Curriculum Vitae

Dr. Luis Carlos Martins da Silva

17 December 2024

Ricercatore tempo determinato RTDa at Politecnico di Milano
Settore Scientifico Disciplinare CEAR-06/A - Mechanics of Solids and Structures

Contents

1 Personal information

Name: *Luís Carlos* Surname: *Martins da Silva*
Nationality: *Portuguese* Date of birth: *04/06/1989*
Civil state: Single Hometown: Viana do Castelo

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SCOPUS ID: *57162064900* , H-index 13 , citations=478
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Website: *www.dabc.polimi.it/en/persona/luis-carlos-martins-da-silva/*

Research interests:
My current research interests focus on developing and applying numerical strategies for the mechanical analysis of heterogeneous materials. I am a strong advocate for multi-scale analysis and discrete-based approaches. Consequently, my work is centered on the development and implementation of homogenization-based strategies coupled with Rigid-Body-Spring models. I have extensively applied this approach to the analysis of traditional materials like masonry. Since started my current position, I have been investigating the mechanical analysis and design of structured meta-materials. The mathematical model developed during this period - with a discrete nature, thence an extension of my doctoral studies - presents a promising tool for the numerical modeling, but also as a framework for designing micro-structures for these materials. Currently, I have designed two complex micro-structures with exotic mechanical properties, incorporating both geometric and material nonlinear responses. My goal is to publish soon these findings and, with the support of data collected in the lab during my time as an RTDA, to further extend the model to encompass multi-physics phenomena, such as electro-mechanical behavior. I believe that my research background, experience, and expertise align well with the scope of the research project for this open position.

2 Career and Education

2.1 Academic positions

Current Position

National Scientific habilitation as Associate Professor in ICAR 08/B2 (Structural mechanics), 2023

Assistant Professor (rtd-a) A.B.C. Department, Milan
Politecnico di Milano Jan. 2022 - Present

- Current Research with focus on multi-physics of metamaterials under PON Research and Innovation 2014–2020, and research project code (CUP) D45F21003530001: 'Multiphysics of innovative micro-structured materials with adaptive mechanical properties for the safety and optimal performance of constructions'

Research period in industry under the current rtd-a position
At DOLPHIN FLUIDICS s.r.l. Nov 2023 to 30 May 2024

- Joint collaboration with the Department of Physics at the University of Milan, on the development of an elastomer with conductive particles (electro-elastomer), intended for use in measuring hydraulic pressures. The target application is in the biomedical field, where the first prototypes are currently being developed. For the solutions studied, data on the electrical hysteresis with the mechanical out-of-plane deflections (multi-physics) have been gathered.

Vice-Director of the Civil Engineering Bachelor's course Faculty of Engineering, Lisbon
Universidade Lusófona de Humanidades e Tecnologias Set. 2020 - Jan. 2022
- General administrative role in the academic program

Assistant Professor Faculty of Engineering, Lisbon
Universidade Lusófona de Humanidades e Tecnologias Set. 2020 - Jan. 2022
- Teaching activity in Bachelor's and Master level
- Research activity

Post-doctoral researcher School of Engineering, Campus Azurém, Guimarães
University of Minho Oct 2019 - Aug 2020
Under RESIST2020: project funded by Portuguese Foundation for Science and Technology (Portugal)
- Project focus: seismic rehabilitation of historic buildings made of masonry-concrete systems (so-called 'placa' buildings) — Reabilitação Sísmica de Edifícios Antigos de Alvenaria-Betão.

2.2 Professional positions

Structural Engineer Viana do Castelo
SprenPlan - Engineering Oct 2013 - Oct 2014
- Design of steel structures (Industrial and Commercial facilities)
- Responsible for the implementation of the Building Information Modelling (BIM) framework

2.3 Education

PhD degree in Civil Engineering *(cum laude)* School of Engineering, Campus Azurém, Guimarães
University of Minho Nov 2014 - Jun 2019
Thesis tittle: Dynamic analysis of out-of-plane loaded masonry walls using homogenization
- Supervisor: Prof. Dr. Paulo B. LOURENÇO
- Co-supervisor: Prof. Dr. Gabriele MILANI

Defence: June, 11 2019
Committee:
- President: Prof. Dr. António CORREIA (UMinho)
- Examiner: Dr. José V. LEMOS, National Laboratory of Civil Engineering, Portugal (LNEC)
- Examiner: Prof. Dr. Romeu VICENTE, University of Aveiro, Portugal (UAveiro)
- Internal Examiner: Prof. Dra. Graça VASCONCELOS, University of Minho, Portugal (UMinho)

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MSc degree in Civil Engineering School of Engineering, Campus Azurém, Guimarães
University of Minho Sep 2008 - Sep 2013
Integrated Masters in Civil Engineering (Structures) **GPA:** 17/20 (ECTS scale A - Percentile 1%)
Thesis Tittle: Seismic assessment of the ChristChurch Catholic Basilica, New Zealand
- Supervisor: Prof. Dr. Paulo B. LOURENÇO
- Co-supervisor: Dr. Nuno MENDES

Defence: September, 26 2013
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2.4 Technical skills

Software

Text and spreadsheet software: Microsoft Office, LaTeX. MathCAD
Drawing and modelling software: AutoCAD, REVIT (Structures), TEKLA Structures
Structural Analysis software: TNO DIANA, ABAQUS (user sub-routines), ROBOT, MIDAS, SAP2000
Programming language: MATLAB, PYTHON, FORTRAN

Languages

Mother tongue:	Portuguese
Other languages:	English (Professional level)
	Italian (independent)
	Spanish (independent)

2.5 Awards and Scholarships

Ph.D. Scholarship 2013 Foundation for Science and Technology of Portugal - FCT
Scholarship reference SFRH/BD/95086/2013.
Ranked as 3^{rd} in 14 grant holders/130 candidates at a national level and included all Civil Engineering fields: structural, geotechnical, hydraulics and construction.

