

Gary S. Prinz, Ph.D., P.E.

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Department of Civil Engineering
University of Arkansas
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PROFESSIONAL APPOINTMENTS/ EXPERIENCE:

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|-----------|---|
| 2022–Cur | James T. Womble Endowed Professorship in Computational Mechanics and and Nanotechnology Modeling |
| 2019–Cur | Director: Grady E. Harvell Civil Engineering Research and Education Center |
| 2024–Cur | Professor
Department of Civil Engineering
University of Arkansas |
| 2019–2024 | Associate Professor
Department of Civil Engineering
University of Arkansas |
| 2014–2019 | Assistant Professor
Department of Civil Engineering
University of Arkansas |
| 2011–2013 | Postdoctoral Research Scientist
École Polytechnique Fédérale de Lausanne (EPFL) |
| 2010–2011 | Staff Engineer IV, Applied Research Associates, Inc.
Security Engineering & Applied Science Sector |

EDUCATION:

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| 2011–2013 | Postdoc, École Polytechnique Fédérale de Lausanne (EPFL)
Supervisors: Alain Nussbaumer, Jean-Paul Lebet
Steel Structures Laboratory, ICOM (now RESSLAB)
School of Architecture, Civil and Environmental Engineering, ENAC |
| 2010 | Ph.D., Civil and Environmental Engineering, Brigham Young University
Advisor: Paul W. Richards
Dissertation: <i>“Using buckling-restrained braces in eccentric configurations”</i> |
| 2007 | M.S., Civil and Environmental Engineering, Brigham Young University
Advisor: Paul W. Richards
Thesis: <i>“Effect of beam splicing on the seismic response of buckling-restrained braced frames”</i> |
| 2007 | B.S., Civil and Environmental Engineering, Brigham Young University
<i>Minor in Mathematics: Elective coursework in advanced numerical methods</i> |

RESEARCH INTERESTS:

Mechanics and simulation of ductile fracture; ultra low- and high-cycle fatigue of structural components; steel infrastructure fatigue assessment methods; seismic design and retrofit solutions for structures; large-scale experimental testing of structural components and systems; computer simulation under complex loads.

HONORS & AWARDS:

- NSF CAREER Award
- AISC Milek Fellowship
- AISI Robert J. Dexter Memorial Award
- ASCE Fellow
- UofA College of Engineering Rising Star Teacher Award – 2020
- UofA Dept of Civil Engineering Outstanding Teacher Award – 2016 & 2019
- UofA Dept of Civil Engineering Outstanding Researcher Award – 2017 & 2018
- T. Leslie Youd Family Fellowship
- 2nd Place, Earthquake Engineering Research Institute Graphics Competition
- Joseph Layne Black Scholarship
- NCGA Top of the State Golf Scholarship (2003–2007)
- Licensed Professional Civil Engineer (P.E. license), California and Arkansas

PUBLICATIONS:

(Journal Articles)

- J34.** Dang, C.N., Jones, C., Kareem, R.S., **Prinz, G.S.**, and Hale, W.M. (2024). “Flexural performance of bridge decks reinforced with high-strength steel.” *Structures*, [Under Review].
- J33.** Puttbach, C., **Prinz, G.S.**, and Murray, C.D. (2024). “Estimation of cement paste and UHPC elastic modulus through measured phase-property upscaling.” *Cement*, [Accepted].
- J32.** Puttbach, C., **Prinz, G.S.**, and Murray, C.D. (2024). “Strength and Stiffness Characterization of Ultra High-Performance Concrete (UHPC) Cement Paste Phases Through In-Situ Micro-Mechanical Testing.” *Cement and Concrete Composites*, 149(2024), 105520.
- J31.** **Prinz, G.S.**, and Richards, P.W. (2024). “Experimental Evaluation and Design Procedure for All-Steel Tube-in-Tube Buckling Restrained Braces.” *Journal of Structural Engineering, ASCE*, 150(1).
- J30.** Puttbach, C., **Prinz, G.S.**, and Murray, C.D. (2023). “A detailed review of existing equations for estimating elastic modulus in specialty concretes.” *Journal Materials in Civil Engineering, ASCE*, 35(6), 03123001.
- J29.** Castilla-Casadiago, D.A., Miranda-Muñoz, K.A., Robert, J.L., Crowell, A.D., Gonzalez-Nino, D., Choudhury, D., Aparicio-Solis, F.O., Servoss, S.L., Rosales, A.M., **Prinz, G.S.**, Zou, M., Zhang, Y., Coetzee, J.F., Greenlee, L., Powell, J., and Almodovar, J. (2022). “Biodegradable microneedle patch for delivery of meloxicam for managing pain in cattle.” *PLoS ONE*, 17(8): e0272169.
- J28.** Lozano, C., Langston, M., Kashefzadeh, M-H., and **Prinz, G.S.** (2022). “Analytical and experimental investigation into pre-stressed carbon fiber reinforced polymer (CFRP) fatigue retrofits for steel waterway lock-gate structures.” *Metals*, 12(1), 88.
- J27.** Gonzalez-Niño, D., Strasser, T., and **Prinz, G.S.** (2021). “Ultra low-cycle fatigue behavior comparison between additively manufactured and rolled 17-4 PH (AISI 630) stainless steels.” *Metals*, 11(11), 1726.
- J26.** **Prinz, G.S.** and Murray, C.D. (2021). “On the pullout strength of human nasal hair.” *Materialia*, 16(2021), 101102.
- J25.** Gonzalez-Niño, D., Sonntag, S., Afshar-Mohajer, M., Goss, J., Zou, M., and **Prinz, G.S.** (2021). “Micromechanical tension testing of additively manufactured 17-4PH stainless steel specimens.” *J. Vis. Exp.* (170) e62433: <https://doi.org/10.3791/62433>
- J24.** Dominguez, D., and **Prinz, G.S.** (2021). “Cyclic behaviour of laterally skewed special moment frame connections having composite concrete slabs.” *Steel Construction*, 14(2021): <https://doi.org/10.1002/stco.202000032>
- J23.** Castilla-Casadiago, D.A., Carlton, H., Gonzalez-Niño, D., Miranda-Munoz, K., Daneshpour, R., Huitnik, D., **Prinz, G.S.**, Powell, J., Greenlee, L., and Almodovar, J. (2021). “Design, characterization, and modeling of a chitosan microneedle patch for transdermal delivery of meloxicam as a pain management strategy for use in cattle.” *Materials Science and Engineering C*, 118(2021), 111544.
- J22.** Kareem, R.S., Jones, C., Dang, C.N., **Prinz, G.S.**, and Hale, W.M. (2020). “Structural performance concrete bridge decks reinforced with grade-830 steel bars.” *Structures*, 27(2020), pp. 1396-1404.
- J21.** Hillhouse, B., and **Prinz, G.S.** (2020). “Effects of clustering and flange surface friction on headed shear stud demands.” *Journal of Bridge Engineering, ASCE*, 25(6).
- J20.** Norwood, J., and **Prinz, G.S.** (2019). “Effect of Continuity-Plate Alignment on the Capacity of Welded Beam-to-Column Moment Connections.” *Engineering Structures*, 198(2019), 109550.
- J19.** Desrochers, C., **Prinz, G.S.**, and Richards, P.W. (2018). “Column axial load effects on the performance of skewed SMF RBS connections” *Journal of Constructional Steel Research*, 150(2018), pp. 505-513.

