

Hessam Yazdani, Ph.D.

Assistant Professor, Department of Civil and Environmental Engineering, Howard University

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I. Education

B.Sc., Civil Engineering, University of Kerman, Iran, 2005

M.Sc., Civil Engineering, University of Kerman, Iran, 2008

Ph.D., Civil Engineering, The University of Oklahoma, 2015

II. Research and Teaching Interests

High-performance, multifunctional materials; Bio-inspired computing and engineering design; Infrastructure geotechnics; Metaheuristic optimization

III. Professional Positions

2016 – Present, Assistant Professor of Department of Civil and Environmental Engineering, Howard University

2020 – Present, Research Fellow, Arizona State University

IV. Research Support and/or Scholastic Performance

A. Ongoing Support (total funding secured = \$1.83M (\$1.13M as PI, \$0.70M as Co-PI))

Role: PI

Title: "CAREER: Multiscale Mechanics of Carbon Nanotube-Polymer Composites"
[link](#)

Sponsor: The National Science Foundation

Period: 2021–2026

Amount: \$562,555

Role: PI

Title: "A Materials Characterization and Testing System for Enhancing Transdisciplinary Research and Education at Howard University"

Sponsor: The Air Force Office of Scientific Research

Period: 2020–2021

Amount: \$569,904

Role: Co-PI

Title: "Industry-Research Inclusion in STEM Education (I-RISE)"

Sponsor: The US Department of Education

Period: 2019–2022

Amount: \$700,000

V. Recent Fellowships, Honors and Awards

- CAREER Award, The National Science Foundation, 2021
- DS4A (Data Science for All) Empowerment Fellow, Correlation One, 2021
- DURIP Award, The Air Force Office of Scientific Research (AFOSR), 2020

- Community Service Award, ASCE National Capital Section, 2020
- Faculty of the Year Award, Howard University ASCE Student Chapter, 2019
- Invited Presenter, “Computational mathematics for model reduction and predictive modelling in molecular and complex systems” workshop, Bernoulli Center, (CIB), EPFL Lausanne, 2019
- Best Paper Award, Technology Systems & Ships (TSS), Washington, DC, 2018
- Best Teacher Award, Howard University ASCE Student Chapter, 2017
- Best Mentor Award, Howard University ASCE Student Chapter, 2017

VI. Publications († and ‡ denote HU undergraduate and graduate student co-authors, respectively)

B. Books and Book Chapters

[B1] **Yazdani H.**, Smith B. and Hatami K., “Multiscale 3D dispersion characterization of carbon nanotube-filled polymer composites using microscopic imaging and data mining.” in Carbon Nanotubes, W.I. Milne (ed.), One Central Press, Manchester, UK, 2016.

C. Inventions and Pending Patents

[P1] Development of VirusTrap, a cationic antiviral coating (25% share).

D. Refereed Journal Articles (Link to Google Scholar Profile)

Refereed Articles

a. Publications related to modeling and simulation of materials

- [J29] Ghasemi H.‡, **Yazdani H.**, Mosleh M. (under review). “An atomistic insight into ratio of wear coefficient to coefficient of friction.”
- [J28] Ghasemi H.‡, **Yazdani H.**, Rajib A., Fini E. (under review). “Enhancing the aging resistance of bitumen using functionalized carbon.”
- [J27] Araghi M., **Yazdani H.**, Khatibinia M. (under review). “Modified support vector machines for prediction of pavement roughness.”
- [J26] Eliasi H., **Yazdani H.**, Khatibinia M., Mahmoudi M. (under review). “Optimum design of a sliding mode control for seismic mitigation of structures equipped with active tuned mass dampers.”
- [J25] Ghasemi H.‡, **Yazdani H.**, Fini E., Mansourpanah Y. (2021). “Interactions of SARS-CoV-2 with Inanimate Surfaces in the Built Environment.” *Sustainable Cities and Society*, 72.
- [J24] Mansourpanah Y., Ghanbari A., **Yazdani H.**, Mohammadi A.G., and Rahimpour A. (2021) "Silver-polyamidoamine/graphene oxide thin film nanofiltration membrane with improved antifouling and antibacterial properties for water purification and desalination", *Desalination*, 511.
- [J23] Ghasemi H.‡, Abraham B.†, Rutledge J.† and **Yazdani H.** (2020). “Mechanical properties of C3N nanotubes.” *Diamond and Related Materials*, 109, 108090.
- [J22] Ghasemi H.‡, Rutledge J.† and **Yazdani H.** (2020). “Mechanical properties of defective cyanoethynyl (2D polyaniline – C3N): A comparative molecular dynamics

