

# GASTON A. FERMANDOIS

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## ACADEMIC POSITION

Assistant Professor (since 2011)  
Department of Civil Engineering  
Universidad Tecnica Federico Santa Maria  
Av. Vicuña Mackenna 3939, Santiago 8940897, Chile

## RESEARCH INTERESTS

Numerical simulation and experimental evaluation of complex structural systems under extreme loading, real-time hybrid simulation testing, smart structures technology, structural control and health monitoring, earthquake engineering.

## EDUCATION

*Doctor of Philosophy*, Civil Engineering  
University of Illinois at Urbana-Champaign, May 2018

Dissertation title: “Model-based framework for multi-axial real-time hybrid simulation”

Supervisor: Prof. Billie F. Spencer Jr.

*Professional License*, Civil Engineering  
Universidad Tecnica Federico Santa Maria, Valparaiso, Chile, Dec 2009

*Master of Science*, Civil Engineering  
Universidad Tecnica Federico Santa Maria, Valparaiso, Chile, Dec 2009

Thesis title: “Estimation of seismic performance factors of buckling restrained braced frame systems used in chilean practice”

Supervisor: Prof. Carlos Aguirre

*Bachelor of Science*, Civil Engineering  
Universidad Tecnica Federico Santa Maria, Valparaiso, Chile, Dec 2004

## HONORS & AWARDS

*2nd Prize, Student Competition, 3rd Midwest Colloquium in Smart Structures*, University of Illinois at Urbana-Champaign, October 6–7, 2017.

*Illinois CEE Structures Group Student Travel Award*, Engineering Mechanics Institute Conference 2017 (EMI 2017), San Diego, CA, June 4-7, 2017.

*NSF Student Scholarship*, US-EU-Asia Workshop in Hybrid Testing, European Laboratory for Structural Assessment (ELSA), Ispra, Italy, October 5-6, 2015.

*NSF Student Travel Award*, Engineering Mechanics Institute Conference 2015 (EMI 2015), Stanford University, June 16-19, 2015.

*2nd Prize, APSS 2014 Student Competition*, National Taiwan University, Taipei, Taiwan, August 15, 2014.

*NSF Student Scholarship*, 2014 APSS Summer School, Department of Civil and Environmental Engineering, University of Illinois at Urbana-Champaign, April 2014.

*Becas Chile Scholarship*, Chilean National Commission for Scientific and Technological Research (CONICYT), 2013-2017

*Fulbright Foreign Fellowship*, Institute of International Education (IIE), 2013–2017

*Faculty Development Scholarship*, Universidad Tecnica Federico Santa Maria, Chile, 2013–2017

*Postgraduate Fellowship*, Universidad Tecnica Federico Santa Maria, Chile, 2005–2006

*Academic Excellence Award*, Universidad Tecnica Federico Santa Maria, Chile, 1999

## PUBLICATIONS *Manuscripts*

Lu, L., **Fernandois, G.A.**, Spencer, Jr., B.F., Lu, X., Duan, Y-F., Zhou, Y. (2019) “Experimental evaluation of the inertial mass damper and its analytical model for the stay-cable vibration mitigation”. *Smart Structures and Systems*, 23(6), 589-613.

Xu, J., **Fernandois, G.A.**, Spencer, Jr., B.F., Lu, X. (2018). “Stochastic Optimization of Buckling Restrained Braced Frames under Seismic Loading”. *Structure and Infrastructure Engineering*, 1-16.

**Fernandois, G.A.**, and Spencer, Jr., B.F. (2017) “Model-based framework for multi-axial real-time hybrid simulation of complex structures”. *Earthquake Engineering and Engineering Vibrations*, 16 (4), 671-691.

## *Conference Presentations*

**Fernandois-Cornejo, G.**, and Spencer, Jr., B.F. (2017).

“Frequency-domain system identification of a multi-actuator loading assembly for multi-axial real-time hybrid simulation testing”. *Proceedings of Engineering Mechanics Institute Conference 2017 (EMI2017)*, San Diego, CA, June 4 – 7.

**Fernandois-Cornejo, G.**, and Spencer, Jr., B.F. (2017). “Framework development of multi-axial real-time hybrid simulation”. *Proceedings of the 16th World Conference in Earthquake Engineering (16WCEE)*, International Association of Earthquake Engineering, Santiago de Chile, Jan 9 - 13, 2017.

Xu, J., **Fernandois-Cornejo, G.**, Spencer, Jr., B.F., Lu, X. (2017). “Optimization of Buckling Restrained Braced Frame under Seismic Loading”. *Proceedings of the 16th World Conference in Earthquake Engineering (16WCEE)*, International Association of Earthquake Engineering, Santiago de Chile, Jan 9 - 13, 2017.

