

DIMITRIOS VAMVATSIKOS

ASSOCIATE PROFESSOR

Curriculum Vitae

Dr Vamvatsikos studied civil engineering at the National Technical University of Athens (Diploma, 1997) and at Stanford University (MSc 1998, PhD 2002). His research interests are focused on integrating structural modelling, computational techniques, probabilistic concepts and experimental results into a coherent framework for the performance evaluation of structures and infrastructure under man-made and natural hazards. His seminal work in risk assessment via Incremental Dynamic Analysis has received wide attention leading to more than 5600 citations (Scopus, Sep/2022), making him one of the top-cited earthquake engineers worldwide. He has co-operated with leading structural engineering firms (ARUP, Halcrow/CH2M/Jacobs, Buro Happold), the oil & gas industry (Shell, ExxonMobil), catastrophe risk modelers (AIR Worldwide, RED Srl), and insurance/reinsurance companies (AXA Insurance), he has worked on standards for USA and EU (CEN-CENELEC), while his research has been funded by the Applied Technology Council (ATC), the Federal Emergency Management Agency (FEMA), the US National Institute of Standards and Technology (NIST), the International Organization for Standardization (ISO), the World Bank, the European Commission, and the Global Earthquake Model (GEM) Foundation.

Education

PhD	2002	Department of Civil and Environmental Engineering, Stanford University, advised by Professor C.A. Cornell.
MSc Geomechanics	1998	Department of Civil and Environmental Engineering, Stanford University, advised by Professor R.I. Borja.
Diploma in Civil Engineering	1997	Department of Civil Engineering, National Technical University of Athens, advised by Professors I. Vardoulakis & H.G. Georgiadis.

Academic Career History

8/2020 –	Associate Professor	School of Civil Engineering National Technical University of Athens
12/2015 – 8/2020	Assistant Professor	School of Civil Engineering National Technical University of Athens
1/2011 – 12/2015	Lecturer	School of Civil Engineering National Technical University of Athens
1/2010 – 12/2010	Assistant Professor	Department of Civil and Environmental Engineering University of Cyprus
9/2005 – 12/2009	Lecturer	Department of Civil and Environmental Engineering University of Cyprus
3/2005 – 8/2005	Adjunct Lecturer (PD 407/80)	School of Civil Engineering National Technical University of Athens
3/2004 – 3/2005	Postdoctoral Researcher	Department of Mechanical and Industrial Engineering, University of Thessaly

