

## CURRICULUM VITÆ

**Prof. Carlo G. LAI (PhD, PE)**

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### **CURRENT POSITION:**

- Professor of Geotechnical Engineering, Department of Civil Engineering and Architecture, Faculty of Engineering, University of Pavia (Italy). Since 2016.
- Head of Geotechnical Earthquake Engineering Section, European Centre for Training and Research in Earthquake Engineering (EUCENTRE), Pavia (Italy). Since 2003.
- Affiliate faculty at the European School for Advanced Studies in Reduction of Seismic Risk, Institute for Advanced Studies (ROSE School – IUSS), Pavia (Italy). Since 2006.



### **EDUCATION:**

- PhD in Civil Engineering, Georgia Institute of Technology, Atlanta, USA, 1998.
- MSc in Engineering Science and Mechanics, Georgia Institute of Technology, Atlanta, USA, 1997.
- MSc in Civil Engineering, Georgia Institute of Technology, Atlanta, USA, 1995.
- MSc in Civil Engineering, Politecnico di Torino, Italy, 1988.

### **FORMER EMPLOYMENT POSITIONS:**

- 2010–2016: Associate Professor of Geotechnical Engineering, Department of Civil Engineering and Architecture, Faculty of Engineering, University of Pavia (Italy).
- 2003–2010: Associate Researcher at the European Centre for Training and Research in Earthquake Engineering (EUCENTRE), Pavia (Italy).
- 1998–2003: Scientific Consultant in Earthquake Geotechnical Engineering at Studio Geotecnico Italiano Ltd engineering office, Milano (Italy) and Lecturer of Geotechnical Engineering at Politecnico di Torino (Italy).
- 1990–1993: Project Manager in the Cooperation Programme “*Primary Health Care in Arsi Region*” in Ethiopia for the Institute for University Cooperation on behalf of the Italian Ministry of Foreign Affairs.
- 1988–1990: Consulting engineer at I.C.I.S. Ltd, Torino and at I.G.E.A.S. Ltd engineering offices, Torino (Italy).

### **AWARDS AND PROFESSIONAL TITLES:**

- Visiting Erskine Fellowship, Department of Civil and Natural Resources Engineering, College of Engineering, University of Canterbury (Christchurch, New Zealand). August 29 – December 28, 2016.
- Bishop Medal 2003 for the best research contribution in Geotechnical Engineering published by the British Institution of Civil Engineers in 2002. London, UK, November 4, 2003.
- Outstanding Ph.D. Graduate Award, School of Civil and Environmental Engineering, Georgia Institute of Technology, Atlanta, USA, May 27, 1998.
- Domenica Rea D’Onofrio Fellowship, Georgia Institute of Technology, Atlanta, USA, March 23, 1994.
- Habilitation for practicing in Italy the profession of civil engineer. Since 1988.

### **CITATION METRICS:**

- Hirsch's h-index: 13 (Scopus) 20 (Google Scholar).

### **CURRENT COURSES TAUGHT AT THE UNIVERSITY OF PAVIA:**

- Geotechnique (9 credits) for undergraduate students in Civil/Environmental Engineering.
- Geotechnique (6 credits) for graduate students in Architectural Engineering.
- Seismic Geotechnique (6 credits) for graduate students in Civil/Environmental Engineering.
- Geotechnical Engineering (6 credits) for Italian-Chinese graduate students in Architectural Engineering.

### **RECENT COURSES TAUGHT AT OTHER UNIVERSITIES:**

- Geotechnical Earthquake Engineering (6 credits) for graduate students at the European School for Advanced Studies in Reduction of Seismic Risk (ROSE School – IUSS), Pavia (Italy). Academic year 2014–2015.
- Wave Propagation in Elastic Solids (6 credits) for graduate students at the European School for Advanced Studies in Reduction of Seismic Risk (ROSE School – IUSS), Pavia (Italy). Academic year 2010–2011.

### **RESEARCH ACTIVITIES:**

His 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, propagation of Rayleigh waves in dissipative continua, solution of dynamic soil-structure interaction problems, definition of the design earthquake at construction sites. He has been coordinator of several research projects on various subjects of earthquake geotechnical engineering and engineering seismology funded by public as well as

private agencies in Italy and abroad. Currently he is the technical lead of a European research project on the assessment and mitigation of liquefaction potential across Europe. He is also coordinating three projects funded by the Italian Department of Civil Protection on the mitigation of seismic risk at airports, maritime port structures and on seismic stability of slopes under near-fault seismic excitations.

