

## Yazhou (Tim) Xie, PhD

### Assistant Professor, McGill University

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### EDUCATION

- Ph.D.** Civil Engineering, [University of California, Los Angeles](#) 09/2012-03/2017
- Major: Structural Engineering; Minors: Geotechnical Engineering and Structural Mechanics
  - Dissertation: *Seismic Modeling, Quantifying, and Protection of Highway Bridges Considering Shaking and Lateral Spreading*
  - Advisor: Prof. Jian Zhang; Committee: Profs. Scott J. Brandenberg, Ertugrul Taciroglu, Christopher S. Lynch
- M.S.** Bridge Engineering, [Tongji University, China](#) 09/2008-03/2011
- Thesis: *Structural System Study of Long-span Arch Bridges*
  - Advisor: Prof. Rucheng Xiao
- B.E.** Civil Engineering, [Tongji University, China](#) 09/2004-07/2008

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### PROFESSIONAL EXPERIENCE

- Assistant Professor, McGill University** 01/2020-present  
Assistant Professor of Structural Engineering at Department of Civil Engineering and Applied Mechanics.
- Postdoctoral Research Associate, Rice University** 07/2017-12/2019  
Postdoctoral Research Associate at [Natural Hazards Mitigation Research Group](#) under Prof. Reginald DesRoches.
- PhD Researcher, University of California, Los Angeles** 09/2012-07/2017  
Research and teaching assistant at the Department of Civil and Environmental Engineering.
- Technical Intern, Simpson Gumpertz & Heger** 2015, 2016, 2017  
Summer and part-time intern at the Structural Mechanics Group at Newport Beach Office, CA.
- Research Assistant, Tongji University, China** 07/2008-03/2011  
Master student researcher at the Department of Bridge Engineering.

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### RESEARCH INTERESTS

**Resilient and sustainable infrastructure systems using advanced modeling and smart protection:** (1) Soil-structure interaction; soil liquefaction; (2) Innovative seismic design; smart material and device (shape memory alloy, rocking isolation, base isolator, energy dissipation device); (3) Performance-based earthquake engineering; (4) Statistical and machine learning; (5) Hybrid simulation; structural control; (6) Regional risk, loss, and resilience assessment; (7) Multi-hazard, multi-objective optimization and decision making.

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### HONORS AND AWARDS

- Travel Grant, \$550, NHERI Wall of Wind Experimental Facility Research Planning Workshop, Florida International University, NSF, 2019

- Travel Grant, \$1000, NSF NHERI EF + RAPID Workshop, Oregon State University, NSF, 2019
- Travel Grant, \$1000, SimCenter Training in Natural Hazards Engineering, UC Berkeley, NSF, 2019
- Travel Grant, \$2000, Southeast University Overseas Young Scholar Forum, Southeast University, China, 2019
- Research Mentor Grant, \$500, Nakatani RIES Fellowship Program, Nakatani Foundation, 2018
- Registration Grant, \$475, 11th US National Conference on Earthquake Engineering, EERI, 2018
- Dissertation Year Fellowship, \$20,000 plus tuition, UCLA Graduate Division, 2016-2017
- Conference Travel Award for Graduate Students, \$1000, UCLA, 2016
- Graduate Student Researcher Assistantship and Department Grant, UCLA, 2013-2016
- Martin Rubin Scholarship, \$1000, UCLA, 2013-2014
- Outstanding Student and Excellent Graduate Award, Tongji University, 2008-2011
- Outstanding Student Scholarships, Tongji University, 2005-2008