Mobility training grant 2021 Erasmus+ mobility funding
Host Institution: Politecnico di Milano (14-19 June)

Academic year 2011-2012 Merit Award School of Engineering

CYPE CAD award 2012 (Best student RC structures II) Top informatica

Recognition Top Cited Article 2020-2021 Wiley Publisher
Numerical homogenization-based seismic assessment of an English-bond masonry prototype: Structural level application, pusblished in *Earthquake Engineering & Structural Dynamics*

2.6 Main scientific/professional consulting activities

Technical report. Number 2018-DEC/E-12: *Diagnostic and remedial measures for the building of Tribunal da Relação in Guimarães*.
Department of Civil Engineering, University of Minho.
From 15-12-2018 to 17-02-2019
Structural consultancy provided for the Municipality of Guimarães (Portugal) for the diagnosis and definition of interventions for the structural and non-structural safety of the 'Relação' court (court of appeal).
The specialized work was carried out by a research group from Historic Masonry Structures (HMS) at the Institute for Sustainability and Innovation in Structural Engineering (ISISE), University of Minho.

Report authors: Mendes, L. C. Silva, Jorge Branco, Paulo B. Lourenço.

Technical report. Number 2019-DEC/E-14: *Diagnostic and remedial measures for the subterranean parking garage of the Praceta 25 de Abril in Vila Nova de Gaia*
Department of Civil Engineering, University of Minho.
From 19-12-2019 to 20-03-2020
Structural consultancy provided for the Municipality of Vila Nova de Gaia (Portugal) for the structural diagnosis and reinforcement of the underground parking garage in Praceta '25 de Abril' in Vila Nova de Gaia, conducted by the Department of Civil Engineering, University of Minho. The specialized work was carried out by a research group from Historic Masonry Structures at the Institute for Sustainability and Innovation in Structural Engineering (ISISE), University of Minho.

Report authors: Nuno Mendes, L. C. Silva, Paulo B. Lourenço.

Authorship of a Technical Book for the Regional Civil Engineering Laboratory of the Azores (LREC)
From 08-02-2020 to 24-08-2022

The book provides insights into the fundamentals of diagnostics, testing, masonry mechanics, structural analysis of masonry buildings, and consolidation interventions.

Book Title: *Manual de Avaliação de Segurança Sísmica e Reforço de Edifícios Tradicionais de Alvenaria dos Açores / Manual for the Seismic Safety Evaluation and Strengthening of Traditional Masonry Buildings in the Azores*
Published by LREC Azores, Regional Laboratory of Civil Engineering (in Portuguese)

Authors: Dr. Rui Marques, Dr. Luis C. Silva, Dr. Tiago M. Ferreira, Dr. Elisa Poletti, Dr. Pedro Medeiros, and Prof. Paulo B. Lourenço
ISBN: 978-972-95648-2-6 ; Legal deposit: 505178/22

The book is only available in physical format to the technical community and is not available online. The **candidate** was responsible for the following chapters:

L. C. Silva. Manual for the seismic safety evaluation and strengthening of traditional masonry buildings of Azores. ISBN 978-972-95648-2-6. Chapter 5: Structural analysis of masonry structures. LREC Azores, Regional Laboratory of Civil Engineering (in Portuguese).

L. C. Silva. Manual for the seismic safety evaluation and strengthening of traditional masonry buildings of Azores. ISBN 978-972-95648-2-6. Chapter 6: Structural safety evaluation of masonry strutures. LREC Azores, Regional Laboratory of Civil Engineering (in Portuguese).

Rui Marques, **L. C. Silva**, Pedro Medeiros. Manual for the seismic safety evaluation and strengthening of traditional masonry buildings of Azores. ISBN 978-972-95648-2-6. Chapter 9: Application to a case study. LREC Azores, Regional Laboratory of Civil Engineering (in Portuguese).

2.7 Member of Academic and Professional associations

ISISE - Integrated member of the Institute for Sustainability and Innovation in Structural Engineering
Part of the research group of excellence in Portugal, evaluated by FCT (Portuguese Foundation for Science and Technology). Member of the Historical and Masonry Structures (HMS) Group.
From 01-01-2015 to 31-12-2022

APMTAC - Portuguese Association of Theoretical, Applied, and Computational Mechanics
http://www-ext.lnec.pt/APMTAC/welcome.html](http://www-ext.lnec.pt/APMTAC/welcome.html)

From 01-01-2022 to present

EUROMECH - European Mechanics Society
https://euromech.org/
From 08-09-2022 to present

AIMETA - Associazione Italiana di Meccanica Teorica e Applicata
Part of the Italian Group of Computational Mechanics (GIMC). https://www.aimeta.it/
From 08-09-2022 to present

APEE - Portuguese Society of Structural Engineers
Individual member - ID number 278) From 01-09-2019 to present

SPES - Portuguese Society of Seismic Engineering Individual member - ID number 289)

Portuguese Order of Engineers
Licensed Civil (Structural) Engineer in Portugal - ID number 76847

3 Teaching activities

3.1 Bachelor's level: national (Italy)

Coordinator role
Mechanics of Materials and Structures, Milan, Italy
8 ECTS/CFU 1st Semester
Bachelor's degree in Prog. della Architecture at Politecnico di Milano
Academic Year:
AY: **2024-2025** - **155** students enrolled (score: −/4) Sep 2024 - present
Teaching in English

Coordinator role
Statics, Milan, Italy
4 ECTS/CFU 1st Semester
Bachelor's degree in Prog. della Architecture at Politecnico di Milano
Academic Years:
AY: **2022-2023** - **168** students enrolled (score: 3.4/4) Sep 2022 - Jan 2023
AY: **2023-2024** - **162** students enrolled (score: 3.6/4) Sep 2023 - Jan 2024
AY: **2024-2025** - **148** students enrolled (score: −/4) Sep 2024 - present
Teaching in English

