

FERNANDO MOREU, Ph.D., PE

Assistant Professor Civil Engineering Department
Assistant Professor Electrical and Computer Engineering Department (cross-appointed)
University of New Mexico in Albuquerque
CENT 3056 MSC01 1070

210 University of New Mexico, Albuquerque, NM 87131-0001

fmoreu@unm.edu • office: (505) 277-1784 • cell: (217) 417-1204 <http://smilab.unm.edu/>

RESEARCH INTERESTS

Structural dynamics, structural health monitoring, wireless smart sensor networks, railroad engineering, infrastructure management, performance monitoring, unmanned aerial vehicles, machine learning, remote sensing technologies, cyber-physical systems

EDUCATION

Ph.D. Civil and Environmental Engineering May 2015

University of Illinois at Urbana-Champaign

Dissertation: “*Framework for Risk-based Management of Railroad Bridge Infrastructure; an Application of Structural Health Monitoring (SHM) using Wireless Smart Sensor Networks (WSSNs)*”

Adviser: Professor B. F. Spencer, Jr.

M. S. Civil and Environmental Engineering May 2005

University of Illinois at Urbana-Champaign

Sponsored by ESCA Consultants, Inc. (Urbana, IL)

Adviser: Professor Doug A. Foutch

B. S. Civil and Environmental Engineering August 1999

University of Granada (Spain)

Senior Project: “Pedestrian Bridge over C/Méndez Núñez at Granada, Spain”

With excellence award from the University of Granada for outstanding students

PROFESSIONAL EXPERIENCE

Los Alamos National Laboratory May 2016-August 2016

Los Alamos, New Mexico

Research Scientist

- Collaborated with the Los Alamos Dynamics Summer School (LADSS) mentoring and advising of students for 10 weeks
- Developed experiments and validation in remote sensing technologies
- Prepared research grants and journal and conference publications summarizing this research

ESCA Consultants, Inc. November 2000-April 2011

Urbana, Illinois

Structural engineer

- Designed, checked, and constructed diverse structural systems
- Expert in highway and railroad bridges, University laboratories, diverse industry buildings, cooling towers and special foundations

- Diverse specialized services such as concrete ready-mix plant management and mix design, and design, fabrication, and evaluation of pre-stressed concrete beams

Newmark Structural Engineering Laboratory (NSEL)

January 2000-November 2000

Urbana, Illinois

Laboratory engineer

- Programmed, tested, collected and analyzed data of multiple specimens, materials (aluminum, concrete, steel, masonry)
- Conducted experiments testing multiple behavior of structures (shear, tension, compression, flexure)

Ofiteco Consultants

July 1997-August 1997

Nerja, Málaga (Spain)

Survey engineer

- Elaborated new cost diagrams and tables and geologic sections for the resident engineer
- Created new cartography, mapping, and directed field surveys

TEACHING

Structural Dynamics

Spring 2017

CE521, University of New Mexico

- New course adapted for the Civil Engineering Department
- Directed to seniors and graduate students

Biodesign

Fall 2016

ME 561 section 001, University of New Mexico

- New multi-disciplinary course developed at UNM
- To provide experience in innovating medical technologies
- Combines concepts of both engineering and medicine
- Directed to seniors and graduate students

Structural Design

Fall 2016, 2015

CE410, University of New Mexico

- New course developed for the Civil Engineering Department
- Combines concepts of both concrete and steel design
- Includes 3D printing
- Directed to senior students

Advanced Structural Dynamics

Spring 2016

CE598, University of New Mexico

- New course developed for the Civil Engineering Department
- Combines concepts of both theory and experimental dynamics
- Directed to graduate students
- First time this course is offered

Introduction to Remote Shake Table Experiments

Spring 2016

STEM, University of New Mexico

- New course developed for the STEM School of Engineering
- Combines creating a website, running experiments, drone technology
- Directed to freshmen and sophomore students
- First time this course is offered

Other teaching experiences

Advanced Structural Dynamics

CEE 573, University of Illinois at Urbana-Champaign
Teaching Assistant

Spring 2013

Instructor: Professor B. F. Spencer, Jr.

Steel Design III

CEE 560, University of Illinois at Urbana-Champaign
Teaching Assistant

Spring 2011

Instructor: Professor James M. LaFave

Structural Engineering

CEE 360, University of Illinois at Urbana-Champaign
Lecturer

Spring 2014

Instructor: Professor B. F. Spencer, Jr.

Design of Structural Systems

CEE 360, University of Illinois at Urbana-Champaign
Lecturer

Spring 2003, Spring 2005

Instructor: Professor Doug A. Foutch

UNM STUDENT MENTORING

PhD students

Shreya Vemuganti

December 2015-present

“Advanced sensing technologies for performance assessment of critical infrastructure” (expected graduation May 2020)

MS students

Jose A. Gomez

December 2015-present

“Cost-effective monitoring of railroad bridge performance” (expected graduation May 2017)

Piyush Garg

December 2015-present

“Non-contact monitoring of railroad bridge performance using UAS” (expected graduation May 2017) (ECE student)

Parya Nickbeen

January 2016-May 2016

Currently PhD student in construction engineering at UNM

Undergraduate students

Laura Gomez (*expected graduation May 2018*)

