PERSONAL INFORMATION

Carlo Giovanni LAI

University of Pavia – Department of Civil Engineering and Architecture
Via Adolfo Ferrata, 3 – 27100 Pavia, Italy

+39 0382 985470

carlogiovanni.lai@unipv.it

http://webing.unipv.eu/

ORCID ID 0000-0002-6651-8828

Nationality Italian

Current Position Professor of Geotechnical Engineering

RESEARCH INTERESTS

Synopsis

My main research interests are in earthquake geotechnical engineering and engineering seismology with special regard to stochastic ground response analyses, probabilistic and deterministic seismic hazard assessment, theoretical modeling of seismic wave propagation in geomaterials, dynamic soil-structure interaction and definition of design earthquake at critical construction sites. I have been coordinator of several research projects on various subjects of earthquake geotechnical engineering and engineering seismology funded by public and private agencies in Italy and abroad. Recently I was the technical lead of LiquefACT, a three and a half years H2020 European research project on the assessment and mitigation of soil liquefaction potential across Europe. I'm author/co-author of over 250 scientific publications including two books and one software package tool for the geotechnical characterization of soil deposits via surface Rayleigh wave analysis.

Citation metrics

Scopus: h-index 27, citations 2617, documents 92
Google Scholar: h-index 35, citations 5278, i10-index 93

JOB EXPERIENCE

From 01/10/2016 to present

Professor of Geotechnical Engineering

Department of Civil Engineering and Architecture – University of Pavia, Italy

- Research and education

From 29/12/2010 to 30/09/2016

Associate Professor of Geotechnical Engineering

Department of Civil Engineering and Architecture – University of Pavia, Italy

- Research and education

From 01/09/2003 to 28/12/2010

Associate Researcher of Geotechnical Engineering

European Centre for Training and Research in Earthquake Engineering – Pavia, Italy

- Principal investigator in research projects in earthquake geotechnics and engineering seismology
- Lecturer at the University of Pavia of courses in geotechnical engineering

From 01/08/1998 to 30/08/2003

Scientific Consultant in Geotechnical Engineering

Studio Geotecnico Italiano Ltd Milano (Italy) – Private Sector, Civil (Geotechnical) Engineering

- Scientific consultant in numerous projects in the field of earthquake geotechnical engineering
- Lecturer at Politecnico di Torino of courses of geotechnical engineering

From 01/01/1993 to 20/12/1993

Team Leader and Project Manager in a Cooperation Programme in Ethiopia

Institute for University Cooperation on behalf of Italian Ministry of Foreign Affairs – Public Sector

- Team leader of the cooperation programme "*Primary Health Care in Arsi Region*" in Ethiopia
- Elaboration of the strategies and methodologies of intervention of the cooperation project
- Management of funds and technical resources of the programme. Coordination of project activities

From 01/07/1992 to 31/12/1992

Consulting Engineer in Geotechnical Engineering

Studio Geotecnico Italiano Ltd Milano (Italy) – Private Sector, Civil (Geotechnical) Engineering

- Geotechnical design of the high-speed railway line Milano – Genova

From 26/03/1990 to 05/06/1992

Civil Engineer Volunteer in a Cooperation Programme in Ethiopia

Institute for University Cooperation on behalf of Italian Ministry of Foreign Affairs – Public Sector

- Design and construction of 15 health facilities and restoration of 7 rural hospitals
- Implementation of small projects in environmental and sanitary engineering
- Organization of training courses in environmental engineering for local land surveyors

From 01/09/1988 to 15/03/1990

Consulting Engineer in Structural and Geotechnical Engineering

I.C.I.S. Ltd Torino (Italy) and I.G.E.A.S. Ltd Torino (Italy) – Private Sector, Civil Engineering

- Structural design of reinforced and prestressed concrete viaducts and bridges
- Structural and geotechnical design of reinforced concrete and masonry structures

ACADEMIC TITLES

1998

PhD in Civil Engineering

Georgia Institute of Technology – Atlanta, USA

- Dissertation title: "*Simultaneous inversion of Rayleigh phase velocity and attenuation for near-surface site characterization*"