Coordinator role
Statics, Piacenza, Italy
4 ECTS/CFU 1st Semester
Bachelor's degree in Prog. della Architecture at Politecnico di Milano
Academic Years:
AY: **2022-2023** - **48** students enrolled (score: 3.5/4) Sep 2022 - Jan 2023
AY: **2023-2024** - **43** students enrolled (score: 3.6/4) Sep 2023 - Jan 2024
AY: **2024-2025** - **55** students enrolled (score: −/4) Sep 2024 - present
Teaching in English

3.2 Bachelor's level: international

Coordinator role
Statics of Structures, Lisbon, **5 ECTS/CFU** Sep 2020 - Jan 2022
Bachelor's degree in Civil Engineering at Universidade Lusófona de Humanidades e Tecnologias
Teaching in Portuguese

Coordinator role
Concrete Structures, Lisbon, **5 ECTS/CFU** Sep 2020 - Jan 2022
Bachelor's degree in Civil Engineering at Universidade Lusófona de Humanidades e Tecnologias
Teaching in Portuguese

Coordinator role
Design of Buildings, Lisbon, **5 ECTS/CFU** Fev 2021 - June 2021
Bachelor's degree in Civil Engineering at Universidade Lusófona de Humanidades e Tecnologias
Teaching in Portuguese

Coordinator role
Steel Structures, Lisbon, **5 ECTS/CFU** Fev 2021 - Jun 2021
Bachelor's in Civil Engineering at Universidade Lusófona de Humanidades e Tecnologias
Teaching in Portuguese

3.3 Master's level: international

Coordinator role
Structural Dynamics and Seismic Engineering, Guimarães, Portugal, **5 ECTS/5CFU** Oct 2019
Master's in Structural Engineering - STREMUM at University of Minho
Teaching in English

Teaching assistant
Seismic behaviour and Structural Dynamics, Guimarães, Portugal, **5 ECTS/CFU** Oct 2019 (3w)
Master's Structural Analysis of Historical Constructions - SAHC, at University of Minho
Support to Prof. Daniel V. Oliveira for the practical classes. Teaching in English

Coordinator role
Modelling and Structural Analysis, Lisbon, Portugal **7 ECTS/CFU** Fev 2021 - Jun 2021
Master's in Civil Engineering at Universidade Lusófona de Humanidades e Tecnologias
Teaching in Portuguese

Invited for teaching support
Non-linear structural analysis, Bristol, U.K., **7.5 ECTS/CFU** Mar 2021 - May 2021
Master's in Civil Engineering at University of the West of England, UWE Bristol
(remote mode)
Support to Prof. Dr. André Jesus in the development of the course contents related with material and geometric non-linearities.

3.4 Doctoral level: national (Italy)

Co-coordinator role
Modelling the mechanics of masonry structures, Milan, Italy **5 ECTS** June 2024 - July 2024

MI (1367) - Doctoral school of the Architecture, Built Environment and Construction Engineering Department at Politecnico di Milano
AY: 2023-2024 - **12** students enrolled

4 Research activities

4.1 International Journal publications

[J1] L. C. Silva, P. B. Lourenço, and G. Milani, (2017). Nonlinear Discrete Homogenized Model for Out-of-Plane Loaded Masonry Walls. ASCE Journal of Structural Engineering, vol. 143, no. 9. doi: 10.1061/(ASCE)ST.1943-541X.0001831

[J2] L. C. Silva, P. B. Lourenço, and G. Milani, (2017). Rigid block and spring homogenized model (HRBSM) for masonry subjected to impact and blast loading. International Journal of Impact Engineering, vol. 109, pp. 14–28. doi: 10.1016/j.ijimpeng.2017.05.012

[J3] L. C. Silva, N. Mendes, P. B. Lourenço, and J. Ingham, (2018), Seismic Structural Assessment of the Christchurch Catholic Basilica. New Zealand, Structures, vol. 15, pp. 115–130. doi: 10.1016/j.istruc.2018.06.004

[J4] L. C. Silva, P.B. Lourenço, and G. Milani (2018). Derivation of the out-of-plane behaviour of masonry through homogenization strategies: micro-scale level. Computers and Structures 2018; 209;30–43. doi: 10.1016/j.compstruc.2018.08.013.

[J5] A. Aşıkoğlu, Ö Avşar, P.B. Lourenço, and **L. C. Silva** (2019). Effectiveness of seismic retrofitting of a historical masonry structure: Kütahya Kurşunlu Mosque, Turkey. Bulletin of Earthquake Engineering 17:3365–3395. doi: 10.1007/s10518-019-00603-6.

[J6] E. Bertolesi, **L. C. Silva**, and G. Milani (2019). Validation of a two-step simplified compatible homogenisation approach extended to out-plane loaded masonries. International Journal of Masonry Research and Innovation. 2019;4:265. doi: 10.1504/IJMRI.2019.10019407.

[J7] Lourenço PB, **L. C. Silva** (2020). Computational applications in masonry structures: from the meso-scale to the super-large/super-complex. International Journal for Multiscale Computational Engineering. 18:1–30. doi: 10.1615/IntJMultCompEng.2020030889.

[J8] L. C. Silva, P.B. Lourenço, G. Milani (2020). Numerical homogenization-based seismic assessment of an English-bond masonry prototype: Structural level application. Earthquake Engineering Structural Dynamics 49:841–862. doi: 10.1002/eqe.3267.

[J9] S. Sharma, **L. C. Silva**, G. Milani, F. Graziotti, G. Magenes (2021): Modelling the experimental seismic out-of-plane two-way bending response of unreinforced periodic masonry panels using a non-linear discrete homogenized strategy. Journal of Engineering Structures. Volume 242, 1 September 2021, 112524. doi: 10.1016/j.engstruct.2021.112524.

[J10] J. A. Dauda; **L. C. Silva**; P. B. Lourenço; O.Iuorio (2021): Out-of-Plane Loaded Masonry Walls Retrofitted with Oriented Strand Boards: Numerical Analysis and Influencing Parameters. Eng. Struct., 243, 112683. doi: 10.1016/j.engstruct.2021.112683.

[J11] Funari, M.F.; **L. C. Silva**; Mousavian, E.; Lourenço, P.B. Real-time Structural Stability of Domes through Limit Analysis: Application to St. Peter's Dome. International Journal of Architectural Heritage. 2021, 1–23, doi:10.1080/15583058.2021.1992539.