study versus graphene and hexagonal boron nitride.” *Physica E: Low-dimensional Systems and Nanostructures*, 121, 114085.

- [J21] **Yazdani H.**, Ghasemi H.[‡], Wallace C.[†] and Hatami K. (2019) “Mechanical properties of carbon nanotube-filled polyethylene composites: a molecular dynamics simulation study”, *Polymer Composites*.
- [J20] Ghasemi H.[‡], **Yazdani H.** and Ayyub B.M. (2018) “Graphene Inhibits Corrosion of Metals: A Molecular Dynamics Study”, *Naval Engineers Journal*, 130 (3), 62-64.
- [J19] **Yazdani H.**, Hatami K. and Eftekhari, M. (2017) “Mechanical properties of single-walled carbon nanotubes: a comprehensive molecular dynamics study”, *Materials Research Express*.
- [J18] **Yazdani H.** and Hatami K. (2015) “Failure criterion for graphene in biaxial loading – a molecular dynamics study”, *Modelling and Simulation in Materials Science and Engineering*, 23 (6), pp. 14.
- [J17] **Yazdani H.** and Hatami K., (2016) “Sensor-enabled geogrids for stabilization and performance monitoring of earth structures: the state of development”, *International Journal of Geosynthetics and Ground Engineering*, No. 2 (37).
- [J16] **Yazdani H.**, Smith B. and Hatami K. (2016) “Electrical conductivity and mechanical performance of multi-walled carbon nanotube-filled polyvinyl chloride composites subjected to tensile load”, *Journal of Applied Polymer Science*.
- [J15] **Yazdani H.**, Smith B. and Hatami K. (2016) “Multi-walled carbon nanotube-filled polyvinyl chloride composites: influence of processing methods on dispersion quality, electrical conductivity and mechanical properties” *Composites Part A: Applied Science and Manufacturing*, No. 82, pp. 65–77.
- [J14] **Yazdani H.**, Hatami K. and Grady B.P. (2016) “Sensor-enabled geogrids for performance monitoring of reinforced soil structures”, *ASTM Journal of Testing and Evaluation*, No. 44 (1).
- [J13] Smith B., **Yazdani H.** and Hatami K. (2015) “Three-dimensional imaging and quantitative analysis of dispersion and mechanical failure in filled nanocomposites”, *Composites Part A: Applied Science and Manufacturing*, No. 79.
- [J12] **Yazdani H.**, Hatami K., Khosravi E.[‡], Harper K.[†] and Grady B.P. (2014) “Strain-sensitive Conductivity of Carbon Black-filled PVC Composites Subjected to Cyclic Loading”, *Carbon*, No. 79, 393–405.
- [J11] **Yazdani H.** and Hatami K. (2018) “Laboratory tests on the engineering properties of sensor-enabled geobelts (SEGB) by Cui et al., *Geotextiles and Geomembranes* 46 (2018) 66–76.”, *Geotextiles and Geomembranes*, 46 (5), 678-680.
- [J10] Hatami K., Hassanikhah A., **Yazdani H.** and Grady B.P. (2014) “Tensoresistive PVC coating for sensor-enabled geogrids”, *Invited Paper. ASCE Journal of Nanomechanics and Micromechanics*, No. 4(4).
- [J9] Khosravi E.[‡], Ghasemzadeh H., Sabour M.H. and **Yazdani H.** (2013) “Geotechnical properties of gas oil-contaminated clays”, *Engineering Geology*, No. 166, pp. 11–16.

