) for the design contest by the Municipality of Trani for a stone house in Trani (BA). Structural aspects were conjugated with the expressive and architectural values of stones in order to study its use combining shapes and structures safety in a modern architectural design approach;
2003	Letter of appreciation for activities due as visiting professor at the Cambridge University, Prof. Prof. Robin Langley;
2008	Letter of appreciation for the teaching and scientific activities carried out by prof. Marano at the 2nd Faculty of Engineering – faculty council;
2008	The paper “Robust optimum design of tuned mass dampers devices in random vibrations mitigation”, Journal of Sound and Vibration, Volume 313, Issue 3-5, June 2008, Pages 472-492, Marano, G.C.; Sgobba, S.; Greco, R.; Mezzina, M., was ranked 3rd among the Top 25 Hottest Articles published by “Journal of Sound and Vibration” (period: April2008 to june2008);
2008	The paper: “Fuzzy-based robust structural optimization” International Journal of Solids and Structures, Volume 45, Issue 11-12, June 2008, Pages 3544-3557 Marano, G.C.; Quaranta, G.; was ranked twelfth 12th among the Top 25 Hottest Articles published by “International Journal of Solids and Structures” (period: April 2008 to June 2008);
2010	The paper: “A comparison between different optimization criteria for tuned mass dampers design”, Journal of Sound and Vibration, Volume 329, Issue 23, November, Pages 4880-4890 Carlo Marano, G.; Greco, R.; Chiaia, B.; was ranked sixth among the Top 25 Hottest Articles published by “Journal of Sound and Vibration” (period: June 2010 to September 2010);
2011	Letter of appreciation for the Keynote lecture at the International Conference on Earthquake Analysis and Design of Structures (EQADS 2011), December 1-3, 2011 Department of Civil Engineering, PSG College of Technology, Coimbatore, Tamilnadu, India; “Soft Computing Applications in Structural Dynamic Monitoring”;
2012	Certificate of Appreciation, for the Outstanding Lecture at the “2012 New Millenium, International Forum on Advanced Construction Technologies”, Changsha, Hunan, China, September 14-17, 2012; “Parametric identification of nonlinear devices for seismic protection using soft computing techniques”;
2013	Maximum ranking evaluation (3/3 – excellent) at the first Italian scientific quality evaluation (VQR 2004-2010)
2013	Acknowledgement of reviewers - prof. DM Frangopol Editor of the international journal “Structure and Infrastructure Engineering”;
2014	Letter of appreciation for the “High level of professionalism that have shown during the process of peer review” from the JSC (National Centre of Science and Technology Evaluation” of Kazakistan;

- 2014 | Mention of honor “Italian prize for sustainable architecture Fassa Bortolo” - Co-supervisor of the architecture master thesis “New railway station AV/AC in Bari“
- 2015 | The paper “INELASTIC SEISMIC SPECTRA INCLUDING A DAMAGE CRITERION: A STOCHASTIC APPROACH” (Soil Dynamics and Earthquake Engineering, Volume(s) 70, 01-Jan-2015, Pages 75-79 has been downloaded more than 128 times in the first two months since its online publication;
- 2015 | The paper “Parameters Identification of Stochastic Nonstationary Process Used in Earthquake Modelling” has achieved impressive readership results. The chapter published with InTech in the book Earthquake Research and Analysis - New Advances in Seismology” has so far been accessed 1000 times (by the end of 2014). For this reason Editors sent congratulations on the significant impact that your work has achieved to date;
- 2015 | The paper “Modified Genetic Algorithm for the Dynamic Identification of Structural Systems Using Incomplete Measurements”, published in Computer-aided civil and infrastructure engineering, Vol 26 Issue 2 Pages 92-110, has been indicated as a “Highly Cited paper” on Web of Science, as of July/August 2015. This highly cited paper received enough citations to place it in the top 1st percent of its academic field based on a highly cited threshold for the field and publication year. (Data from Essential Science Indicators)
- 2016 | Certificate of appreciation for the Keynote Lecture “Automatic knowledge discovery in structural engineering: perspectives using evolutionary polynomial regression EPR”, International Workshop “New Trends in Structural Engineering”, 18 Luglio 2016, Fuzhou University, Fuzhou, P.R. China;
- 2017 | Maximum ranking evaluation (2/2 - excellent) at the second Italian scientific quality evaluation (VQR 2011-2014)
- 2017 | The chapter “Parameters Identification of Stochastic Nonstationary Process Used in Earthquake Modelling”, published in the book “Earthquake Research and Analysis - New Advances in Seismology” Edited by: Sebastiano D’Amico, ISBN 978-953-51-1054-5 Publisher: InTech, Publication date: March 2013 has been downloaded 1500 times to August 2017 (official chapter performance metrics from INTECH)
- 2021 | **Certificate of Appreciation** as eminent speaker, SECON2021, ASCE India Chapter
- 2021 | **Certificate of Appreciation**, for lecturing at the 2021 online course “*New Trends in Structural Health Monitoring*”, College of Civil and Architecture, Zhejiang University (P.R. China).
- 2022 | **Certificate of Appreciation**, as eminent speaker, SECON2022, ASCE India Chapter

5.6 Invited speaker

5.6.1 International conferences

- 2009 | Invited lecture at the CSC2009: The First International Conference on Soft Computing Technology in Civil, Structural and Environmental Engineering, Funchal, Madeira, Portugal, 1-4 September 2009, “Genetic algorithms in mechanical systems identification: state-of-the-art review”;
- 2011 | Keynote lecture at the International Conference on Earthquake Analysis and Design of Structures (**EQADS 2011**), December 1-3, 2011 Department of Civil Engineering, PSG College of Technology, Coimbatore, Tamilnadu, India - “Modelling of stochastic process for earthquake representation as alternative way for structural seismic analysis: past, present and future”;

- 2012 | Keynote lecture, "Parametric identification of nonlinear devices for seismic protection using soft computing techniques" at ICACIE2012 - International conference on advances in civil infrastructure engineering, Changsha, Hunan, China, on Sep. 14-16, 2012., (<http://icacie2012.csuft.edu.cn/dct/page/65581>);
- 2013 | Invited lecture at the CSC2013: The Third International Conference on Soft Computing Technology in Civil, Structural and Environmental Engineering, Cagliari, Sardinia, Italy, September 3-6, 2013 – "Soft Computing Applications in Structural Dynamic Monitoring";
- 2014 | Semi-plenary keynote "Knowledge discovery in engineering using evolutionary polynomial regression: past experiences and perspectives" 1st International Conference on Engineering and Applied Sciences Optimization (OPT-I), Kos (Greece) 2-4 June;
- 2015 | Invited lecture for The Fourth International Conference on Soft Computing Technology in Civil, Structural and Environmental Engineering (CIVIL-SOFT-COMP 2015) to be held in Prague, Czech Republic 1-4 September 2015, "Evaluation of the plastic hinge length for nonlinear analysis of reinforced concrete buildings";
- 2016 | Invited for a Keynote at the at the 10th National Conference on Theory and application of Random Vibration and the 5th National Conference on Stochastic Dynamics of China - International Conference on Theory and Application of Random Vibration (ICTARV 2016), on 5th and 6th of November 2016, Fuzhou, Fujain Province, P.R.China - G.C. Marano "*Random Vibrations in Earthquake Engineering: State of the Art and Future Perspectives*"
- 2016 | Invited Speaker at the 2nd International Young Researchers Conference "Youth, Science, Solutions: Ideas and Prospects, presenting a lecture: "Recent Developments on Seismic engineering research: A focus on new developing and applications", (YSSIP-2016) - 22-25 November 2016 at Tomsk State University of Architecture and Building (Tomsk, Russia)
- 2017 | Invited Speaker at the 15th Annual Meeting of China 's Uncertainty System and the 19th Youth Information and Management Scholars Conference, 26-30 July 2017 (Fuzhou, China) presenting a lecture: "Uncertainty in Structural Engineering: current problems and future challenges"
- 2020 | Invited speaker at the IWSS2020 - "Italian Workshop in Shell and Space Structures" State of the art and future challenges in evolutive algorithms for structural optimization
- 2021 | Invited speaker "Machine Learning in Structural Health Monitoring: past, present and future" at the International Conference on Structural Engineering and Construction Management (SECON'21) 12 -15 May 2021
- 2021 | Invited speaker at CINPAR2021 "Machine Learning approaches for structural rehabilitation".

