

# Stefano De Santis

BEng, MScEng, PhD, CEng

## Curriculum Vitae



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### PERSONAL INFORMATION

Date and place of birth: 28 June 1983, Rome, Italy  
Nationality: Italian  
E-mail address: stefano.desantis@uniroma3.it

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### OVERVIEW AND CURRENT POSITION

Stefano De Santis is Associate Professor in Structural Engineering (Tecnica delle Costruzioni) at the Department of Civil, Computer and Aeronautical Engineering of Roma Tre University, in Rome, Italy. He is a member of the Structures Research Group, of the Scientific Board of the PhD School in Civil Engineering, and appointed teacher for the Courses of Design of Steel and Reinforced Concrete Structures (BSc in Civil Engineering) and of Special Structures (MSc in Civil Engineering).

He got his BSc, MSc and PhD in Civil Engineering at Roma Tre University. Before getting his current position, he was a post-doc research assistant at the University of the West of England (UWE) at Bristol, UK (2012), and at Roma Tre University (2013-2017), researcher (RTD/A, 2018-2019) and assistant professor (RTD/B, 2019-2022) at Roma Tre University.

Stefano's scientific interests and expertise include laboratory and field testing of traditional and innovative materials and of full-scale structural members (both unreinforced and reinforced) under static and dynamic/seismic loading, rehabilitation and strengthening of structures with composites, seismic assessment of existing constructions including bridges and cultural/architectural heritage, analytical/numerical modelling, self-sensing smart composites for integrated structural strengthening and monitoring, innovative measurement techniques for laboratory testing and structural health monitoring. On these topics, Stefano coordinated scientific activities involving research and industrial partners and is author of over 100 scientific publications including papers in International Journals, conference proceedings, and a book on masonry arch bridges based on his PhD Thesis, which was awarded a Special Mention at the Edoardo Benvenuto Prize (10th edition, 2012). He presented his works in national and international conferences and has been invited to give lectures and seminars. Stefano is member of the Editorial Board of MDPI Buildings Journal and review editor for the International Journals Frontiers in Materials and Frontiers in Built Environments, and member of the scientific committee of several International Conferences. He has been supervisor of about 40 PhD and MSc Theses and of over 60 BSc Theses.

Stefano was Visiting Researcher at the University of Miami (2016) and at the University of Sheffield (2017), with a Short-Term Scientific Mission grant awarded by the Cost Action TU1207. Stefano is (or has recently been) involved in International Research Projects and is member of Technical Committees, including the RILEM TCs 223-MSC, 250-CSM and 290-IMC, the ASTM D30 Committee, the COST Action TU1207, and the UIC Research Group on Masonry Arch Bridges. Stefano has been member of standardization boards, including the ACI 549-0L Committee "Design and Construction of Externally Bonded Fabric Reinforced Cementitious Matrix (FRCM) Systems for Repair and Strengthening Masonry Structures", the CNR Committee for the development of design recommendations for externally bonded reinforcements with FRCM composites, and the Committee "Guidelines for the design, construction and acceptance testing of FRCM structural reinforcements" (Commissione Relatrice del CSLP "Linee Guida per la progettazione, l'esecuzione e il collaudo di interventi di rinforzo strutturale tramite l'impegno di FRCM").

## RESEARCH ACTIVITIES AND EXPERTISE

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Most of Stefano's studies are, or have been, devoted to the development of innovative and sustainable technologies for the seismic strengthening of existing structures, of innovative measurement and monitoring techniques, and of structural assessment methods. His research aims at contributing to the advancement of knowledge and to its transfer to industry and engineering practice, for a direct exploitation of scientific outcomes. Stefano gained experience and highly contributed to the activities of his research groups in the following specific topics.

- *Characterization, durability and acceptance of composite materials for strengthening existing structures*  
Stefano coordinates the experimental activities within his research group on composite materials, with both organic (fibre/steel reinforced polymer, FRP/SRP) [1-5] and inorganic (textile reinforced mortar/steel reinforced grout, TRM/SRG) [6-17], focused on their mechanical properties [6-8,11-14,17], interlaminar [9,10] and shear bond [2-4,6,8,9,11-17] performance, and durability [5,6,17], and to the development of methods for mechanical characterization [18] and acceptance [19-21].
- *Static and dynamic tests of full-scale structures reinforced with composites*  
Stefano carried out a number of experimental investigations on full-scale specimens. Brick masonry vaults strengthened with different SRG [22] and basalt [23] TRM composites were tested under cyclic loading. Stone and tuff masonry walls and subassemblies underwent shake table tests to investigate their seismic behaviour [24] and the effectiveness of different strengthening solutions, ranging from traditional tie-bars to innovative mortar-based composites, such as SRG [25], basalt TRM [26], Composite Reinforced Mortars (CRM) [27], and low-impact technologies tailored for fair-faced rubble masonry [28].
- *Assessment and design methods for the rehabilitation and seismic retrofitting of architectural heritage*  
Stefano worked on experimental and numerical methods for the seismic assessment of masonry structures, with particular reference to the analysis of local collapse mechanisms [29] and of the out-of-plane response of rubble masonry walls, as well as to the design of strengthening under bending [30] and shear [31], also taking advantage of the expertise gained during post-earthquake assessment of existing buildings [32].
- *Innovative measurement/monitoring techniques for laboratory tests and structural health monitoring*  
Stefano's expertise includes the development of innovative displacement/strain measurement methods, such as the Digital Image Correlation for quasi-static tests [33] and the 3DVision motion capture system for shake table tests [34]. Stefano also worked on the application of the Acoustic Emission (AE) monitoring technique to laboratory tests [35] and field monitoring of masonry arch bridges [36]. Research activities are currently underway devoted to the dynamic identification of structures based on motion magnification, to the expeditious inspection with drones and to the development of self-sensitive smart strengthening systems with the use of fibre Bragg grating sensors and of carbon nanotubes.
- *Mechanical behaviour of masonry, masonry arch bridges and seismic performance of the building stock*  
Stefano carried out experimental investigations on brick masonry, which led to the calibration of a fibre beam-based model for the structural analysis of arch structures [37], which was used for the assessment of masonry arch bridges under traffic loads [38] and seismic actions [39,40]. As regards the seismic assessment of existing structures, Stefano worked at the calibration and validation of a modelling strategy for rubble stone masonry walls under seismic loading through the Distinct Element Method (DEM) [41], on innovative seismic resistant deck-to-pier connections for steel-concrete composite bridges [42].