[J12] Funari, M.F.; **L. C. Silva**; Savalle, N.; Lourenço, P.B. A concurrent micro/macro FE-model optimized with a limit analysis tool for the assessment of dry-joint masonry structures. International Journal for Multiscale Computational Engineering. 2022, doi:10.1615/IntJMultCompEng.2021040212.

[J13] L.C.M. da Silva; Milani, Gabriele. A FE-Based Macro-Element for the Assessment of Masonry Structures: Linear Static, Vibration, and Non-Linear Cyclic Analyses. Applied Sciences, vol. 12, no. 3. 2022, doi: 10.3390/app12031248.

[J14] M. F. Funari, **L. C. Silva**, P. Lonetti, S. Spadea, and P. B. Lourenço, Numerical Simulation of Fracture in Layered and Sandwich Structures: A Systematic Literature Review, Compos. Part C Open Access, p. 100294, 2022, doi: 10.1016/j.jcomc.2022.100294.

[J15] C. Sansoni, **L.C.M. da Silva**, R. Marques, S. Pampanin, P.B. Lourenço, SLaMA-URM method for the seismic vulnerability assessment of UnReinforced Masonry structures: Formulation and validation for a substructure, J. Build. Eng. 63 (2023) 105487. doi: 10.1016/j.jobe.2022.105487.

[J16] C. Riccio, A. Remus, S. Tezcan, **L.C.M. da Silva**, G. Milani, and R. Perucchio, A Macroblock 2D Finite Element Model for Assessing the Roots of Failure of Huaca de La Luna's Main Pyramid (Peru) under Seismic Action, Engineering Failure Analysis, vol. 151, p. 107417, 2023. doi: 10.1016/j.engfailanal.2023.107417

[J17] L.C.M. da Silva, G. Milani, P.B. Lourenço, Probabilistic-based discrete model for the seismic fragility assessment of masonry structures, Structures. 52 (2023) 506–523. doi: 10.1016/j.istruc.2023.04.015.

[J18] L.C.M. da Silva, N. Grillanda, S. Casolo, Heuristic molecular modelling of quasi-isotropic auxetic metamaterials under large deformations, International Journal of Mechanical Sciences. Sci. 251 (2023) 108316, doi: 10.1016/j.ijmecsci.2023.108316.

[J19] A. Barontini, J. Scacco, **L.C.M. da Silva**, G. Vasconcelos, P.B. Lourenço, G. Milani, Experimental quasi-static out-of-plane test of a U-shaped brick masonry wall, Eng. Struct. 287 (2023) 116195. doi: 10.1016/j.engstruct.2023.116195.

[J20] L.C.M. da Silva, G. Milani, E. Grande and M.F. Funari, Mechanistic Model for the Compression Strength Prediction of Masonry Columns Strengthened with Fibre–Polymer Composites, Composite Structures, 338, p. 118088 (2024). doi:10.1016/j.compstruct.2024.118088

[J21] J. A. Dauda, O. Iuorio, I. B. Muhit, and **L.C.M. da Silva**, Systematic Review of Experimental Testing of Masonry Walls' Failure: Comparative Analysis and Future Directions, Engineering Failure Analysis, vol. 163, p. 108571, doi: 10.1016/j.engfailanal.2024.108571

[J22] F. Vadalà, **L.C.M. da Silva**, I. Caliò and P.B. Lourenço, Semi-Probabilistic Calibration of Material Partial Safety Factors for the Capacity Assessment of Existing Masonry Structures, Engineering Structures, vol. 318, p. 118656, from https://www.sciencedirect.com/science/article/pii/S0141029624012185, 2024. DOI: 10.1016/j.engstruct.2024.118656

[J23] Aquino, C. D., Schweigler, M., Rodrigues, L. G., **L.C.M. da Silva**, Branco, J. M. and Bader, T. K., Numerical and Fracture Mechanics-Based Simulations of Brittle Failure Modes in Dowelled Timber Connections Loaded Parallel to the Grain, Engineering Structures, vol. 325, p. 119398, from https://www.sciencedirect.com/science/article/pii/S0141029624019606, 2025. DOI: https://doi.org/10.1016/j.engst

For further details see the **Scopus** page

4.2 Book chapters

[BC1] PB Lourenço, MF Funari, **L. C. Silva**. Building resilience and masonry structures: How can computational modelling help? In: Meschke G, Pichler B, Rots JG, eds. Computational Modelling of Concrete and Concrete Structures. 1st Editio. CRC Press; 2022:30-37. doi:10.1201/9781003316404-4

[BC2] E. Figueiredo, Pedro Alves, Ionut Moldovan, Hugo Rebelo, **Luís Silva**, Laura Souza, Rômulo Lopes, Paulo Oliveira, Nuno Penim. "App4SHM – Smartphone Application for Structural Health Monitoring," in Lecture Notes in Civil Engineering book series (LNCE,volume 270), P. Rizzo and A. Milazzo, Eds. Cham: Springer International Publishing, 2023, pp. 1034–1043.

4.3 National/International Conference proceedings

[CP1] L. C. Silva, P.B. Lourenço, N. Mendes. (2014) Seismic Assessment of Christchurch Catholic Basilica, New Zealand. Proc. 9th Int. Conf. Mason., Guimarães, Portugal.

[CP2] L. C. Silva, P.B. Lourenço, N. Mendes. (2015) O Caso de estudo da Basílica Católica de Christchurch, Nova Zelândia: Diagnóstico e análise estrutural. XIII Congr. Latino-Americano Patol. da Construção, Lisboa.

[CP3] L. C. Silva, G. Milani, P.B. Lourenço **(**2016). A discrete macro-model homogenized with a holonomic approach for the nonlinear static analysis of out-of-plane loaded masonry. In: Balen V, Verstrynge, editors. Proc. Struct. Anal. Hist. Constr. - Anamn. diagnosis, Ther. Control., Taylor & Francis Group, London, ISBN 978-1-138-02951-4; p. 1276–83.