Selected Publications

Available at <http://users.ntua.gr/divamva/publications.html>

A. Journal Papers

1. Kazantzi A.K., Karaferis N.D., Melissianos V.E., Bakalis K., Vamvatsikos D. (2022). Seismic fragility assessment of building-type structures in oil refineries. *Bulletin of Earthquake Engineering*, **20**: 6853–6876. DOI: 10.1007/s10518-022-01476-y
2. Lachanas C.G., Vamvatsikos D. (2022). Rocking incremental dynamic analysis. *Earthquake Engineering and Structural Dynamics*, **51**(3): 688–703. DOI:10.1002/eqe.3586
3. Chatzidaki A., Vamvatsikos D. (2021). Mixed probabilistic seismic demand models for fragility assessment. *Bulletin of Earthquake Engineering*, **19**: 6397–6421. DOI: 10.1007/s10518-021-01163-4
4. Kazantzi A.K., Vamvatsikos D., Miranda E. (2020). Evaluation of seismic acceleration demands on building nonstructural elements. *ASCE Journal of Structural Engineering*, **146**(7): 04020118. DOI: 10.1061/(ASCE)ST.1943-541X.0002676
5. Vamvatsikos D., Bakalis K., Kohrangi M., Pyrza S., Castiglioni C., Kanyilmaz A., Morelli F., Stratan A., D' Aniello M., Calado L., Proença J.M., Degee H., Hoffmeister B., Pinkawa M., Thanopoulos P., Vayas I. (2020). A risk-consistent approach to determine EN1998 behaviour factors for lateral load resisting systems. *Soil Dynamics and Earthquake Engineering*, **131**: 106008. DOI: 10.1016/j.soildyn.2019.106008
6. Sakka E.G., Bilonis D.V., Vamvatsikos D., Gantes C.J. (2020). Onshore wind farm siting prioritization based on investment profitability for Greece. *Renewable Energy*, **146**: 2827–2839. DOI: 10.1016/j.renene.2019.08.020
7. Silva V., Akkar S., Baker J.W., Bazzurro P., Castro J.M., Crowley H., Dolsek M., Galasso C., Lagomarsino S., Monteiro R., Perrone D., Pitilakis K., Vamvatsikos D. (2019). Current challenges and future trends in analytical fragility and vulnerability modelling. *Earthquake Spectra*, **35**(4): 1927–1952. DOI: 10.1193/042418EQS1010
8. Kohrangi M., Vamvatsikos D., Bazzurro P. (2019). Pulse-like versus non-pulse-like ground motion records: Spectral shape comparisons and record selection strategies. *Earthquake Engineering and Structural Dynamics*, **48**(1): 46–64. DOI: 10.1002/eqe.3122
9. Papadopoulos A.N., Vamvatsikos D., Kazantzi A.K. (2019). Development and application of FEMA P-58 compatible story loss functions. *Earthquake Spectra*, **35**(1): 95–112. DOI: 10.1193/102417EQS222M
10. Giannopoulos D., Vamvatsikos D. (2018). Ground motion records for seismic performance assessment: To rotate or not to rotate? *Earthquake Engineering and Structural Dynamics*, **47**(12): 2410-2425. DOI: 10.1002/eqe.3090
11. Bakalis K., Vamvatsikos D. (2018). Seismic fragility functions via nonlinear dynamic methods. *ASCE Journal of Structural Engineering*, **144**(10): 04018181. DOI: 10.1061/(ASCE)ST.1943-541X.0002141
12. Kohrangi M., Vamvatsikos D., Bazzurro P. (2017). Site dependence and record selection schemes for building fragility and regional loss assessment. *Earthquake Engineering and Structural Dynamics* (accepted).
13. Vamvatsikos D., Aschheim M.A. (2016). Performance-based seismic design via Yield Frequency Spectra. *Earthquake Engineering and Structural Dynamics*, **45**(11): 1759–1778.
14. Olmati P., Petrini F., Vamvatsikos D., Gantes C. (2016). Simplified fragility-based risk analysis for impulse governed blast loading scenarios. *Engineering Structures*, **117**: 457–469.
15. Kohrangi M., Bazzurro P., Vamvatsikos D. (2016). Vector and scalar IMs in structural response estimation: Part I – Hazard Analysis. *Earthquake Spectra*, **32**(3): 1507–1524.
16. Vamvatsikos D., Kazantzi A.K., Aschheim M.A. (2016). Performance-based seismic design: Avant-garde and code-compatible approaches. *ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part A: Civil Engineering*, **2**(2): C4015008.

17. Kazantzi A.K., Vamvatsikos D. (2015). Intensity measure selection for vulnerability studies of building classes. *Earthquake Engineering and Structural Dynamics*, **44**(15): 2677–2694.
18. Kazantzi A.K., Vamvatsikos D., Lignos D.G. (2014). Seismic performance of a steel moment-resisting frame subject to strength and ductility uncertainty. *Engineering Structures*, **78**: 69–77.
19. Vamvatsikos D. (2014). Seismic performance uncertainty estimation via IDA with progressive accelerogram-wise latin hypercube sampling. *ASCE Journal of Structural Engineering*, **140**(8), A4014015.
20. Vamvatsikos D. (2013). Derivation of new SAC/FEMA performance evaluation solutions with second-order hazard approximation. *Earthquake Engineering and Structural Dynamics*, **42**(8): 1171–1188.
21. Vamvatsikos D., Dolsek M. (2011). Equivalent Constant Rates for Performance-Based Assessment of Ageing Structures. *Structural Safety*, **33**(1): 8–18.
22. Vamvatsikos D., Fragiadakis M. (2010). Incremental dynamic analysis for estimating seismic performance uncertainty and sensitivity. *Earthquake Engineering and Structural Dynamics*, **39**(2): 141–163.
23. Vamvatsikos D., Cornell C.A. (2005). Developing efficient scalar and vector intensity measures for IDA capacity estimation by incorporating elastic spectral shape information. *Earthquake Engineering and Structural Dynamics*, **34**(13): 1573–1600.
24. Vamvatsikos D., Cornell C.A. (2004). Applied Incremental Dynamic Analysis. *Earthquake Spectra*, **20**(2): 523–553.
25. Vamvatsikos D., Cornell C.A. (2002). Incremental Dynamic Analysis. *Earthquake Engineering and Structural Dynamics*, **31**(3): 491–514.