[1] Compos Part B: Eng, 2016;104:87-110  
[2] Compos Struct 2016;152:499-515  
[3] Mater Struct, 2016;49(7):2581-2596  
[4] Mater Struct, 2016;49(7):2563-2580  
[5] Compos Part B: Eng, 2018;153:194-201  
[6] Compos Struct, 2015;134:533-548  
[7] Compos Part B: Eng, 2015;68:401-413  
[8] Mater Struct, 2014;47(12):2021-2037  
[9] Constr Build Mater 2021;305:124750  
[10] Mater Struct 2021;54:108  
[11] Constr Build Mater 2021;308:124964  
[12] Compos Part B: Eng, 2017;127:175-195  
[13] Compos Part B: Eng, 2017;128:1-18  
[14] Compos Part B: Eng, 2017;127:100-120

[15] Front Built Env, 2020;6:5  
[16] Constr Build Mater 2017;150:367-382  
[17] Constr Build Mater 2022;322:126465  
[18] Compos Part B: Eng, 2017;127:121-132  
[19] Compos Part B: Eng, 2015;78:497-506  
[20] J Compos Constr, 2018;22(6):04018048  
[21] Mater Struct, 2018;51:95  
[22] Compos Part B: Eng, 2018;141:20-36  
[23] Int J Archit Herit 2019;13(7):1061-1077  
[24] Earthq Eng Struct Dyn, 2022;51(5):1245-1266  
[25] Earthq Eng Struct Dyn, 2016;45(2):229-251  
[26] Bull Earth Eng 2019;17(11):6265-6300  
[27] Compos Struct 2021;275:114508  
[28] Constr Build Mater 2021;307:124962

[29] Int J Archit Herit, 2017;11(1):143-160  
[30] Constr Build Mater 2020;240:117946  
[31] Constr Build Mater 2021;279:122452.  
[32] Bollett Geof Teor Appl, 2017;58(4):353-376  
[33] Compos Struct, 2017;160:670-688  
[34] Earthq Struct, 2016;10(1):53-71  
[35] Masonry Int, 2013;26(2):41-48  
[36] NDT & E Int, 2013;55:64-74  
[37] Int J Archit Herit, 2010;4(2):115-137  
[38] Int J Archit Herit, 2014;8(3):452-474  
[39] Earthq Eng Struct Dyn, 2014;43(11):1661-1681  
[40] Struct Infrastruct Eng, 2016;12(11):1439-1464  
[41] Int J Archit Herit, 2019;13(7):1110-1123  
[42] J Constr Steel Res, 2018;150:31-50

### *Activity as editor and reviewer, participation to Scientific Committees of International Conferences*

Stefano is member of the Editorial Board of MDPI Buildings Journal and Review Editor for Frontiers in Materials International Journal, sections Structural Materials, Built Environment and Earthquake Engineering. He also regularly contributes as a reviewer to the following Journals: Materials and Structures, Construction and Building Materials, Composite Structures, Composite Part B: Engineering, International Journal of Architectural Heritage, Proceedings of the ICE: Bridge Engineering, Fibers, Engineering Structures, Case Studies in Construction Materials. Stefano is, or has been, member of the Scientific Committees of the following international conferences:

- **MuRiCo7** 7th Int. Conf. on mechanics of masonry structures strengthened with composite materials. Online conference, 24-26/11/2021. Organizer of a mini-symposium.
- **17th IB2MAC** Int. Brick&Block Masonry Conf., Cracow, Poland, 5-8/07/2020. Organizer of a special session.
- **SAHC2018** 11th Int. Conf. on Structural Analysis of Historical Constructions. Cusco, Peru, 11-13/09/2018
- **Baltic Conference Series**
- **EMAHP2016** Engineering and Medical Aspects of the Humans Protections against Environmental Influences. Cracow, Poland, 16-18/11/2016

### *Participation to scientific and institutional Technical Committees*

Stefano is, or has been, involved in the activities of the following Technical Committees:

