

Paolo Franchin

Department of Structural Engineering & Geotechnics
Faculty of Architecture “Valle Giulia”
“Sapienza” University of Rome
Via Gramsci 53 I-00197 Rome Italy
Tel. +39 (06) 49919189 Fax. +39 (06) 3221449
Email paolo.franchin@uniroma1.it
Web http://w3.uniroma1.it/franchin/Paolo_Franchin/MAIN.html

Positions

- Assistant professor (2006-present), Dept. of Structural Engineering & Geotechnics, Faculty of Architecture “Valle Giulia”, “Sapienza” University of Rome
- Post-doctoral research fellow (2001-2006), Dept. of Structural Engineering & Geotechnics, “Sapienza” University of Rome

Education

- Doctor of Research, Structural Engineering, Sapienza - University of Rome, 2001
- MSc, Civil Engineering, University of California, Berkeley, 2000
- Laurea, with honors, Civil (structural) engineering, Sapienza - University of Rome, 1997

Research Interests

- Earthquake engineering and Structural reliability
 - Probabilistic methods and applications in earthquake engineering
 - Seismic assessment of existing RC and masonry buildings
 - Seismic design and assessment of bridges (isolation, multi-support excitation)
 - Analysis of infrastructural systems in seismic areas (road networks, health-care facilities, oil-refineries)
 - Soil-foundation-structure interaction problems (seismic earth pressures on retaining structures)
 - Response sensitivity of non-linear structures to model and load parameters

Publications

INTERNATIONAL JOURNALS

- Calvi GM, Pinto PE, [Franchin P](#), Marnetto R “The highway network in the area struck by the event” *Progettazione Sismica*, IUSSPress, Pavia, Vol.1(3), 2009 [Special Issue on the April 6th 2009 l’Aquila earthquake]
- Pinto PE and [Franchin P](#) “Issues in the upgrade of Italian highway structures” *Journal of Earthquake Engineering*, Taylor and Francis, *in press* 2010
- [Franchin P](#), Pinto PE and Rajeev P (2009) “CF?” *Journal of Earthquake Engineering*, Taylor and Francis, *in press*.
- [Franchin P](#) and Pinto PE (2009) “Allowing traffic over mainshock-damaged bridges” *Journal of Earthquake Engineering*, Taylor and Francis, Vol.13(5): 585-599.
- Rajeev P, [Franchin P](#) and Pinto PE (2008) “Increased accuracy of vector-IM-based seismic risk assessment?” *Journal of Earthquake Engineering*, Taylor and Francis, Vol.12(Special Issue 1):111-124.
- Jalayer F, [Franchin P](#) and Pinto PE (2007) “A scalar damage measure for seismic reliability analysis of RC frames” *Earthq. Engng Struct. Dyn.*Vol.36(13): 2059-2079.
- [Franchin P](#), Pinto PE and Schotanus MIJ(2006) “Seismic loss estimation by efficient simulation” *Journal of Earthquake Engineering*, Imperial College Press, Vol.10(Special Issue 1): 31-44.
- Lupoi G, [Franchin P](#), Lupoi A and Pinto PE (2006) “Seismic fragility analysis of structural systems” *ASCE Journal of Engineering Mechanics* Vol.132(4): 385-395.
- [Franchin P](#), Lupoi A and Pinto PE (2006) “On the role of road networks in reducing human losses after earthquakes” *Journal of Earthquake Engineering*, Imperial College Press, Vol.10(2): 195-206.