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## PUBLICATIONS

### Journal Articles - Published and In Review

1. **Y. Xie**, M. Ebad Sichani, J. Padgett, R. DesRoches, The promise of implementing machine learning in earthquake engineering: A state-of-the-art review, *Earthquake Spectra*, 2020 (in review).
2. L. Han, **Y. Xie**, Y. Gu, W. Yuan, R. DesRoches, Shake table tests of highway bridges installed with unbonded steel mesh reinforced rubber bearings, *Engineering Structures*, 2020, 110124, 1-15.
3. S. Gur, **Y. Xie**, R. DesRoches, Seismic fragility analysis of steel building frames installed with superelastic SMA dampers: comparison with yield dampers, *Journal of Intelligent Materials Systems and Structures*, 2019, 30 (18-19) 2670-2687.
4. **Y. Xie**, R. DesRoches, Sensitivity of seismic demands and fragility estimates of a typical California highway bridge to uncertainties in its soil-structure interaction modeling, *Engineering Structures*, 2019, (189) 605-617.
5. **Y. Xie**, J. Zhang, R. DesRoches, J. Padgett, Seismic fragility of single-column highway bridges with rocking column-footing, *Earthquake Engineering and Structural Dynamics*, 2019; 1-22.
6. **Y. Xie**, Q. Zheng, C.S.W. Yang, W. Zhang, R. DesRoches, J. Padgett, E. Taciroglu, Probabilistic models of abutment backfills for regional seismic assessment of highway bridges in California, *Engineering Structures*, 2019, (180) 452-467.
7. J. Zhang\*, **Y. Xie\***, G. Wu, Seismic responses of bridges with rocking column-foundation: a dimensionless regression analysis, *Earthquake Engineering and Structural Dynamics*, 2019; 48: 152-170. (\*equal contribution).
8. **Y. Xie**, J. Zhang, W. Xi, Effectiveness evaluation and optimal design of nonlinear viscous dampers for inelastic structures under pulse-type ground motions, *Earthquake Engineering and Structural Dynamics*, 2018, 47: 2802-2820.
9. **Y. Xie**, J. Zhang, Y. Huo, Simplified drift demand prediction of bridges under liquefaction induced lateral spreading, *ASCE Journal of Bridge Engineering*, 2018, 23(8): 04018053.
10. **Y. Xie**, J. Zhang, Design and optimization of seismic isolation and damping devices for highway bridges based on probabilistic repair cost ratio, *ASCE Journal of Structural Engineering*, 2018, 144(8): 04018125.
11. **Y. Xie**, Y. Huo, J. Zhang, Development and validation of p-y modeling approach for seismic response predictions of highway bridges, *Earthquake Engineering and Structural Dynamics*, 2017, 46(4): 585-604.
12. **Y. Xie**, J. Zhang, Optimal design of seismic protective devices for highway bridges using performance based methodology and multi-objective genetic optimization, *ASCE Journal of Bridge Engineering*, 2016, 22(3): 04016129.

13. S Chai, R. Xiao, X. Zhang, **Y. Xie**, Study of longitudinal stiffness of middle pylon in multi-span suspension bridge, *China Journal of Highway and Transport* 2012, 25(2): 67-71.(in Chinese)

#### Journal Articles - In Preparation

1. Q. Zheng, C.S.W. Yang, **Y. Xie**, J. Padgett, R. DesRoches, Influence of abutment backwall fracture on seismic responses and design of bridges, *Earthquake Engineering and Structural Dynamics*.
2. **Y. Xie**, Q. Zheng, C.S.W. Yang, J. Padgett, R. DesRoches, Probabilistic models of pile foundations for regional seismic assessment of highway bridges in California, *ASCE Journal of Structural Engineering*.
3. Q. Zheng, C.S.W. Yang, **Y. Xie**, J. Padgett, R. DesRoches, Lateral capacity limit states and demands of bridge columns under earthquakes, *ASCE Journal of Bridge Engineering* .
4. Q. Zheng, C.S.W. Yang, **Y. Xie**, J. Padgett, R. DesRoches, Robust probabilistic seismic demand models for bridges considering strength degradation for column collapse, *ASCE Journal of Bridge Engineering*.

#### Book Chapter

1. **Y. Xie**, X. Wu, Y. Li, "Arch Bridge Systems", *Bridge Structural Systems* S.K. KATARIA & SONS, 2013.