5.6.2 Workshops

- 2010 | AICAP: Invited talk "New perspectives on structural health monitoring", Study Committee AICAP for concrete structures, 19 Ottobre 2010 - Roma (IT);
- 2011 | Invited speaker, "Use of recycled elements from tyres in concrete", one day workshop "Utilizzo di prodotti da riciclo dei pneumatici fuori uso nel calcestruzzo", Faculty of Engineering, Department of Innovation Engineering, University of salento, 16 march 2011, Lecce;
- 2015 | Invited lecture - IABMAS (Italy): WORKSHOP "Innovative solutions for bridges' maintainance": -Reti di sensori per la gestione efficiente dei ponti con criteri multi-performance: il caso del ponte S. Francesco da Paola a Taranto, Benevento 27 Ottobre 2015

- 2015 | Invited lecture at the 6th Sino-Italian Workshop on “New topics in civil engineering research” - 3-5 December 2015, Tongji University (Shanghai - Cina): “Energy Harvesting for Random Vibrating Structures”;
- 2016 | Invited Speaker at the International Workshop “New Trends in Structural Engineering”, July 18, 2016 Fuzhou University - Collage of Civil Engineering (Fujian, China), “Automatic knowledge discovery in structural engineering: perspectives using evolutionary polynomial regression EPR”;
- 2017 | Invited Speaker at the International Workshop “Holistic Approach to Sustainable New and Existing Structures and Bridges”, Fuzhou University, College of Civil Engineering, 1° - 2° July 2017, G.C. Marano: “Structural Optimization: past, present and future”;

5.6.3 Universities

- 2002 | Invited at the Friday talk “Stochastic analysis of base-isolation of buildings from earthquakes” Department of Engineering, Dynamics and Vibration Research Group, Cambridge University (UK), February 2002;
- 2012 | Invited lecture at New Castle University (UK) “Soft Computing Applications in Structural Dynamic Monitoring”, November 2012
- 2012 | Invited lecture at Hunan University (China) “Performance Based Seismic Design”, 28 September 2012, College of Civil Engineering, Hunan University, Changsha, Hunan (China);
- 2015 | Invited lecture at Xiamen University, November 11th 2016, “Uncertainty in Earthquake Engineering”, Xiamen (China)
- 2015 | Invited lecture “Applications in Structural Dynamic Monitoring”, University of Cagliari
- 2020 | Invited speaker at the on-line Workshop on “Advances in safety assessment of existing reinforced concrete structures”, November 4th, 2020, University of Porto

5.6.4 Technical and Professional Organizations

- 2005 | Invited speaker at the meeting “Costruzioni portanti in blocchi: aspetti strutturali e Tecnologici” in – Workshop organaised by Assoindustria Taranto, Assobeton, “Blocchi e Masselli in Cls: Evoluzione Normativa e Prospettive di impiego”;
- 2006 | Invited speaker at the Workshop organaised by Professional Association of Engineers, Architects and quantity surveyor and Confindustria - “Aspetti progettuali per una struttura durevole”, Matera, 29 November 2006;
- 2008 | Invited speaker at the one day workshop “New standards structural engineering”, presenting a talk “Materials for structural engineering”, organised by Province of Taranto Professional Association of Engineers, Taranto , 20th July 2008
- 2009 | Invited speaker “Modelling of seismic actions, Workshop “Il calcolo delle azioni sismiche e la combinazione degli effetti modali alla luce delle nuove NTC”, organised by Province of Taranto Professional Association of Engineers, Masafra, 16/01/2009
- 2009 | Invited speaker at the workshop “Analysis of seismic risk after the l’Aquila earthquake”, Rotary Club Bari Castello, Bari, 2.10.2009
- 2009 | Invited speaker at the workshop “Terremoto d’Abruzzo 2009: Prime considerazioni ad un mese dal sisma”, organised by 2nd Faculty of Engineering in Taranto, Politecnico di Bari, 8.05.2009

- 2009 Invited speaker at the workshop “Diagnosi e monitoraggio dei dissesti degli edifici”, organized by Province of Matera Association of Geologist, 9.10.2009, Matera
- 2009 Invited speaker at the workshop “Seismic loads modelling”, organised by the Province of Barletta Andria Trani (BAT) Professional Association of Engineers, Bisceglie, 10.11.2009
- 2011 Invited speaker “Scenari nella gestione del ponte mediante tecniche di monitoraggio”, at the Workshop Il Ponte Girevole di Taranto: una salute di ferro? Attualità e prospettive, organised by Politecnico di Bari, Università la Sapienza Roma and Italian Navy, 7.02.2011, Taranto
- 2012 Invited speaker “Il rischio sismico - Prevenzione e controllo sulle strutture industriali”, at the “Giornata sulla sicurezza sul lavoro”, organised by Ente Scuola Edile Taranto - 22/23 June 2012, Taranto
- 2012 Invited speaker at the Workshop “Seismic Safety of Industrial Scaffolds”, organised by ICAM srl , “Una scaffalatura antisismica vale più di un buon formaggio”, 17.12.2012, Noci (Bari)
- 2013 Invited speaker “Protezione sismica di edifici mediante isolamento alla base: una tecnologia matura (?)” at the Workshop “Il Progetto integrato per l’edilizia residenziale pubblica: la ricerca a servizio del territorio”, ARCA Capitanata, Foggia, 7.10.2013
- 2014 Invited speaker “Le Norme Tecniche per le Costruzioni: Aggiornamenti”, Workshop organised by Formedil-Bari, 18.12.2014
- 2014 Invited speaker “Monitoraggio dinamico nelle opere civili”, Auditorium Giovanni Paolo 2nd, organised by Università Europea di Roma, Roma, 12.06.2014
- 2016 Invited speaker “Progettazione sismica con sistemi dissipative” in “Soluzioni per la progettazione antisismica”, workshop organised by Province of Bari Professional Association of Engineers, 27.06.2016
- 2017 Invited speaker “Giornata di studio: Zona Sportiva e Nuovo Stadio: un progetto per la Città di Bitonto”, organised by da Urban Center, Department of urban planning policies of the Municipality of Bitonto, Bitonto July 2017;
- 2017 Invited speaker “Archeologia industriale: La sintesi della forma nella struttura”, in one day workshop “Riqualficazione dei siti dismessi tra rigenerazione urbana e innovazione sociale”- organised by Confindustria - Council of Architects, Planners Landscape and Conservatives of the Province of Bari, Bari July 2017.
- 2019 Invited speaker at the conference “Le Linee guida del Consiglio Superiore dei Lavori Pubblici per la classificazione del rischio, le verifiche di sicurezza ed il monitoraggio dei ponti stradali esistenti. Verifiche di sicurezza ed applicazioni”, 16 June 2019 at Torino (Italy)
- 2022 Invited speaker at the conference “Completamento delle Opere Portuali Pizzoli-Marisabella nel Porto di Bari: giornata di studi”, as expert in structural durability, 28 June 2022 at Bari (Italy) - Provveditorato alle Opere Pubbliche