Cassy Scarlott-Mcclintock (*expected graduation May 2018*)

Biraj Rawal (*expected graduation May 2019*)

Post-doctorate students

Ali I. Ozdagli

December 2015-present

High school students

Douglas Natseway, Native American Community Academy, junior year

November 2015-present

Valentino Pettis, Native American Community Academy, junior year

November 2015-present

Sunjeev Salomon, La Cueva High School, senior year
Currently civil engineering freshmen student at UNM January 2016-May 2016

Clayon Bliss, Saint Pius the 10th, senior year
Currently mechanical engineering freshmen student at ASU June 2016-July 2016

Manny Rivas, South Valley Academy, junior year
Currently senior year June 2016-July 2016

STUDENT COMMITTEE SERVICE

PhD students

Sherif Aboubark (advisor Dr. Mahmoud R. Taha) May 2018

“Digital design and fabrication of biodegradable Scaffold for ligament regeneration”

Darren Luke (advisor Dr. Percy Ng) December 2017

“Elevated Temperature Progressive Damage and Failure of Duplex Stainless Steel”

MS students

Sushil Ghimire (advisor Dr. Walter Gerstle) May 2017

“Nuclear plants vibration analysis using non-contact sensors”

Mojgan Maadandar (advisor Dr. Mahmoud R. Taha) May 2017

“Composite materials for resilient structures”

Jaime Adroher (advisor Rafael Palacios, ICAI, Madrid, Spain) June 2017

“Analysis of railroad bridge data using advanced wavelet sensors”

OTHER MENTORING / CERTIFICATION

Sandia National Laboratory January 2016-August 2016

Albuquerque, New Mexico

Faculty Mentor

- Collaborated with the Non Linear Mechanics and Dynamics (NOMAD) as a lead faculty mentor
- Developed the research project and coordinated with external industry throughout the project
- Selected students to participate in the project

Professional Development Certificate May 2015

Department of Civil and Environmental Engineering

University of Illinois at Urbana-Champaign

- Three years program
- Assisting senior undergraduate students and junior graduate students to grow academically and professionally through mentoring
- Involves at least meeting once a month to monitor students’ progress towards their academic program
- Includes regular service to the community through regular service hours

Certificate in Foundations of Teaching April 2015

Center for Innovation in Teaching and Learning (CITL)

University of Illinois at Urbana-Champaign

- Attending and evaluating the teaching of a professor and discussing teaching methodology after the lecture
- Reading one textbook about teaching philosophy and presenting results to a consultant in teaching
- Attending more than 8 hours of workshops in teaching
- Preparing teaching materials for a large audience of students, being evaluated by a teaching consultant, and receiving feedback and implementing lessons learned for a second lecture

AWARDS AND HONOR SOCIETIES

Center for East Asian and Pacific Studies (CEAPS) Graduate Fellow	2014-2015
Foreign Language and Area Studies (FLAS) Graduate Fellow (click here)	summer 2014
ASCE SEI Structures Congress Poster Selected as “Best of the Best Voting”	April 2012
Graduate College Dissertation Travel Grant, University of Illinois	2011-2012
Talentia Graduate Fellow, Spanish Government	2010-2011
2010 O. H. Ammann Research Fellow, ASCE (click here)	2010
ASCE Young Engineer of the Year Award Central Illinois Section (click here)	2010
Spanish Society of Civil Engineers Young Engineer of the Year Award (click here)	2010
Max Zar Scholarship, Structural Engineering Foundation	fall 2009
National Science Foundation (NSF) Scholarship	July 2009
Regional Finalist “Idea to Product™ Competition”, Midwest Competition	March 2008
Award towards research assistants, University of Illinois	June 2000
Prize due to exceptional grades, University of Granada	June 1998
Tuition scholarship, Minister of Education of Spain	1996-1997

REFEREED JOURNAL PUBLICATIONS

1. Gomez, J. A., Ozdagli, A., **Moreu, F.**, “Cost-effective, Total, Reference-Free Displacements of Railroad Bridges”. Smart Structures and Systems (to be submitted by February 2017)
2. Gomez, J. A., Ozdagli, A., **Moreu, F.**, “Reference-Free Dynamic Displacements of Railroad Bridges Using Low-Cost Sensors” Journal of Intelligent Material Systems and Structures (submitted)
3. **Moreu, F.**, Ayorinde, E., Mason, J., Farrar, C., Mascarenas, D.;”Remote Railroad Bridge Structural Tap Testing using Aerial Robots”; International Journal of Intelligent Robotics and Applications, Intelligent Robotics for Civil Infrastructure (submitted)
4. Ozdagli, A., Gomez, J. A., **Moreu, F.**, “Real-time Model-free and Reference-free Displacement of Railroad Bridges during Train-crossing Events”. Journal of Bridge Engineering (under review)
5. Hoag, A., Hoult, N., Take, A., **Moreu, F.**, Le, H. and Tolikonda, V. (2017); “Measuring displacements of a railroad bridge using DIC and accelerometers”; Smart Structures and Systems (click [here](#))