1997

Master of Science in Engineering Science and Mechanics

Georgia Institute of Technology – Atlanta, USA

1995

Master of Science in Civil Engineering

Georgia Institute of Technology – Atlanta, USA

1988

Master Degree in Civil Engineering (five years programme)

Politecnico di Torino – Torino, Italy

SPOKEN LANGUAGES

Mother tongue: Italian

Other languages

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C1	C1	C1	C1	C1

Levels: A1/2: Basic user - B1/2: Independent user - C1/2 Proficient user
Common European Framework of Reference for Languages

INSTITUTIONAL NOMINATIONS

International appointments

2024 – 2029 Adjunct faculty at the Department of Civil Engineering at the Indian Institute of Technology Madras

2020 – 2026 Member of PIANC (World Association for Waterborne Transport Infrastructure) WG 225 "*Seismic design guidelines for port structures*". Appointed by Maritime Navigation Commission (MarCom)

2010 – 2017 Member of the executive group of technical committee TC 202 "*Transportation Geotechnics*" of the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE)

National appointments

2015 – 2020 Member of WG for the revision and update of "*Seismic hazard map of Italian territory*". Appointment assigned by the Italian Institute of Geophysics and Volcanology (INGV)

2014 – 2017 Member of Italian national committee for the update of "*Commentary of the Italian building code*" for WG on geotechnical engineering. Decree of CSLP n. 8570 of 19/12/2014

2010 – 2012 Member of Italian national committee for the revision of "*Italian building code*" Ministerial Decree 14/01/2008. WG n. 1 (seismic design of structures) and WG n. 8 (geotechnical engineering)

Institutional service at the University of Pavia

2015 – present Member of university library commission and of scientific council for the library of engineering

2015 – present Erasmus representative for the Bachelor and Master programmes in Civil Engineering

2019 – 2025 Member of the executive committee of the Faculty of Engineering

2018 – 2022 Coordinator of the Master Degree Programme in Civil Engineering

Other institutional appointments

2018 – present Advisor of the Department of Risk Scenarios of the European Centre for Training and Research in Earthquake Engineering (Eucentre) Foundation, Pavia, Italy

2011 – present Member of the academic board of the International Doctoral Research Programme in Understanding and Managing the Extremes at the University Institute for Advanced Studies (IUSS) Pavia, Italy

2023 – 2025 Member for the University of Pavia in the scientific committee under the framework agreement between the Italian Institute of Geophysics and Volcanology (INGV) and the University of Pavia

RELEVANT NATIONAL AND INTERNATIONAL GRANTS (last 10 years as PI)

2022 – 2025 Scientific coordinator for University of Pavia of national project "*GIANO: Geo-Risks Assessment and Mitigation for the Protection of Cultural Heritage*" funded by Italian Ministry of Education, University and Research through PRIN 2020 Call. No. of research units: 5; unit research funds: € 240.000.

2021 Project coordinator for Eucentre Foundation of research project funded by Government of Cayman Islands on "*Probabilistic Seismic Hazard Assessment at Cayman Islands*". Project funds: € 50.000.

2019 – 2026 Project coordinator for the University of Pavia of research project funded by the Italian Department of Civil Protection through the RELUIS Consortium. WP18 on "*Ground response analysis and liquefaction*" and WP16 on "*Building code contribution on seismic action*". Project funds: € 125.000.

2016 – 2019 Technical lead of European Research Project "*Assessment and Mitigation of Liquefaction Potential across Europe: a Holistic Approach to Protect Structures/Infrastructures for Improved Resilience to Earthquake-Induced Liquefaction Disasters*" (LIQUEFACT). Horizon 2020 – Call: H2020-DRS-2015; Topic: DRS-13-2015; Project No. 700748. No. of research units: 11; unit research funds: € 445.000.

2011 – 2014 Scientific coordinator for Eucentre Foundation of European Research Project "*Strategies and Tools for Real Time Earthquake Risk Reduction*" (REAKT). FP7 Collaborative Project Large-scale integrating project. Work programme topic ENV.2011.1.3.1-1 Towards Real-Time Earthquake Risk Reduction. Project number 282862. No. of research units: 23; unit research funds: € 250.000.