5.7 Organization of scientific events

5.7.1 Conferences

- 2011 | Member of the Organization Committee of Italian congress of seismic engineering, Anidis 2011, Bari September 2011;
- 2011 | Member of CSC2011 Editorial Board: The Second International Conference on Soft Computing Technology in Civil, Structural and Environmental Engineering - Creta, Chania, September 2011;
- 2012 | Member of the scientific committees at ICACIE2012 - International Conference on Advances in Civil Infrastructure Engineering, September 15-16, 2012, Changsha, China
- 2012 | Member of the Scientific Committees of International Symposium on "Engineering Under Uncertainty: Safety Assessment and Management", (ISEUSAM-2012), January 4 to 6, 2012, at Bengal Engineering and Science University (BESU), Shibpur, India;
- 2012 | Member of the Scientific Committees, "Opensees Days: Modeling, calculation and analysis of structures in seismic areas - First Italian Conference "Rome (Italy), 24-25 may 2012;
- 2013 | Member of CSC2013 Editorial Board: The third International Conference on Soft Computing Technology in Civil, Structural and Environmental Engineering , Cagliari, Sardinia, Italy 3-6 September 2013 (<http://www.civil-comp.com/conf/csc13.htm#edtbrd>);
- 2015 | Member of the International Scientific Committee - 7th International Conference on Structural Health Monitoring of Intelligent Infrastructure in Torino - Turin - Italy, on July 1-3, 2015 (<http://www.shm2nd2015.org/index.html>);
- 2015 | Member of the Committee for the International conference OpenSeesDay Italy 2015, Salerno, 10-11 June 2015 (<http://www.openseesdays.org/>);
- 2015 | Member of the International Scientific Committee - ACE2015 - The 2nd International Symposium on Advances in Civil and infrastructure Engineering, Vietri sul Mare, Italy, 12-13 June 2015 (<http://ace2015.org/>);
- 2015 | Member of the Editorial Board of the Fourth International Conference on Soft Computing Technology in Civil, Structural and Environmental Engineering (CIVIL-SOFT-COMP 2015), Prague, Czech Republic 1-4 September 2015.
- 2016 | Member of the Scientific Committee at the 10th National Conference on "Theory and application of Random Vibration and the 5th National Conference on Stochastic Dynamics of China - International Conference on Theory and Application of Random Vibration (ICTARV 2016)", on 5th and 6th of November 2016, Fuzhou, Fujain Province, P.R.China.
- 2019 | Member of the scientific committee, COMPDYN2019 - International Conference on Computational Methods in Structural Dynamics and Earthquake Engineering (ECCOMAS conference) 22/26 June 2019, Crete (GR)

- 2019 | Member of the scientific committee of the first Eurasian conference on OpenSees days (EOS) 2019, June 2019, Hong Kong

5.7.2 Workshops

- 2009 | Coordinator of the one day Workshop "Terremoto d'Abruzzo prime considerazioni ad un mese dal sisma", organised by Politecnico di Bari, May 8th 2009, Taranto (It);
- 2011 | Scientific coordinator Workshop Il Ponte Girevole di Taranto: una salute di ferro? Attualità e prospettive, organised by Politecnico di Bari-Università la Sapienza Roma, 7 FEBBRAIO 2011, Taranto (Italy)
- 2012 | Scientific coordinator, Workshop "Codes evolution in structural design: from NTC2008 to NTC2012" organizzato da Taranto engineers council, February 12, 2012;
- 2012 | Scientific Coordinator, Workshop "ModelCode 2010, verso le normative strutturali del prossimo ventennio", organized by the Technical University of Bari and Bari Engineers Council, 4 May 2012, Bari;
- 2015 | Member of the Scientific Committee of the Workshop Italy - Portugal in "Structural Monitoring", 26-27 October, Porto;
- 2015 | Member of the Scientific Committee of 4th International Workshop DISS_15 - Dynamic Interaction of Soil and Structure, 12-13 November 2015, Rome (Italy);
- 2016 | Member of the Scientific Committee of international workshop "New Trends in Structural Engineering", 18 July 2016, Fuzhou University, Fuzhou, P.R. China
- 2017 | Member of the scientific committee, international workshop on "Holistic Approach to Sustainability of Existing and New Structures", 30 June -2 July, Fuzhou University, Fuzhou, China.

5.7.3 Courses and Schools

- 2011 | Scientific coordinator of professional course for architects a: first four editions engineering's "Structural Engineering module 1 - reinforced concrete structures", Province of Taranto Scuola Edile;
- 2012 | Scientific coordinator of professional course for architects and engineerings "Structural Engineering module 2nd - Masonry structures", Province of Taranto Scuola Edile;
- 2016 | Chair and Member of the scientific committee "First International Summer School in Structural Morphology", Fuzhou University Fuzhou, Cina, September 12-21 (2016)
- 2017 | Scientific coordinator of the "Second International Summer School in Structural Morphology", Fuzhou University Fuzhou, Cina, September 2017;

- 2017 | Chair of the **Second International Summer School in Structural Morphology** (SSSM2017) in **Fuzhou University**, with Fuzhou University, RomaTre University (IT) and Politecnico di Bari (IT), June 2017;
- 2017 | Member of the scientific committee of the “Second International Short Course - Seismic Analysis of RC Structures Using Opensees”, 3-4 July 2017, Fuzhou University, Fuzhou China;
- 2017 | Member of the scientific committee of the “Second International Short Course -Seismic Analysis of RC Structures Using Opensees”, 6-7 July 2017, Nanjing University, Nanjing China.
- 2018 | Chair of the **third International Summer School in Structural Morphology** (SSSM2018) in **Fuzhou University**, with Fuzhou University, RomaTre University (IT), Politecnico di Bari (IT) and National Technical University of Athens (GR), september 2018;
- 2019 | Chair and scientific committee member of the **fourth International Summer School in Structural Morphology** (SSSM2019) in **Fuzhou University**, with Fuzhou University, RomaTre University (IT), National Technical University of Athens (GR), Politecnico di Bari (IT) and Politecnico di Torino (IT), June 2019;
- 2021 | Chair and scientific committee member of the **fifth International Winter School in Structural Morphology** (SSSM2021) in **Politecnico di Torino**, with Fuzhou University, RomaTre University (IT), National Technical University of Athens (GR) and Politecnico di Torino (IT), December 2021;

5.7.4 Symposiums and Special Sessions

- 2011 | Organiser of special session for the XIV Italian Conference of Seismic Engineering, ANIDIS “Associazione Nazionale di Ingegneria Sismica”, (Bari, 18-21 September 2011), “Structural diagnostic using dynamic monitoring”, organised by Giovanni Fabbrocino, Giuseppe Carlo Marano, Giorgio Monti and Giuseppe Quaranta;
- 2011 | Organizer of special session for the XIV Italian Conference of Seismic Engineering, ANIDIS “Associazione Nazionale di Ingegneria Sismica”, (Bari, 18-21 September 2011), “I Prodotti in Acciaio nella Progettazione Antisismica”, (Bari, 18-21 Settembre 2011), organised by G.C. Marano e Walter Salvatore;
- 2011 | Minisymposium organisation “Fuzzy methods in computational dynamics”, nella 3rd International Conference on Computational Dynamics and Earthquake Engineering (Compdyn2011), Corfu, Greece, May 26-28, 2011, with Michael Beer and Yiannis Tsompanakis;
- 2021 | “Advances in the optimum design and control of large structures under dynamic loads”, Minisymposium organized at the COMPDYN 2021