- [J8] **Yazdani H.** and Toufigh M.M. (2012) “Nonlinear consolidation of soft soils subjected to cyclic loading. Part I: theory”, *Geomechanics and Engineering*, No. 4 (4), pp. 229–241.
- [J7] **Yazdani H.** and Toufigh M.M. (2012) “Nonlinear consolidation of soft soils subjected to cyclic loading. Part II: verification and application”, *Geomechanics and Engineering*, No. 4(4), pp. 243–249.
- [J6] Gharehbaghi S., **Yazdani H.** and Khatibinia M. (2019) “Estimating inelastic seismic response of reinforced concrete frame structures using a wavelet support vector machine and an artificial neural network”, *Neural Computing and Applications*.
- [J5] Shayesteh Bilondi M.R., **Yazdani H.** and Khatibinia M. (2018) “Seismic energy dissipation-based optimum design of tuned mass dampers”, *Structural and Multidisciplinary Optimization*, 58 (6), 2517-2531.
- [J4] Khatibinia, M. and **Yazdani H.** (2018) “Accelerated multi-gravitational search algorithm for size optimization of truss structures”, *Swarm and Evolutionary Computation*.
- [J3] **Yazdani H.**, Khatibinia M., Gharehbaghi S. and Hatami K. (2017) “Probabilistic performance-based optimum seismic design of RC structures considering effects of soil-structure interaction”, Special Issue on “Interdisciplinary Applications of Reliability Analysis, Risk Analysis and Optimization” in *ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part A: Civil Engineering*, No. 3 (2).
- [J2] **Yazdani H.**, Hatami K. and Khosravi E.‡ (2013) “Ant colony optimization method for design of piled-raft foundations”, *DFI (the Deep Foundations Institute) Journal*, No. 7 (2), pp. 17–27.
- [J1] Yaghobi Moghaddam M., Asgari A. and **Yazdani H.** (2009) “Exact travelling wave solutions for the generalized nonlinear Schrödinger (GNLS) equation with a source by extended tanh-coth, sine-cosine and exp-function methods”, *Applied Mathematics and Computation*, 210 (2), 422–435.

Refereed Proceedings and Presentations

- [C21] Ghasemi H.‡, **Yazdani H.** and Ayyub B. (2018) “Graphene as a corrosion-inhibiting coating for metals: a molecular dynamics study”, *MegaRust*, San Diego, CA.
- [C20] **Yazdani H.** and Hatami K. (2016) “Sensor-Enabled Geogrids for Stabilization and Instrumentation of Earth Structures”, *Fifth International Symposium on Life-Cycle Civil Engineering, IALCCE2016*, Delft, Netherlands, October 2016.
- [C19] **Yazdani H.**, Khatibinia M. and Hatami K. (2015) “Probabilistic Optimization of Performance-based Seismic Design of Structures Considering Soil-Structure Interaction Effects”, *The Engineering Mechanics Institute (EMI) Conference*, Stanford, CA.
- [C18] **Yazdani H.**, Hatami K. and Khatibinia M. (2014) “Computational Intelligence in Structural Optimization”, *The 10th Annual Conference in Computer Science*, Norman, OK.