- J18. Ovuoba, B., and **Prinz, G.S.** (2018). "Analysis of shear demands near the steel-concrete interface in composite bridge girders having varied stud pitch, girder depth, and span length" *Journal of Bridge Engineering, ASCE*, 23(11).
- J17. Ovuoba, B., and **Prinz, G.S.** (2018). "Investigation of residual fatigue life in shear studs of existing composite bridge girders following decades of traffic loading." *Engineering Structures*, 161(2018), pp.134-145.
- J16. Noernberg, M., and **Prinz, G.S.** (2018). "Automated Pin-Dot Marking Effects on Steel Bridge Component Fatigue Capacity." *Journal of Constructional Steel Research*, 142(2018) 1-4.
- J15. Alsalman, A., Dang, C.N., **Prinz, G.S.**, and Hale, W.M. (2017). "Evaluation of Modulus of Elasticity of Ultra-High Performance Concrete." *Construction & Building Materials*, 153(2017), pp. 918-928.
- J14. Cortes, G., and **Prinz, G.S.** (2017). "Seismic fragility analysis of large unanchored steel tanks considering instability and fatigue damage." *Bulletin of Earthquake Engineering*, 15(3), pp 1279-1295.
- J13. Ovuoba, B., and **Prinz, G.S.** (2016). "On the fatigue capacity of headed shear studs in composite bridge girders." *Journal of Bridge Engineering, ASCE*, 21(12).
- J12. Dang, C.N., Floyd, R.W., **Prinz, G.S.**, and Hale, W.M. (2016). "Determination of bond stress distribution coefficient by maximum likelihood method." *J. Structural Engineering, ASCE*, 142(5).
- J11. **Prinz, G.S.**, and Richards, P.W. (2016). "Demands on reduced beam section connections with out-of-plane skew." *J. Structural Engineering, ASCE*, 142(1).
- J10. Ghafoori, E., Motavalli, M., Nussbaumer, A., Herwig, A., **Prinz, G.S.**, and Fontana, M. (2015). "Determination of minimum CFRP pre-stress levels for fatigue crack prevention in retrofitted metallic beams." *Engineering Structures*, 84(2015), pp.29-41.
- J9. Ghafoori, E., Motavalli, M., Nussbaumer, A., Herwig, A., **Prinz, G.S.**, and Fontana, M. (2015). "Design criterion for fatigue strengthening of riveted beams in a 120-year-old railway metallic bridge using pre-stressed CFRP plates." *Composites Part B*, 68(2015).
- J8. **Prinz, G.S.**, and Nussbaumer, A. (2014). "Effect of radial base-plate welds on the ULCF capacity of tank connections" *J. Constructional Steel Research*, 103(2014), p.131-139.
- J7. Ghafoori, E., **Prinz, G.S.**, Nussbaumer, A., Motavali, M., Herwig, A., and Fontana, M. (2014). "Finite element analysis for fatigue damage reduction in metallic riveted bridges using pre-stressed CFRP plates." *Polymers*, 6(4), p.1096-1118.
- J6. **Prinz, G.S.**, Coy, B., and Richards, P.W. (2014). "Experimental and numerical investigation of ductile top-flange beam splices for improved buckling-restrained braced frame behavior" *J. of Structural Engineering, ASCE*, 140(9), p.04014052:1-9.
- J5. **Prinz, G.S.**, Nussbaumer, A., Borges, L., and Khadka, S. (2014). "Experimental testing and simulation of bolted beam-column connections having thick extended end-plates and multiple bolts per row" *Engineering Structures*, 59(2014), p. 434-447.
- J4. **Prinz, G.S.**, and Nussbaumer, A. (2012). "On the low-cycle fatigue capacity of unanchored steel liquid storage-tank shell-to-base connections" *Bulletin of Earthquake Engineering*, 10(6), p.1943-1958.
- J3. **Prinz, G.S.**, and Nussbaumer, A. (2012). "Fatigue analysis of liquid storage-tank shell-to-base connections under multi-axial loading" *Engineering Structures*, 40(2012), p.75-82.
- J2. **Prinz, G.S.**, and Richards, P.W. (2012). "Seismic performance of buckling-restrained braced frames with eccentric configurations." *J. Structural Engineering, ASCE*, 138(3), p.345-353.
- J1. **Prinz, G.S.**, and Richards, P.W. (2009). "Eccentrically braced frame links with reduced web sections" *J. Constructional Steel Research*, 65(2009) 1971-78.