5.7.5 Guest editor

- 2018 | Guest editor for *Shock and Vibration* Special Issue on "**Vibration Energy Harvesting for Monitoring Dynamical Systems**", editors: *Vikram Pakrashi, Giuseppe Marano, Paul Cahill, Shaikh Faruque Ali, Michele Magno*, *Shock and Vibration*, vol. 2018, Article ID 8396029, 2 pages, 2018.[doi](#)

5.8 Patents and Industrial innovation

5.8.1 International Patents

- 2011 | European Patent - Designation as inventor (under rule 19(3)) European Patent Office, Application N°.11425262.0 - 1255): "Structural Node for Steel-Concrete composite truss joint";
- 2011 | European Patent - Designation as inventor (under rule 19(3)) European Patent Office, Application N°.11425264.6 - 1255): "Non self supporting steel truss for mixed steel-concrete systems";
- 2011 | European Patent - Designation as inventor (under rule 19(3)) European Patent Office, Application N°.11425268.7 - 1255): "Concrete and steel structural node to connect beams to column";
- 2011 | European Patent - Designation as inventor (under rule 19(3)) European Patent Office, Application N°.11425263.8 - 1255): "Self-supporting steel truss for mixed steel-concrete truss system";
- 2015 | European Patent - Designation as inventor "Lightweight resilient concrete sub-base layer with recycled rubber from discarded tyres with reduced walking impact noise" registered as CA2963065 A1 or WO2016051382A1

5.8.2 Industrial innovations

- 2012 | Inventor and Designer of system "**Thor**-structural dynamic monitoring expert system" (<http://thor.waveng.it/Home.html>) for structural monitoring;
- 2021 | Coordinator and Designer of "**PyOma**" - a python module that allows to perform OMA on ambient vibration measurements datasets, that includes the following algorithms: **Frequency Domain Decomposition (FDD)** 1a. Original Frequency Domain Decomposition (FDD) 2a. Enhanced Frequency Domain Decomposition (EFDD) 3a. Frequency Spatial Domain Decomposition (FSDD); **Stochastic Subspace Identification (SSI)** 2a. Covariance-driven Stochastic Subspace Identification (cov-SSI) 2b. Data-driven Stochastic Subspace Identification (dat-SSI)

5.8.3 Innovative companies development

- 2012 /2017 | Associate and founder, of **IDEA** (Innovation, Decision, Environment, Awareness) Research Transfer s.r.l. - Politecnico di Bari Spin Off company;

5.9 International research projects evaluations

- | | |
|-------------|---|
| 2009 | Referee for the National Research Foundation in South Africa to the Project Evaluation for the SA/Germany scientific cooperation agreement; |
| 2010 | Referee for the Chilean National Commission for scientific and technological development (conicyt - chile) to review scientific project presented to the national research funding (Chile) competition; |
| 2010 | Referee for the National Center of science and technology evaluation, Ministry of Education and Science, Astana, Republic of Kazakhstan; |
| 2012 | Referee for the Czech Science Foundation - The Main Public Funding Agency in the Czech Republic supporting all areas of basic scientific research; |
| 2014 | Referee for the National Center of Science and Technology Evaluation, Ministry of Education and Science, Astana, Republic of Kazakhstan; |

5.10 Scientific projects

- | | |
|------------------|--|
| 2009/2011 | Scientific coordinator (designer) of the Industrial and Experimental research project “New construction system (MTR) by mixed steel and concrete cross-sectional elements for structural engineering”, founded by POR Puglia 2007-2013 line 1.1 – action 1.1.2 - “Supports for investments in research for small and medium-sized enterprises”, initial budget 1.059.930,00€ (650.000,00€ final budget); |
| 2010/2011 | Scientific leader of the research project “Dynamic monitoring of strategic structures using soft-computing strategies”, founded by ” Foundation of the savings bank of Puglia ”, (40.000,00€); |
| 2015/2017 | Scientific committee member – project AdriHealthMob - Adriatic Model of Sustainable Mobility in the Health and Care Sector- Strategic Call Adriatic IPA CBC Programme 2007-2013; Budget 6.293.496€ - Sector: Transport and Health – Countries 8 –Partners 17; |
| 2015/2017 | Scientific committee member – project AWARD - Agricultural Waste valorisation for a competitive and sustainable Regional Development- Greece - Italy Programme 2007-2013; Ordinary Call, Budget € 1.803.272,40- Sector: Strengthening competitiveness and innovation; Countries 2, Partners: 6; |
| 2015/2017 | Scientific committee member – project EA SEA-WAY - Europe-Adriatic SEA-WAY - Strategic Call Adriatic IPA CBC Programme 2007-2013; Budget € 6.293.496,41, Countries 8, Partners: 36; |
| 2015/2020 | Member of the Management Committee as Italian delegate in the COST Action ”Quality Specifications for Roadway Bridges, Standardization at a European Level”, Action number TU1406 (2015); |
| 2015 | Scientific Leader of the project “Provincial Foreigner Recruitment Program-Supporting Poor counties, old revolutionary areas and the cooperation between Fujian and Taiwan”. Fujian (P.R. China) (50.000 YUAN); |

- 2016** | Scientific Leader of the project “Provincial foreigner recruitment program -1 hundred talents - Fujian (P.R. China) (200.000 Yuan);
- 2006/2008** | Scientific leader of the research contract “Design, verification and optimization procedures for special and ordinary steel-concrete mixed reticular beams”, founded by Metal.Ri snc (105,000,00€);
- 2008/2009** | Scientific consultant, research project “Electronic Build” - POR Campania 2000/2006 measure 3.17 - Framework agreement on e-government and information society for a metadistrict project of the second phase - (Executive Decree No. 52/06”);
- 2009/2011** | Scientific leader of the research project “RUCOSE”, with Italcementi Spa and Irigom Srl, “Study on the possible uses of recycled tires in concrete structural elements”;
- 2009/2011** | Scientific leader of the research contract between Politecnico di Bari and Avangarde s.r.l., “Design and coding of algorithms for vibration analysis to evaluate quality of dynamic surveys”, as part of the project “ISYMOT”, 39.000,00€;
- 2009/2011** | Scientific leader of the research contract between Politecnico di Bari and Irigom srl, titled “RU.CO.CE” (rubber concrete for civil engineering), founded by Irigom srl, 60.000,00€;
- 2010** | Co-scientific leader of the research contract between Puglia region and Department DICAR of Politecnico di Bari, titled “Srepas - (Preliminary study of the Apulian school heritage)”, € 70.000,00;
- 2010/2013** | Scientific leader of Politecnico di Bari of local research unit - research contract DPC/RELUIS, Line 1, thematic area 1, Task 2 – structures in ordinary and precast reinforced concrete - “Criteria evaluation for Optimum sensors placement for Structural Monitoring: Comparison of Classic and New Generation Algorithms for Structural Monitoring and Identification” (12.750,00 €);
- 2011** | Scientific leader of the research project between Italian Navy and Politecnico di Bari, “preliminary evaluation for the dynamic monitoring of the Taranto’s swing bridge”, founded by Marigeminil (Direzione Genio Militare per la Marina) Taranto, 10.000,00€;
- 2012/2020** | scientific and technical principal investigator of the Research Contract between the Department of Environmental Engineering and Sustainable Development (DIASS) Polytechnic of Bari and the Province of Taranto for “Support activities of verification of structural projects with regard to their compliance with N.T.C. 2008” (first year – 2008 - 20,000 € , following years (to date) € 10,000/year.
- 2014** | Local unit scientific leader- Research Contract with the DPC / RELUIS - Project AQ DPC/ReLUIS 2014-2018 - Line Reinforced Concrete, RS 11 – “Uncertainties in structural evaluation of existing buildings” (20.000,00€);