ACADEMIC TEACHING ACTIVITY

Tenured and untenured courses taught at the University of Pavia

2004 – present

"Propagation of Mechanical Waves in Deformable Solids" for doctoral students (6 credits)

"Geotechnical Earthquake Engineering" for graduate students in civil engineering (6 credits)

"Foundations and Earth-Retaining Structures" for graduate students in civil engineering (6 credits)

"Geotechnical Engineering" for undergraduate students in civil-environmental engineering (9 credits)

Untenured courses taught at other Universities

1995 – 2018

"Earthquake Geotechnical Engineering" for graduate students in civil engineering (6 credits) at the University School for Advanced Studies (IUSS Pavia) in Pavia, Italy. Three academic years.

"Wave Propagation in Elastic Solids" for graduate students in civil engineering (6 credits) at the University School for Advanced Studies (IUSS Pavia) in Pavia, Italy. Two academic years.

"Geotechnical Engineering" for undergraduate students in civil engineering (5 credits) at the II Faculty of Engineering of Politecnico di Torino in Vercelli, Italy. One academic year.

"Introduction to Rigid Body Dynamics" for undergraduate students in civil engineering (3 credits) at the Georgia Institute of Technology, Atlanta, USA. Two academic years.

AWARDS AND TITLES

2016 Visiting Erskine Fellowship, University of Canterbury, College of Engineering, Christchurch, New Zealand, August 29 – December 28, 2016

2003 Bishop Medal for the best research article in Geotechnical Engineering published by the British Institution of Civil Engineers in 2002. London, UK, November 4, 2003

1998 Outstanding Ph.D. Graduate Award, School of Civil and Environmental Engineering, Georgia Institute of Technology, Atlanta, USA, May 27, 1998

1994 Domenica Rea D'Onofrio Fellowship, Georgia Institute of Technology, Atlanta, USA, March 23, 1994

1988 Habilitation for practicing the profession of civil engineer in Italy

INVITED SPEAKER AT INTERNATIONAL CONFERENCES (last 10 years)

2026 Invited speaker at the Cubrinovski International Symposium on Geotechnical Earthquake Engineering. Presentation title: "*National-scale mapping of the expected earthquake magnitude for soil liquefaction analyses*". University of Canterbury, Christchurch, New Zealand, February 2-3, 2026.

2025 Invited speaker at the 7th International Working Group on Rotational Seismology Meeting. Presentation title: "*Damping measurement in soils by inversion of dispersion functions of P and S waves*". Opole University of Technology, Poland, June 23-26, 2025

2023 Keynote speaker at the 9th Conference of the Croatian Geotechnical Society on the 2020 Petrinja earthquake (SISAK 2023). Presentation title: "*Multi-scale zoning of a territory for earthquake-induced soil liquefaction*". Sisak, Croatia, May 4-6, 2023

2019 Keynote speaker at the International Symposium on Geotechnical Aspects of Heritage Structures (ISGHS-2019). Presentation title: "*Geotechnical modeling and design earthquake at archaeological and cultural heritage sites*". Chennai, India, September 16-18, 2019

2018 Keynote speaker at the XXV International Conference of Geotechnics of Torino (CGT 2018) on "*Analyses and design of geotechnical systems in seismic areas*". Presentation title: "Seismic microzonation for liquefaction risk". Torino, November 8-9, 2018

2015 Keynote speaker at the 6th International Conference on Earthquake Geotechnical Engineering (6ICEGE). Presentation title: "*Non-conventional methods for measuring dynamic properties of geomaterials*". Christchurch, New Zealand, November 1-4, 2015

2015 Invited speaker at the Rapid-Fire Conference at Massachusetts Institute of Technology. Presentation title: "*Damping in soils by inversion of dispersion of bulk waves*". Boston, USA, October 26, 2015