6. **Moreu, F.**, Spencer Jr, B. F., Foutch, D. A., & Scola, S. (2017). Consequence-based management of railroad bridge networks. *Structure and Infrastructure Engineering*, 1-14. (click [here](#))
7. **Moreu, F.**; Kim, R. E.; and Spencer, Jr., B. F. (2017); “Railroad Bridge Monitoring Using Wireless Smart Sensors”; *Structural Control and Health Monitoring* (2017). (click [here](#))
8. Kim, R. E.; **Moreu, F.**; and Spencer, Jr., B. F. (2016); “Hybrid Model for Railroad Bridge Dynamics”; *Journal of Structural Engineering* (click [here](#))
9. Kim, R. E.; **Moreu, F.**; and Spencer, Jr., B. F. (2015); “Development of a Calibrated Railroad Bridge FE Model using Wireless Smart Sensors”; *Smart Structures and Systems* (click [here](#))
10. **Moreu, F.**; Jo, H.; Li, J.; Kim, R. E., Scola, S.; Spencer, Jr., B. F.; and LaFave, J. M. (2015); “Reference-Free Displacement Estimation and Assessment for Railroad Bridges using Wireless Smart Sensors”; *ASCE Journal of Bridge Engineering* (click [here](#))
11. **Moreu, F.**; Jo, H.; Li, J.; Kim, R.; Cho, S.; Kimmle, A.; Scola, S.; Le, H.; Spencer, Jr., B. F.; and LaFave, J. M. (2014); “Dynamic Assessment of Timber Railroad Bridges using Displacements”; *ASCE Journal of Bridge Engineering* (click [here](#))
12. **Moreu, F.** and LaFave, J. (2011); “Survey of current research topics-Railroad Bridges and Structural Engineering”; *Railway Track & Structures*, September, pgs. 65-70 (click [here](#)).

TECHNICAL REPORTS

1. **Moreu, F.**, and Spencer Jr, B. F. (2015). *Framework for Consequence-based Management and Safety of Railroad Bridge Infrastructure Using Wireless Smart Sensors (WSS)*. Newmark Structural Engineering Laboratory. University of Illinois at Urbana-Champaign.
2. Spencer Jr, B. F., **Moreu, F.**, and Kim, R. E. (2015). *Campaign Monitoring of Railroad Bridges in High-Speed Rail Shared Corridors using Wireless Smart Sensors*. Newmark Structural Engineering Laboratory. University of Illinois at Urbana-Champaign.
3. **Moreu, F.** and LaFave, J. (2012); “Current Research Topics: Railroad Bridges and Structural Engineering”; Newmark Structural Engineering Laboratory (NSEL) Report Series 032; University of Illinois at Urbana-Champaign (UIUC), Urbana, IL (click [here](#))

MAGAZINE ARTICLES

1. **Moreu, F.** (2014); “China Ministry OKs Code for Structural Health Monitoring Systems for Large Bridges”; *ASCE Technical Notes* (October) (click [here](#))
2. **Moreu, F.** (2007); Book review: “A story of the College of Civil Engineering; The College of Civil Engineering throughout its protagonists (Part I, 1802- 1898)”, by Fernando Sáenz Ridruejo. Madri+D. Dirección General de Universidades e Investigación. Consejería de Educación. Comunidad Autónoma de Madrid, Spain. October [In Spanish]
3. **Moreu, F.** (2007); “Seminar by Martita Mullen in the Civil Engineering College at the University of Granada”. The engineer’s activity. “Young & Engineer”. *Revista de Obras Públicas*. Number 3480. Colegio de Ingenieros de Caminos, Canales y Puertos. September [In Spanish] (click [here](#))