- 2015 | Local unit scientific leader- Research Contract with the DPC/ReLUIIS- Project AQ DPC/ReLUIIS 2014-2018; Research line “Reinforce concrete structures - WP1 Task 1.1 Techniques for the geometric and mechanical characterization, WP3 Task 3.1 Modelling and analysis methods for complex structures and / or irregular (€ 17,000,00);
- 2016 | Local unit scientific leader- Research Contract with the DPC/ReLUIIS- Project AQ DPC/ReLUIIS 2014-2018; Research lines – Reinforce concrete structures and Special Project – WP1 Task 1.1 Techniques for the geometric and mechanical characterization, WP3 Task 3.1 Modelling and analysis methods for complex structures and / or irregular (€ 4,250.00 + 12.750,00);
- 2016 | National task leader, Project AQ DPC/ReLUIIS 2014-2018 of WP1 - task 1 of research line “Reinforce concrete structures”;
- 2018 | **Polito2China** (*Italian Cooperation project*) , student mobility between Fuzhou and Technical University of Bari (PoliBa, Italy), full supported by PoliBa
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to Politecnico di Bari (10 students from Fuzhou University for 6 months)
to Fuzhou University (8 students from Politecnico di Bari to Fuzhou for 6 months)
Full funded by Politecnico di Bari, about 1.400,00€/month/student
- 2017 | Local unit scientific leader- Research Contract with the DPC/ReLUIIS- Project AQ DPC/ReLUIIS 2014-2018; Research line “Reinforce concrete structures” 11.475,00;
- 2019 | National PI for the RICE Project OPT4MIL, dealing optimization and additive materials technology in civil and structural engineering (110k €)
- 2019 | PI – Bridge safety evaluation with visual inspection – industrial project with the Italian Highway company, (120k€)
- 2020/2022 | Reluis - *Existing Bridges* Scientific research project with the Reluis consortium (300k€)
- 2020/2022 | ASPI - *Verification and validation of bridge vulnerability assessment and retrofitting design* Technical/Scientific research project with the Autostrade per l’Italia (300k€)

6 Teaching

6.1 Academic teaching activities

6.1.1 Innovative teaching

One open question in Universities is how to deal with new environmental and social evolution in society in producing a high quality teaching. Nowadays the evolution of technological environmental conditions has induced a dramatic mutation in young students, as they cloud access with internet and personal devices to an incredible source of information (not necessarily appropriate). The teaching that has been done since a couple o decades ago nowadays is going to be older and older, and a deep question about the approach to properly sustain the top quality in teaching processes is still open; if possible, it has been greater as the COVSARS2 epidemic increases the mutation because of the long distance teaching process that has been done since the beginning of 2020 and is sometime still working.

In this contest it is a primary necessity to upgrade and search new approaches in teaching, especially in technical areas as engineering, where innovations are faster and faster. An interesting experience has been the **Challenge@PoliTO**, an innovative teaching activities carried out at the **Politecnico di Torino**, in particular at the CLIK (Connection Lab and Innovation Kitchen). It is a real challenge to find the most innovative idea in a specific area. 30 Master's Degree students, divided into multidisciplinary teams with different backgrounds from all degree courses, look for new solutions that solve the proposed challenges. I personally have been in charge in one challenge done with the ASPI SpA (Autostrade per l'Italia) to find a solution for an holistic evaluation of existing bridges maintenance cost. The challenge last one semester, equal to 14 weeks, and had been carried out in the second semester of 2022 (**DSS for sustainable infrastructures maintenance by Movyon**). It has been entirely in English and students was divided into groups of 5-6 people, work hard to overcome the challenge by developing the most promising idea. The teams that I coordinated was by professors and mentors, both from a technical and business point of view. At the end of the activity, each team have a presentation pitch of the project, followed by a moment of Q&A and demonstration of the solution.






Another "less conventional" approach (compared with standard university classes) is the Summer/Winter intensive school organised with several students about a specific, well defined theme. My personal experience is a specific Summer School, that I have organised every year since 2016 (except for 2020 because of the pandemic) about the Structural Morphology. The starting point is the reinterpretation of the main consolidated "forms" and the relationships between the spatial configurations and structures. Particular importance will be given to the possible morphological - structural "forms" (through geometric, static and materials logic), rethought in order to obtain new design and production methods. Footbridges are commonly used as case study, analysing both the architectural applications and structural solutions for a number of real configurations.





Computer supports for the geometrical and analytical aspects of structural design are a specific tool that will be used by students to develop the case studies. The summer school will be based on a group design approach and specific lessons done by expert in different fields involved in structural morphology. Working groups are organised in teams composed by students from different countries, both with engineering and architecture backgrounds, to guarantee a complete contamination between form and structure. Each group produces a final project, comprehensive of drawings, animation, 3D rendering and real scale models. As final result, solution developed to properly satisfy both architectural aspects and structural safety requirements will be presented to a public evaluation committee.

6.1.2 international courses

 <p>2012</p>	<p>Loughborough University, (UK)</p> <p>Master of Science's in Civil Engineering 🎓“Structural analysis and mechanics 4 (pre-stressed concrete)” 30 hours - curriculum course</p>
 <p>2016</p>	<p>Fuzhou University, Fuzhou, (P.R. China);</p> <ul style="list-style-type: none">🎓 Bridge Abutment Design🎓 Matlab in structural engineering🎓 Pile design for seismic loads🎓 Pre-stressed Concrete Design <p>module(s) (4h) - Master degree in Civil Engineering</p>
 <p>2017</p>	<p>Fuzhou University, Fuzhou, P.R. China</p> <p>🎓“Soils mechanics” 52 hours: curriculum course - Bachelor in Civil Engineering international bachelor in Civil Engineering and Environmental engineering, Manitoba University (Canada) and Fuzhou University</p>
 <p>2017</p>	<p>Hunan University (P.R. China)</p> <p>🎓“Pre-stressed Concrete Design” Bachelor's in Civil Engineering module (4h)</p>
 <p>2018</p>	<p>Fuzhou University, Fuzhou, (P.R. China);</p> <ul style="list-style-type: none">🎓 Structural Optimization🎓 Bridge Conceptual Design <p>modules (8h) - Master in Civil Engineering/PhD</p>

6.1.3 Bachelor and Master courses

2003/2018



Politecnico di Bari, Bari, (Italy);