(Book Chapters)

- B1. **Prinz, G.S.**, and Nussbaumer, A. (2013). "On fast transition between shelters and housing after natural disasters in developing regions." Chapter 19 in "*Technologies for Sustainable Development: A Way to Reduce Poverty?*" Springer-Verlag. ISBN 978-3-319-00638-3.

(Conference Papers)

- C15. Verkamp, L., Kashfizadeh, M.H., **Prinz, G. S.**, and Hernandez, S.V. (2019). "Statistical methods for bridge fatigue regression modeling," *19th International Conference on New Trends in Fatigue and Fracture*, Tucson, AZ, October 2019.
- C14. Mayhorn, D. T., Murray, C. D., Floyd, R. W., and **Prinz, G. S.** (2018). "Effect of corrosion on end region behavior of pre-tensioned, pre-stressed bridge girders," *PCI Convention and National Bridge Conference*, Denver, CO, February 20-24.
- C13. Cortes, G., and **Prinz, G.S.** (2017). "Seismic fragility analysis of large unanchored steel tanks considering shell buckling." *16th World Conference on Earthquake Engineering*, Santiago Chile, paper no. 509.
- C12. Ghafoori, E., Motavalli, M., Herwig, A., Nussbaumer, A., **Prinz, G.S.**, and Fontana, M. (2016). "Fatigue strengthening of riveted girders in a historic railway metallic bridge in Switzerland using pre-stressed un-bonded CFRP laminates." *8th International Conference on Bridge Maintenance, Safety and Management (IABMAS)* Foz do Iguacu, Brazil.
- C11. Ghafoori, E., Motavalli, M., Herwig, A., Nussbaumer, A., **Prinz, G.S.**, and Fontana, M. (2016). "A strengthening theory to prevent fatigue crack initiation in old metallic bridges." *8th International Conference on Bridge Maintenance, Safety and Management (IABMAS)* Foz do Iguacu, Brazil.
- C10. **Prinz, G.S.**, Nussbaumer, A., Borges, L., and Khadka, S. (2014). "Beam-column connections with thick endplates." *Eurosteel, September 10-12, 2014*, Naples, Italy.
- C9. **Prinz, G.S.**, and de Castro-e-Sousa, A. (2014). "Effect of slab stiffness on EBF link rotation demands and implications for link ultra low-cycle fatigue susceptibility." *ASCE Structures Congress, 2014*, Boston, Massachusetts.
- C8. Ghafoori, E., Motavalli, M., Nussbaumer, A., Herwig, A., **Prinz, G.S.**, and Fontana, M. (2014). "Determination of minimum CFRP pre-stress level for fatigue crack prevention in retrofitted metallic beams." *7th International Conference on FRP Composites in Civil Engineering (CICE)*, Vancouver, Canada.
- C7. **Prinz, G.**, Ghafoori, E., Nussbaumer, A., Motavalli, M., Herwig, A., and Fontana, M. (2013). "Finite element modeling for fatigue strengthening of metallic riveted bridges using un-bonded pre-stressed CFRP plates." *2nd Conference on Smart Monitoring, Assessment and Rehabilitation of Civil Structures (SMAR)*, Istanbul, Turkey.
- C6. **Prinz, G.S.**, and Nussbaumer, A. (2013). "Ultra low-cycle fatigue modeling of welded joints under multi-axial strain conditions for better seismic design." *Darmstadter Ingenieurkongress: Bau und Umwelt*, Technische Universitat Darmstadt (TUD), Darmstadt, Germany. [Invited presenters].
- C5. **Prinz, G.S.**, and Richards, P.W. (2012). "Dynamic performance comparison between buckling-restrained braced frames with concentric and eccentric configurations" *15th World conference on earthquake engineering*, Lisbon, Portugal.
- C4. **Prinz, G.S.**, Nussbaumer, A., and Cortes, G. (2012). "Fatigue analysis of unanchored steel liquid storage tank shell-to-base connections during dynamic earthquake induced uplift." *15th World conference on earthquake engineering*, Lisbon, Portugal.
- C3. Cortes, G., **Prinz, G.S.**, and Nussbaumer, A. (2012). "Cyclic demand at the shell-bottom connection of unanchored steel tanks" *15th World conference on earthquake engineering*, Lisbon, Portugal.
- C2. **Prinz, G.S.**, and Richards, P.W. (2008). "Seismic response of buckling-restrained braced frames with beam splices." *14th World conference on earthquake engineering*, Beijing, China

- C1. Richards, P.W., and **Prinz, G.S.** (2007). “Non-linear time history analysis of refined mesh steel structures.” *9th Canadian conference on earthquake engineering*, Ontario, Canada.