- [C17] **Yazdani H.** (2013) “Optimization of Piled-raft Foundations Considering Soil-Pile-Raft Interactions”, *DFI’s 38th Annual Conference on Deep Foundations*, Phoenix, AZ.
- [C16] **Yazdani H.**, Momeni M. and Hatami K. (2013) “Micropiled-raft Foundations for High-rise Buildings on Soft Soils – A Case Study: Kerman, Iran”, *The 7th International Conference on Case Histories in Geotechnical Engineering*, Chicago, US, Paper No. 2.40.
- [C15] **Yazdani H.**, Hatami K., Hawa T. and Grady B.P. (2013) “Atomic-Scale Simulation of Sensor-Enabled Geosynthetics for Health Monitoring of Reinforced Soil Slopes and Embankments”, *ASCE Geo-Congress*, San Diego, pp. 1529 – 1535.
- [C14] Shivaifar I., **Yazdani H.** and E’temadi Shad L. (2013) “A Nomograph to Predict the Deflection of Two-way Reinforced Concrete Slabs”, *The 9th International Concrete Conference & Exhibition*, Manama, Bahrain, Paper No. 35.
- [C13] **Yazdani H.**, Hatami K., Hawa T. and Grady B.P. (2012) “Molecular Dynamics Simulation of Sensor-Enabled Geosynthetics”, *The 15th Nanotechnology Conference*, Santa Clara, US, Paper No. 918.
- [C12] Momeni M., **Yazdani H.**, Fakharian K., Shafiee A., Salajegheh J. and Salajegheh E. (2012). “Case Study of a Micropiled-raft Foundation Design in Soft Calcareous Sandy Soil, Kerman–Iran”, *The 4th International Conference on Geotechnical and Geophysical Site Characterization*, Porto de Galinhas, Pernambuco, Brazil, pp. 1063 – 1068.
- [C11] Askari Y., **Yazdani H.**, Yusefi M. and Salajegheh E. (2011) “Optimal Design of Micropiled-raft Foundations by the Ant Colony Optimization Method”, *The 6th National Congress on Civil Engineering*, Semnan, Iran, 205–213.
- [C10] Shivaifar I., Salajegheh E. and **Yazdani H.** (2011) “Optimal Design of Concrete Diaphragm Wharfs Using the Artificial Neural Networks and the Genetic Algorithm”, *The 6th National Congress on Civil Engineering*, Semnan, Iran, pp. 235–244.
- [C9] Yusefi M., **Yazdani H.**, Askari Y. and Salajegheh E. (2011) “Application of Numerical Methods in Determination of the Subgrade Modulus of Slabs on Elastic Foundations.” *The 6th National Congress on Civil Engineering*, Semnan, Iran, pp. 286–295.
- [C8] **Yazdani H.**, Toufigh M.M. and Mas’oodzade A. (2010) “Nonlinear Analysis of Land Subsidence Due to Groundwater Level Oscillation by a Finite Difference Method”, *The 8th International Symposium on Land Subsidence*, EISOLS, Queretaro, Mexico, pp. 90–95.
- [C7] Mas’oodzade A., Toufigh M.M. and **Yazdani H.** (2010) “1-D Infiltration, Analysis of Unsaturated Flow and Increase in Land Subsidence”, *The 8th International Symposium on Land Subsidence*, EISOLS, Queretaro, Mexico, pp. 472–475.
- [C6] Mas’oodzade A., Toufigh M.M. and **Yazdani H.** (2010) “1-D Infiltration Influence on the Effective Stress”, *The 17th Congress of the Asia and Pacific Division of the International Association of Hydraulic Engineering and Research*, Auckland, New Zealand, pp. 325–329.

- [C5] **Yazdani H.**, Toufigh M.M. and Khosravi E. (2010) “Analytical Study on the Parameters Affecting the Coefficient of Consolidation of Soft Soils Subjected to Cyclic Loading”, *The 4th International Conference on Geotechnical Engineering and Soil Mechanics, ICGESM*, Tehran, Iran, Paper No. 399.
- [C4] Toufigh M.M. and **Yazdani H.** (2007) “Consolidation Theory for Cyclic Loading”, *The 1st International Congress on Civil Engineering and Quality Improvement*, Gorgan, Iran, pp. 152–163.
- [C3] Toufigh M.M. and **Yazdani H.** (2007) “One-dimensional Consolidation of Soft Clays with Variable Compressibility and Permeability”, *The 9th Conference on Watershed Management and Evaporation Reduction*, Kerman, Iran, pp. 56–63.
- [C2] Toufigh M.M., Vaezi M. and **Yazdani H.** (2007) “Field Study on the Land Subsidence in Kerman, Iran”, *The 3rd Civil Engineering National Congress*, Tabriz, Iran, pp. 134–142.
- [C1] Fadaee M.J., Shivafar I. and **Yazdani H.** (2007). “Presenting a Diagram to Determine Two-way RC Slabs Deflection”, *The 3rd Civil Engineering National Congress*, Tabriz, Iran, pp. 261–269.