- 2003/04 🎓 Structural design I – 6 credits
- 🎓 Structural design II – 6 credits
- 2004/05 🎓 Structural design I – 6 credits
- 🎓 Structural design II – 6 credits
- 2005/06 🎓 Structural design I – 6 credits
- 🎓 Seismic Engineering – 6 credits
- 🎓 Advanced Structural Design – 6 credits
- 2006/07 🎓 Seismic Engineering – 6 credits
- 🎓 Elements of Seismic engineering for environmental engineering – 3 credits
- 2007/08 🎓 Seismic Engineering – 6 credits
- 🎓 Elements of Seismic engineering for environmental engineering – 3 credits
- 2008/09 🎓 Advanced in Structural Design – 6 credits
- 🎓 Elements of Seismic engineering for environmental engineering – 3 credits
- 🎓 Elements of structural automatic analysis – 3 credits
- 2009/10 🎓 Advanced in Structural Design – 6 credits
- 🎓 Elements of Seismic engineering for environmental engineering – 3 credits
- 🎓 Elements of structural automatic analysis – 3 credits
- 2010/11 🎓 Advanced in Structural Design – 6 credits
- 2011/12 🎓 Structural Design II – 6 credits
- 🎓 Advanced structural design – 6 credits
- 🎓 Elements of structural automatic analysis – 3 credits
- 2012/13 🎓 Advanced in Structural Design – 9 credits
- 🎓 Structural Testing – 9 credits
- 2013/14 🎓 Structural design in Lab. of architectural design 2/B - 9 credits
- 2014/15 🎓 Structural design in Lab. of architectural design 2/B - 9 credits
- 2015/16 🎓 Structural design in Lab. of architectural design 2/B - 9 credits
- 2016/17 🎓 Structural design in Lab. of architectural design 2/B - 9 credits
- 2017/18 🎓 Structural design in Lab. of architectural design 2/B - 9 credits
- 2018/19 🎓 Structural design in Lab. of architectural design 2/B - 9 credits

2018/today



Politecnico di Torino, Torino, (Italy);




- 2018/19 🎓 Structural design – 10 credits
- 2019/20 🎓 Structural design – 10 credits
- 2020/21 🎓 Structural design – 10 credits
- 🎓 Structural morphology – 6 credits
- 2021/22 🎓 Structural design – 10 credits
- 🎓 Structural morphology – 6 credits

6.1.4 PhD courses

2003/2018






Politecnico di Bari, Bari, (Italy);

- 2003  Structural dynamics – 3 credits
 - 2004  Structural dynamics – 3 credits
 - 2005  Structural dynamics – 3 credits
- PhD in Civil and environmental engineering;

2015/today






Fuzhou University, Fuzhou, (P.R. China);

- 2015  Probability and Statistic for Civil Engineering – 8 credits
 - 2018  Optimization in civil engineering – 8 credits
 - 2020  Optimization in civil engineering – 8 credits
- PhD in Civil and Structural engineering;

2018/today



Politecnico di Torino, Torino, (Italy);

- 2018/19  Random Vibration – 6 credits
 - 2019/20  Random Vibrations - 6 credits
 - 2020/21  Random Vibrations - 6 credits
- PhD in Civil and Environmental engineering

6.2 Professional courses

- | | |
|-----------|--|
| 1999/2001 | Teaching at the training course "Quality standards in building engineering"; Misura 5.6 Interreg 2nd Italia-Albania", organised by Bari IRIS-CNR, as experts in courses "Standard codes" and "Technology" at the three editions of the course 1999 (20 h), 2000 (110 h) and 2001 (80 h); |
| 2003 | Teaching at the training course "Limit state design of reinforced concrete structures", organised by Province of Taranto Professional Association of Engineers (4 h); |
| 2006 | Teaching at the training course "new seismic codes - OPCM 3274/2003 and 3431/2005", collage of chartered surveyor - province of Taranto (4 h); |
| 2008 | teaching at the one day course organised by the Province of Bari Professional Association of Engineers "DM 14.01.2008 - GU. 7.02.2008 new standard codes for structures and materials" 29/02/2008 (2 h); |
| 2008 | teaching at the training school "new standard code for structural design", organised by CTE, Module "methods for structural analysis", Foggia 13.06.2008 (2 h); |
| 2011 | teaching at the training school "Design and verification with new standard codes" 2nd module - "Inelastic Seismic Spectra", organised by Engineering council of Bari Province (30 h); |
| 2011 | Teaching at the training course "Structural engineering, Module 1 - Buildings in reinforced concrete", organised by Scuola Edile of Taranto's Province (8 h); |
| 2012 | Teaching at the training course "Structural engineering, Module 2nd - masonry buildings organised by Scuola Edile of Taranto's Province (4 h); |
| 2012 | Teaching at the training course in Structural Engineering at CONFAPI Taranto for the F.G.M. Engineering Sud srl " Stress analysis" (30 h); |
| 2012 | Teaching at the training course IFTS "Static and dynamic stability " (24 h) |
| 2019 | Teaching at the training course IFTS "Static and dynamic stability " (24 h) |
| 2020 | Teaching at the "Council of Engineering of Torino", Ductility in concrete structures (18 h) |
| 2021 | Teaching at the "Council of Engineering of Torino", Ductility in concrete structures (18 h) |

6.3 Post degree teaching

- 2003 | International Master (2nd level) “Environmental Policy and Management” - Institut National des Sciences Appliquées (Lion) and Technical University of Bari - modulus “Risk associated to earthquakes”
- 2004 | Master (2nd level) “Safety Engineering” (Technical University of Bari), Modulus “Structural design and nondestructive testing in Civil engineering”
- 2004 | Master (2nd level) “Disaster and Risk and Management” Faculty of Engineering of Taranto, Politecnico di Bari, modulus “seismic engineering”.
- 2005 | International Master (2nd Level) “Environmental Policy and Management” (Institut National des Sciences Appliquées – Lion Technical University of Bari)-, Modulus “Risk associated to earthquakes”.
- 2009 | Master (2nd level) “Innovation in design, rehabilitation and control of structures: assessment and retrofitting in seismic areas” (master MICA), Modulus “Dynamic Structural Monitoring”, Università Roma Tre”, Rome (4 h);
- 2010 | Master (2nd level) “Innovation in design, rehabilitation and control of structures: assessment and retrofitting in seismic areas” (master MICA), module “Dynamic Structural Monitoring”, Università Roma Tre”, Rome (4 h);
- 2011 | Master (2nd level) “Innovation in design, rehabilitation and control of structures: assessment and retrofitting in seismic areas” (master MICA), module “Dynamic Structural Monitoring”, Università Roma Tre”, Rome (4 h);
- 2012 | International Master (2nd level) “Evaluation control and reduction of environmental seismic risk - EU-NICE (Eurasian university network for international cooperation in earthquakes)”, module “Structural health monitoring” e “Monumental structures” (8 h);
- 2015 | MADIS - Master “Dirigenza Scolastica”, module “Structural safety of education buildings”; - University LUM, Casamassima (Bari), (8 h);
- 2015 | International Master (2nd level) EuroProject “Advanced Structural design according Eurocodes (Università la Sapienza Roma); module “reinforce concrete structural design”, (8 h);
- 2015 | Master (2nd level) “Expert in natural and man-made risks” - Polo Scientifico Tecnologico “Magna Grecia” and University of Bari Aldo Moro, module “Structural design”, (4 h);
- 2016 | International Master (2nd level) EuroProject “Advanced Structural design according Eurocodes (University Sapienza Roma); Module in “State limit design” (4 h);
- 2016 | International school “Structural Morphology”, module “Structural optimization”, Fuzhou University, Fujian Province, P.R. of China (4 h);

