

PERSONAL INFORMATION

Giulia Angelucci



ACADEMIC EMPLOYMENT HISTORY

July 2021 – ongoing

Research fellow, PostDoc position

Department	Department of Structural and Geotechnical Engineering
Institution	Sapienza University of Rome, Rome, Italy
Project	Typological and detailed analysis for the optimized selection of morphologies of existing reinforced concrete buildings
Supervisor	Prof. Fabrizio Mollaioli
Activity	Advancement of specific knowledge aimed at refining the modeling of the design loading for the accurate prediction of the stochastic responses of earthquake-resistant structural systems in order to achieve higher levels of performance reliability.

July 2020 – June 2021

Research fellow, PostDoc position

Department	Department of Structural and Geotechnical Engineering
Institution	Sapienza University of Rome, Rome, Italy
Project	Typological and detailed analysis for the optimized selection of morphologies of existing reinforced concrete buildings
Supervisor	Prof. Fabrizio Mollaioli
Activity	Investigation of efficient structural types for multi-story buildings on the basis of optimum criteria, aimed at demonstrating the robustness and effectiveness of topology optimization for the design of structural systems subjected to lateral load scenarios.

July 2019 – June 2020

Research fellow, PostDoc position

Department	Department of Structural and Geotechnical Engineering
Institution	Sapienza University of Rome, Rome, Italy
Project	Typological and detailed analysis for the optimized selection of morphologies of existing reinforced concrete buildings
Supervisor	Prof. Fabrizio Mollaioli
Activity	Modeling refinement for the seismic assessment of reinforced concrete frames by implementing a macro-model in OpenSees for predicting the out-of-plane response of masonry infill panels.

February 2019 – June 2019

Holder of Scholarship

Department	Department of Structural and Geotechnical Engineering
Institution	Sapienza University of Rome, Rome, Italy
Project	Numerical analyses for topology optimization of tall buildings
Supervisor	Prof. Fabrizio Mollaioli
Activity	Investigation of modelling and loading strategies to incorporate numerical optimization routines in the definition of lateral resisting systems for large structures using adaptive multi-mode patterns.

April 2017 – September 2017

J-1 Short-term scholar

Department	Department of Civil and Environmental Engineering
Institution	University of Michigan, Ann Arbor, Michigan, USA
Project	Topology optimization of wind excited dynamic structures
Supervisor	Prof. Seymour Spence
Activity	Definition of a versatile and integrated topology optimization framework for large-scale 3-D domains aimed at identify efficient and high-performing wind excited structural systems.

November 2015 – November 2018

Holder of PhD Scholarship

Department	Department of Structural and Geotechnical Engineering
Institution	Sapienza University of Rome, Rome, Italy
Supervisor	Prof. Fabrizio Mollaioli
Activity	Development of an iterative topology optimization procedure intended to find optimal lateral resisting systems for regular and complex-shape buildings and evaluation of performance gains associated with the implementation of optimization techniques within the design process.

EDUCATION AND TRAINING

26 February 2019

Doctor of Philosophy (PhD) in Structural and Geotechnical Engineering

Title	Evaluation of optimal structural layouts for tall buildings using topology optimization
Department	Department of Structural and Geotechnical Engineering
Institution	Sapienza University of Rome, Rome, Italy
Supervisor	Prof. Fabrizio Mollaioli

26 February 2019

Master's degree in Architecture U.E.

