

# Hesam Talebiyan | Curriculum Vitae

Ph.D.

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## Education

- **Rice University** **Houston, TX**  
*Doctor of Philosophy in Civil Engineering,* *Aug 2016–Aug 2021*
  - Thesis: Interdependent restoration of infrastructure networks with humans in the loop
  - Advisor: Prof. Leonardo Duenas-Osorio
  - GPA = 3.85, Honor: 2020 Robert P. and Eleanor Warden Shubinski Award
- **Sharif University of Technology** **Tehran, Iran**  
*Master of Science in Earthquake Engineering,* *Sep 2013–Jan 2016*
  - Thesis: Optimal seismic risk mitigation by prioritization of structures for retrofit
  - GPA = 89.3%, Advisor: Dr. Mojtaba Mahsuli
- **Sharif University of Technology** **Tehran, Iran**  
*Bachelor of Science in Civil Engineering,* *Sep 2008–July 2013*
  - Project: Study of maximum acceleration in regular steel frames using endurance time method
  - GPA = 86.1%

## Research and Professional Experience

- **Rice University, NIST CoE for Community Resilience** **Houston, TX**  
*Postdoctoral Associate* *Sep 2021–Present*
  - End-to-end mitigation and restoration decision models
  - Integrated physical and socio-economic systems
- **Rice University** **Houston, TX**  
*Research Assistant* *Aug 2016–Aug 2021*
  - Decentralized decision making for real-world interdependent networks
  - Game-theoretic methods for decentralized decision-making: Auctions and Bayesian games
  - Bayesian Hierarchical models of network dynamics
  - Congestion and observability in cyber-physical systems
  - Databases of synthetic and realistic infrastructure networks
  - Funded by ARL's MURI and NSF's CRISP 2.0, and NIST CoE Community Resilience
- **Sharif University of Technology** **Tehran, Iran**  
*Research Assistant* *Sep 2014–Jan 2016*
  - Models for prediction of damage cost and retrofit cost of masonry structures
  - Risk analysis on schools of Iran and prioritized them based on optimal mitigation of risk
  - Novel sensitivity method based on Monte Carlo sampling to prioritize buildings
  - Database of retrofit plans for school in Iran including structural properties of retrofit plan
- **Kasra Consulting Engineers** **Tehran, Iran**  
*Structural Design Engineer* *Apr 2013–Dec 2013*
  - Design of commercial and residential structure of various steel and concrete buildings

## Other Projects

- **Risk-based Prioritization of School Buildings for Seismic Retrofit**  
*Collaboration with Research and Technical Department of National Organization for School Development, Renovation and Equipping, Tehran, Iran*
- **Pluvial Flood Modeling and risk communication**

NSF grant proposal in collaboration with Researchers from computer science and political science at Rice University, Houston, Tx

## Software Developments.....

- **Rtx: Reliability | Risk | Resilience tools** [link]  
Contribution: reliability sensitivity analysis using sampling and masonry damage and retrofit cost models
- **Interdependent Networked Community Resilience Modeling Environment (IN-CORE)** [link]  
Contribution: optimization-based centralized and decentralized decision support tools

## Teaching Experience

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- **Rice University** **Houston, TX**  
Co-lecturer Aug 2021–Dec 2021
  - Graduate: Modeling and Analysis of Networked Systems
- **Rice University** **Houston, TX**  
Teaching Assistant Jan 2020–May 2020
  - Undergraduate: Uncertainty and Risk-Based Decisions for Infrastructure Systems
- **Sharif University of Technology** **Tehran, Iran**  
Teaching Assistant Sep 2013–Dec 2014
  - Graduate: Dynamic of Structure, Earthquake Engineering Seminar
  - Undergraduate: Mechanics of Material, Statics
- **Self-employed** **Tehran, Iran**  
Private Tutor Jan 2014–July 2015
  - Undergraduate: Statics, Mechanics of Material, Analysis of Structure I & II

## Publications

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### Refereed journal articles.....