PUBLICATIONS IN CONFERENCE PROCEEDINGS

1. Vemuganti, S., **Moreu, F.**, Ozdagli, O., Bajric, A., Liu, B., Brake, M., Troyer, K., *Sensing and Rating of vehicle-bridge collisions*, IMAC XXXV conference by Society of Experimental Mechanics (SEM). Garden Grove, CA, USA, January 30-February 2 2017.
2. Garg, P., Ozdagli, A., **Moreu, F.** (2017). *Optimal Bridge Displacement Controlled by Train Speed on Real-Time*. IMAC XXXV conference by Society of Experimental Mechanics (SEM). Garden Grove, CA, USA, January 30-February 2 2017
3. Vemuganti, S., Ozdagli, A., **Moreu F.**, Survey Bottom Surface Abrasion of Concrete Crossties, TRB 96th Annual Meeting, 2017.
4. Lauren G., Shreya V., **Moreu, F.** (2017, January). Cyber-physical systems related to historic infrastructure maintenance, TRB 96th Annual Meeting, 2017.
5. **Moreu, F.**; Altwood, T. J.; Jo, H.; Kim, R.; Cho, S.; LaFave, J.M.; and Spencer Jr., B.F. (2016, August). Displacements of Steel Railroad Bridges under Revenue Service Traffic for Performance-Based Assessment. In Proc., AREMA 2016 Annual Conf. and Exposition (pp. 1-20). Lanham, MD: American Railway Engineering and Maintenance-of-Way Association (AREMA).
6. Gomez, J. A., Ozdagli, A. I., & **Moreu, F.** (2016, September). Application of Low-Cost Sensors for Estimation of Reference-Free Displacements Under Dynamic Loading for Railroad Bridges Safety. In ASME 2016 Conference on Smart Materials, Adaptive Structures and Intelligent Systems (pp. V001T05A021-V001T05A021). American Society of Mechanical Engineers (click [here](#))
7. Garg, P., Gomez, J., Ozdagli, A., **Moreu, F.** (2016). Non-Contact, Reference-Free Measurement of Bridge Displacement Using Viberometer. 2nd Huixian International Forum on Earthquake Engineering for Young Researchers. Beijing, China, August 19-21 2016
8. **Moreu, F.**, and Spencer Jr, B. F. (2015). *Consequence-Based Management of Railroad Bridge Infrastructure enabled by Structural Health Monitoring*. 2015 World Congress on Advances in Structural Engineering and Mechanics (ASEM15). Incheon, South Korea, August 25-29 2015.
9. Spencer, Jr., B.F., **Moreu, F.**, Kim, R. (2014); "Structural Health Monitoring of Railroad Bridges Using Wireless Smart Sensors (WSSs): Recent Real-world Experiences in North America"; Fourth International Symposium on Life-Cycle Civil Engineering (IALCEE 2014); Waseda University, Tokyo, Japan, November 16-19 (click [here](#))
10. **Moreu, F.**; Jo, H.; Li, J. Cho, S.; Kim, R.; Spencer, B.; and LaFave, J.; (2012); "Reference-free displacement estimation for structural health monitoring of railroad bridges"; AREMA 2012 Annual Conference & Exposition, Chicago, IL, September (click [here](#))
11. **Moreu, F.**; LaFave, J.; Spencer, B. (2012); "Structural health monitoring of railroad bridges – research needs and preliminary results"; Structures Congress (ASCE-SEI 2012), Chicago, IL, March (click [here](#))
12. **Moreu, F.**; LaFave, J.; Spencer, B. (2012); "New regulations on railroad bridge safety: opportunities and challenges for railroad bridge monitoring"; SPIE, Smart Structures and Nondestructive Evaluation and Health Monitoring, San Diego, CA, March (click [here](#))

13. Ren, J. J.; Wang, P.; Xiang, R.; **Moreu, F.** (2011); “Rub-plate length influence on longitudinal coupled slab track forces and displacements in railroad bridges turnouts”, Transportation Research Board (TRB) Annual Meeting, Washington, DC, January (click [here](#))
14. **Moreu, F.** (2008); “Young Structural Engineers Building Structures for the Poor”; Proceedings of the 17th Congress of IABSE (International Association for Bridge and Structural Engineering): “Creating and Renewing Urban Structures. Tall Buildings, Bridges and Infrastructure”, Chicago, IL, September (click [here](#))
15. **Moreu, F.**, Nagayama, T., Zeman, J., Rus, G., Lee, S.Y., and Park, T. (2008); “Railroad Bridge Replacement in the US Today: Current Technology and Future Possibilities”; Proceedings of the Fourth International Conference on Bridge Maintenance, Safety and Management, IABMAS (International Association for Bridge Maintenance and Safety), Seoul, South Korea, July (click [here](#))
16. **Moreu, F.** (2008); “Upgrading Railroads Infrastructure with Prestressed Concrete Bridges”; Proceedings of the 2008 Concrete Bridge Conference. HPC – Safe, Affordable and Efficient. NCBC (National Concrete Bridge Council), Saint Louis, MO, April
17. **Moreu, F.** and Nagayama, T. (2008); “Use of Wireless Sensors for Timber Trestle Railroad Bridges Health Monitoring Assessment”; ASCE Conf. Proc. 314, 36; Proceedings of the 2008 Structures Congress: Crossing Borders; DOI:10.1061/41016 (314) 36, April (click [here](#))
18. **Moreu, F.** and Nagayama, T. (2007); “Possibilities of Using Sensing Technology For Railroad Bridges Maintenance and Repair”; Proceedings of the IABSE Symposium ‘Improving Infrastructure Worldwide – Bringing People Closer’; Weimar, Germany, September 19-21. ISBN: 978-385748-116-1 (click [here](#))
19. **Moreu, F.** (2007); “Building US Railroad Bridges Within Hours a.k.a. “Railroad Bridge Change-Outs””; Proceedings of the IABSE Symposium ‘Improving Infrastructure Worldwide – Bringing People Closer’; Weimar, Germany, September 19-21. ISBN: 978-385748-116-1 (click [here](#))
20. **Moreu, F.** (2007); “Consulting Engineering, Research and Innovation in Civil Engineering in the United States. Potential Applications to Engineering Practice in Spain”. Proceedings of the II Nacional Consulting Engineering Congress. Madrid, Spain. April 23, 24 [In Spanish]
21. **Moreu, F.** (2006); “Construction of a New 80’–0” Steel Girder Span. Mile U5.6 Edgewood Subdivision, Cruse, IL”; Proceedings of the 7th International Conference on Short and Medium Span Bridges 2006, Montreal, Canada, August
22. **Moreu, F.** (2006); “New Memphis Super Terminal (MST) Intermodal Railroad. Bridge over Horn Lake Cut-off Ditch Design and Construction”; Proceedings of the 7th International Conference on Short and Medium Span Bridges 2006, Montreal, Canada, August
23. **Moreu, F.**; Gagnon, E.; Edwards, R. (2006); “Railroad Bridges in the Service of Society”; Fernando Moreu, Eric Gagnon, Riley Edwards. Proceedings of the 3rd National Congress of Civil Engineering, Zaragoza, Spain, October
24. **Moreu, F.** (2005); “Prestressed Concrete Railroad Bridges on Driven H-Piles: The Mile Bridge, KY (USA)””; Proceedings of the Structural Engineering Seminar 2004-2005. Seminario José Antonio García García. University of Granada (Spain), May

