

Xuchun Ren, PhD

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Education

May,2015 PhD in Mechanical Engineering, The University of Iowa
PhD in Engineering Mechanics, Tsinghua University, China
MEng in Engineering Mechanics, Dalian University of Technology, China
BE in Mechanical Engineering, Dalian University of Technology, China

Grants:

2016 P.I., "Novel Decomposition Methods for Reliability-Based Topology Optimization." *National Science Foundation (NSF)*, CMMI, Amount Requested: \$261,066.36 ; Awarded.

Teaching experience:

Spring,2017 **Instructor**, *Introduction to Finite Element Analysis*.
Spring,2017 **Instructor**, *Modeling and Simulation*.
Fall,2016 **Instructor**, *Introduction to Finite Element Analysis*.
Fall,2016 **Instructor**, *Numerical Methods in Engineering*.
Spring,2016 **Instructor**, *Introduction to Finite Element Analysis*.
Spring,2016 **Instructor**, *Numerical Methods in Engineering*.
Fall,2015 **Instructor**, *Introduction to Finite Element Analysis*.

Publications & presentations

Refereed journal articles

2015 **X.C. Ren**, V. Yadav and S. Rahman, "Reliability-Based design optimization by adaptive-sparse polynomial dimensional decomposition." *Structural and Multidisciplinary Optimization*, DOI, (2015).
2014 S. Rahman and **X.C. Ren**, "Novel computational methods for high-dimensional stochastic sensitivity analysis." *International Journal for Numerical Methods in Engineering*, 98, no. 12 (2014): 881-916.
2013a **X.C. Ren** and S. Rahman, "Robust design optimization by polynomial dimensional decomposition." *Structural and Multidisciplinary Optimization*, 48, no. 1 (2013): 127-148.
2013b X.D. Zhang, Y. Ding, and **X.C. Ren**, "Simulation of the concrete crack propagation process with the extended finite element method." *Engineering Mechanics*, 7 (2013): 005.

- 2010a J. Bi, H.B. Fang, Q. Wang, and **X.C. Ren**, "Modeling and optimization of foam-filled thin-walled columns for crashworthiness designs." *Finite Elements in Analysis and Design*, 46, no. 9 (2010): 698-709.
- 2010b X.D. Zhang and **X.C. Ren**, "Finite Element Numerical Simulation for Propagation of Concrete Crack Process." *Technology of Highway and Transport*, 3 (2010): 025.
- 2009 M. Horstemeyer, **X.C. Ren**, et al., "A comparative study of design optimization methodologies for side-impact crashworthiness using injury-based versus energy-based criterion." *International Journal of Crashworthiness*, 14, no. 2 (2009): 125-138.
- 2006a **X.C. Ren** and Z.H. Yao, "Self-adaptive sequential response surface method in shape optimization of tire tread." *J Tsinghua Univ (Sci & Tech)*, 46, no. 5 (2006): 736-739.
- 2006b **X.C. Ren** and Z.H. Yao, "A new rubber-cord composite model and corresponding parameter identification scheme." *Engineering Mechanics*, no. 12 (2006): 180-187.
- 2005 L.L. Zhao, L. Hong and **X.C. Ren**, "Three-dimensional finite element comparative study between perpendicular and oblique endosseous dental implantation in zygomatic area." *Chinese Journal of Prosthodontics*, 6, no. 1 (2005): 68-73.
- 2004a **X.C. Ren** and Z.H. Yao, "Structure optimization of pneumatic tire using an artificial neural network." *Lecture Notes in Computer Science*, no. 3174 (2004): 841-847.
- 2004b **X.C. Ren**, Z.Y. Hong, et al., "Application of finite element method for optimization of young's modulus of radial truck tire." *Rubber Industry*, 51, no. 8 (2004): 464-466.
- 2003 Y.K. Sui, **X.C. Ren**, et al., "Topological optimization of frame based on ICM method." *Chinese Journal of Computational Mechanics*, 20, no. 3 (2003): 286-289.
- 2002 Y.K. Sui, **X.C. Ren**, "Optimization of shaft size and centralizer span of single screw pump in declined oil well." *Chinese Journal of Computational Mechanics*, 19, no. 1 (2002): 58-62.

Journal articles under review or to be submitted

- 2017 **X.C. Ren** and X.D. Zhang "Stochastic Topology Derivatives by Polynomial Dimensional Decomposition Method." *International Journal for Numerical Methods in Engineering*, (2017).
- 2017 **X.C. Ren** and S. Rahman, "Adaptive Sparse Polynomial Dimensional Decomposition Based on f -index." *Computer Methods in Applied Mechanics and Engineering*, (to be submitted).
- 2017 **X.C. Ren** and S. Rahman, "Robust design optimization and reliability-based design optimization containing both structural and distributional design parameters.", *Engineering Computations*, (2017).
- 2017 **X.C. Ren**, and S. Rahman, "Adaptive-Sparse Polynomial Dimensional Decomposition for Robust Design Optimization." to be submitted, (2017).

Book chapters

- 2016 S. Rahman, **X.C. Ren** and V. Yadav, "High-Dimensional Stochastic Design Optimization by Adaptive-Sparse Polynomial Dimensional Decomposition." *Sparse Grids and Applications - Stuttgart 2014*, Springer, DOI, (2016).