- **Rilem TC 223-MSC** Masonry Strengthening with Composites (2008-2012), **Rilem TC 250-CSM** Composites for the Sustainable Strengthening of Masonry (2012-2018) and **Rilem TC 290-IMC** Inorganic Matrix Composites (2018 - present).
- **CSLLPP** (Board of Public Works) Committee “Guidelines for the design, construction and acceptance testing of FRCC structural reinforcements” (Commissione Relatrice del Consiglio Superiore dei Lavori Pubblici “Linee Guida per la progettazione, l’esecuzione e il collaudo di interventi di rinforzo strutturale tramite l’impegno di FRCC”) (2019).
- **CNR** (National Research Council) Standardization Committee for the development of design guideline for externally bonded reinforcements with FRCC composites (Gruppo di Studio CNR per la redazione delle Istruzioni per la Progettazione, l’Esecuzione ed il Controllo di Interventi di Consolidamento Statico mediante l’utilizzo di sistemi di rinforzo FRCC) (2017-2019).
- **ACI 549 - Rilem TC 250 0L** Liaison Subcommittee Design and Construction of Externally Bonded Fabric Reinforced Cementitious Matrix (FRCC) and Steel Reinforced Grout (SRG) Systems for Repair and Strengthening Masonry Structures (2016-2019).
- **ASTM International Committee D30** on Composite Materials - Subcommittee D30.10 on Composites for Civil Structures (2017-2018).
- **Committee of the Board of Engineering of Rome** “Engineering applied to architectural and archaeological heritage” (2017-2019).
- **Committee of the Board of Engineering of Rome** “Composite and innovative materials” (2013-2016).
- **UIC International Railways Union AMAB RG** Assessment of Masonry Arch Bridges (2011-2014).

### *Research projects*

The research activity includes (or has included) the involvement in the following research projects:

- Research project **RIPARA** Sistemi integrati di miglioramento sismico del patrimonio architettonico (Integrated systems for the seismic retrofitting of architectural heritage) funded by Regione Lazio (2021-2023). *Role: WP Leader.*
- Research project **STAND** Stima e analisi del danneggiamento di edifici storici indotto da opere in sotterraneo (Estimate and assessment of damage in historic structures caused by underground works) funded by Regione Lazio (2021-2023). *Role: WP Leader.*
- **ReLUIS 2019-2021** WP 14: Contributi normativi per Materiali Innovativi per Interventi su Costruzioni Esistenti (Contributions to standard codes on innovative materials for applications to existing structures) *Role: Team member.*
- Research project **SICURA** Tecnologie sostenibili per la protezione sismica del patrimonio culturale (Sustainable technologies for the seismic protection of cultural heritage) funded by Regione Lazio (2018-2020). *Role: Team member.*
- Research project **SISMI** Tecnologie per la messa in sicurezza e la ricostruzione dei centri storici in area sismica (Technologies for the protection and reconstruction of historic centres in earthquake prone areas) funded by Regione Lazio (2017-2019). *Role: Task leader.*
- **Short Term Scientific Mission** “Best practice and key challenges in bond tests on composite reinforcements” with a grant awarded by the Cost Action TU1207 Next generation guidelines for composites in constructions (Grant N. COST-STSM-ECOST-STSM-TU1207-130217-082433). *Role: Principal Investigator.*

- **ITALY – USA Science and Technology Cooperation Project Composites with inorganic matrix for sustainable strengthening of architectural heritage** (Topic: Technologies Applied to Cultural and Natural Heritage) Funded by the Italian Ministry for Foreign Affairs (MAECI, Grant ID PGR00234) (2016-2018). *Role: Team member.*
- **SMART ENVironments** Integrated methodologies for Seismic Assessment of Cultural Heritage and Sustainable retrofitting strategies (2015). *Role: Team member.*
- **ReLUIS 2014-2018** Line 1: Masonry constructions. Line 6: innovative materials for the seismic retrofitting of existing structures. *Role: Team member.*
- **COST Action TU1207 2013-2017:** Next Generation Design Guidelines for Composites in Construction. *Role: Team member.*
- **PRIN 2011-2013:** Methodologies for analysis and modelling of multi-leaf masonry walls for the conservation of historic built heritage. *Role: Team member.*
- **UIC 2011-2013:** Assessment of masonry arch bridges. *Role: Team member.*
- **ReLUIS 2010-2013** Line 1: Tools for the assessment and management of the seismic risk of the built heritage. *Role: Team member.*
- **EPSRC 2007-2011:** Fatigue behaviour and remaining service life of masonry arch bridges. *Role: Team member.*
- **ReLUIS 2005-2008** Line 1: Safety assessment and vulnerability reduction of masonry buildings - Line 3: Safety assessment and vulnerability reduction of existing bridges. *Role: Team member.*
- **CNR 2008:** Guidelines for the structural analysis and the strengthening of masonry bridges. *Role: Team member.*
- **PRIN 2003-2005:** Safety, conservation and management of masonry bridges. *Role: Team member.*