B. Technical Reports

1. Porter K., Farokhnia K., Vamvatsikos D. and Cho I.H. (2014). Guidelines for component-based analytical vulnerability assessment of buildings and nonstructural elements. *GEM Technical Report 2014-13*, Global Earthquake Model Foundation, Pavia, Italy. DOI: 10.13117/GEM.VULN-MOD.TR2014.13.
2. D’Ayala D., Meslem A., Vamvatsikos D., Porter K., Rossetto T. (2014). Guidelines for Analytical Vulnerability Assessment of Low/Mid-Rise Buildings. *GEM Technical Report 2014-12*, Global Earthquake Model Foundation, Pavia, Italy. DOI 10.13117/GEM.VULN-MOD.TR2014.12.
3. fib (2012). Probabilistic performance-based seismic design. *Bulletin 68*, International Federation of Structural Concrete, Lausanne, CH.
4. NIST (2010). Applicability of Nonlinear Multiple-Degree-of-Freedom Modeling for Design. *Report No. NIST GCR 10-917-9*, prepared for the US National Institute of Standards and Technology by the NEHRP Consultants Joint Venture, Gaithersburg, MD.
5. FEMA (2009). Effects of Strength and Stiffness Degradation on Seismic Response. *Report No. FEMA-P440A*, prepared for the Federal Emergency Management Agency by the Applied Technology Council, Washington, DC.
6. Vamvatsikos D., Cornell C.A. (2004). Tracing and post-processing of IDA curves: Theory and software implementation. *Report No. RMS-44*, RMS Program, Stanford University, Stanford.
7. Vamvatsikos D. (2002). Seismic Performance, Capacity and Reliability of Structures as seen through Incremental Dynamic Analysis *Ph.D Dissertation and Report No. RMS-46*, Stanford University, Stanford.
8. Vamvatsikos D., Georgiadis H.G., Vardoulakis I. (1997). Numerical implementation of the integral-transform solution to Lamb’s point load problem. *Technical report*, Geomechanics Laboratory, National Technical University of Athens (in greek).

Awards and Honors

Keynote Lectures

- ❑ 18th World Conference on Earthquake Engineering – 18WCEE, Milan, Italy (2024).
- ❑ Society for Earthquake and Civil Engineering Dynamics Conference – SECED 2023, Cambridge, UK (2023).
- ❑ 3rd European Conference on Earthquake Engineering & Seismology, Bucharest, Romania (2022).
- ❑ 9th Turkish Conference on Earthquake Engineering, Istanbul, Turkey (2021).
- ❑ 2nd International Conference on the Seismic Design of Industrial Facilities – SeDIF, Aachen, Germany (2021).
- ❑ 8th International Conference on Seismology & Earthquake Engineering, Tehran, Iran (2019).
- ❑ 16th D-A-CH Tagung Conference on Earthquake Engineering and Structural Dynamics, Austrian-German-Swiss National Associations of Earthquake Engineering, Innsbruck, Austria (2019).
- ❑ XVII Italian National Association of Earthquake Engineering ANIDIS2017 Conference, Pistoia, Italy (2017).
- ❑ First European Conference on OpenSees, EOSD2017, Porto, Portugal (2017).
- ❑ EURO DYN 2014, 9th International Conference on Structural Dynamics, Porto, Portugal (2014).

Publication Distinctions

- ❑ According to Scopus (Jan 2024): h=31, 7000+ citations (excluding self-citations).
- ❑ Most-Cited Paper of 2019–2016, for the paper “Incremental Dynamic Analysis”, Earthquake Engineering and Structural Dynamics (2002).
- ❑ Top 10% Popular Paper of the Year, for the paper “Pulse-like versus non-pulse-like ground motion records: Spectral shape comparisons and record selection strategies”, Earthquake Engineering and Structural Dynamics (2019).
- ❑ Second Most Cited Paper of 2009–2011, for “Incremental dynamic analysis for estimating seismic performance sensitivity and uncertainty” in Earthquake Engineering and Structural Dynamics (2012)
- ❑ Outstanding Spectra Paper Award, for the paper “Applied Incremental Dynamic Analysis” (2004).
- ❑ Most Popular Paper of the Year, for the paper “Incremental Dynamic Analysis”, Earthquake Engineering and Structural Dynamics (2002).

Reviewer Distinctions

- ❑ Outstanding Contribution in Reviewing, Structural Safety, Elsevier (2018).
- ❑ Outstanding Contribution in Reviewing, Structures, Elsevier (2018).
- ❑ Outstanding Contribution in Reviewing, Soil Dynamics and Earthquake Engineering, Elsevier (2017).
- ❑ Outstanding Reviewer for Journal of Structural Engineering, ASCE (2014).
- ❑ Outstanding Contribution in Reviewing, Engineering Structures, Elsevier (2014, 2016).