(Technical Reports)

- R17. Pyukarel, S., **Prinz, G.S.**, and Murray, C.D. (2024). “Development of an innovative rapidly constructible bridge” *Engineering Research and Development Center (ERDC)*, Final Research Report of Contract No. W912HZ22C0051, University of Arkansas, Fayetteville, AR.
- R16. **Prinz, G.S.** (2024). “K8 MEMES: K-8 Maritime Education Modules to Engage Students” *MarTREC Final Research Report*, University of Arkansas, Fayetteville, AR.
- R15. Puttbach, C., Briggs, G., Edwards, L., and **Prinz, G.S.** (2023). “Toward the development of self-prestressing ultra high-performance concrete” *Engineering Research and Development Center (ERDC)*, Final Research Report for Task 4 of Contract No. W912HZ21C0037, University of Arkansas, Fayetteville, AR.
- R14. Callaway, K. and **Prinz, G.S.** (2023). “Port infrastructure resilience through combined wind-surge demand characterization” *MarTREC Final Research Report*, University of Arkansas, Fayetteville, AR.
- R13. Verkamp, L. and **Prinz, G.S.** (2021). “Development of multi-axial fatigue retrofits for waterway lock gate components” *MarTREC Final Research Report*, University of Arkansas, Fayetteville, AR.
- R12. Hillhouse, B., and **Prinz, G.S.** (2020). “Investigation into shear stud fatigue demands: Towards modification of the existing AASHTO stud fatigue provisions” *AISC Final Report*, American Institute of Steel Construction, Chicago, IL.
- R11. Lozano, C., Langston, M. and **Prinz, G.S.** (2018). “Corrosion-tolerant pre-stressed CFRP fatigue retrofits for improved waterway lock reliability” *SSRL Report No. 2018-1*, University of Arkansas, Fayetteville, AR.
- R10. Desrochers, C., and **Prinz, G.S.** (2017). “Effect of column axial load on skewed SMF RBS connection demands” *SSRL Report No. 2017-1*, University of Arkansas, Fayetteville.
- R9. Noernberg, M., and **Prinz, G.S.** (2016). “Materials Testing Report: Automated pin-dot marking effects on A709-Gr50 steel plate fatigue capacity” *SSRL Report No. 2016-2*, University of Arkansas, Fayetteville, AR.
- R8. Pough, K. and **Prinz, G.S.** (2016). “Development of pre-stressed CFRP fatigue retrofits for common steel bridge connections” *SSRL Report No. 2016-1*, University of Arkansas, Fayetteville, AR.
- R7. Ovuoba, B., and **Prinz, G.S.** (2015). “On the fatigue capacity of headed shear studs in composite bridge girders.” *SSRL Report No 2015-1 Submitted to W&W|AFCO Steel and AASHTO T-14 Committee*. University of Arkansas, Fayetteville AR.
- R6. **Prinz, G.S.**, and Nussbaumer, A. (2013). “Seismic performance of liquid storage-tank shell-to-base connections – Phase 3,” *Report submitted to the Swiss Federal Office for the Environment (OFEV) and CARBURA*, École Polytechnique Fédérale de Lausanne (EPFL), Switzerland, Rapport d’EPFL 186862, Mandat N° IC 495-3.
- R5. **Prinz, G.S.**, and Nussbaumer, A. (2013). “Fatigue strengthening of metallic riveted bridges using un-bonded pre-stressed CFRP plates,” *Report prepared for the Swiss Commission for Technology and Innovation (CTI)*, École Polytechnique Fédérale de Lausanne (EPFL), Switzerland, Rapport d’EPFL 185959, Mandat N° IC 497.
- R4. **Prinz, G.S.**, and Nussbaumer, A. (2012). “Seismic performance of liquid storage-tank shell-to-base connections – Phase 2,” *Report submitted to the Swiss Federal Office for the Environment (OFEV) and CARBURA*, École Polytechnique Fédérale de Lausanne (EPFL), Switzerland, Rapport d’EPFL 174640, Mandat N° IC 495-2.
- R3. **Prinz, G.S.**, and Nussbaumer, A., (2012). “Material characterization of existing Swiss tanks for fatigue reliability – Supplement to Report EPFL 174640.” *Report submitted to*

the Swiss Federal Office for the Environment (OFEV) and CARBURA, École Polytechnique Fédérale de Lausanne (EPFL), Switzerland.

- R2. **Prinz, G.S.**, and Nussbaumer, A. (2013). “Experimental testing and simulation of bolted beam-column connections having thick extended endplates and multiple bolts per row,” *Report submitted to the Swiss Institute of Steel Construction (SZS), École Polytechnique Fédérale de Lausanne (EPFL), Switzerland, Rapport d’EPFL 181194, Mandat N° IC 707.*
- R1. **Prinz, G.S.**, and Richards, P.W. (2008). “Eccentrically braced frame links with reduced web sections.” *Report submitted to the American Institute of Steel Construction (AISC), Department of Civil and Environmental Engineering, Brigham Young University, Provo, UT.*

SELECTED
PRESENTATIONS:

(Selected Invited Talks)