[CP4] L. C. Silva, G. Milani, P.B. Lourenço. (2017). Derivation of the out-of-plane behaviour of an English bond masonry wall through homogenization strategies. ICCMSE - Int. Conf. Comput. Methods Struct. Eng., Thessaloniki, Greece.

[CP5] L. C. Silva, P.B. Lourenço, G. Milani. (2017). A discrete macro-model using homogenization with strain-rate dependency for the out-of-plane study of masonry panels subjected to impact loading. In: Papadrakakis M, Fragiadakis M, editors. ECCOMAS Themat. Conf. Comput. Methods Struct. Dyn. Earthq. Eng., Rhodes Island, Greece.

[CP6] L. C. Silva, P.B. Lourenço, G. Milani. (2017). Two-step procedure for the study of masonry walls subjected to a blast load. Congr. Numer. Methods Eng. C., Valencia, Spain.

[CP7] L. C. Silva, P.B. Lourenço, G. Milani. (2018). Quasi-static analysis of an English-bond masonry structure: two-step homogenized based approach vs macroscopic model. 10th IMC - International Masonry Conference, Milan, Italy.

[CP8] L. C. Silva, G. Milani, P.B. Lourenço. (2019). Dynamic Behaviour Analysis of an English-Bond Masonry Prototype Using a Homogenized-Based Discrete FE Model BT - Structural Analysis of Historical Constructions. In: Aguilar R, Torrealva D, Moreira S, Pando MA, Ramos LF, editors. Structural Analysis of Historical Constructions: An Interdisciplinary Approach - SAHC 2018, Cham: Springer International Publishing; p. 966–74.

[CP9] L. C. Silva, P.B. Lourenço, G. Milani. (2019) Metodologia para a avaliação probabilística do comportamento dinâmico de estruturas em alvenaria: conceitos e aplicação. 11o Congresso Nacional de Sismologia e Engenharia Sísmica, Lisbon.

[CP10] L. C. Silva, G. Milani, and P.B. Lourenço (2019). A probabilistic framework using a discrete FE-based homogenized model for the in- and out-of-plane analysis of masonry structures. In: Papadrakakis

M, Fragiadakis M, editors. ECCOMAS Themat. Conf. Comput. Methods Struct. Dyn. Earthq. Eng., Crete, Greece.

[CP11] A. Aşıkoğlu, Ö Avşar, P.B. Lourenço, **L. C. Silva**, Onur Kaplan, and Georgios Karanikoloudis (2019). Finite Element modelling and operational modal analysis of a historical masonry mosque. In: Papadrakakis M, Fragiadakis M, editors. ECCOMAS Themat. Conf. Comput. Methods Struct. Dyn. Earthq. Eng., Crete, Greece.

[CP12] L. C. Silva, P.B. Lourenço, G. Milani. (2019). A parametrized homogenized-based FE model for the probabilistic assessment of an English-bond masonry structure. Congr. Numer. Methods Eng. C., Guimarães, Portugal.

[CP13] Jamiu A. Dauda, **L. C. Silva**, Ornella Iuorio, Paulo B. Lourenço (2020). Numerical study of out-of-plane behaviour of timber retrofitted masonry prisms. 12th International Conference on Structural Analysis of Historical Constructions SAHC2020. (streamed online in 2021). — WOS:000856026402058

[CP14] Marco F. Funari, **L. C. Silva**, Daniel V. Oliveira, Paulo B. Lourenço (2020): An user-friendly digital tool for the structural assessment of historic domes: the case study of Saint Peter in Rome - SAHC2020. 12th International Conference on Structural Analysis of Historical Constructions SAHC2020. (streamed in 2021)

[CP15] Jacopo Scacco, **L. C. Silva**, Graça Vasconcelos, Paulo B. Lourenço, Gabriele Milani (2021): Out-of-plane lateral capacity of Unreinforced Masonry walls: a predictive analysis before the experimental study. 14th Canadian Masonry Symposium, Montreal, Canada. 14th CMS-2021 (streamed online in 2021)

[CP16] J. Scacco , **L. C. Silva**, G. Vasconcelos, G. Milani, P.B. Lourenço, Advanced numerical prediction of unreinforced U-shaped masonry walls loaded out-of-plane. Proceedings of the 8th ECCOMAS Thematic Conference on Computational Methods in Structural Dynamics and Earthquake Engineering, COMPDYN 2021, M. Papadrakakis and M. Fragiadakis (Eds.), Online, p. 278-285 (2021).

[CP17] M. Nocera, **L. C. Silva**, D. Addessi, P.B. Lourenço. Correlation Studies for the In-Plane Analysis of Masonry Walls Based on Macroscopic FE Models with Damage, in: Proceedings of the 12th International Conference on Structural Analysis of Historical Constructions, SAHC 2021, P. Roca, L. Pelà and C. Molins (Eds.), Online, p. 1893-1904 (2021)

[CP18] Federica Vadalà, Valeria Cusmano, Simon Szabó, Marco F. Funari, **Luis C.M. da Silva**, Ivo Caliò, Paulo B. Lourenço. Seismic assessment of unreinforced masonry structures: a coupled mesoscale-DMEM approach. 3rd European Conference on Earthquake Engineering & Seismology, Bucharest, Romania, 2022.

[CP19] L. C. Silva, André Jesus, Gabriele Milani. Gaussian process emulation for rapid in-plane mechanical homogenization of periodic masonry. Congresso Nazionale AIMETA 2022, 4-8 September, Palermo, Italy, 2022.

[CP20] L. C. Silva, Ernesto Grande,Gabriele Milani. Simplified numerical tool for a fast strength estimation of squared masonry columns reinforced with FRP wraps. International Conference of Steel and Composite for Engineering Structures, 12-13 September, Ancona, Italy, 2022.