### Research agreements

- **Cofunding for a PhD scholarship within the Industrial Doctorate for Innovation and Enterprises** awarded by Regione Lazio and Indagini Strutturali srl (2022-2025). *Role: scientific coordinator (PI).*
- **Structural rehabilitation of the Cathedral of SS Carlo e Biagio** (Risanamento conservativo e consolidamento generale della Chiesa dei SS. Biagio e Carlo ai Catinari). Signed with Carla Tomasi srl. 2021-ongoing. *Role: scientific coordinator (PI).*
- **Development of guidelines for strengthening design with Kerakoll SRG composites** (Linee Guida per la riabilitazione strutturale con sistemi Kerakoll SRG). Signed with Kerakoll SpA. 2010-2016. *Role: Task coordinator.*
- **Experimental characterization of Kerakoll SRG and FRCM composites for the strengthening of masonry structures** (Caratterizzazione sperimentale di sistemi in SRG per il rinforzo ed il miglioramento sismico delle costruzioni murarie). Signed with Kerakoll SpA. 2010-2016. *Role: Task coordinator.*
- **Certification of Steel Reinforced Polymer (SRP) composites in accordance with Italian Guidelines (Certificato di Idoneità Tecnica all’Impiego, CIT) and EAD (European Technical Assessment, ETA).** Signed with Kerakoll SpA. 2015-2016. *Role: Task coordinator.*
- **Certification of Fibre Reinforced Polymer (FRP) and Steel Reinforced Polymer (SRP) composites in accordance with Italian Guidelines (Certificato di Idoneità Tecnica all’Impiego, CIT) and EAD (European Technical Assessment, ETA).** Signed with G&P Intech srl. 2015-ongoing. *Role: Task coordinator.*
- **Certification of Fabric Reinforced Cementitious Matrix (FRCM) and Steel Reinforced Grout (SRG) composites in accordance and EAD (European Technical Assessment, ETA).** Signed with Kerakoll SpA. 2017-ongoing. *Role: Task coordinator.*
- **Certification of Steel Reinforced Grout (SRG) composites in accordance with Italian Guidelines (Certificato di Valutazione Tecnica all’Impiego, CVT).** Signed with Kimia SpA. 2018-ongoing. *Role: Task coordinator.*
- **Shake Table Tests for the seismic retrofitting of masonry structures with Composite Reinforced Mortar and innovative technologies.** Signed with Fibre Net SpA. 2017-ongoing. *Role: Task coordinator.*

### Invited lectures

Stefano has been invited to give the following lectures and seminars:

- Semi key-note speaker at the 17th IB<sup>2</sup>MAC International Brick&Block Masonry Conference “Unconventional measurement techniques in experiments on masonry”, Cracow, PL (5-8/07/2020).
- Invited speaker for the seminars “Experimental characterization of Textile Reinforced Mortars” and “Retrofitting historic structures with Textile Reinforced Mortars” at the University of Sheffield, Sheffield, UK (16-23/02/2017).
- Invited speaker at the meeting of the Edoardo Benvenuto awards, Department of Architecture and Design of the University of Genoa, Italy (22/03/2017).
- Invited speaker at the COST Action TU1207 – Rilem TC 250-CSM Joint Workshop on Textile Reinforced Mortars for the Strengthening of Masonry Structures “Out-of-plane strengthening of masonry walls with mortar-based composites. University of Salento, Lecce, Italy (21/05/2015).

- Invited lecturer at the International Masterclass on Masonry Arch Bridge Assessment. Title of the lecture “Structural analysis and assessment of masonry arch bridges. Italian experience in research and practice” University of the West of England, Bristol, UK (24-25/05/2012).

### ***Presentations at national and international conferences***

Stefano presented his works at the following conferences:

- 12th International Conference on Structural Analysis of Historical Constructions SAHC 2020. Online conference, 29-30 September - 01 October 2021.
- 17th IB<sup>2</sup>MAC International Brick&Block Masonry Conference. Online conference, 5-8 July 2020.
- MuRiCo6 6th International Conference on mechanics of masonry structures strengthened with composite materials. Bologna, Italy, 26-28 June 2019.
- CICE 2018, 9th International Conference on Fibre-Reinforced Polymer (FRP) Composites in Civil Engineering. Paris, France, 17-19 July 2018.
- IMC 2018, 10th International Masonry Conference. Milan, Italy, 9-11 July 2018.
- MuRiCo5 5th International Conference on mechanics of masonry structures strengthened with composite materials. Bologna, Italy, 28-30 June 2017.
- SAHC'16 10th International Conference on Structural Analysis of Historic Constructions. Leuven, Belgium, 13-16 September 2016.
- 16IB<sup>2</sup>MAC 16th International Brick&Block Masonry Conference. Padova, Italy, 26-30 June 2016.
- ACE 2015 2nd International Symposium on Advances in Civil Engineering. Vietri sul Mare, Italy, 12-13 June 2015.
- MuRiCo4 4th International Conference on mechanics of masonry structures strengthened with composite materials. Ravenna, Italy, 9-11 September 2014
- PROHITECH'14 2nd International Conference on Protection of Historical Constructions. Antalya, Turkey, 7-9 May 2014.
- ARCH'13 7th International Conference on Arch Bridge. Split, Croatia, 2-4 October 2013.
- WCEE'12 15th World Conference on Earthquake Engineering. Lisbon, Portugal, 24-28 September 2013.
- XIV Convegno di Ingegneria Sismica ANIDIS 2011. Bari, Italy, 18-22 September 2011.
- ARCH'10 6th International Conference on Arch Bridges. Fuzhou, China, 11-13 October 2010.
- Convegno WonderMasonry 2009. Ischia, Italy, 8-10 October 2009.
- XIII Convegno di Ingegneria Sismica ANIDIS 2009. Bologna, Italy, 28 June-2 July 2009
- HMC'08 Historical Mortar Conference. Lisbon, Portugal, 24-26 September 2008.

