# George P. Mavroeidis


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## EDUCATION

- Ph.D. in Civil Engineering, State University of New York at Buffalo, Buffalo, NY (8/99-1/04).
  Specialization: Earthquake Engineering and Engineering Seismology.
- M.S. in Civil Engineering, Rensselaer Polytechnic Institute, Troy, NY (8/97-12/98).
  Specialization: Geotechnical Engineering.
- Diploma in Civil Engineering (5-year program), National Technical University of Athens, Greece (9/92-7/97).
  Specialization: Structural and Geotechnical Engineering.

## PROFESSIONAL EXPERIENCE (*Academia*)

- Assistant Professor, Department of Civil Engineering, The Catholic University of America, Washington, DC (8/07-present).
  [Tenure-track faculty position].
- Postdoctoral Research Associate, Department of Structural Engineering, University of California, San Diego, CA (12/06-7/07).
  [Research project funded by the Association of Industrial Metallizers, Coaters and Laminators dealing with the investigation of the seismic performance of laminated glass panel systems through in-plane racking experiments and the development of a dynamic loading protocol for seismic testing of non-structural components].
- Marie Curie Fellow, Institute of Engineering Seismology & Earthquake Engineering, Thessaloniki, Greece (6/06-12/06).
  [Research fellowship awarded by the European Union for participation in a collaborative project of several European universities and research institutes dealing with the development and improvement of strong ground motion simulation methods for earthquake engineering applications].
- Postdoctoral Research Associate, Department of Civil, Structural and Environmental Engineering, State University of New York at Buffalo, Buffalo, NY (1/04-4/05).
  [Research project funded by the United States Geological Survey dealing with the investigation of the effect of fault rupture characteristics on near-fault strong ground motions].
- Research Assistant, Department of Civil, Structural and Environmental Engineering, State University of New York at Buffalo, Buffalo, NY (5/00-1/04).
  [Research projects funded by the National Science Foundation, the Federal Highway Administration, and the Multidisciplinary Center for Earthquake Engineering Research dealing with the analytical modeling and numerical simulation of near-fault strong ground motions for earthquake engineering applications].
- Teaching Assistant, Department of Civil, Structural and Environmental Engineering, State University of New York at Buffalo, Buffalo, NY (8/99-5/00).

[Courses: CIE 427 Civil Engineering Materials (Duties: two laboratory sessions per week, report grading, office hours; Enrollment: 58); EAS 209 Mechanics of Solids (Duties: three recitation sessions per week, homework and exam grading, office hours; Enrollment: 132)].

- Research Assistant, Department of Civil and Environmental Engineering, Rensselaer Polytechnic Institute, Troy, NY (8/97-5/99).
  [Research project funded by the National Science Foundation dealing with the development of a micromechanical model for the constitutive relation of a granular material based on pressure-dependent contact formation between spheres].

**PROFESSIONAL EXPERIENCE (*Industry*)**

- Consulting Engineer, Ricardo Dobry Consultant, Clifton Park, NY (12/98-4/99).
  [Rion - Antirion Bridge project in Greece: Global energy and damping calculations for unloading-reloading of bridge pier foundations using results from 2D finite element runs].

**SELECTED HONORS AND AWARDS**

- Charles H. Kaman Award for Excellence in Teaching, School of Engineering, The Catholic University of America (2009).
- National Science Foundation – Early career researcher travel grant for participation in the Fourteenth World Conference on Earthquake Engineering held in Beijing, China (2008).
- American Society of Civil Engineers – Fellowship for participation in the 2008 ExCEEd Teaching Workshop held at the United States Military Academy, West Point, New York (2008).
- CSEE Chair's Recognition Award given to "*a student who demonstrated high scholastic achievement and dedication to the Department of Civil, Structural and Environmental Engineering at the State University of New York at Buffalo*" (2004).
- Earthquake Engineering Research Institute – Student travel grant for participation in the Seventh U.S. National Conference on Earthquake Engineering held in Boston, Massachusetts (2002).
- Technical Chamber of Greece – Awards for excellence in academic studies (1992 – 1996).
- National Scholarship Foundation of Greece – Awards for excellence in academic studies (1992 – 1996).

**RESEARCH INTERESTS**

Earthquake Engineering, Engineering Seismology, Structural Dynamics, Structural Mechanics, Seismic Hazard and Risk Analysis, Mechanics and Physics of Earthquakes, Fracture and Frictional Processes, Computational Modeling.