- T20. “Conclusions from shear stud fatigue investigations and recommendation for modification to the AASHTO provisions” Presented at NASCC World Steel Bridge Symposium, St. Louis, MO, April 3, 2019.
- T19. “Controlling fatigue and fracture in steel and composite structures during extreme and repeated loading” ETH Zurich invited seminar presentation, Zurich, Switzerland, August 20, 2018.
- T18. “Automated Pin-Dot Marking Effects on A709-GR50 Steel Plate Fatigue Capacity” Presented at the World Steel Bridge Symposium, Baltimore, Maryland, April 12, 2018.
- T17. “Fabricated Steel Shelters for Urban Environments in Developing Regions Affected by Natural Disasters” Presented to MEDAIR, Ecublens, Switzerland, June 8, 2017.
- T16. “Recent Steel Research at the University of Arkansas” Presented to École Polytechnique Fédérale de Lausanne (EPFL) RESSLAB, Lausanne, Switzerland, June 9, 2017.
- T15. “Closure on the Fatigue Capacity of Headed Shear Studs in Composite Bridge Girders & Future Research” Presented to the AASHTO T-14 Committee and Bridge Task Force Design Advisory Group (DAG), Orlando, FL, January 2017.
- T14. “Earthquake Resistant Design Strategies, Case Studies, and Recent Research Efforts” Presented at the Arkansas Governor’s Earthquake Advisory Council, Fayetteville, AR, July 22, 2016.
- T13. “Research on the fatigue capacity of headed shear studs in composite bridge girders” Presented at NASCC World Steel Bridge Steel Bridge Symposium, Orlando, FL, April 13, 2016.
- T12. “Final recommendations on the fatigue capacity of shear connectors in composite bridge girders” Presented to the AASHTO T-14 Committee and Bridge Task Force Design Advisory Group (DAG), Orlando, FL, January 26-29, 2016.
- T11. “Re-visiting the fatigue capacity of shear connectors in composite bridge girders” Presented to the AASHTO T-14 Committee and Bridge Task Force Design Advisory Group (DAG), Philadelphia, PA, August 6, 2015.
- T10. “Earthquake-induced fatigue and fracture of liquid storage tank connections,” presented to: Structural Engineering and Structural Mechanics (SESM) Seminar, Department of Civil and Environmental Engineering, UC Davis, May 2014, Davis, California.
- T9. “Fatigue of welded joints,” presented to Dept. of Civil and Environmental Engineering, Brigham Young University, October 2013, Provo, Utah.
- T8. “On LCF and ULCF of welded steel connections during earthquakes,” presented to the College of Engineering, University of Tennessee, March 2013, Knoxville, Tennessee.
- T7. “Findings from ULCF experiments on welded tank connections,” presented at ICOM seminar, École Polytechnique Fédérale de Lausanne (EPFL) April 2012, Lausanne, Switzerland.

- T6. “On the Low-Cycle Fatigue Capacity of Steel Liquid Storage Tank Shell-to-Base Connections,” presented to the Cockrell School of Engineering, University of Texas at Austin, February 2012, Austin, Texas.

(Selected Conference/Workshop Talks)

- T5. “Development of pre-stressed CFRP fatigue retrofits for common steel bridge connections” presented at the ASCE Structures Congress, April 2017, Denver Colorado, USA.
- T4. “MBTC 5103: Evaluation and repair of existing bridges in extreme environments” presented at the MBTC Advisory Board Meeting, November 2014, Fayetteville, Arkansas, USA.
- T3. “Effect of slab stiffness on EBF link rotation demands and implications for link ultra low-cycle fatigue susceptibility” presented at the ASCE Structures Congress, April 2014, Boston, Massachusetts, USA.
- T2. “On fast transition between shelters and housing after natural disasters in developing regions” presented at the International Conference on Technologies for Sustainable Development, May 2012, Lausanne, Switzerland.
- T1. “Locally produced structural elements for fast rebuilding,” presented at the FAST Rebuilding Workshop – Fabricating Steel Housing in Developing Regions, École Polytechnique Fédérale de Lausanne (EPFL), September 2011, Lausanne, Switzerland.

FUNDED
RESEARCH:

[*Funded while at EPFL]

- \$500,000 CAREER: A micromechanics-based approach to ductile fracture simulation in additively manufactured steels for seismic structural fuse design
Funded by: U.S. National Science Foundation (NSF); Award No. 1751699
Sole PI: Gary S. Prinz
- \$800,000 NCHRP 12-124: Design of stud shear connectors in composite steel bridges
Funded by: National Cooperative Highway Research Program (NCHRP)
PI: Gary S. Prinz, Co-PIs: Matt Hebdon (UT Austin), Tom Murphy (M&M)
- \$500,000 Development of an innovative rapidly constructible bridge
Funded by: *US Army Research and Development Center - GSL*
PI: Cameron Murray, Co-PI: Gary S. Prinz.
- \$200,000 Steel seismic systems with architectural flexibility: *Seismic performance of non-orthogonal SMF beam-to-column connections*
Funded by: American Institute of Steel Construction (AISC) [Milek Fellowship]
Sole PI: Gary S. Prinz
- \$5,000,000 Establishing the “Arkansas Center for Large-Scale Testing of Seismic Systems”
Funding *pending* by: *National Institute of Standards and Technology (NIST)*
PI: Gary S. Prinz, Co-PI: Cameron Murray
- \$5,000,000 Rapid infrastructure and development (RIDE) – Phase II
Funded by: *US Army Research and Development Center - GSL*
PI: Rick Coffman, Co-PIs: Gary S. Prinz, Cameron Murray, Wen Zhang, Andrew Braham (note, Prinz portion is \$1,000,000 for project subtask: *Fabrication and testing of an innovative rapidly constructible bridge*)
- \$3,000,000 Advanced Concrete Research and Development
Funded by: *US Army Research and Development Center - GSL*
PI: Cameron Murray, Co-PIs: Gary S. Prinz, Rick Coffman (note, Prinz PI for \$500,000 project subtask: *Development of self-prestressing UHPC materials*)
- \$45,000 Shape-core buckling-restrained braces
Funded by: PR & Associates
Sole PI: Gary S. Prinz
- \$31,000 K8 MEMES: K-8 maritime education modules to engage students
Funded by: Maritime Transportation Research and Education Center (MarTREC)
Sole PI: Gary S. Prinz