E. Non-refereed Publications/Presentations

- [PR15] Ghasemi H.‡, Tilford C.† and **Yazdani H.** (2019) “Atomistic simulation of thermal conductivity of graphene: challenges and recommendations”, *Howard University Research Symposium*, Howard University, Washington, DC.
- [PR14] Skinner S.†, Tilford C.† and **Yazdani H.** (2019) “Atomistic insight into temperature- and strain rate-dependent mechanical properties of graphene”, *Howard University Research Symposium*, Howard University, Washington, DC.
- [PR13] Gwerengwe E.†, Ghasemi H.‡ and **Yazdani H.** (2019) “Anisotropic dependency of tensile properties of hexagonal boron nitride to strain rate and temperature: an atomistic simulations study”, *Howard University Research Symposium*, Howard University, Washington, DC.
- [PR12] Ghasemi H.‡ and **Yazdani H.** (2018) “Atomistic insight into corrosion of metals coated with graphene”, *Howard University Research Symposium*, Howard University, Washington, DC.
- [PR11] Skinner S.†, Gwerengwe E.† and **Yazdani H.** (2018) “Developing an integrated materials design paradigm using artificial intelligence”, *Howard University Research Symposium*, Howard University, Washington, DC.
- [PR10] Wallace C.† and **Yazdani H.** (2018) “Atomistic insight into mechanical properties of nanocarbon-filled polymer composites”, *Howard University Research Symposium*, Howard University, Washington, DC.
- [PR9] **Yazdani H.** (2014) “High-performance Computing in Materials Science and Engineering”, *The 10th Annual Conference in Computer Science*, Norman, OK.

- [PR8] **Yazdani H.** (2014) "Sensor-enabled Geosynthetics; where Cutting-edge Science Meets Transportation Infrastructure." *Oklahoma Department of Transportation (ODOT) Research Day*, OKC, OK.
- [PR7] **Yazdani H.** (2014) "Recent Advances in Sensor-enabled Geosynthetics." *Research Day*, National Weather Center, Norman, OK.
- [PR6] **Yazdani H.**, Harper K., Hatami K. and Grady B.P. (2013) "Sensor-enabled geogrids for stabilization and instrumentation of transportation infrastructure." *Oklahoma Department of Transportation (ODOT) Research Day*, OKC, OK.
- [PR5] **Yazdani H.**, Hatami K. and Grady B.P. (2012) "Developing Sensor-enabled Geosynthetics using Conducting Carbon Networks: A Proof-of-Concept Study." *The NSF CMMI Engineering Research and Innovation Conference*, Boston, Massachusetts.
- [PR4] **Yazdani H.** (2012) "Molecular Dynamics Simulation of Sensor-enabled Geosynthetics." *USUCGER 1st Early Career Geotechnical Engineering Conference*, Boston, Massachusetts.
- [PR3] **Yazdani H.** (2012) "Molecular Dynamics Simulation of Sensor-enabled Geosynthetics." *Oklahoma Department of Transportation (ODOT) Research Day*, OKC, OK.
- [PR2] **Yazdani H.** (2011) "The Application of Molecular-scale Simulation in Civil Engineering." *Oklahoma Department of Transportation (ODOT) Research Day*, OKC, OK.
- [PR1] **Yazdani H.** (2011) "Molecular-scale Simulations in Civil Engineering." *Research Day of the OU Supercomputing Center for Education & Research (OSCER)*, National Weather Center, Norman, OK.

F. Other Reports

- [R1] Hatami K. and **Yazdani H.** (2013) "Fabrication, Cyclic Loading and In-soil Performance of Sensor-Enabled Geosynthetics." *Vice President for Research*, The University of Oklahoma.