BOOK

1. **Moreu, F.** (2001); Seismic Performance of the non-linear new element 08 for DRAIN-2DX, analysis software for non-linear elements under seismic demands; University of Granada, Granada (Spain) [In Spanish] (click [here](#))

BOOK CHAPTERS

1. **American Society of Civil Engineering (ASCE), Engineering Mechanics Institute (EMI)** (2018); Manual of Objective Resilience; Chapter in Resilience of Railroad Infrastructure (in preparation)
2. **American Railway Engineering and Maintenance-of-way Association (AREMA)** (2018); Manual of Railroad Bridge Maintenance; Chapter in Railway Bridge Monitoring (in preparation).

OTHER PAPERS AND POSTERS PRESENTED AT PROFESSIONAL MEETINGS

1. **Moreu, F.**, Ayorinde, E., Mason, J., Mascarenas, D. “Remote Railroad Bridge Structural Tap Testing using Aerial Robots”, Los Alamos Summer Symposium (winners of the student poster competition).
2. Vemuganti, S., Ozdagli, A., **Moreu F.**, Survey Bottom Surface Abrasion of Concrete Crossties, AREMA Annual Conference, Orlando, Florida (2nd place in the student competition).
3. **Moreu, F.**; Spencer, Jr., B. F.; Foutch, D. A.; and Scola, S. (2015); “Consequence-Based Management of Railroad Bridges”; 6th International Conference on Advances in Experimental Structural Engineering, 11th International Workshop on Advanced Smart Materials and Smart Structures Technology, University of Illinois, Urbana-Champaign, Urbana, Illinois. August 1-2
4. **Moreu, F.**, Li, J., Jo, H., Kim, R. E., Scola, S., Spencer Jr., B.F., LaFave, J.M. (2015); “Reference-free Displacements for Condition Assessment of Railroad Bridges”; 6th International Conference on Advances in Experimental Structural Engineering, 11th International Workshop on Advanced Smart Materials and Smart Structures Technology, University of Illinois, Urbana-Champaign, Urbana, Illinois. August 1-2
5. Kim, R. and **Moreu, F.** (2014): “Model Development and Identification for a Railroad Bridge using Wireless Smart Sensors”; Computational Science and Engineering Annual Meeting, National Center for Super Computer Applications (NCSA), Urbana, IL, April 7
6. **Moreu, F.** (2014): “Campaign Monitoring of Railroad Bridges using Wireless Smart Sensors: Past, Present, and Future”; EKS Research Retreat, Allerton Conference Center, University of Illinois, Monticello, IL, February
7. **Moreu, F.** (2013): “Structural Health Monitoring of Railroad Bridges”; EKS Research Retreat, Allerton Conference Center, University of Illinois, Monticello, IL, February
8. **Moreu, F.** and LaFave, J. M. (2012): “Wireless Sensing Technology to Enhance Safety and Reliability for Railroad Bridges”; Association of American Railroads (AAR) Annual Research Review, Pueblo, CO, March
9. **Moreu, F.** (2012): “Railroad Bridge Replacement Prioritization”; EKS Research Retreat, Allerton Conference Center, University of Illinois, Monticello, IL, February

10. **Moreu, F.** (2012); “Structural Health Monitoring of Timber Railroad Bridges”; AREMA Committee 10 meeting, Burlington, IA, June 18-20
11. **Moreu, F.** and LaFave, J. M. (2010): “Bridge Performance Assessment using Simplified Field Monitoring”; Association of American Railroads (AAR) Annual Research Review, Pueblo, CO, February

GRANTS, CONTRACTS

Grants and funded projects to date at UNM (all awarded):

1. Department of Civil Engineering at UNM, Major Teaching Instrumentation (MTI) Proposal. Spring 2017. “Shake Table repair” (\$30,000)
2. National Aeronautics and Space Administration (NASA) and New Mexico Space Grant Consortium (NMSGC); “Structural Performance Monitoring Using Wireless Sensors (WSW) for Cost-Efficient Management and Development of Commercial Space Vehicles” (\$25,000)
3. National Academy of Sciences, Transportation Research Board (TRB) IDEA Safety: “Railroad Bridge Inspections for Replacement Prioritization Using Unmanned Aerial Vehicles (UAVs) with 3D Laser Scanning Capabilities” (\$100,000)
4. UNM Center for Teaching Excellence. Teaching Allocation Grant. Fall 2016. “Augmented Reality for Structural Inspection: Teleportation” (\$2,500)
5. New Mexico Consortium, Los Alamos National Laboratory “Ensuring the Sustainability and Resilience of Timber Bridge Railroad Infrastructure Using Remotely Deployed Sensor Nodes”, Summer 2016 (\$22,222)
6. Department of Civil Engineering at UNM, Curriculum Committee and Chair. Spring 2016. “Shake Table for Research of Dynamic Loads” (\$5,000)
7. UNM Center for Teaching Excellence. Teaching Allocation Grant. Fall 2015. “Shake Table for Teaching Experimental Structural Dynamics” (\$2,000)
8. UNM Chair Competition on Innovative Educational Tools. Fall 2015. “UAV for Infrastructure Monitoring” (\$1,000)