### ***Main collaborations***

Stefano's research activity includes the following collaborations:

- Italian Research Council (CNR IGAG) and Italian Civil Protection Department (DPC): for innovative methods for structural model updating based on dynamic monitoring (SMAV method)
- L'Aquila Special Office for post-earthquake reconstruction (USRA): for expeditious methods for seismic vulnerability assessment in earthquake reconstruction
- Institute for environmental protection and research (ISPRA): for integrated post-earthquake emergency works and seismic retrofitting
- ANAS and Niccolò Cusano University: for the development of non-destructive inspection of structures and infrastructures methods with drones
- Proff. Paulo Lourenço and Daniel Oliveira, University of Minho, Guimaraes, PT: for the characterization of mortar-based composites, textile-to-matrix bond, and durability
- Prof. Antonio Nanni, University of Miami, Miami, US: on acceptance of Textile Reinforced Mortar (TRM) composites and on design criteria for repair and strengthening existing structures with TRMs
- Prof. Arkadiusz Kwiecien, Cracow University of Technology, Cracow, Poland: Collaboration on Digital Image Correlation and on composite materials with highly deformable matrices
- Prof. Maurizio Guadagnini, University of Sheffield, Sheffield, UK: on composite materials with natural fibres and on multi-ply steel reinforcements
- Proff. Bahman Ghiassi and Georgina Thermou, University of Nottingham, Nottingham, UK: on mechanical characterization of TRM and SRG reinforcements
- ENEA, Italian Agency for New Technologies and Sustainable Development, Italy: for shake table tests on full-scale structures, unconventional optical monitoring systems (3DVision), and structural monitoring with optical fibres housing Fibre Bragg Grating (FBG) sensors
- Prof. Thanasis Triantafyllou, prof. Corina Papanicolaou: on test methods for the characterization of composite materials
- Dr. Adrienn Tomor, University of the West of England, Bristol, UK, Mistras NDT Products & Systems, Inc. (Cardiff, UK): on Acoustic Emission technique and structural health monitoring

- Cooperation with industrial partners (Fibrenet srl, G&P Intech srl, Kerakoll SpA, Ruredil SpA, Kimia SpA) for the development, testing and qualification of composite materials and reinforcement solutions. These activities led to the publication of scientific papers and to the achievement of formal technical qualification certificate for FRP and SRP systems.
- Cooperation with Italian Civil Protection and Italian National Fire Corps: for post-earthquake emergency activities related to structural assessment, survey of damage, and design of securing measures on residential and commercial buildings, churches, architectural heritage and monuments.

### ***Professional activity as practitioner***

Stefano works as a practicing engineer and is involved in the design of post-earthquake repair, structural rehabilitation and seismic retrofitting of historic masonry buildings and churches. The most important works include, amongst others, Palazzo Ciolina-Ciampella and San Bernardino cathedral in the city centre of L'Aquila, Italy. These activities included structural and crack pattern survey, field tests during the design and the execution phases, numerical modelling of structural members (e.g., vaults, walls, floors) for seismic assessment, design of strengthening works with traditional and innovative technologies, such as mortar-based externally bonded composite materials.

### ***Teaching activity and supervision of grad and postgrad students***

Stefano is currently in charge of the following courses:

- **Design of Steel and Reinforced Concrete Structures.** BSc course in Civil Engineering at the Department of Engineering of Roma Tre University (Tecnica delle Costruzioni, 72h, 9 CFU, SSD Icar/09) (<https://www.romatrestrutture.eu/course/steel-and-reinforced-concrete-structures/>)
- **Special Structures.** MSc course in Civil Engineering for Natural Risk Mitigation at the Department of Engineering of Roma Tre University (Strutture Speciali, 63h, 7 CFU, SSD Icar/09) (<https://www.romatrestrutture.eu/course/special-structures/>)

Stefano is member of the Teaching Board of Civil Engineering and, since 2018, supervised over 30 MSc theses and over 60 MSc theses. Since 2013, Stefano is member of the Commission for the Examination for the professional qualification in Engineering.

### ***Supervision of PhD students***

Stefano is member of the Scientific Board of the PhD School in Civil Engineering and is or has been supervisor of 4 PhD Students:

- Francesca Roscini (XXX Cycle, 2014-2018) "Strengthening of masonry vaults with Steel Reinforced Grout" (European Label award)
- Pietro Meriggi (XXXIII Cycle, 2017-2021) "Fabric Reinforced Cementitious Matrix systems for the strengthening of masonry: experimental investigation and design rules" (European Label award)
- Sara Fares (XXXV Cycle, 2019-ongoing) "Mechanical characterization and durability of Fabric Reinforced Cementitious Matrix (FRCM) composites"
- Giovanni Moretti (XXXVII Cycle, 2021-ongoing) "Dynamic monitoring and condition assessment of retrofitted structures in earthquake prone areas" (cofunded by Regione Lazio and Indagini Strutturali srl)

