

## RESEARCH EXPERIENCE AND INTERESTS

- Maintenance and preventive conservation of cultural heritage buildings
- Structural assessment and seismic vulnerability
- Masonry vaults
- Construction history
- Nonlinear static and dynamic analysis
- Shaking table testing
- FRP concrete
- Pultruded GFRP beams
- Digital Image Correlation

## POSTDOC EXPERIENCE

### SCHOLARSHIP

Department of Structural and Geotechnical Engineering,  
Sapienza University of Rome, Italy

June – July 2021

**Project:** Damage diagnosis of prestressed concrete beams by means of tension release technique

### POSTDOCTORAL RESEARCHER

ISISE, Department of Civil Engineering, University of Minho,  
Guimarães, Portugal

April 2018 – March 2020

**Project:** SAHC – Structural Analysis of Historical Constructions, funded by ISISE (Portugal)

### POSTDOCTORAL RESEARCHER

Department of Structural and Geotechnical Engineering,  
Sapienza University of Rome, Italy

April 2017 – March 2018

**Project:** Random Lattice Modelling of Pultruded GFRP beams: numerical investigation vs experimental results, funded by the mentioned Department

### POSTDOCTORAL RESEARCHER

ISISE, Department of Civil Engineering, University of Minho,  
Guimarães, Portugal

March 2017 – August 2018

**Project:** Specific Grant Agreement for an Action Nr. 2015-2008 /001 – EMMC – Advanced Masters in Structural Analysis of Monuments and Historical Constructions” funded by European Commission through Erasmus+ program

## EDUCATION

### **PHD IN CIVIL ENGINEERING (cotutelle program)**

University of Minho, Guimarães, Portugal

26 February 2016

**Thesis:** Seismic performance of masonry cross vaults: learning from historical developments and experimental testing

**Supervisor:** Prof. Paulo Lourenço

### **PHD IN CIVIL AND GEOTHECNICAL ENGINEERING**

Sapienza University of Rome, Italy

26 February 2016

**Thesis:** Seismic performance of masonry cross vaults: learning from historical developments and experimental testing

**Supervisor:** Prof. Giorgio Monti

### **UNIVERSITY POSTGRADUATE PROFESSIONAL DEGREE (Master di II livello)**

**“Design of seismic sustainable structures in construction works”**

Polytechnic University of Milan - Master School Pesenti

March 2009 - April 2010

**Thesis:** Structural analysis of a strategic building hit by the April 6<sup>th</sup> 2009 earthquake in L’Aquila: analysis of recorded seismic data, Codes of Practice comparison and strengthening interventions

### **MSc IN ARCHITECTURE AND BUILDING ENGINEERING - full marks with honours**

University of Calabria - Italy

19 December 2008

**Thesis:** Seismic design: guidelines, issues and structural analysis models (in Italian)

### **ERASMUS PLACEMENT**

SINTEF Building and Infrastructure - Trondheim (Norway)

May – September 2008

**Steel and Polypropylene fibre reinforced concrete:**

Laboratory activities and results processing for assessing capacity and ductility of different typologies of specimen

## TEACHING EXPERIENCE

### **TEACHING ASSISTANT FOR “STRUCTURAL DESIGN”**

Faculty of Civil, Building and Environmental Engineering,  
Sapienza University of Rome, Italy – Rieti University campus  
Degree in Sustainable Building Engineering and Building and  
environmental systems engineering (held in Italian)  
February – July 2017

### **TEACHING ASSISTANT FOR “SEISMIC DESIGN”**

Faculty of Civil, Building and Environmental Engineering,  
Sapienza University of Rome, Italy – Rieti University campus  
Degree in Sustainable Building Engineering and Building and  
environmental systems engineering (held in Italian)  
February – July 2017

### **TUTOR FOR “THEORETICAL AND APPLIED MECHANICS”**

Faculty of Architecture, Sapienza University of Rome, Italy  
Degree in Product Design (held in English)  
November 2016 – February 2017