\$149,000	<p>Improved port infrastructure resilience through combined wind-surge demand characterization Funded by: Maritime Transportation Research and Education Center (MarTREC) US DOT Grant Number 69A3551747130 <u>Sole PI: Gary S. Prinz</u></p>
\$183,283	<p>Corrosion-tolerant pre-stressed CFRP fatigue retrofits for improved waterway lock reliability Funded by: Maritime Transportation Research and Education Center (MarTREC) <u>Sole PI: Gary S. Prinz</u></p>
\$175,504	<p>Fatigue crack control in waterway lock gate pintle locations subjected to multi-modal fracture Funded by: Maritime Transportation Research and Education Center (MarTREC) <u>Sole PI: Gary S. Prinz</u></p>
\$158,780	<p>Evaluation and repair of existing bridges in extreme environments Funded by: Southern Plains Transportation Center (SPTC) US DOT Grant Number <i>DTRT13-G-UTC36</i> PI: Royce Floyd (Univ. of Oklahoma), <u>Co-PI: Gary S. Prinz</u> (\$75,780 to UofA)</p>
\$100,000	<p>Fatigue of welded shear studs in composite bridge girders Funded by: W&W AFCO Steel <u>Sole PI: Gary S. Prinz</u></p>
\$40,000	<p>Investigation into shear stud fatigue demands: Towards modification of the existing AASHTO stud fatigue provisions Funded by: American Institute of Steel Construction (AISC) <u>Sole PI: Gary S. Prinz</u></p>
\$22,500	<p>Toward a fast reconstruction paradigm for urban environments in developing regions affected by natural disasters Funded by: Engineering Research and Innovation Seed Funding Program <u>PI: Gary S. Prinz</u>, Co-PI: Julian Fairey</p>
\$920,000*	<p>ULCF of welded joints under variable multi-axial strains Funded by: Swiss National Science Foundation (SNSF), (D-A-CH proposal) Total Funding: 800,000 CHF (approx. \$920,000 in 2012) Collaborating Universities: Graz University of Technology (Austria) Karlsruhe Institute of Technology, KIT (Germany)</p>
\$88,182*	<p>Effect of radial base-plate welds on tank shell-to-base connection rotation capacity Funded by: the Swiss Federal Office for the Environment (OFEV) and CARBURA, Total Funding: 76,680 CHF (approx. \$88,182 in 2012)</p>
\$10,000*	<p>Sustainable FABricated STEel (FAST) structures for developing regions Funded by: Ingineur du Monde (EPFL), TRONCO Systems (InterTronco S.A.) Collaborating Universities: University of Stellenbosch (South Africa) Indian Institute of Technology (India) Universidade do Estado do Rio de Janeiro (Brazil)</p>
TEACHING	<p>2014-Cur University of Arkansas: <i>Graduate Courses:</i></p> <p style="padding-left: 40px;">CVEG 5953 - Fundamentals of Fracture and Fatigue in Structures Mean Purdue Rating (Spring 2014): 4.88/5.0 (9 students) Mean Purdue Rating (Fall 2017): 4.73/5.0 (12 students) Mean Purdue Rating (Spring 2020): 4.03/5.0 (6 students) Mean Purdue Rating (Fall 2024): TBD/5.0 (X students)</p> <p style="padding-left: 40px;">CVEG 5323 – Structural Dynamics Mean Purdue Rating (Spring 2015): 4.79/5.0 (15 students) Mean Purdue Rating (Fall 2016): 4.54/5.0 (10 students) Mean Purdue Rating (Fall 2023): 4.64/5.0 (13 students)</p>

Undergraduate Courses:

CVEG 3303 – Structural Analysis

Mean Purdue Rating (Fall 2014):	4.70/5.0	(47 students)
Mean Purdue Rating (Fall 2015):	4.54/5.0	(37 students)
Mean Purdue Rating (Spring 2016):	4.83/5.0	(35 students)
Mean Purdue Rating (Fall 2016):	4.30/5.0	(43 students)
Mean Purdue Rating (Spring 2017):	4.49/5.0	(52 students)
Mean Purdue Rating (Fall 2017):	4.61/5.0	(52 students)
Mean Purdue Rating (Spring 2018):	4.34/5.0	(60 students)
Mean Purdue Rating (Spring 2019):	4.70/5.0	(37 students)
Mean Purdue Rating (Sum: 2019):	4.94/5.0	(12 students)
Mean Purdue Rating (Spring: 2020):	4.57/5.0	(11 students)
Mean Purdue Rating (Spring: 2021):	4.48/5.0	(18 students)
Mean Purdue Rating (Spring: 2022):	4.60/5.0	(11 students)
Mean Purdue Rating (Spring: 2023):	4.44/5.0	(15 students)
Mean Purdue Rating (Spring: 2024):	TBD/5.0	(20 students)

CVEG 4313 – Design of Steel Structures

Mean Purdue Rating (Fall 2018):	4.37/5.0	(66 students)
Mean Purdue Rating (Fall 2019):	4.61/5.0	(60 students)
Mean Purdue Rating (Fall 2020):	4.73/5.0	(59 students)
Mean Purdue Rating (Fall 2021):	4.59/5.0	(55 students)
Mean Purdue Rating (Fall 2022):	4.52/5.0	(42 students)
Mean Purdue Rating (Fall 2023):	4.73/5.0	(42 students)
Mean Purdue Rating (Fall 2024):	TBD/5.0	(42 students)

2009-2010 (2-Terms) Instructor, Brigham Young University, Provo, UT: Engineering Mechanics - Statics
Class sizes of 32 & 39 undergraduate students.
Mean Instructor Rating: 7.6/8.0

2006-2010 Teaching Assistant, Brigham Young University, Provo, UT:
Graduate Courses:

Structural Dynamics (3-Semesters)
Design of Aircraft Structures (3-Semesters)

Undergraduate Courses:

Structural Engineering Materials (5-Semesters): Taught experimental labs.