- [1] **H. Talebiyan**, K. Leelardcharoen, L. Dueñas-Osorio, B. J. Goodno, and J. I. Craig, "Congestion and observability across interdependent power and telecommunication networks under seismic hazard," *Earthquake Spectra*, p. 875529302110266, aug 2021.
- [2] **H. Talebiyan** and L. Duenas-Osorio, "Decentralized Decision Making for the Restoration of Inter-dependent Networks," *ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part A: Civil Engineering*, vol. 6, no. 2, p. 04020012, 2020.
- [3] **H. Talebiyan** and M. Mahsuli, "Sampling-Based Reliability Sensitivity Analysis Using Direct Differentiation," *ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part A: Civil Engineering*, vol. 6, no. 2, 2020.
- [4] **H. Talebiyan** and M. Mahsuli, "Risk-Based Prioritization of a Building Portfolio for Retrofit," *Journal of Structural Engineering*, vol. 144, no. 1, p. 04017181, 2018.
- [5] H. Nasrazadani, M. Mahsuli, **H. Talebiyan**, and H. Kashani, "Probabilistic Modeling Framework for Prediction of Seismic Retrofit Cost of Buildings," *Journal of Construction Engineering and Management*, vol. 143, no. 8, p. 04017055, 2017.

### Under review.....

- [6] **H. Talebiyan** and L. Duenas-Osorio, "Auctions for Resource Allocation and Decentralized Restoration of Interdependent Networks," *Reliability Engineering & System Safety*, 2022.
- [7] **H. Talebiyan** and L. Dueñas-Osorio, "Accelerating Utility Restoration Planning with Ensemble Statistical Models," in *13th International Conference on Structural Safety & Reliability (ICOSSAR 2021-2022)*, (Shanghai, China), 2022.

- [8] R. Paredes, **H. Talebiyan**, and L. Dueñas-Osorio, "Path-Dependent Reliability and Resiliency of Critical Infrastructure via Particle Integration Methods," in *13th International Conference on Structural Safety & Reliability (ICOSSAR 2021-2022)*, (Shanghai, China), 2022.
- [9] A. Beck, **H. Talebiyan**, E. J. Cha, and L. Duenas-Osorio, "Comparative nodal retrofit prioritization schemes for electric power networks," in *International Symposium on Reliability Engineering and Risk Management (ISRERM)*, 2022.
- [10] H. Talebiyan and L. Duenas-Osorio, "Interdependent network restoration games with incomplete information and bounded rationality," *Risk Analysis*, 2022.

#### Conference proceedings.....

- [11] S. Alemzadeh, **H. Talebiyan**, S. Talebi, L. Duenas-Osorio, and M. Mesbahi, "Resource Allocation for Infrastructure Resilience using Artificial Neural Networks," in *2020 IEEE 32nd International Conference on Tools with Artificial Intelligence (ICTAI)*, (virtual), pp. 617–624, IEEE, nov 2020.
- [12] **H. Talebiyan** and L. Duenas-Osorio, "Probabilistic Assessment of Decentralized Decision-making for Interdependent Network Restoration," in *13th International Conference on Applications of Statistics and Probability in Civil Engineering, ICASP13* (J. Song, ed.), (Seoul, South Korea), 2019.
- [13] **H. Talebiyan**, H. Nasrazadani, and M. Mahsuli, "Probabilistic Prediction of Retrofit Cost of Masonry Buildings," in *7th International Conference of Seismology and Earthquake Engineering (SEE7)*, (Tehran, Iran), 2015.

#### Working papers.....

- [14] **H. Talebiyan**, A. D. González, L. Dueñas-Osorio, J. Wu, and J. W. Baker, "Interdependent Infrastructure Network of Shelby County, TN: A Restoration-oriented Database." 2022.

#### Other publications.....

- [15] **H. Talebiyan**, *Interdependent Restoration of Infrastructure Networks with Humans in the Loop: decentralized and strategic decision processes*. Phd dissertation, Rice University, 2021.
- [16] S. Alemzadeh, **H. Talebiyan**, S. Talebi, L. Duenas-Osorio, M. Mesbahi, L. Dueñas-Osorio, and M. Mesbahi, "Deep Learning-based Resource Allocation for Infrastructure Resilience," *Arxiv*, pp. 1–14, 2020.
- [17] **H. Talebiyan**, *Optimal seismic risk mitigation by prioritization of structures for retrofit*. Ms thesis, Sharif University of Technology, Tehran, Iran, 2016.