2015 Keynote speaker at the 2nd International Conference Continuous Media with Microstructure (CMwM2015). Presentation title: "*Measurement of damping in soils from exact solution of Kramers–Kronig equations of linear viscoelasticity*". Łagòw, Poland, March 2-5, 2015

2013 Invited speaker at the ALERT-Geomaterials Workshop 2013 on Soil-Structure Interaction. Presentation titles: "*Soil-structure interaction under earthquake loading: theoretical framework*" and "*Advanced numerical modeling of soil-structure interaction: peculiarities, examples and case studies*". Aussois, France, October 3-5, 2013

FURTHER RELEVANT SCIENTIFIC ACTIVITIES

Student guidance of PhD theses
- Supervisor/co-supervisor of 15 doctoral dissertations (14 completed)

Student guidance of MSc theses
- Supervisor/co-supervisor of over 50 completed master theses

Research visits at foreign academic institutions
- Visiting professor at the University of Canterbury, New Zealand to carry out research and teaching activities (20 hours) on earthquake geotechnical engineering. Christchurch, New Zealand. Period: August 29, 2016 – December 28, 2016
- Visiting professor at the School of Civil and Environmental Engineering of the Georgia Institute of Technology, Atlanta, USA to carry out research activities on near-surface geotechnical characterization using Rayleigh waves. Period: July 25 – August 15, 2011
- Visiting scholar at the Department of Civil and Environmental Engineering, Faculty of Engineering of the University of Waterloo, Canada to carry out research activities on dynamic characterization of geomaterials using non-resonant methods. Waterloo. Period: July 15 –August 14, 2007
- Visiting scholar at the Weierstrass Institute for Applied Analysis and Stochastics, Berlin (Germany) to carry out research activities on Biot's model, its admissibility and testing of granular by means of acoustic measurements. Period: May 6 – June 5, 2002

Teaching activities at foreign universities

- Lecturer at the Indian Institute of Technology Madras to deliver a two-week course (30 hours) on "*Advances in seismic hazard analysis and soil-structure interaction*" within the "Global Initiative for Academic Networks (GIAN) in Higher Education". Chennai (India). Period: July 18-31, 2016
- Lecturer of the module "*Seismicity and seismic risk*" at the Master Programmes in Civil Engineering at the Aristotle University of Thessaloniki (Greece), Instituto Superior Técnico of Lisbon (Portugal) and the University of Cantabria at Santander (Spain) for 12 hours. European project Erasmus – Lifelong Learning Programme Safety and Sustainability in Civil Engineering (SASICE) 2010 – 2013
- Lecturer of the module "*Ground response analyses*" (8 hours) at the course on mitigation of seismic risk organized at An-Najah National University in Nablus (Palestinian Territories). European project SASPARM – Call ID FP7-INCO.2011-6.2). Nablus, May 2-4, 2013

Coordinator of Summer Schools

- "*Propagation of Mechanical Waves in Deformable Solids and Meta-Materials*". Intensive School for Advanced Graduate Studies, University of Pavia (Italy). September 5 – 9, 2022
- "*Surface Waves in Geomechanics: Direct and Inverse Modeling for Soils and Rocks*". International Centre for Mechanical Sciences, Udine (Italy). September 27 – October 1, 2004 with K. Wilmanski

Participation at relevant missions

- Member of the team of experts in post-earthquake investigation in Blenheim region (New Zealand) struck by the November 14, 2016 Kaikoura earthquake. Period: November 17-19, 2016
- Member representing the scientific committee of institutional mission of municipality of Milan at the Caribbean Islands for the promotion of candidacy of Milan for EXPO 2015. February 21–29, 2008
- Member of the team of experts of the Italian Civil Protection Department and Ministry of Cultural Heritage for a post-earthquake investigation at the archaeological site of Bam in Iran struck by the December 26, 2003 earthquake. February 13 – 19, 2004

Affiliation to editorial boards

- Member of editorial board of Italian Geotechnical Journal (Pátron). Period: 2016 to present
- Member of editorial board of Seismic Design (IUSS Press). Period: 2008 to present
- Member of editorial board of Transportation Geotechnics (Elsevier). Period: 2013 – 2018