7 Professional activities

7.1 consultancies

1999/2002	Consultant on structural analysis and design for ECOFORMA srlc (Bari) - European projects (for urban suitable requalification) "HOME" and "Cradle to Cradle"
2009/2010	Consultant of Soft.Lab Srl (Benevento) for developing of structural software;
2014	Consultant of INFOSYS CONSULTING S.r.l. (Bari) for developing structural software code;
2018/today	Consultant of Metal.Ri Srl for new technical solutions of mixed steel and concrete structures;
2020/today	Consultant of Atostrade per l'Italia (ASPI) for supervision of design and assessment of bridges and tunnels;

7.2 designer

1998	Structural designer for the project of reuse of an existing building (ex Snia Viscosa), Municipality of Roma;;
1999	Designer for the structural and functional update of the bridge connecting east residential districts in the municipality of Molfetta (Bari);
1999	Structural consultant for the seismic structural design of new buildings for social houses in Fondo gesù district, municipality of Crotone (IT) - 144 new accommodations) Total action founding £12.000.000.000;;
2000	Consultant as structural designer (main designer Prof. G. Tortorici) for the seismic and functional retrofitting of 17 existing social housing buildings in the municipality of Crotone (district "Fondo Gesù"), total project founds £5.500.000.000 ;
2007	Structural designer of seismic vulnerability assessment of two bridges located in the "invaso del Locone"; commissioned by Province of Bari;
2010	Static tester of structural update of the former ward named "Calderai", in Taranto, on behalf of MARIGENIMIL TARANTO (Italian Navy)
2014/2017	Administrative and technical reviewer for the project "maintenance of docks' flooring, water disposal network and reordering sub-services in the Manfredonia port", total budget 11.400.000,00€
2014/2017	Static tester (in progress) for the structural elements of the project "maintenance of docks' flooring, water disposal network and reordering sub-services in the Manfredonia port", total project amount 11.400.000,00€

G.C. Marano Curriculum Vitae

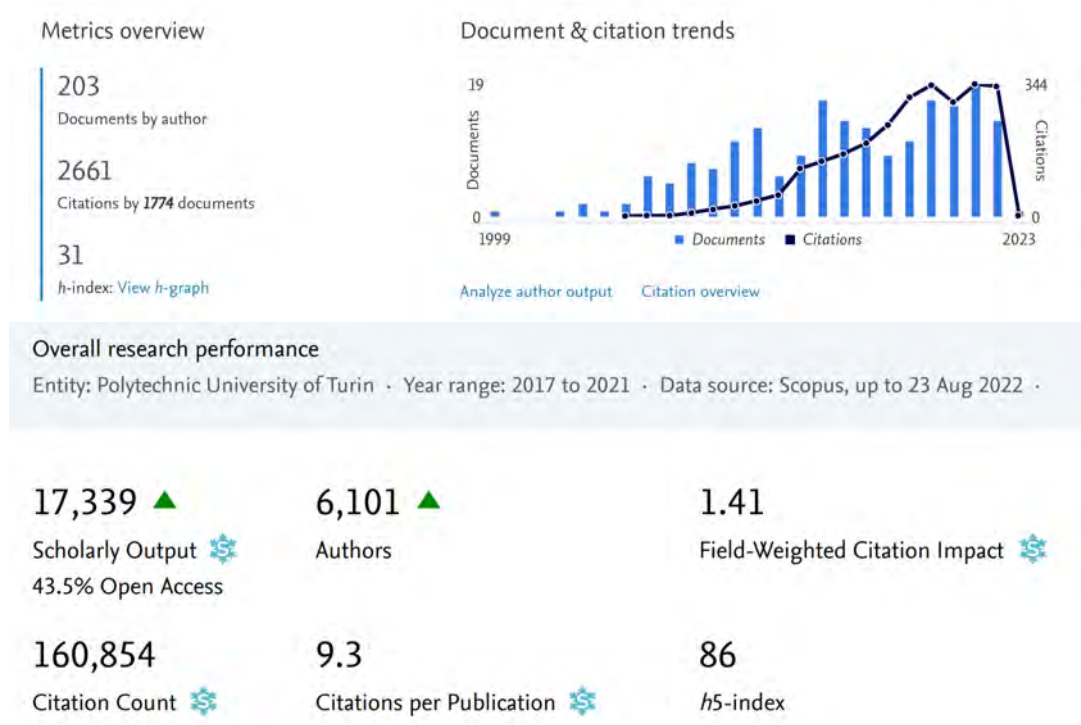
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|------------|---|
| 2016 | Structural designer for seismic vulnerability analysis of the RAI (Italian Broadcast Corporation) Building located in Rome, Via Asiago n. 3-7 called "House of the Soldier" CPRF Rome; |
| 2009 | Static tester in progress of "Updating of building C" at the Naval Military Navy School Officers - Taranto, on behalf of MARIGENIMIL TARANTO (Italian Navy); |
| 2016/2017 | Static tester in progress of a steel structure of Politecnico di Bari, concerning the project ZERO Zero Emission Research Option"; |
| 2016/2017 | Administrative and technical reviewer (during the course of work) of retrofitting and Technical installations updating of an industrial building "ex Officine Scianatico- Polilab" in Bari. Total amount of project € 1.419.239,80 |
| 2016/today | Static tester in progress of project for the seismic retrofitting and functional recovery of existing buildings and new ones of the Foggia hospital "OSPEDALI RIUNITI", Foggia (total project budget 2.541.681,05€ step 1, 9.113.693,10€ step 2); |
| 2014 | Technical and scientific consultant for ARCA Capitanata (Foggia Province Social Housing Administration) for the structural design of two base isolated buildings (social housing with 45 accommodations) named "Comparto Ordona Sud" - Italian national plan for social housing DPCM 16.07.2009 - total project funds 6.366.349,97€;; |
| 2017 | Structural designer, workmanager and security co-ordinator (in progress) of the seismic retrofitting of the Bari Airport Passenger Station - Total design budget 5.323.333,46€.; |
| 2022 | Structural designer, workmanager and security co-ordinator (in progress) of the seismic retrofitting of the Foggia Airport Passenger Station - Total design budget 3M€.; |

8 Publications

8.1 bibliometric information

Giuseppe Carlo MARANO co-authored more than 170 journal papers and about 300 conference and book contributions, received 2700 citations for an h-index of 31 (updated at August 2022 - **Orcid ID:** [0000-0001-8472-2956](https://orcid.org/0000-0001-8472-2956)).