## **PREVIOUS EMPLOYMENTS**

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2022-present	Associate Professor in Structural Engineering at the Department of Engineering of Roma Tre University, SC 08/B3 - SSD ICAR 09 - Tecnica delle Costruzioni.
2019-2022	Tenured researcher in Structural Engineering at the Department of Engineering of Roma Tre University (Ricamatore Universitario a tempo determinato ai sensi dell'art. 24, C. 3, lett. B) l. 240/2010), SC 08/B3 - SSD ICAR 09 - Tecnica delle Costruzioni.
2018-2019	Researcher in Structural Engineering at the Department of Engineering of Roma Tre University (Ricamatore Universitario a tempo determinato ai sensi dell'art. 24, C. 3, lett. A) l. 240/2010), SC 08/B3 - SSD ICAR 09 - Tecnica delle Costruzioni. He waived before the end of the contract.
2018	Research Contract as Consultant with the Department of Engineering of Roma Tre University "Sviluppo e stesura di linee guida per le applicazioni dei sistemi FRCM/TRM nel rinforzo delle strutture esistenti in muratura". (Development of design guidelines for the reinforcement of existing masonry structures with for FRCM/TRM systems).
2018	Teaching contract as appointed professor of Design of Steel and Reinforced Concrete Structures within the BSc course in Civil Engineering at the Department of Engineering of Roma Tre University (Tecnica delle Costruzioni, 72h, 9 CFU, SSD Icar/09).

2016-2017	Research assistant at the Department of Engineering, Roma Tre University, within the research project “Mortar-based composites for the sustainable strengthening of architectural heritage”.
2017	Research Contract as Consultant with the Department of Engineering of Roma Tre University “Sperimentazione in situ ed in laboratorio di volte in foglio rinforzate con sistemi Steel Reinforced Grout” (Field and laboratory testing of masonry vaults strengthened with Steel Reinforced Grout systems).
2016	Research Contract as Consultant with the Department of Engineering of Roma Tre University “Controllo di accettazione di Compositi FRCC-Fabric Reinforced Cementitious Matrix” (Qualification and Acceptance of FRCC Composites)
2011-2016	Research assistant at the Department of Engineering, Roma Tre University within a research project titled “Criteria and methodologies for the seismic assessment of masonry structures”.
2015	Research Contract as Consultant with the Department of Engineering Roma Tre University “Numerical simulations for fragility curves evaluation of steel storage tanks”
2011	Research assistant at UWE (University of the West of England) at Bristol within the research project “Fatigue behaviour and remaining service life of masonry arch bridges” (experimental tests on the fatigue strength of masonry and on the condition assessment of masonry bridges with the acoustic emission monitoring technique).
2007-2010	Ph.D. in Science of Civil Engineering. Roma Tre University, Department of Structures. Title of the Doctoral Thesis: “Load carrying-capability and seismic assessment of masonry bridges”. Position provided with a 3-year scholarship.

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## EDUCATION, QUALIFICATIONS, PROFESSIONAL LICENCES

### *Education*

2018	National Scientific Qualification as Associate Professor in Structural Engineering (Abilitazione Scientifica Nazionale alle funzione di Professore di II Fascia, SC 08/B3 – Tecnica delle Costruzioni). 20 September 2018.
2007-2011	Ph.D. in Civil Engineering. Roma Tre University, Department of Structures. Title of the Doctoral Thesis: “Load carrying-capability and seismic assessment of masonry bridges”. 11 April 2011. The Ph.D. Thesis was awarded a special mention in the final judgement of the jury of the Edoardo Benvenuto Prize (10th Edition, year 2012).
2005-2007	Master’s Degree in Engineering for the Protection of Territory from Natural Risks – Specialization Area: Structures and Seismic Risk, Roma Tre University. Mark: 110/110 cum Laude. Title of the thesis: “Modelling of masonry walls as thin plates”. Homogenization and limit analysis of periodic masonry walls. 4 October 2007.
2002-2005	Bachelor’s Degree in Civil Engineering – Specialization Area: Civil Buildings, Roma Tre University. Mark: 110/110 cum Laude. Title of the thesis: “Analysis of masonry elements subjected to eccentric axial load through the fibre beam model: determination of material properties”. 28 September 2005.
2002	High school leaving qualifications, Senior high school specializing in science education “Amedeo Avogadro”, Rome. Mark: 100/100.

### *Other titles*

2007	GRE (Graduate Record Examination) General Test, ETS. Mark: 800/800 Quantitative section (94 percentile) and 550/800 Verbal section (80 percentile).
2007	TOEFL (Test of English as a Foreign Language), ETS. 104/120.
2002	FCE (First Certificate in English), University of Cambridge. Mark: Grade B. Trinity College of London: Grade 7 (1998), 6 (1997), 5 (1996), 4 (1995), 3 (1994).

### *Professional licences*

2009	Licence to the professional activity of Civil and Environmental Engineer (February 2008). Stefano is registered in the Board of Engineers of Rome, Section A (Civil and Environmental Engineering) at n. 30084 (19/01/2009).
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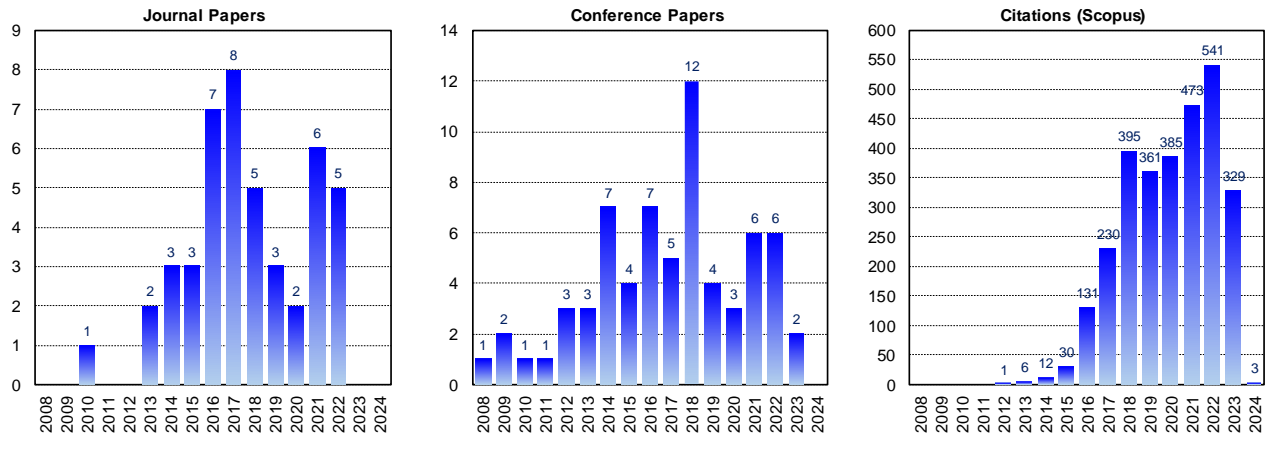
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## LANGUAGE SKILLS