### **TUTOR FOR “FUNDAMENTALS OF STATICS”**

Faculty of Architecture, Sapienza University of Rome, Italy  
Degree in Industrial Design (held in Italian)  
November 2016 – February 2017

### **THESIS SUPERVISION**

November 2015 – May 2016

**Master thesis:** Seismic analyses of cross vaults by means of  
micro-modelling approach (in Italian)

### **MATHS AND PHYSICS TEACHER**

Scientific and Classical secondary schools, Rome, Italy  
November 2016 – May 2019

## PROFESSIONAL EXPERIENCE

### **STUDIO INARCH PASCA - Rome**

August 2020 - present

**Civil engineer involved in:**

- Works management for a pedestrian cable stayed bridge
- Auctions and works for public administrations
- Third-party public auction compliance assessments
- Seismic analysis of existing constructions

## **Alien Technology Transfer - Ciampino**

June - September 2018

**Project manager:** Proposal writer for SME contribution within Horizon 2020 program

## **PRAS Tecnica Edilizia srl - Rome**

September 2009 - December 2012

**Structural engineer involved in (see Annex 2):**

- Multidisciplinary team design, in cooperation with Architects and Plant Engineers
- Structural design of new buildings
- Works management & HSE coordination assistant
- Proposals for national and foreign auctions
- Structural analysis of historical constructions
- Masonry and concrete buildings retrofit

## **POST-SEISMIC BUILDINGS ASSESSMENT**

2009, 2012, 2016

Inspections about the bearing capacity of structures after the strong Italian earthquakes in Central Italy (2016), Emilia Romagna Region (May 2012) and L'Aquila (2009)

In cooperation with Italian Department of Civil Protection and Fire Department (Ordinary and cultural heritage buildings)

### **Selected as expert for post-earthquake inspections**

DRHOUSE project (Development of Rapid Highly-specialized Operative Units for Structural Evaluation), in cooperation with EUCENTRE of Pavia and the European Department of Civil Protection

## **HONOURS AND AWARDS**

### **DAVID C. FISCHETTI AWARD**

**APT conference, Buffalo (USA)**

September 2018

*In recognition of an outstanding peer-reviewed article that advances the field of conservation engineering*

### **PHD THESIS AWARD 2016**

**Sapienza University of Rome (Italy)**

October 2020

Publication of his thesis with Sapienza Università Editrice

### **PHD GRANT**

November 2012 – October 2015

Italian Ministry of Education, Universities and Research (MIUR)

## MEMBERSHIP

### **ACCREDITED FOR POST-SEISMIC SURVEY OF CULTURAL HERITAGE BUILDINGS**

Since 2016

In cooperation with Italian Department of Civil Protection and Ministry of Cultural Heritage and Activities and Tourism

### **PEER-REVIEW ACTIVITY for**

- International Journal of Architectural Heritage
- International Journal of Masonry Research and Innovation

### **PROFESSIONAL ENGINEERS REGISTRATION BOARD OF ROME**

Since May 2010

## PUBLICATIONS

### **BOOKS**

**(1) Finite element analysis for building assessment: Advanced use and practical recommendations (see annex 3)**

P. B. Lourenço, A. Gaetani

about 400 pages | New York: Routledge

Manuscript submitted

**(2) Seismic performance of masonry cross vaults: learning from historical developments and experimental testing**

A. Gaetani

200 pages | Rome: Sapienza Università Editrice

ISBN 9788893771443

[doi.org/10.13133/9788893771443](https://doi.org/10.13133/9788893771443)

June 2020

**(3) Historic construction and conservation: materials, systems and damage**

P. Roca, P.B. Lourenço, A. Gaetani

324 pages | 717 Illustrations., New York: Routledge

ISBN 9780367145743

1<sup>st</sup> ed. August 2019

### **JOURNAL PAPERS**

(1) A. Gaetani, N. Bianchini, P.B. Lourenço (2021)

**Simplified micro-modelling of masonry cross vaults: stereotomy and interface issues**

*International Journal of Masonry Research and Innovation*, 6(1), 97–125 (doi: 10.1504/IJMRI.2020.10032218)