Conference papers and presentations

- 2017 **X.C. Ren** and S. Rahman, "Polynomial Dimensional Decomposition with Adaptive-Sparse Schemes for Stochastic Analysis and Design." *12th International Conference on Structural Safety & Reliability*, Vienna, Austria, August 2017.

- 2017 **X.C. Ren** and X.D. Zhang, “Stochastic Sensitivity Analysis for Robust Topology Optimization.” *12th World Congress of Structural and Multidisciplinary Optimisation*, DOI, Braunschweig, Germany, June 2017.
- 2016 **X.C. Ren** and S. Rahman, “Reliability-Based Design Optimization by Adaptive-Sparse Polynomial Dimensional Decomposition.” *ASME IDETC/CIE International Design Engineering Technical Conferences & Computers & Information in Engineering Conference*, Charlotte, NC, August 2016.
- 2014 **X.C. Ren**, Vaibhav Yadav, and S. Rahman, “Reliability-Based Design Optimization by Adaptive-Sparse Polynomial Dimensional Decomposition.” *Engineering Mechanics Institute Conference*, Hamilton, Ontario, Canada, August 2014.
- 2013a **X.C. Ren** and S. Rahman, “Stochastic design sensitivity analysis and optimization of complex systems.” *11th International Conference on Structural Safety & Reliability*, New York, NY, July 2013.
- 2013b S. Rahman and **X.C. Ren** “Stochastic design optimization of complex systems.” *4th International Symposium on Inverse Problems, Design And Optimization*, Albi, France, June 2013.
- 2012a **X.C. Ren** and S. Rahman, “Robust design optimization by polynomial dimensional decomposition.” *Proceedings of 14th AIAA/ISSMO Multidisciplinary Analysis Optimization Conference*, Indianapolis, IN, September 2012.
- 2012b **X.C. Ren** and S. Rahman, “Reliability-based design optimization by polynomial dimensional decomposition.” *Proceedings of 11th ASCE Joint Specialty Conference on Probabilistic Mechanics and Structural Reliability*, South Bend, IN, June 2012.
- 2009a **X.C. Ren**, X.W. Tangpong, et al., “Numerical investigations of mechanical responses, friction and the formation of debris of UHMWPE in total joint replacement.” *Proceedings of the ASME 2009 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference*, San Diego, CA, August 2009.
- 2009b J. Bi, H. Fang, Q. Wang, and **X. Ren**, “Crashworthiness optimization of foam-filled thin-walled structures.” *10th US National Congress of Computational Mechanics*, Columbus, OH, July 2009.
- 2004a **X.C. Ren**, Z.Y. Hong, and G.Z. Wu, “Finite element analysis and the screening of Young’s module of radial truck tire.” *International Rubber Conference*, Beijing, China, September 2004.
- 2004b **X.C. Ren**, P. Li, “Measure constitutive parameters of carbon-filled rubber using digital speckle correlation method.” *International Rubber Conference*, Beijing, China, September 2004.
- 2004c Y. K. Sui, L. C. Long, and **X. C. Ren**, ”Topological optimization of frame structures with stress and displacement constraints under multi-loading cases.” *WCSMO-4*, June (2001): 4-8.

Conference posters

- 2017 **X.C. Ren**, “Novel Decomposition Methods for Reliability-Based Topology Optimization.” *NSFESD/SYS Program Workshop and Grantees Meeting*, Atlanta, GA, January 2017.
- 2014 **X.C. Ren** and S. Rahman, “Novel Computational Methods for High-Dimensional Stochastic Sensitivity Analysis.” *Engineering Mechanics Institute Conference*, Hamilton, Ontario, Canada, August 2014.

Service to the profession

- 2017 **Reviewer**, *Journal of Mechanical Design*
- 2017 **Reviewer**, *Structural and Multidisciplinary Optimization*
- 2017 **Reviewer**, *Mathematical Reviews/MathSciNet*
- 2017 **Reviewer**, *International Journal of Robotics and Automation*
- 2017 **Reviewer**, *ASME International Design Engineering Technical Conferences & Computers and Information in Engineering Conference*
- 2016 **Reviewer**, *Structural and Multidisciplinary Optimization*
- 2016 **Reviewer**, *Mathematical Reviews/MathSciNet*
- 2016 **Reviewer**, *ASME International Design Engineering Technical Conferences & Computers and Information in Engineering Conference*
- 2016 **Reviewer**, *International Journal of Robotics and Automation*
- 2015 **Reviewer**, *International Journal for Numerical Methods in Engineering*
- 2015 **Reviewer**, *Structural and Multidisciplinary Optimization*
- 2015 **Reviewer**, *International Journal of Robotics and Automation*
- 2014 **Reviewer**, *International Journal of Crashworthiness*
- 2014 **Reviewer**, *International Journal of Robotics and Automation*
- 2014 **Reviewer**, *ASME International Mechanical Engineering Congress and Exposition*
- 2014 **Reviewer**, *ASME International Design Engineering Technical Conferences & Computers and Information in Engineering Conference*

Last updated: November 23, 2017