

DANIEL J. BORELLO

Ph.D. Candidate, E.I.T., LEED AP

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EDUCATION

- 2013 **Ph.D., Civil Engineering**, *Specialization in Structural Engineering*
University of Illinois at Urbana-Champaign, Urbana, Illinois.
Dissertation Title: *Experimental and Analytical Study of Steel Plate Shear Walls with Coupling*
Dissertation Advisor: Larry Fahnstock
- 2009 **M.S., Civil Engineering**, *Specialization in Structural Engineering*
University of Illinois at Urbana-Champaign, Urbana, Illinois.
Thesis Title: *Forensic Collapse Investigation of a Concrete Bridge with Timber Piles*
Thesis Advisors: Jerome Hajjar and Bassem Andrawes
- 2007 **B.S., Civil Engineering**, *Specialization in Structural and Geotechnical Engineering*
University of Illinois at Urbana-Champaign, Urbana, Illinois.

RESEARCH EXPERIENCE

Experimental and Analytical Study of Steel Plate Shear Walls with Coupling (2009 - 2013)

Doctoral Committee: Larry Fahnstock, Jeffrey Berman, Billie Spencer, Robert Dodds, and Daniel Kuchma

- Collaborate with multiple institutions to investigate an innovative seismic force-resisting system that increases material efficiency and seismic performance
- Large-scale experimental testing program to simulate earthquake excitation in the University of Illinois at Urbana-Champaign NEES MUST-SIM facility

- Analytical study of seismic performance of Steel Plate Shear Wall with Coupling system and estimation of seismic design coefficients
- Design and execution of small-scale testing to validate control algorithms derived to simulate demands imposed by the upper stories of a structure on the experimental subassembly
- Development of analysis and design procedure for Steel Plate Shear Wall with Coupling system

Data Processing of Laser Scans Toward Applications in Structural Engineering (2009)

Principle Investigator: Jerome Hajjar

- Formulation of algorithms for object detection for applications in structural engineering
- Analysis of laser scans of large-scale pseudo-dynamic experimental testing
- Detection of objects in laser scan of a collapsed bridge scene

Forensic Collapse Investigation of a Concrete Bridge with Timber Piles (2009)

Principle Investigators: Bassem Andrawes and Jerome Hajjar

- On-site field investigation of a collapsed structure
- Experimental testing of retrieved in-situ specimens
- Calibration of analytical model to determine structure capacity

Behavior of Bolted Slip-Critical Connections with Fillers (2008 - 2009)

Principle Investigator: Jerome Hajjar

- Large-scale experimental testing of steel connections
- Determination of mechanism to describe observed behavior
- Development of design recommendations

TEACHING EXPERIENCE

Course Instructor – Steel Structures I (2012)

Mentor: Larry Fahnestock

- Creation of curriculum for 70 student course in order to foster understanding of steel structures' behavior
- Preparation of homework assignments and examinations to motivate student scholarship
- Management of two teaching assistants to promote fair grading and individual attention

Teaching Assistant – Introduction to Structural Engineering (2008 - 2009)
Instructors: Robert Dodds (Fall 2007 and Fall 2008) and Keith Hjelmstad (Spring 2007)

- Instruction for analysis of determinate and indeterminate structures
- Responsible for majority of course grading for between 40 and 90 students
- Recognized on *List of Teachers Ranked Excellent by Their Students*

MENTORING

Summer Research Opportunities Program (2012)

- Mentor student from population underrepresented in graduate studies
- Cultivate expertise from their undergraduate architectural experience towards structural engineering applications
- Simulate graduate school experience to promote future studies

Undergraduate Research Assistants (2008-2012)

- Teach students experimental instrumentation principles
- Formulate simplified procedures to aid data processing
- Manage personnel and test program schedules

Summer Research Opportunities Program (2011)

- Advise undergraduate student from Ohio State University
- Develop individual autonomous project and support student's progress
- Encourage future graduate studies through academic accomplishment and laboratory experience

PROFESSIONAL EXPERIENCE

Thornton Tomasetti, Chicago, Illinois (2007 - 2008)

Intern Structural Engineer

- Analysis and design of Bank of America branch vertical expansion
- Construction administration of Shedd Aquarium retrofit
- Preliminary design and modeling of FedEx sorting facility

- Reyes Group**, Markham, Illinois (2006)
Intern Production Engineer
- Analysis of partially erected structures to ensure safe construction
 - Project cost estimation and drafting of proposals
 - Optimization of project scheduling for construction efficiency

HONORS AND AFFILIATIONS

Structural Engineering Instructional Fellowship (2012)

- Provided opportunity to teach an undergraduate steel structures course

Invited Reviewer for Journal of Structural Engineering (2012)

- Evaluation of technical papers for content, rigor and readability

Asia-Pacific Summer School in Smart Structures Technology (2010)