(2) A. Gaetani, A. Fascetti, N. Nisticò (2019)

In compliance with the GDPR 2016/679 and Italian Legislative Decree 196/2003

**Parametric investigation on the tensile response of GFRP elements through a discrete lattice modeling approach**  
*Compos. Part B Eng.* 176, 107254.  
doi:10.1016/j.compositesb.2019.107254

(3) A. Gaetani, P.B. Lourenço, G. Monti, G. Milani (2017)  
**A parametric investigation on the seismic capacity of masonry cross vaults**  
*Engineering Structures* 148:686–703. doi:  
10.1016/j.engstruct.2017.07.013

(4) A. Gaetani, P.B. Lourenço, G. Monti, M. Moroni (2017)  
**Shaking table tests and numerical analyses on a scaled dry-joint arch undergoing windowed sine pulses**  
*Bulletin of Earthquake Engineering*, 15, 4939–61. doi:  
10.1007/s10518-017-0156-0

(5) A. Gaetani, G. Monti, P.B. Lourenço, G. Marcari, (2015)  
**Design and analysis of cross vaults along history**  
*International Journal of Architectural Heritage*, 10(7), 841–856.  
doi: 10.1080/15583058.2015.1132020  
**Recipient of the “David C. Fischetti Award”**

## **BOOK CHAPTERS**

(1) N. Bianchini, A. Gaetani, N. Mendes, P.B. Lourenço (2021)  
**Experimental behavior of masonry: static and dynamic behavior of arches and vaults**  
In *From corbel arches to double curvature vaults: Analysis, conservation and restoration of masonry structures of architectural heritage*, Eds. G. Milani, V. Sarhosis  
Springer International Publishing  
Forthcoming publication

(2) A. Gaetani, P.B. Lourenço (2019)  
**Influences and analogies between masonry arch and cross vault: from construction to seismic response**  
In *2<sup>nd</sup> International Symposium on Tile Vaulting*, Valencia (Spain), 21-24 November 2018  
Ed. Fernando Vegas López-Manzanares  
Forthcoming publication

(3) A. Gaetani, N. Bianchini, P.B. Lourenço (2019)  
**Regras geométricas e estabilidade de abóbadas em cruzaria ao longo da história e outros subsídios para a intervenção no património**

In 3<sup>rd</sup> *International Congress on Luso-Brazilian Construction History*, Salvador - Bahia - Brazil, 3-6 September 2019  
Expected publication: end of 2021

(4) A. Gaetani, P.B. Lourenço, G. Monti, A. Paolone, G. Milani, (2016)

**Seismic capacity of masonry groin vaults through upper bound limit analysis**

In *Structural Analysis of Historical Constructions: Anamnesis, Diagnosis, Therapy, Controls - Proceedings of the 10th International Conference on Structural Analysis of Historical Constructions (SAHC, Leuven, Belgium, 13-15 September 2016)*

Eds. K. Van Balen, E. Verstrynghe

CRC Press (2016) - ISBN 9781138029514

(5) A. Gaetani, P.B. Lourenço, G. Monti, M. Moroni (2016)

**Experimental and numerical analyses of a masonry arch under base impulse excitation**

In *Brick and Block Masonry - Proceedings of the 16th International Brick and Block Masonry Conference, Padova, Italy, 26-30 June 2016*

Eds. C. Modena, F. da Porto, M.R. Valluzzi

CRC Press (2016) - ISBN 9781138029996

(6) A. Gaetani, G. Monti, P.B. Lourenço, G. Marcarì (2015)

**Masonry cross vaults: an overview of the historical developments**

In *Proceedings of AID Monuments 2015. Materials Techniques Restoration for architectural heritage reusing, Perugia (Italy) 13-16 May 2015* (pp. 589-601)

Eds. C. Conforti, V. Gusella

Ermes, Rome 2016 - ISBN: 9788869751387

(7) F. Fornaini, L. Sonnessa, L. Larocca, A. Gaetani, (2010)

**Meditated modelling and interpretation of the structural behaviour under heavy seismic actions, for a sustainable retrofit to the most updated codes**

