

# GASTON A. FERMANDOIS

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<b>Academic Position</b>	Assistant Professor Department of Civil Engineering Universidad Tecnica Federico Santa Maria Av. Vicuña Mackenna 3939, Santiago 8940572, Chile
<b>Research Interests</b>	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.
<b>Education</b>	<p><i>Doctor of Philosophy</i>, Civil Engineering University of Illinois at Urbana-Champaign, May 2018</p> <p>Dissertation title: “Model-based framework for multi-axial real-time hybrid simulation” Supervisor: Prof. Billie F. Spencer Jr.</p> <p><i>Professional License</i>, Civil Engineering Universidad Tecnica Federico Santa Maria, Valparaiso, Chile, Dec 2009</p> <p><i>Master of Science</i>, Civil Engineering Universidad Tecnica Federico Santa Maria, Valparaiso, Chile, Dec 2009</p> <p>Thesis title: “Estimation of seismic performance factors of buckling restrained braced frame systems used in chilean practice” Supervisor: Prof. Carlos Aguirre</p> <p><i>Bachelor of Science</i>, Civil Engineering Universidad Tecnica Federico Santa Maria, Valparaiso, Chile, Dec 2004</p>
<b>Professional Experience</b>	<p>Universidad Tecnica Federico Santa Maria, Dept. of Civil Engineering, Santiago, Chile <i>Assistant Professor</i>, Mar 2019 – Present <i>Academic Instructor</i>, Mar 2011 – Feb 2019</p> <p>University of Illinois at Urbana-Champaign, Dept. of Civil and Environmental Engineering, Urbana, Illinois <i>Graduate Research Fellow</i>, Aug 2013 – Feb 2018 <i>Graduate Research Assistant</i>, Jan 2015 – May 2015</p> <p>Instituto Chileno del Acero (ICHA), Santiago, Chile <i>Technical Manager</i>, May 2010 – Feb 2011</p> <p>ISD Ingenieria Ltda., Santiago, Chile <i>Detailing Manager</i>, Jun 2007 – Apr 2010</p> <p>Sergio Contreras y Asociados, Santiago, Chile <i>Structural Engineer</i>, Mar 2007 – Jun 2007</p> <p>Centro de Estudios e Innovación en Infraestructura (CEII), Universidad Tecnica Federico Santa Maria, Valparaiso, Chile <i>Research Assistant</i>, Dec 2006 – Dec 2007</p> <p>Carvallo Ingenieria, Vina del Mar, Chile <i>Structural Engineer</i>, Jan 2005 – Dec 2006</p>

## Honors and 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

### *Peer-reviewed articles*

1. Gomez, F., **Fernandois, G.A.**, Spencer Jr., B.F. (2021). “Optimal design of nonlinear energy sinks for mitigation of seismic response on structural systems”. *Engineering Structures*, 232, 111756.
2. Galmez, C., **Fernandois, G.A.** (2020). “Online stability analysis for real-time hybrid simulation testing”. *Frontiers in Built Environment: Earthquake Engineering*, 6, 134.
3. Najafi, A., **Fernandois, G.A.**, Spencer, Jr., B.F. (2020). “Decoupled model-based real-time hybrid simulation with multi-axial load and boundary condition boxes”. *Engineering Structures*, 219, 110868.
4. **Fernandois, G.A.** (2019). “Application of model-based compensation methods to real-time hybrid simulation benchmark”. *Mechanical Systems and Signal Processing*, 131, 394-416.
5. 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.
6. 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.
7. **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.

## Presentations

### *Invited lectures*

1. **Fernandois, G.A.** (2020). “HS 201: Advances in multi-axial real-time hybrid simulation”. MECHS Webinar Series, September 14. URL: <https://youtu.be/YGiz0h03vbY>.
2. **Fernandois, G.A.** (2019). “Hybrid Simulation: Fundamentals and State-of-the-art Techniques”. Institute of Engineering Mechanics, China Earthquake Administration, Beijing, China, July 24.

### *Peer-reviewed conference presentations*

1. **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.
2. **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.
3. 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.
4. **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.
5. **Fernandois-Cornejo, G.** (2015), “Development of Multi-axial Real-time Hybrid Simulation Framework”. *1st Midwest Smart Structures Colloquium*, Grafton, IL, October 31, 2015.
6. **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.
7. **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.
8. **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.
9. 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).

**Grants and  
Contracts**

1. *Dynamic compensation of real-time hybrid simulation tests for time-varying, nonlinear structural models under seismic loading*, Fondecyt Iniciación 2019, Project #11190774. PI: Gaston Fernandois.

**Teaching**

*Instructor* Mar 2011 – Present

Universidad Técnica Federico Santa María, Santiago, Chile  
CIV131 Statics of Structures (5 semesters)  
CIV202 Analytical Mechanics (1 semester)  
CIV233 Fundamentals of Structural Analysis (2 semesters)  
CIV234 Matrix Structural Analysis (5 semesters)  
CIV235 Structural Dynamics (3 semesters)  
CIV336 Steel Design (3 semesters)  
IP0426 Advanced Structural Dynamics (2 semesters)

*Guest lecturer*

University of Illinois at Urbana-Champaign  
CEE598SD Structural Damping (Spring 2020). Instructor: Prof. B.F. Spencer, Jr.

*Graduate teaching assistant*

University of Illinois at Urbana-Champaign  
CEE472 Steel Structures II (Spring 2015). Instructor: Prof. Larry Fahnestock

*Undergraduate teaching assistant*

Universidad Técnica Federico Santa María, Valparaíso, Chile Mar 2001 – Dec 2006  
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)

**Student  
Supervision**

*Master students*

1. Maria Elena Quiroz
2. Diego Mera
3. Cristobal Galmez

*Undergraduate students*

1. Ignacio Godoy
2. Diego Figueroa
3. Felipe Rivera
4. Felipe Farias
5. Pablo Seitz
6. Daniel Maurel
7. Juan Matus
8. Javier Leal

## Service

Reviewer of journal manuscripts:

Structural Control and Health Monitoring (Wiley)

International Journal of Robust and Nonlinear Control (Wiley)

Mechanical Systems and Signal Processing (Elsevier)

Engineering Structures (Elsevier)

Shock and Vibration (Hindawi)

Frontiers in Built Environment (Frontiers)

Experimental Techniques (Springer)

International Journal of Vibration and Control (Sage)

International Journal of Lifecycle Performance Engineering (Inderscience)

Review Editor, Frontiers in Built Environment, Structural Sensing, March 2021 – Present

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

## Skills

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

*Operating Systems:* Windows & MacOS.

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

*Updated March 10, 2021*