- Collaboration in Tokyo, Japan with multi-national team to optimize a PID controller
- Development of algorithms to locate structural damage

PROFESSIONAL MEMBERSHIP AND LICENSURE

- Engineering in Training (E.I.T.) obtained in Illinois (2007)
- Leadership in Energy and Environmental Design (LEED) - Accredited Professional (2009)
- Member of American Institute of Steel Construction (AISC)
- Member of American Society of Civil Engineers (ASCE)
- Member of Earthquake Engineering Research Institute (EERI)

REFEREED PUBLICATIONS IN JOURNALS

1. Walsh, S. B., **Borello, D. J.**, Guldur, B. and Hajjar, J. F. (2013). "Data Processing of Laser Scans towards Applications in Structural Engineering." *Computer-Aided Civil and Infrastructure Engineering*.
2. **Borello, D. J.**, and Fahnestock, L. A. (2012). "Behavior and Mechanisms of Steel Plate Shear Walls with Coupling." *Journal of Constructional Steel Research*, 74, 8-16.
3. **Borello, D. J.**, and Fahnestock, L. A. (2012). "Seismic Design and Analysis of Steel Plate Shear Walls with Coupling." *Journal of Structural Engineering*.

4. **Borello, D. J.**, Denavit, M. D., and Hajjar, J. F. (2011). "Bolted Steel Slip-Critical Connections with Fillers: I. Performance." *Journal of Constructional Steel Research*, 67(3), 379-388.
5. Denavit, M. D., **Borello, D. J.**, and Hajjar, J. F. (2011). "Bolted Steel Slip-Critical Connections with Fillers: II. Behavior." *Journal of Constructional Steel Research*, 67(3), 398-406.
6. **Borello, D. J.**, Andrawes, B., Hajjar, J. F., and Olson, S. M. (2010). "Experimental and Analytical Investigation of Bridge Timber Piles under Eccentric Loads." *Engineering Structures*, 32(8), 2237-2246.

TECHNICAL REPORTS

1. **Borello, D. J.**, Andrawes, B., Hajjar, J. F., Olson, S. M., Hansen, J., and Buenker, J. (2009). "Forensic Collapse Investigation of a Concrete Bridge with Timber Piers," FHWA Report No. FHWA-ICT-09-042, Illinois Center for Transportation, University of Illinois at Urbana-Champaign, Urbana, Illinois.
2. **Borello, D. J.**, Denavit, M. D., and Hajjar, J. F. (2009). "Behavior of Bolted Steel Slip-Critical Connections with Fillers," Report No. NSEL-017, Newmark Structural Laboratory Report Series (ISSN 1940-9826), Department of Civil and Environmental Engineering, University of Illinois at Urbana-Champaign, Urbana, Illinois.

CONFERENCE PUBLICATIONS

1. **Borello, D. J.**, and Fahnestock, L. A. (2011). "Coupled Steel Plate Shear Walls for Seismic Design." *3rd Asia Pacific Young Researchers and Graduates Symposium (YRGS 2011)*, Taipei, Taiwan.
2. **Borello, D. J.**, and Fahnestock, L. A. (2011). "Design and Testing of Coupled Steel Plate Shear Walls." *ASCE Structures Congress 2011*, Las Vegas, NV.
3. Denavit, M. D., **Borello, D. J.**, and Hajjar, J. F. (2011). "Bolted Steel Slip-Critical Connections with Fillers." *EUROSTEEL 2011*, Budapest, Hungary.
4. **Borello, D. J.**, Andrawes, B., Hajjar, J. F., and Olson, S. M. (2010). "Experimental and Analytical Forensic Investigation of Bridge Timber Piles under Eccentric Loads." *ASCE Structures Congress 2010*, Orlando, FL.

PROFESSIONAL PRESENTATIONS

1. "Seismic Performance of Coupled Steel Plate Shear Walls." *ASCE Structures Congress 2012*, Chicago, IL, March 2012.
2. "Design of Bolted Steel Slip-Critical Connections with Fillers." *ASCE Structures Congress 2012*, Chicago, IL, March 2012.
3. "LEED Green Building Rating System and the Role of the Structural Engineer." *Steel and Composite Structures Seminar Series*, Urbana, IL, April 2009.

RESEARCH INTERESTS

Resilient and Innovative Seismic Force Resisting Systems

- Self-Centering Systems
- Advanced Energy Dissipation Devices
- Steel Plate Shear Walls

Sustainable Infrastructure

- Life Cycle Analysis
- Durable and Repairable Structures
- Modular Construction

Experimental Methods

- Small and Large Scale Experimental Testing
- Advanced Noncontact Instrumentation
- Pseudo-Dynamic, Hybrid Simulation and Shake Table Testing