In *Strategie di sviluppo sostenibile per le costruzioni in Europa, in Cina ed in Italia per la ricostruzione dopo il terremoto dell'Aquila del 6 Aprile 2009*, Rome (Italy), 19-20 April 2010 (pp. 293-300)

Eds. M. Dolce, C. Nuti, G. Manfredi

Aracne, Rome 2014 - ISBN 9788854844186

## PAPERS IN PROCEEDINGS

(1) A. Gaetani, P.B. Lourenço (2018)

**Finite element modelling of masonry cross vaults: considerations on block interlocking and interface properties**  
In *Proceedings of 10th International Masonry Conference*, Milan (Italy), 9-11 July 2018,  
Eds. G. Milani, A. Taliercio, S. Garrity  
ISSN: 2523532X

(2) A. Gaetani (2017)

**Failure mechanisms of masonry arch and cross vault under seismic action**  
In *Dynamic Interaction of Soil and Structure DISS\_17*, Rome (Italy), 19-20 October 2017

(3) G. Monti, M. Vailati, A. Gaetani, A. Paolone (2014)

**Analytical models for seismic assessment and strengthening of masonry arches**  
In *9th International Masonry Conference*, Guimarães (Portugal), 7-9 July 2014  
Eds. P.B. Lourenço, B. Haseltine, G. Vasconcelos

(4) G. Monti, M. Vailati, A. Gaetani, A. Paolone (2013)

**Modelli analitici di capacità per archi di muratura rinforzati soggetti ad azioni sismiche**  
In *XV Convegno ANIDIS - L'Ingegneria sismica in Italia*, Padova (Italy), 30 June - 4 July 2013  
Eds. F. Braga, C. Modena  
ISBN: 9788897385592

## PRESENTING AUTHOR AT THE FOLLOWING CONFERENCES:

(1) A. Gaetani, P.B. Lourenço (2018)

**Finite element modelling of masonry cross vaults: considerations on block interlocking and interface properties**,  
In *10<sup>th</sup> International Masonry Conference*, Milan (Italy), 9-11 July 2018

(2) A. Gaetani (2017)

**Failure mechanisms of masonry arch and cross vault under seismic action**, In *Dynamic Interaction of Soil and Structure DISS\_17*, Rome (Italy), 19-20 October 2017



(3) A. Gaetani, P.B. Lourenço, G. Monti, A. Paolone, G. Milani, (2016)

**Sensitivity analysis on the seismic capacity of masonry cross vaults**, In *10th International Conference on Structural Analysis of Historical Constructions*, Leuven (Belgium), 13-15 September 2016

(4) A. Gaetani, G. Monti, P.B. Lourenço, G. Marcari, (2015)

**Masonry cross vaults: an overview of the historical developments**, In *2nd International Conference on Architecture and Engineering for the Defence of the Monuments*, Perugia (Italy) 13-16 May 2015

(5) G. Monti, M. Vailati, A. Gaetani, A. Paolone, (2014)

**Analytical models for seismic assessment and strengthening of masonry arches**, In *9th International Masonry Conference*, Guimarães (Portugal), 7-9 July 2014

(6) G. Monti, M. Vailati, A. Gaetani, A. Paolone (2013)

**Modelli analitici di capacità per archi di muratura rinforzati soggetti ad azioni sismiche**. In *XV Convegno ANIDIS - L'Ingegneria sismica in Italia*, Padova, 26-30 June 2016

## LANGUAGES

**Italian** native

**English** full professional proficiency

**Portuguese** minimum professional proficiency

**Spanish** basic professional proficiency

## SOFTWARE

**DIANA, SAP2000, NOLIAN, SISMICAD**

**Matlab**

**Autocad, Archicad, Photoshop**

## OTHER SKILLS

**Violin diploma** and amateur guitar player

Violin player in the **John Cabot Chamber Orchestra** - Rome

**Marathon runner** (Lisbon 2015, Bari 2016, Rome 2018)

Member of **Art Trekking Italia association**

**FAI volunteer** (Fondo Ambiente Italiano), Italian equivalent of British National Trust