- English: fluent knowledge of both written and spoken language (FCE and TOEFL exams).
- French: basic knowledge of written and spoken language.

**Overview of scientific publications and bibliometric indicators**

- International Journal papers: **45** (2 as single author, 16 as first author with co-authors)
- Conference papers: **66** (58 International Conferences, 8 National Conferences, all with peer review)
- National Journals: 3
- Total indexed documents: **75** (source: Scopus)
- Citations: **2897** (source: Scopus)
- H-index: **28** (source: Scopus)



**International Referred Journals**

2022 De Santis S. An expeditious tool for the vulnerability assessment of masonry structures in post-earthquake reconstruction. *Bulletin of Earthquake Engineering* 2022. DOI: 10.1007/s10518-022-01528-3. In press.

de Felice G, De Santis S., AlShawa O, Liberatore D, Roselli I, Sangirardi M, Sorrentino L. A new non-invasive method for the seismic retrofit of rubble masonry using composite connectors. *International Journal of Masonry Research and Innovation* 2022. DOI: DOI: 10.1504/IJMRI.2022.10051746.

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Fares S, Fugger R, De Santis S., de Felice G. Strength, bond and durability of stainless Steel Reinforced Grout. *Construction and Building Materials* 2022;322:126465. DOI: 10.1016/j.conbuildmat.2022.126465. ©

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De Santis S., de Felice G. Shake table tests on a tuff masonry structure strengthened with composite reinforced mortar. *Composite Structures* 2021;275:114508. DOI: 10.1016/j.compstruct.2021.114508. ©

Thermou GE, De Santis S., de Felice G, Alotaibi S, Roscini R, Hajirasouliha I, Guadagnini M. Bond Behaviour of Multi-Ply Steel Reinforced Grout Composites. *Construction and Building Materials* 2021;305:124750. DOI: 10.1016/j.conbuildmat.2021.124750. ©

Dalalbashi A, De Santis S., Ghiassi B, Oliveira DV. Slip rate effects and cyclic behaviour of textile-to-matrix bond in textile reinforced mortar composites. *Materials and Structures* 2021;54:108. DOI: 10.1617/s11527-021-01706-w. ©



- Meriggi P, De Santis S, Fares S, de Felice G. Design of the shear strengthening of masonry walls with fabric reinforced cementitious matrix. *Construction and Building Materials* 2021;279:122452. DOI: 10.1016/j.conbuildmat.2021.122452. [📄](#)
- 2020 de Felice G, D'Antino T, De Santis S, Meriggi P, Roscini F. Lessons learned on the tensile and bond behaviour of Fabric Reinforced Cementitious Matrix (FRCM) composites. *Frontiers in Built Environment*, section Earthquake Engineering 2020;6:5. DOI: 10.3389/fbuil.2020.00005. [📄](#)
- Meriggi P, de Felice G, De Santis S. Design of the out-of-plane strengthening of masonry walls with fabric reinforced cementitious matrix composites. *Construction and Building Materials* 2020;240:117946. DOI: 10.1016/j.conbuildmat.2019.117946. [📄](#)
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- De Santis S, Hadad HA, De Caso y Basalo FJ, de Felice G, Nanni A. Acceptance Criteria for Tensile Characterization of Fabric Reinforced Cementitious Matrix (FRCM) Systems for Concrete and Masonry Repair. *Journal of Composites for Construction* 2018;22(6):04018048. DOI: 10.1061/(ASCE)CC.1943-5614.0000886. [📄](#)
- De Santis S, Roscini F, de Felice G. Full-scale tests on masonry vaults strengthened with Steel Reinforced Grout. *Composites Part B: Engineering* 2018;141:20-36. DOI: 10.1016/j.compositesb.2017.12.023. [📄](#)
- 2017 Di Ludovico M, Digrisolo A, Graziotti F, Moroni C, Belleri A, Caprili S, Carocci C, Dall'Asta A, De Martino G, De Santis S, Ferracuti B, Ferretti D, Fiorentino G, Mannella A, Marini A, Mazzotti C, Sandoli A, Santoro A, Silvestri S, Sorrentino L, Magenes G, Masi A, Prota A, Dolce M, Manfredi G. The contribution of ReLUIS to the usability assessment of school buildings following the 2016 central Italy earthquake. *Bollettino di Geofisica Teorica ed Applicata* 2017;58(4):353-376. DOI: 10.4430/bgta0192. [📄](#)
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- De Santis S, Casadei P, De Canio G, de Felice G, Malena M, Mongelli M, Roselli I. Seismic performance of masonry walls retrofitted with steel reinforced grout. *Earthquake Engineering and Structural Dynamics*, 2016;45(2):229-251. DOI: 10.1002/eqe.2625. [S](#)
- de Felice G, Aiello MA, Bellini A, Ceroni F, De Santis S, Garbin E, Leone M, Lignola GP, Malena M, Mazzotti C, Panizza M, Valluzzi MR. Experimental characterization of composite-to-brick masonry shear bond. *Materials and Structures*, 2016;49(7):2581-2596. DOI: 10.1617/s11527-015-0669-4.
- Kwieceń A, de Felice G, Oliveira DV, Zając B, Bellini A, De Santis S, Ghiassi B, Lignola GP, Lourenço PB, Mazzotti C, Prota A. Repair of composite-to-masonry bond using flexible matrix. *Materials and Structures*, 2016;49(7):2563-2580. DOI: 10.1617/s11527-015-0668-5. [S](#)
- 2015 De Santis S, de Felice G. Steel reinforced grout systems for the strengthening of masonry structures. *Composite Structures*, 2015;134:533-548. DOI: 10.1016/j.compstruct.2015.08.094.
- Ascione L, de Felice G, De Santis S. A qualification method for externally bonded Fibre Reinforced Cementitious Matrix (FRCM) strengthening systems. *Composites Part B: Engineering*, 2015;78:497-506. DOI: 10.1016/j.compositesb.2015.03.079. [S](#)
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- 2014 de Felice G, De Santis S, Garmendia L, Ghiassi B, Larrinaga P, Lourenço PB, Oliveira DV, Paolacci F, Papanicolaou CG. Mortar-based systems for externally bonded strengthening of masonry. *Materials and Structures*, 2014;47(12):2021-2037. DOI: 10.1617/s11527-014-0360-1.
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- 2013 Tomor AK, De Santis S, Wang J. Fatigue deterioration process of brick masonry. *Masonry International*, 2013;26(2):41-48. [S](#)
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### **National Journals**