STUDENT
SUPERVISION

2014-Cur (UofA) Supervisor: University of Arkansas

Post-Doctoral Researchers (1):

- 1) Qian Lin (2014 – 2016): “Experimental investigations into low-triaxiality ductile fracture in structural steel alloys”

PhD Students (7):

- 1) Brianna Ovuoba (PhD, August 2017): “On the fatigue of headed shear studs in steel-concrete composite bridge girders.” – *Now structural engineer at Tatum-Smith-Welcher Engineering.*
- 2) Damaso Dominguez (PhD, May 2020): “On the seismic performance of skewed SMF RBS connections” -- *Now professor at the Technological University of Panama*
- 3) Alhussin Aliwan (PhD, December 2020): “Seismic loading effects within orthogonally connected steel lateral force resisting systems” -- *Now professor in Libya*
- 4) M. Hossein Kashefzadeh (PhD, May 2022): “Cyclic behavior of laterally skewed special moment frame connections: Experimental testing and system-level analyses” – *Now structural engineer at Tatum-Smith-Welcher Engineering.*
- 5) David Gonzalez-Niño (May 2023): “On the micro-mechanical property characterization and bulk-volume behavior prediction of additively

manufactured 17-4 PH stainless steels” – *Now power module design Engineer at Wolfspeed.*

- 6) Charissa Puttbach (May 2024): “Micro-mechanical characterization of UHPC stiffness mechanisms: *Towards a better understanding of concrete elastic modulus*” – *Now design engineer at Garver.*
- 7) Callie Clark (degree expected Dec 2026): “Design of stud shear connectors in composite steel bridges.”
- 8) Samikshya Adhikari (degree expected Dec 2027): “Deployable structural systems for lateral and vertical conditions.”

Master’s Students (17):

- 1) Korey Pough (M.S., Dec. 2015): “Pre-stressed CFRP fatigue retrofits for steel bridge connections.” – *Now at ARDOT Bridge Division*
- 2) Patrick Jacot-Guillarmod (M.S. EPFL, June 2015): “Effect of concrete slab stiffness on the seismic performance of EBF links”. Co-Advised with Alain Nussbaumer at EPFL – *Now design engineer at Jean-Daniel Berset Engineers in Switzerland.*
- 3) Clovis Desrochers (M.S. May 2017): “Effect of column axial load on the seismic performance of special moment frame RBS connections containing skew” – *Now structural engineer at RLG Inc.*
- 4) Michael Noernberg (M.S., Dec. 2017): “Automated pin-dot marking effects on A709 GR50 steel fatigue capacity” – *currently at W&W/AFCO Steel.*
- 5) Christine Lozano (M.S., Dec 2017): “Pre-stressed CFRP retrofits for fatigue mitigation in steel lock gate components: analytical investigation and retrofit development” – *currently at US Army Corps of Engineers, Engineering Research and Development Center (ERDC).*
- 6) Maggie Langston (M.S., Aug 2018): “Pre-stressed CFRP retrofits for fatigue mitigation in steel lock gate components: Full-scale experimental testing and implementation” – *currently at Tatum-Smith Engineers.*
- 7) Brian Hillhouse (M.S., Dec 2018): “Fatigue performance and shear demand distributions in clustered shear connectors of composite bridges designed for strength limit state” – *currently at Genesis Structures.*
- 8) Jason Norwood (M.S., Dec 2018): “Effect of continuity plate eccentricity on the performance of welded beam-to-column connections.” – *currently at Wiss, Janney, Elstner Associates, Inc.*
- 9) Logan Verkamp (M.S., May 2020): “Effective fatigue retrofit strategies for multi-axially loaded lock-gate pintles.” – *currently in the US Navy.*
- 10) Timothy Strasser (M.S., Dec 2020): “Comparison of additively manufactured and wrought 17-4 PH stainless steels in ultra low cycle fatigue.” – *currently with New Millennium Building Systems.*
- 11) Sarah Alimirzaie (May 2021): “Experimental design and preliminary testing for skewed special moment frame prequalification.” – *currently with Thornton Tomasetti (New York).*
- 12) Kaley Collins (May 2022): “Port infrastructure resilience through combined wind-surge demand characterization.” – *currently PhD student at the Ohio State University.*
- 13) Callie Clark (August 2022): “Shear stud demand measurements considering various flange surface friction conditions.” – *currently PhD student at the University of Arkansas.*
- 14) Gavin Briggs (May 2023): “FeSMA fiber activation effects on the self-prestressing behavior of UHPC.”

- 15) Lane Edwards (May 2023): “Tunable self-prestress in UHPC through controlled expansive-admixture activation.”
- 16) Paul Chabaud (May 2023): “Experimental design for the testing of laterally skewed composite interior SMF RBS connections”
- 17) Adam Kirchner (degree expected May 2024): “Experimental testing of laterally skewed composite exterior SMF RBS connections”
- 18) Pratik Ghimire (degree expected May 2025): “Experimental testing of laterally skewed composite exterior SMF RBS connections for interior bays”
- 19) Samuel Wyatt Simpson (degree expected May 2025): “Effect of heat-induced recovery on the ULCF behavior of Fe-SMA materials”

Undergraduate Honors Students (10):