**Fernandois-Cornejo, G.** (2016). “Frequency-domain system identification of a multi-actuator loading assembly for multi-axial real-time hybrid simulation testing”. *2nd Midwest Smart Structures Colloquium*, Purdue University, West Lafayette, IN, September 30 – October 2, 2016.

**Fernandois-Cornejo, G.** (2015), “Development of Multi-axial Real-time Hybrid Simulation Framework”. *1st Midwest Smart Structures Colloquium*, Grafton, IL, October 31, 2015.

**Fernandois-Cornejo, G.** and Spencer, Jr., B.F. (2015), “Framework development of multi-axial real-time hybrid simulation”. *US-EU-Asia Workshop in Hybrid Testing*, European Laboratory for Structural Assessment (ELSA), Ispra, Italy, October 5-6, 2015.

**Fernandois-Cornejo, G.** and Spencer, Jr., B.F. (2015), “Multi-axial framework for real-time hybrid simulation and future applications”. *Engineering Mechanics Institute Conference 2015 (EMI 2015)*, Stanford University, June 16-19, 2015.

**Fernandois-Cornejo, G.** (2014), “Semi-active control strategies for seismic protection of civil infrastructures: an updated perspective”. *Proceedings of 1st Huixian International Forum on Earthquake Engineering for Young*

*Researchers*, Institute of Engineering Mechanics, China Earthquake Administration, August 16-19, 2014, Harbin, China.

Aguirre, C. and **Fernandois-Cornejo, G.** (2010), "Strength reduction factors for buckling restrained braced frames". *Proceedings of 10th Chilean Congress of Seismology and Earthquake Engineering (ACHISINA10)*, 22-27 May 2010, Santiago, Chile (in spanish).

**PROFESSIONAL EXPERIENCE** *Lecturer* Mar 2011 – Present  
Universidad Tecnica Federico Santa Maria, Santiago, Chile  
Appointed as academic instructor for the Department of Civil Engineering.  
Supervised internships for undergraduates of the Civil Engineering program at Campus Santiago.

*Technical Manager* May 2010 – Feb 2011  
Chilean Steel Institute (ICHA), Santiago, Chile  
Developed technical standard proposals related with steel construction in Chile.  
Coordinated the technical committee of professionals and educators in steel design.

*Detailing Manager* Jun 2007 – Apr 2010  
ISD Ingenieria Ltda., Santiago, Chile  
Oversaw and controlled the steel detailing process for national mining and industrial projects.  
Developed and implemented new detailing standards and quality control procedures.  
Scheduled and oversaw steel detailing projects for north american fabricators: Schuff Steel Co., Myrex Industries, Hillsdale Fabricators, S&S Steel Fabrication; and chilean fabricator, Arrigoni Metalurgica.  
Supervised quality control processes for fabrication and erection drawings.

*Structural Engineer* Mar 2007 – Jun 2007  
Sergio Contreras y Asociados, Santiago, Chile  
Developed various structural design projects: apartment, commercial and industrial buildings.

*Structural Engineer* Dec 2006 – Dec 2007  
Center for Study and Research of Infrastructures, Valparaiso, Chile  
Translated several chapters of ANSI/AISC360-05 Specification for Structural Steel Buildings to spanish by request of Chilean Steel Institute (ICHA) and Latinoamerican Institute of Steel (ALACERO).  
Conducted structural assessment and retrofit of Terminal Tower, Laguna Verde Power Station, AES Gener S.A., Chile.

*Structural Engineer* Jan 2005 – Dec 2006  
Carvallo Ingenieria, Vina del Mar, Chile  
Developed various structural design projects: houses, apartment and university buildings.

**ACADEMIC  
EXPERIENCE**

*Academic Instructor* Mar 2011 – Present  
Universidad Técnica Federico Santa María, Santiago, Chile  
CIV131 Statics of Structures (5 semesters)  
CIV233 Fundamentals of Structural Analysis (2 semesters)  
CIV234 Matrix Structural Analysis (3 semesters)  
CIV235 Structural Dynamics (1 semester)  
CIV336 Steel Design (1 semester)

*Teaching Assistant* Jan 2015 – May 2015  
University of Illinois at Urbana-Champaign  
CEE472 Steel Structures II (Spring 2015)

*Teaching Assistant* Mar 2001 – Dec 2006  
Universidad Técnica Federico Santa María, Valparaíso, Chile  
CIV235 Structural Dynamics (1 semester)  
CIV241 Fluids Mechanics (1 semester)  
CIV336 Steel Design (1 semester)  
CIV338 Earthquake Engineering (1 semester)  
CIV339 Projects of Structural Engineering (1 semester)  
FIS110 General Physics I (7 semesters)

**SERVICE**

Organization Committee Member, 3HIFEE Conference, University of Illinois at Urbana-Champaign, Aug 11 – 12, 2017