- 2016 de Felice G, De Santis S. Il rinforzo delle volte in laterizi con sistemi SRG. *Compositi magazine* 2016;40:50-55.
- 2015 Carozzi FG, de Felice G, De Santis S, Poggi C. Materiali compositi a matrice inorganica (FRCM) per il rinforzo di strutture in muratura. Round Robin Test per la caratterizzazione meccanica. *Compositi magazine* 2015;37:23-26.
- 2009 de Felice G, De Santis S, Martinelli A, Petracca A. Palazzo Ciolina a L'Aquila. Speciale Monumenti Dannati. Università sul campo: il come e il perché dei danni a 48 monumenti in Abruzzo. Il giornale dell'arte, Ottobre 2009.

### **Books / Research Monographs**

De Santis S. 2015. Load carrying capacity and seismic behaviour of masonry arch bridges. From experimental testing to structural assessment. Scholars' Press: Saarbrücken, Germany. ISBN: 978-3-639-51179-6.

### **Contributions to Books**

de Felice G, De Santis S, Martinelli A, Petracca A. 2012. Palazzo Ciolina a L'Aquila. In: *L'università e la ricerca per l'Abruzzo: il patrimonio culturale dopo il terremoto del 6 Aprile 2009*. Ed. Textus. ISBN: 978-8-887-13280-9.

De Santis S, Imbimbo M, Marfia S, de Felice G, Grande E, Stavole M. 2021. Materiali compositi innovativi per il miglioramento sismico del patrimonio edilizio. In: *Progetto SISMI-DTC Lazio. Conoscenze e innovazioni per la ricostruzione e il miglioramento sismico dei centri storici del Lazio*. Ed. Quodlibet Studio. ISBN: 978-88-229-0557-4.

### **National and International Conference Proceedings**

2023 De Santis S, Moretti G, Caponero MA, Fares S, Mazzotta C, Dell'Erba D. Investigation on a prototype integrated system for strengthening and monitoring architectural heritage. 2023 IMEKO TC-4 International Conference on Metrology for Archaeology and Cultural Heritage. Rome, Italy, 19-21 October 2023.

de Felice G, De Santis S, Liberatore D, Roselli I, Sangirardi M, AlShawa O, Sorrentino L. New Technologies for the Seismic Protection of Stone Masonry in Earthquake-Prone Regions. fib Symposium 2023 Building for the Future: Durable, Sustainable, Resilient. fib Symposium 2023. Lecture Notes in Civil Engineering, 2023;350:765-774. DOI: 10.1007/978-3-031-32511-3\_79.

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De Santis S, Meriggi P, Fares S, de Felice G. Design relationships for the strengthening of masonry walls with mortar-based composites. 8th European Congress on Computational Methods in Applied Sciences and Engineering, ECCOMAS Congress 2022. Oslo, Norway, 5-9 June 2022. [📄](#)

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AlShawa O, De Canio G, de Felice G, De Santis S, Forliti S, Liberatore D, Mirabile Gattia D, Perobelli S, Persia S, Roselli G, Sorrentino L. Investigation of rubble-masonry wall construction practice in Latium, Central Italy. 12th International Conference on Structural Analysis of Historical

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Date:  
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Signature:

*Stefano De Santis*