- 1) Peter Vayda (Honors, Dec. 2015): “Cost analysis comparison and design of EBF and BRBF-E seismic systems” – *Now developmental engineer at Hanscom Air-Force Base*
- 2) Clay Sutherland (Honors, Dec. 2015): “Effect of column web stiffeners on the performance of bolted beam-column connections having multiple bolts per row” – *Now at Kimley-Horn*
- 3) Chris Maestri (Honors, May 2016): “Toward a fast reconstruction paradigm for urban environments in developing regions affected by natural disasters” – *Now at Tatum-Smith Engineering*
- 4) Maggie Langston (Honors, May 2017): “Fatigue analysis of existing steel lock gates used for waterway transport” – *Now graduate research assistant*
- 5) Mallory Maestri (Honors, Dec 2017): “Coupling K-12 Music Education with Science, Technology, Engineering, and Math (STEM) Curricula: Implementation of a STEMusic Outreach Program.” – *Now structural engineering with Burns & McDonnell.*
- 6) Braelyn Smith (*Thesis not completed*): “Comparison between US and Eurocode fire design provisions.”
- 7) Garrett Tatum (Honors, May 2019): “Simple mechanical devices for damage-history estimation in beam-column connections following seismic loading.”
- 8) Ayumi Fujii (Honors, May 2020): “Multiaxial fatigue of notched steel plates and investigation of CFRP retrofits for crack initiation prevention”
- 9) Kaley Collins (Honors, May 2020): “Extremely low-cycle fatigue behavior of additively manufactured 17-4PH stainless steel.”
- 10) Elizabeth Moriconi (Honors, May 2022): “Local strain observations in skewed special moment frame connections during reversed cyclic loading”

2011-2013
(EPFL)

Co-Supervisor: 4 master’s student theses, School of Architecture, Civil and Environmental Engineering, École Polytechnique Fédérale de Lausanne (EPFL)

- 1) John Monk: “Seismic design and stability of modular constructions”
- 2) Payam Hashemi: “Development and calibration of ductile fracture models for simulating progressive cyclic fracture in steels”
- 3) Martin Garcia: “Development and optimization of a 3-story building made of cold-formed elements (quickly erectable for developing regions)”
- 4) Emmanuel Mayor: “Stress analysis of the riveted Munchenstein bridge”

Supervisor: School of Architecture, Civil and Environmental Engineering, École Polytechnique Fédérale de Lausanne (EPFL).

7 master's semester projects: guided students in laboratory testing and analytical calculations; oversaw project details.

3 Bachelor final projects: guided students in design calculations and analysis; oversaw project details; participated in university review of students work.

UNIVERSITY
SERVICE

2019–Cur Associate Editor: ASCE Journal of Structural Engineering
2022–Cur Associate Editor: ASCE Journal of Bridge Engineering
2021 Guest Editor (Journal - Metals): Special issue on fatigue behavior of structural steel

2011–Cur Reviewer: ASCE Journal of Bridge Engineering
ASCE Journal of Structural Engineering
Bulletin of Earthquake Engineering
Engineering Structures
Journal of Constructional Steel Research
Advances in Structural Engineering
International Journal of Computational Methods
Earthquake Engineering and Structural Dynamics
Panel member, U.S. National Science Foundation
(CMMI: MoMS, ENH, ECI)
Swiss Zwahlen & Mayr Prize, jury member (EPFL)

2019-24 Member, Departmental Unit Committee: Department of Civil Engineering,
University of Arkansas

2018-19 Member, Faculty Search Committee: Transportation systems engineering faculty
hire, Department of Civil Engineering, University of Arkansas

2016 Member, Provost Search Committee: College of Engineering representative,
University of Arkansas

2016-17 Chair, Faculty Search Committee: Structural engineering faculty hire, Department
of Civil Engineering, University of Arkansas

2015-16 Member, Faculty Search Committee: Structural engineering faculty hire,
Department of Civil Engineering, University of Arkansas

2013 Steel Structures Assistant: School of Architectural, Civil and Environmental
Engineering, École Polytechnique Fédérale de Lausanne (EPFL). Aided students in
analysis and design calculations related to steel structures.

2012 Mathematics Assistant: Course in analytical geometry and linear algebra, School of
Basic Sciences (FSB), École Polytechnique Fédérale de Lausanne (EPFL). Aided
students in analytical geometry calculations, linear algebra.

2012 Oversight of Oral Examinations: School of Architecture, Civil and Environmental
Engineering, École Polytechnique Fédérale de Lausanne (EPFL). Performed quality
control for oral examinations (ensuring uniformity) and participated in review of
student performance.

2009 Reviewer, Brigham Young University Office of Research and Creative Activities
mentoring grants (ORCA Grants), Fulton College of Engineering and Technology.

2007-2009 Build-it-Big Program: prepared structural design aids, taught design concepts and
promoted engineering education to Utah high school students.

MEMBERSHIPS
& SOCIETIES:

Chair, ASCE/SEI Methods of Design Committee (2016-2019)
Member, ASCE/SEI Fatigue and Fracture Committee (2014-2017)
Member, AASHTO Bridge Task Force Design Advisory Group (2018-Cur)
Member, TRB AKB20 Steel Bridge Committee (2023 – Cur)
Member, AASHTO/NSBA Shear Stud Provisions Special Task Group (2019-2022)
Member, American Society of Civil Engineering, ASCE (2011-Cur)
Member, Swiss Society for Earthquake Engineering and Structural Dynamics (2012-Cur)

Member, Arkansas Governor's Earthquake Council (2016-2019)
Member, European Association for Earthquake Engineering (2012-2014)
Member, American Institute of Steel Construction, AISC (2014-Cur)

LANGUAGES: English Fluent, Mother Tongue
 French Conversational

NATIONALITY: American,
Date of Birth: October 8, 1984