- Pinto PE, Lupoi A, Franchin P and Monti G (2005) “Seismic design of bridges accounting for spatial variability of ground motion” *Earthquake Engineering and Structural Dynamics*, Wiley, Vol.34: 327-348.
- Schotanus MIJ, Franchin P, Lupoi A and Pinto PE (2004) “Seismic fragility analysis of 3D structures” *Structural Safety* Vol.26(4): 421-441.
- Scott MH, Franchin P, Fenves GL and Filippou FC (2004) “Response sensitivity for nonlinear beam-column elements” *ASCE Journal of Structural Engineering* Vol.130(9): 1281-1288.
- Franchin P (2004) “Reliability of uncertain inelastic structures under earthquake excitation” *ASCE Journal of Engineering Mechanics* Vol.130(2): 180-191.
- Franchin P, Lupoi A, Pinto PE and Schotanus MIJ (2003) “Seismic fragility of reinforced concrete structures using a response surface approach” *Journal of Earthquake Engineering*, Imperial College Press, Vol.7(Special Issue 1): 45-77.
- Lupoi A, Franchin P and Schotanus MIJ (2003) “Seismic risk evaluation of RC bridge structures” *Earthquake Engineering and Structural Dynamics*, Wiley, Vol.32: 1275-1290.
- Franchin P, Lupoi A and Pinto PE (2002) “Methods of seismic risk analysis: State-of-the-Art versus advanced State-of-the-Practice” *Journal of Earthquake Engineering*, Imperial College Press, Vol.6(Special Issue 1): 131-155.
- Franchin P, Ditlevsen O and Der Kiureghian A (2002) “Model correction factor method for reliability problems involving integrals of non-Gaussian random fields” *Probabilistic Engineering Mechanics*, Elsevier, Vol.17(2): 109-122.
- Franchin P, Monti G and Pinto PE (2001) “On the accuracy of simplified methods for the analysis of seismically isolated bridges” *Earthquake Engineering and Structural Dynamics*, Wiley, Vol.30: 363-382.
- Pignataro M, Pasca M and Franchin P (2000) “Post-buckling analysis of corrugated panels in the presence of multiple interacting modes”, *Thin Walled Structures*, Elsevier, Vol.36: 47-66.

CONFERENCES

- Pinto PE and Franchin P (2010) “Open issues in the seismic design and assessment of bridges” 14th European Conf. Earthquake Engng, Ohrid, Makedonia, August 2010
- Franchin P and Pinto PE “Seismic design and assessment of bridges: selected issues” Handling Exceptions in Structural Engineering 2010, Rome, Italy, July 2010
- Franchin P and Pinto PE (2010) “Direct seismic design for assigned performance probabilities” *fib* 3rd Intl Congress, Washington DC, USA, May 2010
- Franchin P and Pinto PE (2009) “Direct probability-based seismic design of RC buildings” Proc. of *ACES Workshop on Performance-based seismic design*, Corfu, Greece, July 2009
- Franchin P, Pinto PE and Rajeev P (2009) “Adequacy of a single confidence factor to account for epistemic uncertainty in the seismic assessment of existing structures” Proc. of *COMPDYN'09* Rhodes, Greece.
- Franchin P, Pinto PE and Rajeev P (2009) “Incertezza epistemica nella valutazione sismica degli edifici esistenti in c.a.: formato e valori del fattore di confidenza” (in Italian) Proc. of *Giornate AICAP 2009*, Pisa, Italy.
- Franchin P, Pinto PE and Rajeev P (2009) “Epistemic uncertainty in the seismic assessment of existing reinforced concrete buildings: format and values of the Confidence Factor” Proc. of *ANIDIS XIII 13th Italian Conference on Earthquake Engineering*, Bologna, Italy.
- Franchin P, Pinto PE and Rajeev P (2008) “Assessing The Adequacy of a Single Confidence Factor in Accounting for Epistemic Uncertainty” Proc. of *Valutazione e riduzione della vulnerabilità sismica di edifici esistenti in c.a.*, Roma, Italy
- Franchin P, Lupoi A and Pinto PE (2007) “Sull'applicabilità delle analisi statiche non lineari per la valutazione della sicurezza sismica dei ponti” (in Italian) Proc. of *Giornate AICAP 2007*, Salerno, Italy.
- Jalayer F, Franchin P and Pinto PE (2007) “Rappresentazione dello stato di un sistema strutturale nella valutazione probabilistica della sicurezza sismica: proposta di una variabile scalare” (in Italian) Proc. of *Giornate AICAP 2007*, Salerno, Italy.
- Jalayer F and Franchin P (2007) “Seismic Hazard Analysis for Alternative Measures of Ground Motion Intensity Employing Stochastic Simulation Method” Proc. of *ICASP10*, Tokyo, Japan.
- Lupoi G, Franchin P, Lupoi A, Pinto PE (2007) “Valutazione delle prestazioni di sistemi ospedalieri in caso di evento sismico” Proc. of *ANIDIS XII 12th Italian Conference on Earthquake Engineering*, Pisa, Italia.
- Pathmanathan R, Franchin P, Lai GC and Pinto PE (2007) “Numerical modelling of seismic response of cantilever earth-retaining structures” Proc. of *4ICEGE*, Thessaloniki, Greece.