[CP21] Alberto Barontini, Jacopo Scacco, **L. C. Silva**, Graça Vasconcelos, Paulo B. Lourenço. Experimental analysis of the out-of-plane behaviour of a brick masonry wall: preliminary results. 6as Jornadas Portuguesas de Engenharia de Estruturas, 9-11 November, Lisboa, Portugal, 2022.

[CP22] L.C.M. da Silva, Gabriele Milani, Ernesto Grande. Numerical tool to predict the compressive

capacity of squared masonry columns strengthened with FRP jackets. 19th International Conference of Computational Methods in Sciences and Engineering (ICCMSE), 23-26 May, Crete, Greece, 2023.

[CP23] L.C.M. da Silva, Gabriele Milani, Ernesto Grande. Predicting the uniaxial compressive capacity of non-strengthened and FRP strengthened masonry columns using a fast numerical approach. 9th International Conference on Computational Methods in Structural Dynamics and Earthquake Engineering (COMPDYN), 12-14 June, Athens, Greece, 2023.

[CP24] Parisse, F., Buonocunto, V., Cantagallo, C., Primio, A. Di, Domenico, E. Di, Presti, N. Lo, Acconcia, E., et al., Investigating the Seismic Response of Urm Walls With Irregular Opening Layout Through Different Modeling Approaches, COMPDYN Proceedings, pp. 1906–20, 2023. DOI: 10.7712/120123.10530.21423

[CP25] L.C.M. da Silva and Siro Casolo. An example of design of an auxetic material for additive manufacturing derived from a RBSM heuristic molecule. 21th International Conference of Numerical Analysis and Apllied mathematics (ICNAAM), 11-17 September, Crete, Greece, 2023.

[CP26] Parisse, F., Buonocunto, V., Primio, A. Di, and Altri, A. M. D., Harmonization of the Predicted Post-Peak Seismic Response of URM Structures in Finite Element Models, 18th World Conference on Earthquake Engineering, Milan, Italy, no. July, 2024.

[CP27] L.C.M. da Silva and Siro Casolo. Design of an auxetic and standard soft material for additive manufacturing using a heuristic RBSM approach. (ECCOMAS) , 03-07 June, Lisbon, Portugal, 2024.

[CP28] L.C.M. Silva, G. Uva, Siro Casolo. Anisotropic strength evaluation of an auxetic and a standard ultra-soft material by a heuristic RBSM approach for additive manufacturing. Congresso Nazionale AIMETA 2024, 2-6 September, Napoli, Italy, 2024.

[CP29] L.C.M. da Silva, Szabo, S., Funari, M. F., Milani, G., and Lourenço, P. B., Effect of Block Irregular Arrangement on the In-Plane Mechanical Response of Masonry Walls BT - 18th International Brick and Block Masonry Conference, Cham: Springer Nature Switzerland, pp. 315–25, 2025.

See **Scholar Google**

4.4 Speaker in National conferences or convention

[1] SPEAKER at Latin-American Conference:
XIII Congresso Latino-Americano Patologia da Construção, Lisbon (Portugal)
Title of the work: Case study of the Christchurch Catholic Basilica, New Zealand: Diagnosis and structural analysis.
Authors: L. C. Silva, P.B. Lourenço, N. Mendes
(In Portuguese)
From 08-09-2015 to 10-09-2015

[2] SPEAKER at Ibero-Conference:
Congress on Numerical Methods in Engineering - CMN 2017, Valencia, Spain
Title of the work: Two-step procedure for the study of masonry walls subjected to a blast load.
Authors: L. C. Silva, P.B. Lourenço, G. Milani. (2017).
From 03/07/2022-06/07/2022

[3] SPEAKER at Ibero-Conference:
Congress on Numerical Methods in Engineering - CMN 2019, Guimarães, Portugal
Title of the work: A parametrized homogenized-based FE model for the probabilistic assessment of an

English-bond masonry structure.
Authors: L. C. Silva, P.B. Lourenço, G. Milani. (2019).
From 01/07/2022-03/07/2022

[4] SPEAKER at National Conference:
11th National Congress of Seismology and Earthquake Engineering, Lisbon (Portugal)
Title of the work: Metodologia para a avaliação probabilística do comportamento dinâmico de estruturas em alvenaria: conceitos e aplicação.
Authors: L. C. Silva, P.B. Lourenço, G. Milani
(In Portuguese)
From 29-04-2019 to 30-04-2019

[5] SPEAKER at National Conference:
AIMETA National Congress 2022, Palermo (Italy)
Authors of the work: L. C. Silva, André Jesus, Gabriele Milani
Title of the work: Gaussian process emulation for rapid in-plane mechanical homogenization of periodic masonry.
From 04-09-2022 to 08-09-2022

[6] SPEAKER at National Conference:
Congresso Nazionale AIMETA 2024, Napoli (Italy)
Title of the work: Anisotropic strength evaluation of an auxetic and a standard ultra-soft material by a heuristic RBSM approach for additive manufacturing.
Authors: L. C. Silva, G. Uva, Siro Casolo.
From 02/09/2024-06/09/2024

4.5 Speaker in International conferences or convention

[1] SPEAKER at the International Conference:
9th International Masonry Conference, Guimaraes (Portugal)
Title of the work: Seismic Assessment of Christchurch Catholic Basilica, New Zealand.
Authors: L. C. Silva, P.B. Lourenço, N. Mendes
From 07-07-2014 to 09-07-2014

[2] SPEAKER at the International Conference:
10th International Conference on Structural Analysis of Historical Constructions, Leuven (Belgium)
Title of the work: A discrete macro-model homogenized with a holonomic approach for the nonlinear static analysis of out-of-plane loaded masonry.
Authors: L. C. Silva, G. Milani, P.B. Lourenço
From 13-09-2016 to 15-09-2016

[3] SPEAKER at the International Conference:
ICCMSE2017 - International Conference of Computational Methods in Structural Engineering, Thessaloniki (Greece)
Title of the work: Derivation of the out-of-plane behaviour of an English bond masonry wall through homogenization strategies.
Authors: L. C. Silva, G. Milani, P.B. Lourenço
From 21-04-2017 to 25-04-2017