Title	Design of a sport facility with steel GridShell canopy
Institution	Sapienza University of Rome, Rome, Italy
Supervisor	Prof. Fabrizio Mollaioli
Grade	110 / 110 cum Laude

July 2006

Classical lyceum

Institution	Liceo Classico M.T. Varrone, P.zza Mazzini 1, 02100 Rieti (RI)
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SCHOLARSHIPS AND AWARDS

May 2020 – ongoing

Expert on the subject

Course	Laboratorio di sintesi in progettazione e riabilitazione strutturale
Institution	Faculty of Architecture, Sapienza University of Rome

November 2015 – 2018

PhD scholarship winner

Institution	Department of Structural and Geotechnical Engineering, Sapienza University of Rome
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PERSONAL SKILLS

Mother tongue Italian

Other language

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	B2	B2	B2	B2	B2

Levels: A1/A2: Basic user - B1/B2: Independent user - C1/C2 Proficient user
[Common European Framework of Reference for Languages](#)

Research topics

The research activity mainly focuses on the study and analysis of medium- to high-rise buildings subjected to seismic excitation and wind action, with particular reference to the use of numerical topology optimization techniques and the application of geometric patterns with high structural performance (Diagrid, Hexagrid and Voronoi tessellation). Research topics also concern the investigation of numerical models for the prediction of the out-of-plane response of unreinforced masonry infills, the nonlinear analysis of existing reinforced concrete buildings and the identification of energy-based parameters for standard, long duration and near-fault pulse-like seismic ground motions.

Teaching experience

 March 2022 – ongoing **Adjunct Professor**

Course Laboratorio Avanzato di Costruzioni - Costruzioni Antisismiche
 Degree Program CDS Gestione del Progetto e Della Costruzione dei Sistemi Edilizi
 Institution Faculty of Architecture, Sapienza University of Rome.
 Main topics Fundamentals for the design of reinforced concrete buildings under seismic actions: concepts of engineering seismology, spectral response analysis, capacity design approach, design and detailing of reinforced concrete frames, modelling through finite element codes.

 October 2015 – ongoing **Assistant lecturer**

Course Laboratorio di Sintesi in Progettazione e Riabilitazione Strutturale
 Degree Program Architettura U.E.
 Institution Faculty of Architecture, Sapienza University of Rome.
 Main activity Assistance in the architectural and structural design of tall buildings under seismic excitation and wind loads, aid in the use of the calculation program Sap2000.

 October 2015 – ongoing **Co-Advisor of master's degree thesis**

Institution Faculty of Architecture, Sapienza University of Rome.
 Main activity Supervision of architectural planning and structural modeling with ad hoc programs.
 Main topics Form-finding and optimization of double-curved gridshell structures, optimized forms of tall structures with complex configurations, characterization of the seismic response in buildings with rocking core, analysis of the non-linear behavior of tall structures with varying geometric configuration, design of tall wooden buildings in seismic areas, analysis of the effectiveness of outrigger systems for controlling the deformability of structures, structural design of tubular structures modeled with bio-mimetic patterns, design of innovative devices for the seismic adaptation of existing tall buildings, aerodynamic response of tall buildings with different elevation configurations.

Published Papers

Quaranta, G., **Angelucci, G.**, & Mollaioli, F. (2022). Near-fault earthquakes with pulse-like horizontal and vertical seismic ground motion components: Analysis and effects on elastomeric bearings. *Soil Dynamics and Earthquake Engineering*, 160, 107361.

DOI: 10.1016/j.soildyn.2022.107361

Angelucci, G., Quaranta, G., Mollaioli, F. (2021). Optimal lateral resisting systems for high-rise buildings under seismic excitations, *COMPADYN Proceedings, Volume 2021-June2021 8th International Conference on Computational Methods in Structural Dynamics and Earthquake Engineering*.

DOI: 10.7712/120121.8595.18759

Angelucci, G., Quaranta G., Mollaioli F. (2021). Energy-Based Topology Optimization Under Stochastic Seismic Ground Motion: Preliminary Framework, *Lecture Notes in Civil Engineering*, 155 LNCE, pp. 205-219.

DOI: 10.1007/978-3-030-73932-4_14

Angelucci, G., Spence S.M.J., Mollaioli F. (2021). An integrated topology optimization framework for three-dimensional domains using shell elements, *Structural Design of Tall and Special Buildings*, 30 (1), art. no. e1817.

DOI: 10.1002/tal.1817.

