Masoud Behzadinasab

Curriculum Vitae

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https://scholar.google.com/citations?user=MJSWA7QAAAAJ

Research Interests

- Computational Mechanics
- Fracture Mechanics
- Analysis of Solids, Structures, Fluids, and Fluid-Structure Interaction
- Modeling Extreme Events
- Peridynamics
- Meshfree Methods
- Finite Elements and Isogeometric Analysis
- Machine Learning and Data-Driven Computing
- High-Performance Computing

Full-time Employment

Jan 2020 – Present **Postdoctoral Research Associate**, *Brown University*.
School of Engineering, Mechanics of Solids Group;
Research on developing robust numerical tools for simulation of air-blast-structure interaction;
Advisor: Prof. Yuri Bazilevs.

Education

Sep 2015 – Dec 2019 **Doctor of Philosophy (Ph.D.)**, *University of Texas at Austin (UT Austin)*.
Major: Engineering Mechanics; Program GPA: 3.96/4;
Dissertation: Peridynamic modeling of large deformation and ductile fracture (https://dx.doi.org/10.26153/tsw/8161);
Committee: Prof. John Foster (chair), Prof. Chad Landis, Prof. Stelios Kyriakides, Prof. Krishnaswa Ravi-Chandar, Prof. Rui Huang, Prof. Mukul Sharma.

Sep 2017 – Dec 2018 **Portfolio in Scientific Computation**, *UT Austin*.
Department of Statistics and Data Sciences.

Sep 2013 – Aug 2015 **Master of Science in Engineering (M.S.E.)**, *UT Austin*.
Major: Mechanical Engineering; Program GPA: 3.96/4;
Thesis: Development and application of a parallel chemical compositional reservoir simulator (https://hdl.handle.net/2152/31992);
Advisors: Prof. Kamy Sepehrnoori, Prof. Ofodike Ezekoye.

Sep 2009 – Jun 2013 **Bachelor of Science (B.Sc.)**, *Sharif University of Technology*, Tehran, Iran.
Major: Mechanical Engineering; Program GPA: 18.25/20 (3.90/4).

Internship Experience

Jun – Aug 2019 **Petroleum Engineering Intern**, *Bazean Co.*, Houston, TX.
- Research project: A data-driven framework for predicting oil production in horizontal wells

Apr – May 2019 **Research Associate Intern**, *Advanced Cooling Technologies, Inc.*, Lancaster, PA.
May – Jul 2018
- Research project: Corrosion effects on the failure and fatigue behavior of ductile materials

Sep – Dec 2017
- Recipient of an internal award for key contributions to the NAVAIR Phase II STTR project

Jun – Aug 2012 **Undergraduate Research Assistant**, *Sharif Energy Research Institute*, Tehran, Iran.
- Research project: Experimental investigation of a novel solar desalination system

Academic Awards

- Winner of the Best Student Poster Competition on Computational Mechanics (ASME–AMD), IMECE 2019 2019
- University of Texas Graduate Continuing Fellowship 2018

- 2nd rank among 310,000 participants in Iranian Nationwide University Entrance Exam 2009
- Poster award winner, UT Graduate And Industry Networking Event 2018
- The University of Texas incoming graduate student full scholarship 2013
- The Society of Iranian-American Women for Education scholarship 2015
- The Society of Iranian-American Women for Education scholarship 2014
- Dean's honorary award by President of Sharif University of Technology 2009
- Honorary award by Minister of Science, Research and Technology 2009
- National Elites Foundation 4-Year Fellowship 2009
- Semi-finalist in National Chemistry Olympiads 2007
- Congress grant by IUTAM for ICTAM 2020+1 2020
- Travel award by USACM for WFM2020 2020
- Travel award by USACM for the USNCCM15 2019
- Travel grant by the American Academy of Mechanics for PACAM XVI 2019
- Professional Development Award 2018-19 by the Office of Graduate Studies at UT 2018
- Student travel support by SIAM for the SIAM Texas-Louisiana Sectional Meeting 2018 2018
- Travel grant by SIAM for the SIAM-CSE 2019 Conference 2018
- Travel award by USACM for the MFPM 2018 Conference 2018
- Professional Development Award 2017-18 by the Office of Graduate Studies at UT 2018
- UT Graduate Engineering Council travel grant 2017-18 2018
- Travel support fellowship by WCCM for the WCCM 2018 Conference 2018
- Student travel award by SCCM for the APS-SCCM 2017 Conference 2017