[4] SPEAKER at the International Conference:
COMPDYN 2017 - 6th International Conference on Computational Methods in Structural Dynamics

and Earthquake Engineering, Rhodes Island (Greece)
Title of the work: A discrete macro-model using homogenization with strain-rate dependency for the out-of-plane study of masonry panels subjected to impact loading.
Authors: L. C. Silva, P.B. Lourenço, G. Milani
From 15-06-2017 to 17-06-2017

[5] SPEAKER at the International Conference:
10th IMC - International Masonry Conference, Milan (Italy)
Title of the work: Quasi-static analysis of an English-bond masonry structure: two-step homogenized-based approach vs macroscopic model.
Authors: L. C. Silva, P.B. Lourenço, G. Milani
From 09-07-2018 to 11-07-2018

[6] SPEAKER at the International Conference:
COMPDYN 2019 - 7th International Conference on Computational Methods in Structural Dynamics and Earthquake Engineering, Crete (Greece)
Authors of the work: L. C. Silva, G. Milani, and P.B. Lourenço
Title of the work: *A probabilistic framework using a discrete FE-based homogenized model for the in-and-out-of-plane analysis of masonry structures.*
From 24-06-2019 to 26-06-2019

[7] SPEAKER at the International Conference:
CMN2019 - Congress of Numerical Methods in Engineering, Guimaraes (Portugal)
Authors of the work: L. C. Silva, P.B. Lourenço, G. Milani
Title of the work: A parametrized homogenized-based FE model for the probabilistic assessment of an English-bond masonry structure.
From 01-07-2022 to 03-07-2022

[8] SPEAKER at the International Conference:
19th International Conference of Computational Methods in Sciences and Engineering (ICCMSE), Crete, (Greece)
Title of the work: Numerical tool to predict the compressive capacity of squared masonry columns strengthened with FRP jackets.
Authors: L.C.M. da Silva, Gabriele Milani, Ernesto Grande. From 23/05/2023-26/05/2023

[9] SPEAKER at the International Conference:
9th International Conference on Computational Methods in Structural Dynamics and Earthquake Engineering (COMPDYN), Athens (Greece)
Title of the work: Predicting the uniaxial compressive capacity of non-strengthened and FRP strengthened masonry columns using a fast numerical approach. Authors: L.C.M. da Silva, Gabriele Milani, Ernesto Grande.
From 12/06/2023-14/06/2023

[10] SPEAKER (remote mode) at the International Conference:
21th International Conference of Numerical Analysis and Apllied mathematics (ICNAAM), Crete (Greece).
Title of the work: An example of design of an auxetic material for additive manufacturing derived from a RBSM heuristic molecule.
Authors: L.C.M. da Silva and Siro Casolo.
From 11/09/2023-17/09/2023

[11] SPEAKER at the International Conference:
9th European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS),

Lisbon (Portugal)
Title of the work: Design of an auxetic and standard soft material for additive manufacturing using a heuristic RBSM approach.
Authors: L.C.M. da Silva and Siro Casolo.
From 03/06/2024-07/06/2024

4.6 Invited lectures/seminars

Invited for a 1hour Open class 03 June 2024
Department of Civil Engineering at University Nova of Lisbon
Title: Homogenization and up-scaling strategies for the mechanical analysis of masonry

Invited for a 3hour seminar 23 April 2024
SUBLime, a Marie Skłodowska-Curie Action European Training network – Innovative Training Network (ETN ITN); in *RTC2-2, Meso and macro-scale simulations*, Poland, 22-26 April, 2024
website
Title: Homogenization and up-scaling strategy for the mechanical analysis of materials: masonry, ultra-soft standard materials, and metamaterials

Invited for a 1hour seminar, Bologna, Italy to be held on December 19 (15h), 2024
Department of Civil, Chemical, Environmental, and Materials Engineering, University of Bologna
Invited to give a 1 hour seminar to PhD students of the Mechanics of Solids and Structures and Structural Engineering fields. Confirmed by the Department Council for financial support (compensation).
Title: Homogenization and up-scaling strategy through rigid body spring models for the mechanical analysis of materials: masonry, ultra-soft standard materials, and metamaterials

4.7 Supervision of PhD students

Ongoing Theses:
Co-supervision of Federica Vadalà (Doctoral thesis) October 2021-end
Probabilistic discrete macro-element model for the seismic fragility assessment of masonry structures through nonlinear incremental dynamic analysis, PhD in Sustainable Built Environment, University of Minho.
Supervisors: Ivo Domenico CALIO, Luis C. SILVA, Paulo B. LOURENCO
https://renates2.dgeec.mec.pt/ppsqdet.asp

Hosting Caroline Dapieve Aquino Sep-Oct 2024
Hosting the Ph.D. student Caroline Aquino in a short-term scientific mission in the frame of the **COST Action CA20139**. The research work during this visit periof is related with the "Numerical prediction of crack propagation in dowelled timber connections".

4.8 Supervision of Master students

Theses completed:
Co-supervision of: Signorotti, Marco (Master thesis) 2020 – "Advanced numerical simulation for the structural analysis of infill-masonry walls", Historic Building Rehabilitation Master, University of

Bologna.

Co-supervision of: Chalhoub, Michel (Master thesis) 2020 - "Anisotropic nonlinear homogenized constitutive model of masonry walls", Structural Analysis of Historical Constructions (SAHC), University of Minho.

4.9 Editor of Special Issues in International Journals

1. Special issue in MDPI Applied Sciences - "New Digital Technologies for Masonry Structures"
Editors: Luis C.M. da Silva, Marco F. Funari, Bora Pulatsu, Antonio M. D'Altri
https://www.mdpi.com/journal/applsci/special_issues/C78Y8SD595

5 Other academic-related roles

5.1 Examiner for Master theses

June 2022 - Cristina Riccio, *Seismic analysis of archaeological sites made of adobe blocks: The case of Huaca de la Luna, Peru*. Master's science in Civil Engineering – Earthquake, School of Civil, Environmental and Land Management Engineering, Politecnico di Milano.