- Franchin P, Noto F and Pinto PE (2007) “A nonlinear dynamic model for seismic analysis of earth-retaining diaphragm-walls” Proc. of *4ICEGE*, Thessaloniki, Greece.
- Jalayer F, Franchin P, Pinto PE (2007) “Structural Modeling Uncertainty in Seismic Reliability Analysis of RC Frames: Use of Advanced Simulation Methods” Proc. of *COMPDYN'07* Crete, Greece.
- Lupoi A, Franchin P and Pinto PE (2007) “Further probing of the suitability of push-over analysis for the seismic assessment of bridge structures” Proc. of *COMPDYN'07* Crete, Greece.
- Franchin P and Pinto PE (2007) “Seismic design and assessment of bridge abutments” Proc. of *1st US-Italy Seismic Bridge Workshop*, Pavia, Italy.
- Lupoi A, Franchin P and Pinto PE (2007) “On the application of nonlinear static analysis to irregular bridges” Proc. of *1st US-Italy Seismic Bridge Workshop*, Pavia, Italy.
- Franchin P and Pinto PE (2007) “Transitability of mainshock-damaged bridges” Proc. of *1st US-Italy Seismic Bridge Workshop*, Pavia, Italy.
- Lupoi G, Franchin P, Lupoi A, Pinto PE (2006) “Seismic performance assessment of hospital systems” Proc. of *1ECEES*, Geneva, Switzerland.
- Franchin P, Pinto PE and Schotanus MIJ (2006) “Probabilistic assessment of earthquake losses and safety for existing structures” Proc. of 2nd *fib* Congress, Naples, Italy (paper 0429).
- Franchin P, Lupoi A, Pinto PE and Schotanus MIJ(2006) “Seismic fragility analysis of RC structures: use of response surface for a realistic application” Proc. of *Workshop SPEAR*, Ispra, Italy.
- Lupoi G, Franchin P, Lupoi A, Pinto PE(2004) “Seismic fragility analysis of structural systems” Proc. of *13WCEE*, Vancouver BC, Canada, (Paper 4008).
- Franchin P, Lupoi A, Pinto PE and Schotanus MIJ (2004) “Seismic fragility analysis of RC structures: use of response surface for a realistic application” Proc. of *13WCEE*, Vancouver BC, Canada (Paper 4009).
- Pinto PE, Franchin P, Lupoi A and Lupoi G(2004) “Seismic fragility analysis of structural systems” Proc. of *3rd Int. Workshop on Perf.-Based Seismic Design*, Bled, Slovenia.
- Schotanus MIJ and Franchin P (2004) “Seismic Reliability Analysis Using Response Surface: A Simplified Approach” Proc. of *2nd ASRANet Colloquium*, Barcelona, Spain.
- Lupoi A, Franchin P, Monti G and Pinto PE (2003) “Relevance of spatial variability of ground motion on seismic design of bridges” Proc. of *ACI Conference on Seismic design of bridges*, San Diego, CA.
- Lupoi A, Franchin P, Monti G and Pinto PE (2003) “Relevance of spatial variability of ground motion on seismic design of bridges” Proc. of *fib Symposium on Concrete structures in seismic regions*, Athens, Greece.
- Franchin P, Lupoi A, Pinto PE and Schotanus MIJ (2003) “Response surface for seismic fragility analysis of RC structures” Proc. of *ICASP9 (9th International conference on application of statistics and probability)*, San Francisco, CA.
- Franchin P (2002) “A crossing-rate/FORM method for seismic reliability analysis of inelastic structures” Proc. of the *12th European Conference on Earthquake Engineering*, London, UK.
- Schotanus MIJ, Lupoi A and Franchin P (2001) “Applicazione di metodologie affidabilistiche per il rischio sismico di strutture in c.a.” (in Italian) Proc. of *ANIDIS10 10th Italian Conference on Earthquake Engineering*, Potenza, Italia.
- Franchin P, Ditlevsen O and Der Kiureghian A (2001) “Integrals of Random Fields Treated by the Model Correction Factor Method” Proc. of *ICOSSAR'01 (8th International Conference on Structural Safety and Reliability)*, Balkema.
- Pasca M, Pignataro M and Franchin P (1999) “Post-buckling analysis of V-stiffened corrugated sheets under compression”, *Stability and Ductility of Steel Structures (SDSS'99)*, D.Dubina and M.Ivanyi, editors, Elsevier Science Ltd.