Affiliation to scientific associations

- Member of International Society for Interaction of Mechanics and Mathematics (ISIMM). Since 2003
- Member of Italian Geotechnical Association (AGI). Since 2003
- Member of Geotechnical Extreme Events Reconnaissance Association (GEER). Since 2011

Review and refereeing activities

- Peer reviewer of scientific articles for over 20 international journals
- Peer reviewer for the evaluation of 7 Italian and international research proposals
- Peer reviewer and external referee for the evaluation of over 20 doctoral dissertations

Development of software

- Co-author of software package tools SWAN and SWAMI for the processing and analysis of surface wave data for geotechnical characterization. Technology transfer (http://www.geostudiastier.it/)
- Co-author of software package tool ONDA for computing the nonlinear seismic response of soils (*Journal of Geotech. Geoenviron. Eng., ASCE, Vol. 132, No.2, pp. 223-236*)

Scientific consultancy

- Consultant in several national and international projects worldwide in engineering seismology, earthquake engineering and geotechnical engineering. Since 2003 to present

Personal data

According to law 679/2016 of the Regulation of the European Parliament of 27th April 2016, I hereby express my consent to process and use my data provided in this CV

Date: February 23, 2026

Signature: Carlo Giovanni Lai

Selection of 10 relevant journal articles published in the last 5 years

1. Özcebe A.G., Bozzoni F., Lai C.G., Zuccolo E. (2026). National-scale mapping of earthquake magnitude for liquefaction analyses in Italy. *Earthquake Spectra*, Vol. 42, https://doi.org/10.1002/esp4.70007.
2. Famà A., Andreotti G., Lai C.G. (2025). Hazard-dependent soil factors for site-specific elastic acceleration response spectra of Italian and European seismic building codes – an update from recorded accelerograms. *Bulletin of Earthquake Engineering*, Vol. 23, pp. 5191–5227.
3. Rodriguez-Burneo A., Restrepo J.I., Conte J.P., Lai C.G. (2024). Continuum soil-structure-interaction model of the LHPOST6 shaking table reaction mass at UC San Diego. *Earthquake Engineering & Structural Dynamics*, Vol. 53, No. 13, pp. 4133–4158.
4. Bozzoni F., Misiano G., Lai C.G. (2023). A multi-scale tool for assessing the seismic risk of small dams during emergency preparedness. *Natural Hazards*, 118:2069–2095.
5. Bozzoni F., Furiosi A., Lai C.G. (2023). Probabilistic assessment of seismic liquefaction hazard at national scale: macrozonation of Italy. *Natural Hazards*, 115:2237–2255.
6. Parolai S., Lai C.G., Dreossi I., Ktenidou O., Yong A. (2022). A review of near-surface Q_S estimate using active/passive sources. *Journal of Seismology*, Vol. 26, pp. 823–862.
7. Bozzoni F., Cantoni A., De Marco M.C., Lai C.G. (2021). ECLiq: European interactive catalogue of earthquake-induced soil liquefaction phenomena. *Bulletin of Earthquake Engineering*, Vol. 19, No. 12, pp. 4719–4744.
8. Bozzoni F., Bonì R., Conca D., Lai C.G., Zuccolo E., Meisina C. (2021). Megazonation of earthquake-induced soil Liquefaction hazard in continental Europe. *Bulletin of Earthquake Engineering*, Vol. 19, S.I.: The H2020 European Project LIQUEFACT, pp. 4059–4082.
9. Lai C.G., et al. (2021). Technical guidelines for the assessment of earthquake-induced liquefaction hazard at urban scale. *Bulletin of Earthquake Engineering*, Vol. 19, S.I.: The H2020 European Project LIQUEFACT, pp. 4013–4057.
10. Özcebe A.G., Giretti D., Bozzoni F., Fioravante V., Lai C.G. (2021). Centrifuge and numerical modelling of earthquake-induced soil liquefaction under free-field conditions and by considering soil–structure interaction. *Bulletin of Earthquake Engineering*, Vol. 19, pp. 47-75.