April 2022 - Martina Buzzeti, *Seismic vulnerability assessment of the ex-monastery of Santa Maria della Piacenza*. Master's science in Civil Engineering – Earthquake, School of Civil, Environmental and Land Management Engineering, Politecnico di Milano.

April 2022 - Coline Gouesbier, *Development of a computational tool for seismic vulnerability assessment and reinforcement design for historical masonry buildings*. Master's science in Civil Engineering – Earthquake, School of Civil, Environmental and Land Management Engineering, Politecnico di Milano.

June 2020 - Vuoto, Annalaura - *Numerical safety assessment of earthen structures in La Alhambra, Granada, Spain*, Master in Structural Analysis of Historical Constructions (SAHC), University of Minho.

5.2 Examiner for Doctoral theses milestones

April 2022 - Milestone number 5 - First thesis draft. PhD candidate Peixuan Wang. ABC Department, Politecnico di Milano.

October 2022 - Milestone number 2 - Research plan. PhD candidate Marco Pirrò. ABC Department, Politecnico di Milano.

October 2022 - Milestone number 6 - Final thesis draft. PhD candidate Peixuan Wang. ABC Department, Politecnico di Milano.

January 2023 - Milestone number 6 - Final thesis draft 2. Phd candidate Rejnalda Golemaj. ABC Department, Politecnico di Milano.

April 2023 - Milestone number 5 - First thesis draft. Phd candidate Yu Yuan. ABC Department, Politecnico di Milano.

April 2023 - Milestone number 3 - Thesis Report. Phd candidate Marco Pirrò. ABC Department, Politecnico di Milano.

April 2024 - Milestone number 1 - Literature Review. Phd candidate Eray Temur. ABC Department, Politecnico di Milano.

April 2024 - Milestone number 5 - First thesis thesis draft. Phd candidate Giorgia Venturi. ABC Department, Politecnico di Milano.

5.3 Member of Scientific Committees in National/International conferences

MEMBER of the scientific committee in International conference:
IPW 2020 - 18th International Probabilistic Workshop
University of Minho, Guimaraes (Portugal)
https://ipw2020.com/scientific-committee
From 12-05-2020 to 14-05-2020

MEMBER of the scientific committee in National conference:
SEC 2021, Symposium in Civil Engineering
Polytechnic Institute of Porto – School of Civil Engineering, Porto (Portugal)
https://www2.isep.ipp.pt/sec2021/index.php?page=comissao-cientifica
On 19-05-2021

MEMBER of the scientific committee in International conference:
2022 IEEE International Workshop on Metrology for Living Environment (MetroLivEnv2022)
University of Calabria, Cosenza (Italy)
https://www.metrolivenv.org/committee
From 25-05-2022 to 27-05-2022

CO-CHAIR of the technical program in International conference:
2023 IEEE International Workshop on Metrology for Living Environment (MetroLivEnv2023)
Politecnico di Milano, Milan (Italy)
https://www.metrolivenv.org/committee
From 29-05-2023 to 31-05-2023

PUBLICATION CHAIR in International conference:
2024 IEEE International Workshop on Metrology for Living Environment (MetroLivEnv2024) Chania, Crete (Greece)
https://www.metrolivenv.org/committee
From 12-06-2024 to 14-06-2024

MEMBER of Scientific committee in International conference:
18th International Brick and Block Masonry Conference, Birmingham (U.K.)
https://more.bham.ac.uk/ib2mac2024/committees/
From 21-07-2024 to 24-07-2024

CHAIR of session in International conference:
18th International Brick and Block Masonry Conference, Birmingham (U.K.)
Session title: Modelling and analysis of masonry structures.
On 21-07-2024

5.4 Organization of minisynmposiums in International and National conferences

CO-ORGANIZER of a SPECIAL SESSION in international conference:
IPW 2020 - 18th International Probabilistic Workshop University of Minho, Guimarães (Portugal)
Special Session Title: Probabilistic-based methods to assess the structural safety of historic masonry constructions
Co-organized with Dr. Leonardo Rodrigues and Prof. Tiago Ferreira (UWE Bristo, U.K.)
From 12-05-2020 to 14-05-2020

CO-ORGANIZER of a SPECIAL SESSION in international conference:
9th European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS), Lisbon (Portugal)
Mini-symposium: MS112 Optimization Problems in Computational Mechanics: from Material Design to Structural Analysis
Co-organized with Prof. A. Chiozzi (University of Ferrara, Italy) and Dr. N. Nodargi (University of Rome Tor Vergata, Italy)
From 03-06-2024 to 07-06-2024

5.5 Peer reviewing of scientific Journal papers

Applied Sciences, MDPI

Applied Sciences, Springer Nature

Buildings, MDPI

Engineering Structures

International Journal for computer-aided engineering and software, Emerald

International Journal of Architectural Heritage, Taylor & Francis

International Journal of Disaster Risk Reduction, Elsevier

International Journal of Masonry Research and Innovation, InderScience

International Journal of Mechanical Sciences, Elsevier

International Journal of Reliability and Safety, InderScience

Journal of Building Engineering, Elsevier

Journal of Bulletin of Earthquake Engineering

Journal of Composite Structures

Journal of the International Measurement Confederation, Elsevier

Journal of Structural Engineering, ASCE

Journal of Renewable Materials, Tech Science Press

Materials, MDPI

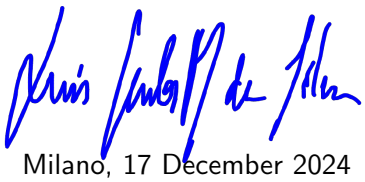
Natural Hazards

Soil Dynamics and Earthquake Engineering

SoftwareX, Elsevier

Structures, Elsevier

"Autorizzo il Politecnico di Milano a pubblicare il presente curriculum sul sito WEB di Ateneo, ai fini istituzionali e in ottemperanza al D. Lgs n. 33 del 14 marzo 2013 "Decreto trasparenza" come modificato dal D. Lgs. 97 del 2016"



Milano, 17 December 2024