BOOKS AND BOOK CHAPTERS

- Pinto PE and Franchin P (2007) Contributions to Chapters 7 (“Design for spatial variability of ground motion”) and 10 (“Assessment of existing bridges”) of *fib Bulletin on Seismic design, assessment and retrofit of bridges*.
- Pinto PE, Giannini R and Franchin P (2004) *Seismic reliability analysis of structures*, IUSSPress, Pavia, ISBN 88-7358-017-3.

TECHNICAL REPORTS AND MANUALS

- Pinto PE, Franchin P and Lupoi A (2009) *Valutazione e Consolidamento Sismico dei Ponti Esistenti*, (in Italian) Design Handbook, IUSSPress, Pavia, ISBN 978-88-6198-036-5
- Lupoi G, Franchin P, Lupoi A, Pinto PE and Calvi GM (2008) *Probabilistic seismic assessment for hospitals and complex-social systems*, Rose School Tech.Rep 2008/02, IUSSPress, Pavia, ISBN 978-88-6198-017-4
- Pinto PE and Franchin P (2007) *Probabilistic seismic risk assessment of road networks: a decision basis for transitability of bridges in the aftermath of a damaging earthquake*, LessLoss Tech. Rep. 130.
- Pinto PE, Franchin P and Lupoi A (2006) State of the art on methods for seismic risk assessment of road networks, LessLoss Tech. Rep. 79.

Reviewer for

- International Journal of Earthquake Engineering & Structural Dynamics, Wiley
- Journal of Earthquake Engineering, Taylor and Francis
- Journal of Structural Engineering, ASCE
- International Engineering of Reliability & Safety
- Bulletin of Earthquake Engineering, Springer
- Soil Dynamics & Earthquake Engineering, Elsevier
- Engineering Structures, Elsevier
- ICASP9 (9th Int. Conf. on Appl. of Statistics and Probability to Civil Eng., San Francisco CA, 2003
- Mid-America Earthquake (MAE) Center reports

Other appointments

- Co-supervisor (with P.E. Pinto) of the PhD thesis “Role of Confidence Factor in Seismic Assessment of Structures” by Rajeev P., ROSE School, Pavia, Italy (2008)
- Member of the Committee for the PhD thesis “A non-linear coupled model for the analysis of reinforced concrete sections under bending, shear, torsion and axial forces” by J.M.B. Bairàn, Universidad Publica de Catalunya 15/12/2005
- Co-supervisor (with G.M. Calvi and P.E. Pinto) of the PhD thesis “Seismic performance assessment of oil refineries” by M.IJ. Schoatnus, ROSE School, Pavia, Italy (2005)
- Co-supervisor (with P.E. Pinto and G.C. Lai) of the MSc thesis “Numerical modelling of seismic behaviour of earth-retaining walls” by Rajeev P., ROSE School, Pavia, Italy (2006)