Angelucci, G., Mollaioli F., Tardocchi R. (2020). A new modular structural system for tall buildings based on tetrahedral configuration, *Buildings*, 10 (12), art. no. 240, pp. 1-22.

DOI: 10.3390/buildings10120240.

Alshawa O., **Angelucci, G.**, Mollaioli F., Quaranta G. (2020). Quantification of energy-related parameters for near-fault pulse-like seismic ground motions, *Applied Sciences (Switzerland)*, 10 (21), art. no. 7578, pp. 1-17.

DOI: 10.3390/app10217578.

Angelucci, G., Mollaioli F., Alshawa O. (2020). Evaluation of optimal lateral resisting systems for tall buildings subject to horizontal loads, *Procedia Manufacturing*, 44, pp. 457-464.

DOI: 10.1016/j.promfg.2020.02.270.

Angelucci, G., Mollaioli F. (2018). Voronoi-like grid systems for tall buildings, *Frontiers in Built Environment*, 4, art. no. 78.

DOI: 10.3389/fbuil.2018.00078.

Angelucci, G., Mollaioli F. (2017). Diagrid structural systems for tall buildings: Changing pattern configuration through topological assessments, *Structural Design of Tall and Special Buildings*, 26 (18), art. no. e1396.

DOI: 10.1002/tal.1396

Communications to International Conferences

G. Angelucci (Presenting Author), Quaranta G., Mollaioli F. Optimal lateral resisting systems for high-rise buildings under seismic excitations. *COMPADYN 2021 - 8th ECCOMAS - Thematic Conference on Computational Methods in Structural Dynamics and Earthquake Engineering*, Athens, Greece, 27-30 June 2021.

G. Angelucci (Presenting Author), Quaranta G., Mollaioli F. Energy-Based Topology Optimization Under Stochastic Seismic Ground Motion: Preliminary Framework. *1st International Workshop on Energy-Based Seismic Engineering*, Madrid, Spain, 24-26 May 2021.

G. Angelucci (Presenting Author), Mollaioli F., Alshawa O. (2020). Evaluation of optimal lateral resisting systems for tall buildings subject to horizontal loads. *OPTARCH 2019 - 1st International Conference on Optimization Driven Architectural Design*, Amman, Jordan, 5-7 November 2019.

Organization of special sessions

27 – 30 June 2021	Member of the organizing committee of mini-symposium
Title	MS-19 Advances in the optimum design and control of large structures under dynamic loads.
Conference	COMPdyn 2021 - 8th ECCOMAS - Thematic Conference on Computational Methods in Structural Dynamics and Earthquake Engineering, Athens, Greece, 27-30 June 2021.
Organizers	Dr. G. Angelucci , Prof. B. Briseghella, Prof. G.C. Marano, Prof. F. Mollaioli, Prof. G. Quaranta

Research projects

2022	Funding Ateneo Sapienza – Medium Project
Project	Optimum topological design of tall buildings under non-stationary seismic ground motions
Role	Component of the research group
Principal Investigator	Prof. Fabrizio Mollaioli
Institution	Sapienza University of Rome
2020	RINTC-Implicit Risk of structures designed according to NTC
Project	WP3-UR2
Role	Component of the research group
Institution	ReLuis - Consortium of the Network of University Laboratories of Seismic and Structural Engineering
2019	Funding Ateneo Sapienza 2019 - Major Project
Project	Towards a comprehensive framework for energy-based seismic assessment and design of structures
Role	Component of the research group
Principal Investigator	Prof. Fabrizio Mollaioli
Institution	Sapienza University of Rome
2018	Funding Ateneo Sapienza 2018 - Medium Project
Project	Determination of the parameters of the directivity pulses and evaluation of the effects of near-fault ground motions on structural response
Role	component of the research group
Principal Investigator	Prof. Fabrizio Mollaioli
Institution	Sapienza University of Rome

Date: 09/06/2022