**GRADUATE STUDENT ADVISEMENT**

**Dissertation / Thesis Primary Advisor**

- Negar Moharrami, Ph.D. Dissertation, 9/09-present
- Derek Hubbard, M.S. Thesis, 5/09-present

**Dissertation / Thesis Committee Member**

- Hamid Karimpour, Ph.D. Dissertation (in progress), Advisor: Dr. Poul V. Lade
- Neils Trads, Ph.D. Dissertation (in progress), Advisor: Dr. Poul V. Lade
- Deding Xu, Ph.D. Dissertation (in progress), Advisor: Dr. Poul V. Lade
- Abdulamit Duzkale, Ph.D. Dissertation (in progress), Advisor: Dr. Gunnar Lucko

## TEACHING EXPERIENCE

### The Catholic University of America

| Term | Course Number | Course Title | Enrollment |
|---|---|---|---|
| Spring 2010 | CE 524 | Matrix Structural Analysis | 10 |
| Fall 2009 | CE 312 | Theory of Structures | 22 |
| Fall 2009 | ENGR 301-01 | Mechanics of Solids | 23 |
| Fall 2009 | ENGR 301-02 | Mechanics of Solids | 21 |
| Spring 2009 | CE 526 | Introduction to Finite Elements | 6 |
| Spring 2009 | ENGR 201 | Engineering Mechanics I – Statics | 28 |
| Fall 2008 | CE 312 | Theory of Structures | 24 |
| Fall 2008 | ENGR 201 | Engineering Mechanics I – Statics | 22 |
| Spring 2008 | ENGR 301 | Mechanics of Solids | 28 |
| Fall 2007 | ENGR 201-01 | Engineering Mechanics I – Statics | 18 |
| Fall 2007 | ENGR 201-02 | Engineering Mechanics I – Statics | 26 |

### State University of New York at Buffalo (*Teaching Assistant*)

| Term | Course Number | Course Title | Enrollment |
|---|---|---|---|
| Spring 2000 | EAS 201 | Mechanics of Solids | 132 |
| Fall 1999 | CIE 427 | Civil Engineering Materials | 58 |

### Teaching Enhancement Activity

Attended the 2008 ASCE ExCEEd Teaching Workshop held at the United States Military Academy, West Point, New York, July 23-28, 2008.

## DISSERTATION / THESES

- Doctor of Philosophy Dissertation: "Modeling and simulation of near-fault strong ground motions for earthquake engineering applications", Advisor: Prof. A. S. Papageorgiou, State University of New York at Buffalo (2004).
- Master Thesis: "A micromechanical model for the constitutive relation of a granular material based on pressure–dependent contact formation between spheres", Advisor: Prof. R. Dobry, Rensselaer Polytechnic Institute (1998).
- Diploma Thesis: "Prediction of the dynamic behavior of sands using constitutive relations", Advisor: Prof. G. D. Bouckovalas, National Technical University of Athens (1997).

## SCIENTIFIC PUBLICATIONS

### Peer-Reviewed Journal Publications

1. Halldorsson, B., G. P. Mavroeidis, and A. S. Papageorgiou (2010). "Near-fault and far-field strong ground motion simulation for earthquake engineering applications using the specific barrier model", *Journal of Structural Engineering – ASCE*, Vol. 136 (in press).
2. Mavroeidis, G. P., and A. S. Papageorgiou (2010). "Effect of fault rupture characteristics on near-fault strong ground motions", *Bulletin of the Seismological Society of America*, Vol. 100, No. 1 (in press).

3. Mavroeidis, G. P., B. Zhang, G. Dong, A. S. Papageorgiou, U. Dutta, and N. N. Biswas (2008). "Estimation of strong ground motion from the Great 1964 $M_w$ 9.2 Prince William Sound, Alaska, earthquake", *Bulletin of the Seismological Society of America*, Vol. 98, No. 5, pp. 2303-2324.
4. Mavroeidis, G. P., G. Dong, and A. S. Papageorgiou (2004). "Near-fault ground motions, and the response of elastic and inelastic single-degree-of-freedom (SDOF) systems", *Earthquake Engineering and Structural Dynamics*, Vol. 33, No. 9, pp. 1023-1049.
5. Mavroeidis, G. P., and A. S. Papageorgiou (2003). "A mathematical representation of near-fault ground motions", *Bulletin of the Seismological Society of America*, Vol. 93, No. 3, pp. 1099-1131.
6. Dobry, R., A. Pecker, G. Mavroeidis, M. Zeghal, B. Gohl, and D. Yang (2003). "Damping/global energy balance in FE model of bridge foundation lateral response", *Soil Dynamics and Earthquake Engineering*, Vol. 23, No. 6, pp. 483-495.