Affiliations and Memberships

- Member, Commission 7 “Seismic design” of International Federation of Structural Concrete (*fib*) since 2008
- *fib* Task Group 7.7 “Probabilistic performance-based seismic design” 2009-ongoing
- Member, Sub-Committee 3 “Structural Reliability and Optimization” of the International Association of Structural Safety And Reliability (IASSAR), since 2008
- Member, American Society of Civil Engineers (*ASCE*) since 2008
- *fib* Task Group 7.5 “High-performance materials and structural systems” 2003-2006
- Member, International Federation of Structural Concrete (*fib*) since 2003
- Professional Board of Engineers of Rome, since 1997

Participation to Research projects

Projects funded by the European Union

- SAFERR (FP5) “Safety Assessment for Earthquake Risk Reduction”
- SPEAR (FP5) “Seismic Performance Assessment and Rehabilitation”
- LESSLOSS (FP6) “Risk Mitigation for Earthquakes and Landslides” – Sub-Project 9 “Probabilistic Seismic Risk Assessment: Methods and Applications”
- SYNERG (FP7) “Systemic Seismic Vulnerability and Risk Analysis for Buildings, Lifeline Networks and Infrastructures Safety Gain”

Projects funded by the Italian Ministry for Higher Education and Research (MIUR)

- PRIN2002 “Aspetti innovativi nella progettazione antisismica dei ponti”

- PRIN2004 “Sicurezza sismica degli edifici esistenti – Sviluppo di metodi ed applicazioni.”
- PRIN2007 “Valutazione probabilistica in tempo reale della transitabilità post-sisma di opere da ponte”

Projects funded by the Italian National Research Council

- VIA “Riduzione della Vulnerabilità sismica di sistemi Infrastrutturali e Ambiente fisico”
- MIUR-CNR “Diagnostica e Salvaguardia dei Manufatti Architettonici con Particolare Riferimento agli Effetti Derivanti da Eventi Sismici e Altre Calamità Naturali”

Projects funded by the Italian Department of Civil Protection

- Progetto Esecutivo DPC-Reluis 2005-2008 – Linea 3 “Valutazione e riduzione del rischio sismico di ponti esistenti”
- Progetto Esecutivo DPC-Eucentre 2009-2012 – d4 “Sicurezza sismica delle reti viabilistiche”

Teaching experience

Sapienza - Università di Roma, Graduate School in Civil Engineering

- Affidabilità strutturale, with PE Pinto and M Ciampoli (2009)

Sapienza - Università di Roma, Faculty of Architecture Valle Giulia

- Laboratorio di Progetto di Strutture (since 2006)
- Laboratorio di Progetto di Strutture, Tutor for M Menegotto (2005)
- Tirocinio di Tecnica delle Costruzioni (2005, 2006)

Sapienza - Università di Roma, Faculty of Architecture Ludovico Quaroni

- Costruzioni in zona sismica, Assistant for PE Pinto, Faculty of Architecture Ludovico Quaroni (2001, 2002, 2003, 2004, 2005, 2008)
- Laboratorio di Costruzioni dell’Architettura II, Assistant for PE Pinto (2004, 2005)

Università di Roma Tre, Master di II livello MICA

- La sicurezza delle costruzioni, le azioni e loro combinazione, with PE Pinto (2003, 2004, 2005, 2006, 2007)

Università di Bologna, Master di II livello “L’ingegneria strutturale nel III millennio”

- La progettazione antisismica delle strutture e i sistemi innovativi di mitigazione dell’azione sismica, with PE Pinto (2004)

European School for Advanced Studies in Reduction of Seismic Risk (ROSE)

- Methods of Seismic Reliability Analysis, with PE Pinto (2001, 2005, 2008)
- Probabilistic Seismic Risk Assessment of Structures, with PE Pinto (2003)

Università degli studi dell’Aquila, Master di II livello MIA (Master in Ingegneria Antisismica)

- La progettazione antisismica delle strutture, with PE Pinto (2007)