Grants and contracts I formulated and wrote proposals for on behalf of the PIs prior to UNM (all awarded):

1. Federal Railroad Administration (FRA): Condition Assessment of Railroad Bridges using Reference-free Estimates of Bridge Displacement under In-service Train Loads (PI B. F. Spencer, Jr.), May 2015-May 2016. Research and Demonstration Projects Supporting the Development of Reference-free Displacement Estimations under Live Loads, FRA BAA-2014-2 (\$144,281)
2. Association of American Railroads (AAR), Technology Scanning Program: Structural Health Monitoring of Railroad Bridges for Impact Detection (PI B. F. Spencer, Jr.), January 2015-December 2015 (\$30,000)

3. Federal Railroad Administration (FRA): Campaign Monitoring of Railroad Bridges in High-Speed Rail Shared Corridors using Wireless Smart Sensors (PI B. F. Spencer, Jr.), February 2013-February 2014. Research and Demonstration Projects Supporting the Development of High Speed and Intercity Passenger Rail Service, FRA BAA-2010-1 (\$164,456)
4. Association of American Railroads (AAR), Technology Scanning Program: Structural Health Monitoring of Railroad Bridges for Impact Detection (PI B. F. Spencer, Jr.), January 2014-December 2014 (\$30,000)
5. Association of American Railroads (AAR), Technology Scanning Program: Wireless Sensing Technology to Enhance Safety and Reliability for Railroad Bridges (PI James M. LaFave), January 2013-December 2013 (\$39,000)
6. Association of American Railroads (AAR), Technology Scanning Program: Wireless Sensing Technology to Enhance Safety and Reliability for Railroad Bridges (PI James M. LaFave), January 2012-December 2012 (\$34,000)
7. Association of American Railroads (AAR), Technology Scanning Program: Bridge Performance Assessment using Simplified Field Monitoring (PI James M. LaFave), January 2011-December 2011 (\$45,000)

INVITED KEYNOTE SPEECHES

1. UNM STEAM-H for middle schools in Albuquerque, June 10, 2016: “structural engineering, railroad bridges, and the future”, presented to over 300 students.
2. ESPE and Universidad Central First Seminar in Structural Engineering State-of-the-art Trends “Structural Dynamics and Structural Health Monitoring”. Quito, Ecuador, July 27-31, 2015.

INVITED WORKSHOP PARTICIPATION

1. National Science Foundation -funded workshop NHERI@UC San Diego User Training Workshop, Dec 12-13, 2016.
2. National Science Foundation -funded workshop NHERI Wall of Wind Experimental Facility User Workshop, November 18, 2016.
3. National Science Foundation NSF-funded workshop on teaching 'structural art', University of Massachusetts (UMass Amherst), June 13-14 2016.
4. Young Researchers Symposium in Earthquake Engineering, Chinese Earthquake Administration, Institute of Engineering Mechanics. August 17-18 2016.
5. Bridge Weigh-in-Motion (BWIM); University of Connecticut, FHWA and Connecticut Department of Transportation, Storrs, CT, October 26-27, 2015.
6. UNM COSMIAC Region Technical Workforce Study, Albuquerque, NM. September 18, 2015.

INVITED ORAL PRESENTATIONS / TECHNICAL SEMINARS

1. Transportation Research Board Committee AFF40 Nugget Presentation: Railroad Bridge Monitoring and Inspection under Live Loads: Current State of the Art and Future Trends; Washington DC, January 11, 2017.
2. American Society of Civil Engineers, Engineering of Mechanics Institute, Objective Resilience Group: Performance Monitoring of Railroad Infrastructure; Washington DC, January 10, 2017.
3. New Mexico Department of Transportation (NMDOT) Annual Transportation and Paving Conference: “Consequence-based management of complex bridge networks using wireless smart sensors”; January 5, 2017.
4. New Mexico Tech, Department of Mechanical Engineering (seminar): “Cost-effective Remote Sensing and Rating of Critical Infrastructure”, October 4, 2016.
5. University of Tennessee at Knoxville, Department of Civil and Environmental Engineering (seminar); “Structural Health Monitoring of Railroad Bridges in North America” May 27, 2016
6. American Society of Civil Engineers, Engineering Mechanics Institute (EMI); “wireless smart sensors monitoring railroad bridge networks” Annual Conference, Nashville, Tennessee, May 23-26.
7. American Society of Civil Engineers New Mexico Section Annual Conference, Socorro, New Mexico, April 29, 2016;” Consequence-based Monitoring of Infrastructure for Decision-making”
8. University of Kansas, Department of Civil, Environmental and Architectural Engineering (seminar), April 15, 2016; “Structural Health Monitoring Using Wireless Smart Sensors (WSSs): Performance Assessment and Decision Tools Applications”
9. University of New Mexico, Department of Mechanical Engineering (seminar); March 25, 2016; Albuquerque, New Mexico; “Hybrid Sensing for Structural Health Monitoring”
10. New Mexico Collaborative Research and Development Council, February 26, 2016, Albuquerque, New Mexico. Unmanned Aerial Systems (UAS) and Remote Sensing (RS) Cluster. “UNM Research Opportunities for UAS and Infrastructure Consequence-Based Assessment”
11. American Society of Civil Engineers, Annual Structural Congress, February 17, 2016, Phoenix, Arizona; Committee in System Identification; Southwest panel in Structural Health Monitoring, representing UNM: “SHM in the Southwest: State of the Art and Future Opportunities”
12. University of New Mexico. Department of Civil Engineering Graduate Seminar; February 3, 2016; “Structural Health Monitoring Using Wireless Smart Sensors”
13. Computational Sustainability at the University of New Mexico (guest lecturer); November 16, 2015; Albuquerque, New Mexico; “Wireless Smart Sensors for Structural Health Monitoring”
14. New Mexico Society of Professional Engineers; November 13, 2015; Albuquerque, New Mexico; “2015 NMSPE Issues Conference”
15. West Point US Military Academy; October 28; “Railroad Bridge Maintenance, Repairs, and Replacement Prioritization Using Wireless Smart Sensors”
16. Department of Civil and Environmental Engineering, University of Arizona, October 23, 2015; Tucson, Arizona; “Management of Railroad Bridges Using Wireless Smart Sensors”
17. Department of Civil Engineering, University of New Mexico, March 26, 2015; “Critical Infrastructure Management using Wireless Smart Sensors”