Organization Committee Member, 6AESE & 11ANCRiSST Joint Conference, University of Illinois at Urbana-Champaign, Aug 1 – 2, 2015

Organization Committee Member, 8APSS Summer School, University of Illinois at Urbana-Champaign, July 26 – August 14, 2015

Volunteer, *Project S.H.A.R.E.* local food bank, Carlisle, PA, 14 Aug 2013

Jury Member, *2012 Software Fair Competition*, Universidad Tecnica Federico Santa Maria (UTFSM), Santiago, 9 Nov 2012

Host, *2012 Open Doors Fair*, UTFSM, Santiago, 11 Oct 2012

Organization Committee Member, Seminar *Consequences and applications of the new seismic and reinforced concrete design codes in Chile*, UTFSM, Santiago, 17–18 Aug 2012

Host, *STESSA 2012* conference technical tour to Vina del Mar to observe consequences of 2010 Chilean Earthquake, 12 Jan 2012

Host, *2011 Open Doors Fair*, UTFSM, Santiago, 25 Nov 2011

**COURSEWORK**

Ph.D. Civil Engineering, University of Illinois at Urbana-Champaign  
CEE462 Steel Structures II  
CEE470 Structural Analysis (Audit)  
CEE471 Structural Mechanics  
CEE472 Structural Dynamics I  
CEE570 Finite Element Method  
CEE572 Structural Dynamics II  
CEE576 Nonlinear Finite Elements

CEE595PHD Orientation to Doctoral Study  
CEE598CMM Constitutive Modeling of Engineering Materials (Audit)  
CEE598RA Reliability Analysis  
CEE598SD0 Structural Design Optimization  
ECE310 Digital Signal Processing (Audit)  
ECE486 Control Systems (Audit)  
ECE515 Control Systems Theory & Design  
ECE528 Nonlinear Systems (Audit)  
ME561 Convex Methods in Control (Audit)

M.S. Civil Engineering, Universidad Tecnica Federico Santa Maria  
CIV235 Dynamics of Structures  
CIV337 Reinforced Concrete Structures  
CIV338 Earthquake Engineering  
IP0414 Advanced Steel Design  
IP0401 Finite Element Methods  
IP0420 Soil Dynamics  
MAT265 Stochastic Models in Engineering

**SHORT  
COURSES &  
SEMINARS**

*Graduate Academy for College Teaching*, Center for Innovation in Teaching & Learning, University of Illinois at Urbana-Champaign, January 14 – 16, 2015.

*7th Asia Pacific Summer School on Smart Structures Technology*, National Taiwan University, Taipei, Taiwan, July 28 – August 15, 2014.

*Fulbright Enrichment Seminar: Education and Youth Empowerment*, hosted by U.S. Department of State, Pittsburgh, PA, 20–23 Mar 2014

*Building Code Requirements for Structural Concrete ACI 318S-2011*, Chilean Cement and Concrete Institute (ICH), 8 Nov 2011, Santiago, Chile.

*Planning to promote learning* (in spanish), Academic Improvement Plan, Center of Innovation for the Quality in Education, UTFSM, Aug 2011, Valparaiso, Chile.

*Practical Connection Design of Steel Structures*, Larry S. Muir & William A. Thornton. NASCC: The Steel Conference, 4 Apr 2009, Phoenix, AZ.

*Seismic Design of Autoclaved Aerated Concrete Masonry and Anchoring*, Prof. Richard Klingner (University of Texas at Austin), Chilean Cement and Concrete Institute (ICH), 9–13 April 2007, Santiago, Chile.

*AISC New Specifications for Steel Structures* (in spanish), Chilean Steel Institute, 29–30 Aug 2006, Santiago, Chile.

*Design of Steel Buildings with Aid of Analysis and Proportioning tools* (in spanish), Chilean Steel Institute, 11–13 Jul 2006, Santiago, Chile.

*Behaviour and Protection Systems of Structures against Fire* (in spanish), Chilean Institute of Steel, 25–27 Oct 2005, Santiago, Chile.

*Displacement Based Seismic Design*, Prof. Nigel Priestley (Rose School), Chilean Cement and Concrete Institute, 18–21 Aug 2003, Santiago, Chile.

**SKILLS**

*Languages:* Spanish (native), English (fluent, TOELF iBT score 109/120).

*Operating Systems:* Windows & MacOS.

*Software & Programming:* Matlab, Simulink, Simulink Coder (Real Time Workshop), dSpace ControlDesk, SAP2000, Etabs, Ruaumoko, Opensees, Abaqus, Patran, Mathcad, Mathematica, Autocad, Tekla Structures, Microsoft Office, Google Apps, Zotero, Mendeley, L<sup>A</sup>T<sub>E</sub>X, Markdown.

*Updated November 3, 2019*