In the following are reported the bibliographically analyses from **Scopus**



Top 5 Research Topic Clusters

Entity: Polytechnic University of Turin · Year range: 2017 to 2021 · Data source: Scopus, up to 23 Aug 2022 ·

Topic Cluster	At this Institution		Field-Weighted Citation Impact	Worldwide Prominence percentile
	Scholarly Output	Publication Share		
Algorithms; Computer Vision; Models TC.0	332	0.13% ▲	1.53	99.799
Buildings; Air Conditioning; Ventilation TC.176	320	0.78% ▼	1.49	97.391
Buckling; Vibration Analysis; Functionally Graded Materials TC.240	292	1.90% ▼	1.43	80.201
Photonics; Optical Communication; Optical Fibers TC.113	265	1.14% ▲	2.20	74.181
Design; Networks (Circuits); Field Programmable Gate Arrays (FPGA) TC.148	246	1.43% ▲	1.16	59.599

8.2 Journals

- [1] M.M. Rosso, A. Aloisio, R. Cucuzza, G.C. Marano, and R. Alaggio. “Train-Track-Bridge Interaction Analytical Model with Non-proportional Damping: Sensitivity Analysis and Experimental Validation”. In: *Lecture Notes in Civil Engineering* 253 LNCE (2023). cited By 0, pp. 223-232. DOI: 10.1007/978-3-031-07254-3_22. URL: https://www.scopus.com/inward/record.uri?eid=2-s2.0-85134343521&doi=10.1007%2f978-3-031-07254-3_22&partnerID=40&md5=96f15ddabd01c358c22295fdd6446a0c.
- [2] A. Aloisio, D.P. Pasca, L.D. Battista, M.M. Rosso, R. Cucuzza, G.C. Marano, and R. Alaggio. “Indirect assessment of concrete resistance from FE model updating and Young’s modulus estimation of a multi-span PSC viaduct: Experimental tests and validation”. In: *Structures* 37 (2022). cited By 6, pp. 686-697. DOI: 10.1016/j.istruc.2022.01.045. URL: <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85123377474&doi=10.1016%2fj.istruc.2022.01.045&partnerID=40&md5=9b944f72821233822643adbed2557f38>.
- [3] P. Castaldo, D. Gino, G.C. Marano, and G. Mancini. “Aleatory uncertainties with global resistance safety factors for non-linear analyses of slender reinforced concrete columns”. In: *Engineering Structures* 255 (2022). cited By 3. DOI: 10.1016/j.engstruct.2022.113920. URL: <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85123577464&doi=10.1016%2fj.engstruct.2022.113920&partnerID=40&md5=475384b1f9732c3ac971bd4f73f9f3bf>.

- [4] R. Cucuzza, G. Devillanova, A. Aloisio, M.M. Rosso, and G.C. Marano. "Analytical solutions for piles' lateral deformations: The nonlinear stiffness case". In: *International Journal of Mechanical Sciences* 229 (2022). cited By 0. DOI: 10.1016/j.ijmecsci.2022.107505. URL: <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85134293362&doi=10.1016%2fj.ijmecsci.2022.107505&partnerID=40&md5=54918715908a110abd13a2338a7080de>.
- [5] F. Di Trapani, A.P. Sberna, and G.C. Marano. "A genetic algorithm-based framework for seismic retrofitting cost and expected annual loss optimization of non-conforming reinforced concrete frame structures". In: *Computers and Structures* 271 (2022). cited By 0. DOI: 10.1016/j.compstruc.2022.106855. URL: <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85134812484&doi=10.1016%2fj.compstruc.2022.106855&partnerID=40&md5=a1d37b4a1d4c6d98285c33413fec0060>.
- [6] F. Di Trapani, G. Tomaselli, A.P. Sberna, M.M. Rosso, G.C. Marano, L. Cavaleri, and G. Bertagnoli. "Dynamic Response of Infilled Frames Subject to Accidental Column Losses". In: *Lecture Notes in Civil Engineering* 200 LNCE (2022). cited By 1, pp. 1100–1107. DOI: 10.1007/978-3-030-91877-4_125. URL: https://www.scopus.com/inward/record.uri?eid=2-s2.0-85121912754&doi=10.1007%2f978-3-030-91877-4_125&partnerID=40&md5=e1813d5078eb36b062987fc56301f809.
- [7] L. He, C. Castoro, A. Aloisio, Z. Zhang, G.C. Marano, A. Gregori, C. Deng, and B. Briseghella. "Dynamic assessment, FE modelling and parametric updating of a butterfly-arch stress-ribbon pedestrian bridge". In: *Structure and Infrastructure Engineering* 18.7 (2022). cited By 1, pp. 1064–1075. DOI: 10.1080/15732479.2021.1995444. URL: <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85119427979&doi=10.1080%2f15732479.2021.1995444&partnerID=40&md5=924e3942545eb7e4de48914e6754689e>.
- [8] A. Manuello Bertetto and G.C. Marano. "Numerical and dimensionless analytical solutions for circular arch optimization". In: *Engineering Structures* 253 (2022). cited By 1. DOI: 10.1016/j.engstruct.2021.113360. URL: <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85121497501&doi=10.1016%2fj.engstruct.2021.113360&partnerID=40&md5=1fd2546f0e0a95842e0388891affa40f>.
- [9] G. Marasco, M.M. Rosso, S. Aiello, A. Aloisio, G. Cirrincione, B. Chiaia, and G.C. Marano. "Ground Penetrating Radar Fourier Pre-processing for Deep Learning Tunnel Defects' Automated Classification". In: *Communications in Computer and Information Science* 1600 CCIS (2022). cited By 0, pp. 165–176. DOI: 10.1007/978-3-031-08223-8_14. URL: https://www.scopus.com/inward/record.uri?eid=2-s2.0-85133002067&doi=10.1007%2f978-3-031-08223-8_14&partnerID=40&md5=a10232a00d1e54dc620ec222af6e9bca.
- [10] S. Marasco, G.C. Marano, and G.P. Cimellaro. "Evolutionary polynomial regression algorithm combined with robust bayesian regression". In: *Advances in Engineering Software* 167 (2022). cited By 0. DOI: 10.1016/j.advengsoft.2022.103101. URL: <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85126143568&doi=10.1016%2fj.advengsoft.2022.103101&partnerID=40&md5=77cc54993ae080d5b10b523cae8ad50d>.
- [11] F. Pellizzari, G.C. Marano, A. Palmeri, R. Greco, and M. Domaneschi. "Robust optimization of MTMD systems for the control of vibrations". In: *Probabilistic Engineering Mechanics* 70 (2022). cited By 0. DOI: 10.1016/j.pro bengmech.2022.103347. URL: <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85135696898&doi=10.1016%2fj.pro bengmech.2022.103347&partnerID=40&md5=e797d4d215b1d5d1edd94f0a8fc462b8>.
- [12] M.M. Rosso, R. Cucuzza, A. Aloisio, and G.C. Marano. "Enhanced Multi-Strategy Particle Swarm Optimization for Constrained Problems with an Evolutionary-Strategies-Based Unfeasible Local Search Operator". In: *Applied Sciences (Switzerland)* 12.5 (2022). cited By 2. DOI: 10.3390/app12052285. URL: <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85125330842&doi=10.3390%2fapp12052285&partnerID=40&md5=26d6c8d9ee17cfa3910086b1354a547d>.
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- [19] F. Di Trapani, A.P. Sberna, and G.C. Marano. "A new genetic algorithm-based framework for optimized design of steel-jacketing retrofitting in shear-critical and ductility-critical RC frame structures". In: *Engineering Structures* 243 (2021). cited By 10. DOI: 10.1016/j.engstruct.2021.112684. URL: <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85109149162&doi=10.1016%2fj.engstruct.2021.112684&partnerID=40&md5=c1fd4eebfabf951a1350cc86e6973db9>.
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- [26] S. Marasco, A. Fiore, R. Greco, G.P. Cimellaro, and G.C. Marano. "Evolutionary Polynomial Regression Algorithm Enhanced with a Robust Formulation: Application to Shear Strength Prediction of RC Beams without Stirrups". In: *Journal of Computing in Civil Engineering* 35.6 (2021). cited By 1. DOI: 10.1061/(ASCE)CP.1943-5487.0000985. URL: <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85111444933&doi=10.1061%2f%28ASCE%29CP.1943-5487.0000985&partnerID=40&md5=3d5cc1d9a1132b46c1e326e04c1c3324>.
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