Hesam Talebiyan | Curriculum Vitae

Ph.D. Candidate

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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
- 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 — **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 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*
- Database of retrofit plans for school in Iran including structural properties of retrofit plan
- 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

Kasra Consulting Enginees — **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

Teaching Experience

- **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

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 Interdependent 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*, 2021.

Conference proceedings

[7] 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.

[8] **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.

[9] **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

[10] **H. Talebiyan**, A. D. González, L. Dueñas-Osorio, J. Wu, and J. W. Baker, "Interdependent Infrastructure Network of Shelby County, TN: Database: A Restoration-oriented Database." 2021.

[11] **H. Talebiyan** and L. Duenas-Osorio, "Interdependent Network Restoration Games with Incomplete Information and Bounded Rationality." 2021.

[12] **H. Talebiyan** and L. Dueñas-Osorio, "Efficient Restoration Planning Using Statistical Models," in *13th International Conference on Structural Safety & Reliability (ICOSSAR 2021) (pending submission)*, (Shanghai, China), 2022.

[13] R. Paredes, **H. Talebiyan**, and L. Dueñas-Osorio, "Uncertainty Quantification via Path-Integral Methods," in *13th International Conference on Structural Safety & Reliability (ICOSSAR 2021) (pending submission)*, (Shanghai, China), 2022.

Other publications

[14] 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.

[15] **H. Talebiyan**, *Optimal seismic risk mitigation by prioritization of structures for retrofit*. M.sc. 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 *IISE 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

- **Journals**
  Reviewer *Jul 2019–Present*
  - Structures (Elsevier)
  - Journal of Infrastructure Systems (ASCE)
  - Environment Systems and Decisions (Springer)
- **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

- **Dr. Leonardo Duenas-Osorio**
  Professor, Department of Civil and Environmental Engineering, Rice University
  - Phone: (713) 348-5292
  - Email: leonardo.duenas-osorio@rice.edu
- **Dr. Mehran Mesbahi**
  Professor, Department of Aeronautics & Astronautics, University of Washington
  - Phone: (206) 543-7937
  - Email: mesbahi@aa.washington.edu
- **Dr. Satish Nagarajaiah**
  Professor, Department of Civil and Environmental Engineering, Rice University
  - Phone: (713) 348-6207
  - Email: satish.nagarajaiah@rice.edu