18. Institute of Disaster Prevention, Beijing (China), August 4, 2014: “Structural Health Monitoring (SHM) of Railroad Bridges”
19. Institute of Engineering Mechanics, China Earthquake Administration, Harbin (China), July 14, 2014: “Structural Health Monitoring (SHM) for Railroad Bridges using Wireless Smart Sensor (WSSs) in North America”
20. Department of Transportation Engineering, Harbin Institute of Technology (HIT), Harbin (China), July 9, 2014: “Railroad Bridges Replacement Projects in North America (Change Outs): Why, What, and How?”
21. Department of Civil Engineering, Northeast Forestry University, Harbin (China), July 7, 2014: “New Smart Technologies for Safely Designing and Maintaining Civil Engineering Structures: The Illinois Approach” (click [here](#))
22. Department of Civil Engineering, Harbin Institute of Technology, Harbin (China), July 4, 2014: “Campaign Monitoring of Railroad Bridges using Wireless Smart Sensors: Past, Present, and Future” (click [here](#))
23. Society of Civil Engineers of Spain, Granada (Spain), December 30, 2011: “Civil Engineering Professional Developments in United States”
24. University of Granada and Society of Civil Engineers of Spain, Granada, Spain, December 30, 2010: “Civil Engineering Education in United States”
25. Engineering Week, LaSalle Bajío University, León (Mexico), Teleconference, October 12, 2010: “Young and Engineer: Is there any Future?”
26. Institute of Engineering Mechanics, China Earthquake Administration, Beijing (China), August 2, 2010: “Railroad Bridges and Structural Health Monitoring”
27. Employment Fair Expo, University of Granada, Granada (Spain), May 20, 2010: “Engineering Education in the Global Market”
28. Maintenance of Way Club of Chicago, Chicago, IL, January 18, 2010: “Railroad Bridges Maintenance”
29. Department of Structural Engineering and Mechanics, University of Granada, Granada (Spain), January 12, 2010: “Railroad Bridges and Structural Health Monitoring”
30. Society of Civil Engineers of Spain, Granada (Spain), December 31, 2009: “Young & Engineering, the American Experience”
31. ASCE Eastern Illinois Professional Chapter, Champaign, IL, December 15, 2009: “Railroad Bridges in the US inspection, maintenance and management”
32. Institute of Engineering Mechanics, China Earthquake Administration (Harbin, China), August 6, 2007: “US Midwest bridges and other structures”
33. Bridges and Structures Laboratory, Department of Civil Engineering, University of Tokyo, Tokyo (Japan), August 2, 2007: “Bridges Connecting Society”
34. Department of Civil and Environmental Engineering, Christian Brothers University, Memphis, TN, March 2007: “Structural Engineering: Projects and Examples”
35. Ecole Nationale des Ponts et Chaussées, Paris (France), May 2006: “USA railroad intermodal facilities”

36. Maintenance of Way Club of Chicago, Chicago, IL, May 2006: “Edgewood Railroad Bridge Design and Construction Particularities”
37. ASCE student chapter, Civil Engineering Department, Santa Clara University, Santa Clara, CA, May 2005: “Midwest Structures Design and Construction”
38. Department of Structural Engineering and Mechanics, University of Granada, Granada (Spain), December 2004: “Prestressed Concrete Railroad Bridges on Driven H-piles: The Mile Bridge, Ky (USA)”
39. Bridges and Structures Laboratory, Department of Civil Engineering, University of Tokyo, Tokyo (Japan), May 2004: “USA Structures throughout their Design”