#### **PUBLICATIONS:**

He is author/co-author of more than 150 scientific publications including two books and one software package tool for surface wave analysis. A selection of recently published journal papers is reported below:

1. Lai, C.G. and Özcebe, A.G. (2016). "Non-conventional lab and field methods for measuring frequency-dependent low-strain parameters of soil dynamic behaviour". *Soil Dynamics and Earthquake Engineering*. <http://dx.doi.org/10.1016/j.soildyn.2016.09.007>.
2. Petaccia, G., Lai, C.G., Milazzo, C., Natale, L. (2016). "The collapse of Sella Zerbino gravity dam". *Engineering Geology*, Vol. 211, pp. 39-49.
3. Calabrese, A., Lai, C.G. (2016). "Sensitivity Analysis of the Seismic Response of Gravity Quay Walls to Perturbations of Input Parameters". *Soil Dynamics and Earthquake Engineering*, Vol. 82, pp. 55-62.
4. Deyanova, M.G., Lai, C.G., Martinelli, M. (2016). "Displacement-Based Parametric Study on the Seismic Response of Gravity Earth-Retaining Walls". *Soil Dynamics and Earthquake Engineering*, Vol. 80, pp. 210-224.
5. Abraham J.R., Lai C.G., Papageorgiou A. (2015). "Basin-Effects Observed During the 2012 Emilia Earthquake Sequence in Northern Italy". *Soil Dynamics and Earthquake Engineering*, Vol. 78, pp. 230-242.
6. Lai, C.G., Bozzoni, F., Mangriotis, M.-D., Martinelli, M. (2015). "Soil liquefaction during the May 20, 2012 M5.9 Emilia earthquake, Northern Italy: field reconnaissance and post-event assessment". *Earthquake Spectra*, Vol. 31, No. 4, pp. 2351-2373.
7. Lai, C.G., Mangriotis, M.-D., Rix, G.J. (2014). "An Explicit Relation for the Apparent Phase Velocity of Rayleigh Waves in a Vertically-Heterogeneous Elastic Half-Space". *Geophysical Journal International*. Vol. 199, No. 2, pp. 673-687.
8. Sanchez-Lizarraga, H., Lai, C.G. (2014). "Effects of spatial variability of soil properties on the seismic response of an embankment dam". *Soil Dynamics and Earthquake Engineering*, Vol. 64, pp. 113-128.
9. Trianni, S.C.T., Lai, C.G., Pasqualini, E. (2014). "Probabilistic Seismic Hazard Analysis at a Strategic Site in the Bay of Bengal." *Natural Hazards*. Vol. 74, No. 3, pp. 1683-1705.
10. Calabrese, A., Lai, C.G. (2013). "Fragility Functions of Blockwork Wharves Using Artificial Neural Networks". *Soil Dynamics and Earthquake Engineering*, Vol. 52, pp. 88-102.

#### **STUDENT GUIDANCE FOR MASTER AND DOCTORAL THESES:**

- He has been advisor/co-advisor of 10 doctoral dissertations (9 completed).
- He has been advisor/co-advisor of over 40 completed master theses.

#### **INSTITUTIONAL APPOINTMENTS:**

He is or he has been affiliated to various scientific and technical committees and associations including:

- Member of the working group for the revision and update of the "Seismic hazard map of Italy". Appointed by the Italian Institute of Geophysics and Volcanology (INGV). Period 06/06/2015 – 31/12/2016.
- Member of the COSMOS project for the co-authorship of chapters/sections of the "COSMOS international guidelines for the application of non-invasive geophysical techniques to characterize seismic site conditions". Appointed by COSMOS Facilitation Committee on November, 2015.
- Member of Italian national committee for the revision and update of the "Commentary of the new Italian Building Code" for working group on geotechnical engineering. Period 19/12/2014 – 31/12/2016.
- Member of Italian national committee for the revision of the Italian Building Code (NTC 2008). Component of two working groups in Geotechnical Engineering and in Seismic Design of Structures. Period 2010-2012.
- 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) in Pavia, Italy. Since 2011.
- Member of technical committees 202 (Transportation Geotechnics) of the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE). Since 2010.
- Member of Geotechnical Extreme Events Reconnaissance (GEER) Association. Since 2011.
- Member of editorial board of the Italian Geotechnical Journal edited by Pátron. Since 2016.
- Member of editorial board of the international journal Transportation Geotechnics (Elsevier). Since 2013.
- Member of editorial board of the Italian journal Progettazione Sismica (EUCENTRE Press). Since 2008.
- Member of the International Society for the Interaction of Mechanics and Mathematics (ISIMM). Since 2003.
- Member of the Italian Geotechnical Association (AGI). Since 2003.

#### **OTHER ACTIVITIES:**

- Keynote lecturer and invited speaker at national and international conferences and symposia.
- Peer-reviewer and external referee for the evaluation of 10 PhD dissertations in Italy and abroad.
- Peer-reviewer of national and international research projects and of several scientific journals.
- Invited instructor of graduate courses at foreign academic institutions in Europe and overseas.
- Visiting scholar at the University of Canterbury (New Zealand), Georgia Institute of Technology (USA), University of Waterloo (Canada), Weierstrass Institute for Applied Analysis and Stochastics (Germany).
- Coordinator and lecturer at Italian universities of advanced courses in earthquake geotechnical engineering.
- Member of the team of experts of the Italian Civil Protection Department for a post-earthquake field reconnaissance at the archaeological site of Bam in Iran struck by the December 26, 2003 earthquake.
- Invited speaker in geotechnical engineering at several professional refresher courses in Italy.
- Scientific consultant in geotechnical engineering and engineering seismology in several projects worldwide.