**Conference Publications**

1. Mavroeidis, G. P., and D. T. Hubbard (2010). "Damping coefficients for the single-degree-of-freedom (SDOF) system subjected to near-fault seismic excitations", in *Proceedings of the Ninth U.S. National Conference on Earthquake Engineering (9NCEE)*, Toronto, Canada, July 25-29, 2010 (submitted).
2. Mavroeidis, G. P., and A. S. Papageorgiou (2010). "Characteristics of earthquake-induced differential ground motions in the near-fault region", in *Proceedings of the Ninth U.S. National Conference on Earthquake Engineering (9NCEE)*, Toronto, Canada, July 25-29, 2010 (submitted).
3. Mavroeidis, G. P., and A. S. Papageorgiou (2008). "Near-fault ground motion and its relation to the fault rupture process", in *Proceedings of the Fourteenth World Conference on Earthquake Engineering (14WCEE)*, Beijing, China, October 12-17, 2008.
4. Mavroeidis, G. P., B. Zhang, G. Dong, A. S. Papageorgiou, U. Dutta, and N. N. Biswas (2008). "The Great 1964 Prince William Sound, Alaska, earthquake: Estimation of strong ground motion", in *Proceedings of the Fourteenth World Conference on Earthquake Engineering (14WCEE)*, Beijing, China, October 12-17, 2008.
5. Mavroeidis, G. P., B. Halldorsson, F. Zhang, and A. S. Papageorgiou (2006). "The Great 1906 San Francisco earthquake: Simulation of broadband strong ground motion", presented at the *101st Annual Meeting of the Seismological Society of America*, San Francisco, CA, April 18-22, 2006 [Abstract in *Seismological Research Letters*, Vol. 77, No. 2, pp. 299-300].
6. Mavroeidis, G. P., B. Halldorsson, and A. S. Papageorgiou (2005). "Modeling and simulation of near-fault strong ground motions for earthquake engineering applications", presented at the *100th Annual Meeting of the Seismological Society of America*, Incline Village, NV, April 27-29, 2005 [Abstract in *Seismological Research Letters*, Vol. 76, No. 2, pp. 243].
7. Mavroeidis, G. P., and A. S. Papageorgiou (2005). "Effect of fault rupture characteristics (i.e., slip, rupture velocity, state of stress) on near-fault strong ground motions", presented at the *100th Annual Meeting of the Seismological Society of America*, Incline Village, NV, April 27-29, 2005 [Abstract in *Seismological Research Letters*, Vol. 76, No. 2, pp. 247].
8. Halldorsson, B., G. Dong, G. P. Mavroeidis, F. Zhang, and A. S. Papageorgiou (2004). "Simulation of earthquake strong ground motion using the specific barrier model", presented at the *2004 Fall Meeting of the American Geophysical Union*, San Francisco, CA, December 13-17, 2004.
9. Mavroeidis, G. P., and A. S. Papageorgiou (2004). "Design spectra for the single-degree-of-freedom system subjected to near-fault strong ground motions", presented at the *99th Annual Meeting of the Seismological Society of America*, Palm Springs, CA, April 14-16, 2004 [Abstract in *Seismological Research Letters*, Vol. 75, No. 2, pp. 266-267].