#### Conference Proceedings

1. **Y. Xie**, M. Ebad Sichani, J. Padgett, R. DesRoches, State-of-the-art review of machine learning applications in earthquake engineering, *17th World Conference on Earthquake Engineering*, Sendai, Japan, 09/2020 (submitted).
2. **Y. Xie**, Q. Zheng, CS W. Yang, J. Padgett, R. DesRoches, Probabilistic response and capacity models of piles for regional seismic assessment of California bridges, *17th World Conference on Earthquake Engineering*, Sendai, Japan, 09/2020 (submitted).
3. **Y. Xie**, J. Zhang, Optimization of seismic protective devices for highway bridges based on probabilistic repair cost ratio: a case study, *11th US National Conference on Earthquake Engineering*, Los Angeles, CA, 06/2018, EERI.
4. **Y. Xie**, J. Zhang, Probabilistic seismic evaluation of bridges with rocking column-foundation, *11th US National Conference on Earthquake Engineering*, Los Angeles, CA, 06/2018, EERI.
5. **Y. Xie**, J. Zhang, Evaluating the effectiveness and optimal design of isolation bearings and fluid dampers for a highway bridge using a fragility function method and genetic optimization, *Geotechnical and Structural Engineering Congress* pp. 1317-1330, Phoenix, AZ, 02/2016, ASCE.
6. **Y. Xie**, Structural study of arch bridge with a span of 600m. part I: trial design; part II: measures to improve mechanical performance" *2nd International Conference on Applied Mechanics and Mechanical Engineering*, Applied Mechanics and Materials, Vols. 138-139, 289-293; 294-298, 2012.
7. **Y. Xie**, R. Xiao, Y. Li, Structural comparison of three arch systems, *Highway Engineering*, 2011, 5: 80-85. (in Chinese)
8. **Y. Xie**, D. Zhuang, B. Sun, R. Xiao, Construction control of replacing bearings of continuous curved girder bridge, *Shanghai Highway*, 2010, 3: 43-46. (in Chinese)

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#### PROJECT GRANTS

1. **Seismic fragility, loss, and resilience assessment of Canada's bridge infrastructure** (under review)  
NSERC Discovery 4/2020-3/2025  
Role: Single-PI. Award: CAD 295,751.

## 2. Hazard Mitigation and Infrastructure Resilience

McGill University Startup Fund

1/2020-12/2022

Role: Single-PI. Award: CAD 40,000.

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## TEACHING EXPERIENCE

### Instructor, McGill University, 01/2020-present

- CIVE 617: Design and Rating of Highway and Railway Bridges (winter 2020)

### Teaching Assistant/Fellow, UCLA, 03/2013-06/2016

TA for five courses in eight quarters

- CEE 142: Design of Reinforced Concrete Structures (winter 2016, winter 2015, winter 2014; average enrollment: 55, average evaluation: 7.95/9.00, highest evaluation: 8.39/9.00)
  - CEE 108: Introduction to Mechanics of Deformable Solids (spring 2016, fall 2013; average enrollment: 36, average evaluation: 7.61/9.00)
  - CEE 135A: Elementary Structural Analysis (fall 2014; enrollment: 69, evaluation: 7.63/9.00)
  - CEE 144: Structural System Design (spring 2014; enrollment: 32, evaluation: 8.13/9.00)
  - CEE 135L: Structural Design and Testing Lab (spring 2013; enrollment: 17, evaluation: 8.71/9.00)
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## PROFESSIONAL MEMBERSHIP AND SERVICE