WORKSHOP PARTICIPATION

- New Mexico Collaborative Research and Development Council, February 26th 2016, Albuquerque, New Mexico.” Unmanned Aerial Systems (UAS) and Remote Sensing (RS) Cluster”
- New Mexico Collaborative Research and Development Council, December 11th 2015, Santa Ana Pueblo, New Mexico.” Unmanned Aerial Systems (UAS) and Remote Sensing (RS) Cluster”
- Connecticut Department of Transportation; October 26-27, 2015; Mystic, Connecticut; “1st Bridge Weigh-in-Motion Workshop in Connecticut”
- Workshop on Cyber-Physical Co-Design of Wireless Monitoring and Control for Civil Infrastructure, Thomas M. Siebel Center for Computer Science, University of Illinois, Urbana, IL, February 17-18 2011
- Interactive Workshop on Bridge Inspection and Rating, University of Illinois, Urbana, IL, February 24, 2010
- Design of Deep Foundations, Ensoft, Inc. Austin, TX, November 11-13, 2003
- Bridge Construction Inspection, Technology Transfer Program, Illinois Department of Transportation (IDOT), 2003

PROFESSIONAL SERVICE

UNM, Resilience Institute, 2nd Annual Resilience Symposium

- Co-organizer

UNM, Dean of School of Engineering

- Search committee, member

UNM, Prince of Asturias Chair Endowment

- Advisory Board, member

UNM, Department of Civil Engineering

- Graduate Committee, member
- Earthquake Engineering Research Institute (EERI) student chapter, faculty mentor

Symposium/Session Chair

- Mini-symposium, chair, structural performance monitoring of railroad infrastructure, ASCE-SEI Annual Congress, Denver, Colorado, April 6-8 2017.
- Mini-symposium, chair, structural health monitoring for bridges, European Workshop for Structural Health Monitoring, Bilbao, Spain, July 7, 2016.
- Mini-symposium, co-chair, structural health monitoring, 6th International Conference on Advances in Experimental Structural Engineering, 11th International Workshop on Advanced Smart Materials and Smart Structures Technology, University of Illinois, Urbana-Champaign, Urbana, Illinois. August 1-2
- Mini-symposium, co-chair, afternoon session, EKS retreat, Allerton Park Retreat Center, Monticello, IL, February 1-2 2014
- Chairman, Second Meeting of Civil Engineers from Spain in the US, Illini Center, Chicago, IL November 10-11, 2012
- Chairman, First Meeting of Civil Engineers from Spain in the US, Urbana Country Club, Urbana, IL, April 27, 2012

Professional committee memberships:

- ASCE-SEI Structural Health Monitoring and System Identification Committee
- UAS/Remote Sensing Cluster of the NM CRDC
- NU Rail faculty member representative (UNM)
- AREMA Committee 7: Guest participant on railroad steel bridge design and rating committees
- AREMA Committee 10: Construction, Management and Maintenance of Railroad Bridges
- AREMA Committee 10, Research and Advancement Subcommittee: Assistant to the Chairman

Technical reviewer for:

- Journal of Engineering Computations
- Journal of Vibration and Control
- Journal of Control and Health Monitoring
- Journal of Smart Structures and Systems (on behalf of Professor B. F. Spencer, Jr.)
- Journal of Performance of Constructed Facilities, ASCE (on behalf of Professor B. F. Spencer, Jr.)
- Journal of Bridge Engineering, ASCE (on behalf of Professor James M. LaFave)
- Journal of Engineering Structures (on behalf of Professor James M. LaFave, multiple times)

Service at professional venues:

- American Society of Civil Engineers Fly-In: Representing New Mexico with the Legislators at Washington DC, March 13-14, 2017.
- American Society of Civil Engineers Fly-In: Representing New Mexico with the Legislators at Washington DC, March 14-18, 2016.

- Fulbright Scholarship Candidates Interview Committee, University of Illinois at Urbana-Champaign, September 2014
- Delegate of the Spanish Society of Civil Engineers, International Meeting with Board of Directors, ASCE Annual Conference, Charlotte, NC, October 15-17, 2013
- Delegate of the Spanish Society of Civil Engineers, International Agreement with the Canadian Society of Civil Engineers (CSCE), International Heritage Landmark in Civil Engineering, Niagara Falls, ON (Canada), September 28-30, 2010
- Host from the Spanish Society of Civil Engineers to Stefan Jaeger (ASCE), ASCE 2025 Vision presentation to the Spanish Civil Engineering Associations, Madrid (Spain) June 21-23, 2010
- Delegate of the Spanish Society of Civil Engineers, International Heritage Landmark in Civil Engineering, with ASCE President Blaine Leonard and Washington State Governor Christine Gregoire, Port Townsend, WA (US), April 20-23, 2010 (click [here](#))

PROFESSIONAL MEMBERSHIP

- American Society of Civil Engineers (ASCE); Chair of structures at the New Mexico Section
- Structural Engineering Institute (SEI)
- Engineering Mechanics Institute (EMI)
- Structural Engineering Mechanics (SEM)
- National Society of Professional Engineers (NSPE)
- Transportation Research Board (TRB)
- American Railway Engineering and Maintenance-of-Way Association (AREMA)
- New Mexico Society of Professional Engineers (NMSPE)
- Chi Epsilon, Civil Engineering Honor Society
- Spanish Society of Civil Engineers (Spain) (AICCP), Member, US & Canada Representative