#### Oral Presentations.....

1. S. Alemzadeh, **H. Talebiyan**, S. Talebi, L. Duenas-Osorio, & M. Mesbahi (2020), "Resource Allocation for Infrastructure Resilience using Artificial Neural Networks," Presented at *ICTAI 2020*, virtual.
2. **H. Talebiyan**, A. Gonzalez, & L. Duenas-Osorio (2020), "Interdependent Infrastructure Network of Shelby County, TN: A Recovery-oriented Database," Presented at *INFORMS 2020*, virtual.
3. **H. Talebiyan** & L. Duenas-Osorio (2019), "Probabilistic Assessment of Decentralized Decision-making for Interdependent Network Restoration," Presented at *ICASP13*, Seoul, South Korea.
4. **H. Talebiyan** & L. Duenas-Osorio (2019), "Auction-based Resource Allocation for Interdependent Network Restoration," Presented at *INFORMS 2019*, Seattle, WA.
5. **H. Talebiyan** & L. Duenas-Osorio (2018), "Bayesian Hierarchical Models for Decentralized Decision-making across Interdependent Network Restoration," Presented at *INFORMS 2018*, Phoenix, AZ.
6. **H. Talebiyan** & L. Duenas-Osorio (2018), "Multi-agent decision-making for interdependent network restoration via decentralized optimization," Presented at *IIE Annual Conference & Expo*, Orlando, FL.
7. **H. Talebiyan**, S. Alemzadeh, L. Duenas-Osorio, & M. Mesbahi (2018), "Optimization and Control of Restoration Strategies across Interdependent Networks," Presented at *NSF CRISP/RIPS Workshop*, Washington, D.C.

## Poster Presentations.....

1. **H. Talebiyan**, S. Perry, J. Patil, K. Shepherd, J. Wheeler, D. Subramanian, R. Stein, R. Wilson, L. Duenas-Osorio, & G. Woods, (2019), "Flood-Radar: A user-informed local pluvial flood forecasting tool," Presented at *SSPEED Conference*, Houston, TX.
2. **H. Talebiyan** & L. Duenas-Osorio, (2018), "Decentralized decision-making for Interdependent Infrastructure Resilience," Presented at *Lloyd's day at Houston*, Houston, TX.
3. **H. Talebiyan** & L. Duenas-Osorio, (2018), "Decentralized Decision-making for the Restoration of Real-world Interdependent Networks," *Rice Data Science Conference*, Houston, TX.
4. S. Alemzadeh, **H. Talebiyan**, M. Mesbahi & L. Duenas-Osorio, (2018), "Optimization and Control of Restoration Strategies Across Interdependent Networks," Presented at *NSF CRISP/RIPS Workshop*, Washington, D.C.
5. **H. Talebiyan**, H. Nasrazadani & M. Mahsuli, (2015), "Probabilistic prediction of retrofit cost for masonry structures," Presented at *SEE7*, Tehran, Iran.

## Service

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### ○ Journals

*Reviewer*

*Jul 2019–Present*

- Structures (Elsevier)
- Journal of Infrastructure Systems (ASCE)
- Environment Systems and Decisions (Springer)
- Natural Hazards Review (ASCE)

### ○ Academic and Professional Institutions

*Member*

- Earthquake Engineering Research Institute
- American Society of Civil Engineers
- The Institute for Operations Research and the Management Sciences
- Institute of Industrial and Systems Engineers

### ○ Educational Research and Improvement Working Group

**Tehran, Iran**

*Chief Secretary*

*Jul 2013–Oct 2013*

- Researched on different accreditation organizations for universities in the world such as ABET
- The working group is affiliated with Sharif University of Technology

## List of References

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- **Dr. Leonardo Duenas-Osorio**  
*Professor, Department of Civil and Environmental Engineering, Rice University*
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  - Email: leonardo.duenas-osorio@rice.edu
- **Dr. John van de Lindt**  
*Professor, Department of Civil and Environmental Engineering, Colorado State University*
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- **Dr. Satish Nagarajaiah**  
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- **Dr. Jamie E. Padgett**  
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