- Member, American Society of Civil Engineers (ASCE), 2020-Present
  - Young Professional Member, Earthquake Engineering Research Institute (EERI), 2020-Present
  - Member, International Association for Bridge Maintenance and Safety, 2019-Present
  - President, UCLA EERI Student Chapter, 2015-2016
  - Vice President, UCLA EERI Student Chapter, 2014-2015
  - Student Member, American Society of Civil Engineers (ASCE), 2013-2017
  - Student Member, Earthquake Engineering Research Institute (EERI), 2013-2017
  - Reviewer: Earthquake Engineering and Engineering Vibration; Bulletin of Earthquake Engineering; ASCE Journal of Bridge Engineering; Earthquake Spectra; Engineering Structures; Journal of Intelligent Material Systems and Structures; Earthquake Engineering and Structural Dynamics
  - Guest Reviewer, 11th National Conference on Earthquake Engineering, Los Angeles, CA, 2018
  - Engineer-in-Training (EIT), State of California
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## PRESENTATIONS

1. **Y. Xie**, The promise of implementing machine learning in earthquake engineering, Southeast University Overseas Young Scholar Forum, 05/2019, Nanjing, China.
2. **Y. Xie**, Seismic resilience of bridge infrastructure using advanced modeling and smart protection, seminar, 05/2019, Southeast University, Nanjing, China.
3. **Y. Xie**, Seismic resilience of bridge infrastructure using advanced modeling and smart protection, seminar, 03/2019, McGill University, Montreal, QC, Canada.
4. **Y. Xie**, Seismic resilience of bridge infrastructure using advanced modeling and optimal protection, seminar, 03/2019, California State University, Los Angeles, CA.

5. **Y. Xie**, Seismic resilience of bridge infrastructure using advanced modeling and smart protection, seminar, 03/2019, San Francisco State University, San Francisco, CA.
6. **Y. Xie**, J. Zhang, Optimization of seismic protective devices for highway bridges based on probabilistic repair cost ratio: a case study, *11th US National Conference on Earthquake Engineering*, 06/2018, EERI, Los Angeles, CA.
7. **Y. Xie**, J. Zhang, Probabilistic seismic evaluation of bridges with rocking column-foundation, *11th US National Conference on Earthquake Engineering*, 06/2018, EERI, Los Angeles, CA.
8. Y. Peng, J. Zhang, **Y. Xie**, G. Wu, Seismic performance enhancement of structures using rocking components, mini-symposium, *Recent Advances in Uplifting Structures and Rocking Isolation*, Engineering Mechanics Institute Conference, 05/2018, Massachusetts Institute of Technology, Boston, MA.
9. **Y. Xie**, J. Zhang, G. Wu, Simplified response predictions of bridges with rocking column-foundation, mini-symposium, *Recent Advances in Uplifting Structures and Rocking Isolation*, Engineering Mechanics Institute Conference, 06/2017, San Diego, CA.
10. **Y. Xie**, Seismic response predictions of highway bridges with rocking column-foundation, oral presentation, *Le Val Lund Lecture with Student Symposium on Lifeline Infrastructure and Community Resilience*, 04/2017, California Institute of Technology, Pasadena, CA.
11. **Y. Xie**, Seismic modeling, quantifying, and protection of highway bridges considering shaking and lateral spreading, seminar, 03/2017, Washington State University, Pullman, WA.
12. **Y. Xie**, J. Zhang, Evaluating effectiveness and optimal design of isolation bearings and fluid dampers for a highway bridge using fragility function method and genetic optimization, oral presentation, Performance Based Design Session, *Geotechnical and Structural Engineering Congress*, 02/2016, Phoenix, AZ.
13. **Y. Xie**, Optimal design of isolation bearings and fluid dampers for a highway bridge, lunch seminar, *Simpson Gumpertz & Heger*, 09/2015, Newport Beach, CA.
14. **Y. Xie**, Optimal protection design of highway bridges, oral presentation, *First Annual Student Showcase Event, EERI UCLA Student Chapter*, 04/2015, UCLA, CA.

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## SOFTWARE SKILLS

Matlab, GTSTRUDL, ANSYS, Midas, OpenSees, ABAQUS, AutoCAD, SAP 2000, LaTeX, MS Office (Word, Excel, PowerPoint, etc.).