10. Halldorsson, B., G. P. Mavroeidis, and A. S. Papageorgiou (2003). "Estimation of near-fault velocity pulses for intra-plate earthquake sources", presented at the *Eastern Section Annual Meeting of the Seismological Society of America*, Toronto, Canada, October 19-21, 2003 [Abstract in *Seismological Research Letters*, Vol. 75, No. 3, pp. 445].
11. Mavroeidis, G. P., and A. S. Papageorgiou (2003). "The elastic and inelastic response of the single-degree-of-freedom (SDOF) system to near-fault seismic excitations", presented at the *98th Annual Meeting of the Seismological Society of America*, San Juan, Puerto Rico, April 29-May 2, 2003 [Abstract in *Seismological Research Letters*, Vol. 74, No. 2, pp. 222].
12. Mavroeidis, G. P., and A. S. Papageorgiou (2002). "Modeling of near-field seismic ground motion", in *Proceedings of the KEERC-MCEER Joint Seminar on Retrofit Strategies for Critical Facilities*, Buffalo, NY, July 30-August 1, 2002.
13. Mavroeidis, G. P., and A. S. Papageorgiou (2002). "Near-source strong ground motion: Characteristics and design issues", in *Proceedings of the Seventh U.S. National Conference on Earthquake Engineering (7NCEE)*, Boston, MA, July 21-25, 2002.
14. Mavroeidis, G. P., and A. S. Papageorgiou (2002). "Near-field ground motions and their implications on seismic response of long-span bridges", in *Proceedings of the Third National Seismic Conference and Workshop on Bridges and Highways*, Portland, OR, April 28–May 1, 2002.
15. Mavroeidis, G. P., and A. S. Papageorgiou (2002). "A simple mathematical expression for the representation of near-fault ground motions", presented at the *97th Annual Meeting of the Seismological Society of America*, Victoria, Canada, April 17-19, 2002 [Abstract in *Seismological Research Letters*, Vol. 73, No. 2, pp. 237].
16. Mavroeidis, G. P., and A. S. Papageorgiou (2001). "Simulation of long-period near-field ground motion for the Great 1906 San Francisco earthquake", presented at the *96th Annual Meeting of the Seismological Society of America*, San Francisco, CA, April 18-20, 2001 [Abstract in *Seismological Research Letters*, Vol. 72, No. 2, pp. 227].
17. Mavroeidis, G. P., and A. S. Papageorgiou (2000). "Analysis and simulation of the near-source motion recorded at Aigion during the $M_s$=6.2, June 15, 1995 Aigion earthquake (Greece)", in *Proceedings of the Sixth International Conference on Seismic Zonation (6ICSZ)*, Palm Springs, CA, November 12-15, 2000.

**Technical Reports**

1. Dobry, R., M. Zeghal, and G. Mavroeidis (1999). "Global energy and damping calculations for unloading-reloading of foundation using results of DYNAFLOW 2D FE runs", *Report No. B&T/003/Rev. 0*.

## SELECTED INVITED PRESENTATIONS

- "Friction problems in earthquake source mechanics", An NSF Workshop on Friction: A Grand Challenge at the Interface of Solid and Fluid Mechanics, Montreux, Switzerland. March 15, 2008.
- "Near-fault strong ground motions: modeling, simulation, and design issues", Department of Civil Engineering, *The Catholic University of America*, Washington, DC, USA. October 27, 2006.

## WORKSHOPS ATTENDED

- 2009 NSF CAREER Proposal Writing Workshop, George Mason University, Arlington, Virginia, March 12-13, 2009.
- 2008 ASCE ExCEEd Teaching Workshop, United States Military Academy, West Point, New York, July 23-28, 2008.

## PROFESSIONAL AFFILIATIONS AND ACTIVITIES

### Member of Professional Organizations

- American Society of Civil Engineers (1997-present).
- Seismological Society of America (1998-present).
- Earthquake Engineering Research Institute (1998-2004).
- Technical Chamber of Greece (1997-present).

### Member of Technical Committees

- Seismic Effects Committee, ASCE (2009-present).

### Reviewer of Technical Papers

- Journal of Structural Engineering, ASCE.
- Journal of Engineering Mechanics, ASCE.
- Earthquake Engineering and Structural Dynamics.
- Engineering Structures.
- Bulletin of the Seismological Society of America.
- Soil Dynamics and Earthquake Engineering.
- Journal of Earthquake Technology, ISET.
- Scientia Iranica.

### Organizer / Chairman of Technical Sessions

- "Session 03. Engineering Seismology", *Fourteenth World Conference on Earthquake Engineering (14WCEE)*, Beijing, China, October 14, 2008.
- "Session GM-4. Ground Motions: Near-Source Ground Motions: Characteristics, Analytical Modeling, Numerical Simulations, and Structural Response", *Seventh U.S. National Conference on Earthquake Engineering (7NCEE)*, Earthquake Engineering Research Institute (EERI), Boston, MA, July 25, 2002.

### Professional Licenses

- Registered Professional Engineer, Greece (1997-present).