Refereed Journal Articles

Published

1. **Behzadinasab, M.**, Trask, N., Bazilevs, Y. (2020). A Unified, Stable and Accurate Meshfree Framework for Peridynamic Correspondence Modeling–Part I: Core Methods. *Journal of Peridynamics and Nonlocal Modeling*. https://doi.org/10.1007/s42102-020-00040-z.
2. **Behzadinasab, M.**, Foster, J.T., Bazilevs, Y. (2020). A Unified, Stable, and Accurate Meshfree Framework for Peridynamic Correspondence Modeling–Part II: Wave Propagation and Enforcement of Stress Boundary Conditions. *Journal of Peridynamics and Nonlocal Modeling*. https://doi.org/10.1007/s42102-020-00039-6.
3. **Behzadinasab, M.**, Foster, J.T. (2020). Revisiting the third Sandia Fracture Challenge: a bond-associated, semi-Lagrangian peridynamic approach to modeling large deformation and ductile fracture. *International Journal of Fracture*. 224:261–267. https://doi.org/10.1007/s10704-020-00455-1.
4. **Behzadinasab, M.**, Foster, J.T. (2020). A Semi-Lagrangian constitutive correspondence framework for peridynamics. *Journal of the Mechanics and Physics of Solids*. 137:103862. https://doi.org/10.1016/j.jmps.2019.103862.
5. **Behzadinasab, M.**, Foster, J.T. (2020). On the stability of the generalized, finite deformation correspondence model of peridynamics. *International Journal of Solids and Structures*. 182:64–76. https://doi.org/10.1016/j.ijsolstr.2019.07.030.
6. Kamensky, D., **Behzadinasab, M.**, Foster, J.T., Bazilevs, Y. (2019). Peridynamic modeling of frictional contact. *Journal of Peridynamics and Nonlocal Modeling*. 1(2):107–121. https://doi.org/10.1007/s42102-019-00012-y.
7. **Behzadinasab, M.**, Foster, J.T. (2019). The third Sandia Fracture Challenge: peridynamic blind prediction of ductile fracture characterization in additively manufactured metal. *International Journal of Fracture*. 218:97–109. https://doi.org/10.1007/s10704-019-00363-z.
8. Kramer, S.L.B., Boyce, B.L., **Behzadinasab, M.**, Foster, J.T., *et al.* (2019). The third Sandia Fracture Challenge: predictions of ductile fracture in additively manufactured metal. *International Journal of Fracture*. 218:5–61. https://doi.org/10.1007/s10704-019-00361-1.
9. **Behzadinasab, M.**, Vogler, T.J., Foster, J.T., Peterson, A.M., Rahman, R. (2018). Peridynamics modeling of a shock wave perturbation decay experiment in granular materials with intra-granular fracture. *Journal of Dynamic Behavior of Materials*. 4(4):529–542. https://doi.org/10.1007/s40870-018-0174-2.
10. **Behzadinasab, M.**, Grein, E.A., Sepehrnoori, K. (2017). Development of a parallel chemical flooding reservoir simulator. *International Journal of Oil, Gas and Coal Technology*. 16(2):111-129. https:

//doi.org/10.1504/IJOGCT.2017.086353.

In preparation

1. **Behzadinasab, M.**, Moutsanidis, G., Trask, N., Foster, J.T., Bazilevs, Y. An immersed formulation for modeling fluid–structure interaction and air blast events: coupling of peridynamics and isogeometric analysis. In preparation.
2. Rokkam, S., **Behzadinasab, M.**, Gunzburger, M., Phan, N., Goel, K. Peridynamics based corrosion modeling approach for modeling ductile failure in engineering metals under corrosion. In preparation.
3. Foster, J.T., **Behzadinasab, M.** Constitutive modeling in peridynamics: a review and unification of theories. In preparation.

Conference Proceedings

1. **Behzadinasab, M.**, Vogler, T.J., Foster, J.T. (2018). Modeling perturbed shock wave decay in granular materials with intra-granular fracture. In: *20th APS Conference on Shock Compression of Condensed Matter*. 1979(1):070005. https://doi.org/10.1063/1.5044814.

Technical Reports

1. Rokkam, S., **Behzadinasab, M.**, Gunzburger, M., and Shanbag, S. (2019). *Development of Novel Peridynamics Framework for Corrosion Fatigue Damage Prediction*. NAVAIR Phase II.5 STTR Interim Final Report (NAVAIR Contract No. N68335-15-C-0032). Advanced Cooling Technologies, Inc.
2. Vogler, T.J., **Behzadinasab, M.**, Rahman, R., Foster, J.T. (2016). *Perturbation decay experiments on granular materials*. Technical Report No. SAND2016-2537C. Sandia National Laboratories.

Technical Presentations

Conferences

1. "Peridynamic modeling of large deformation and ductile fracture: a bond-associated, semi-Lagrangian, correspondence approach." (with J.T. Foster). ASME's International Mechanical Engineering Congress & Exposition (IMECE 2019). Salt Lake City, Utah. November 2019.
2. "A semi-Lagrangian, constitutive correspondence peridynamic framework for large deformation modeling." (with J.T. Foster). 19th International Conference on New Trends in Fatigue and Fracture (NT2F19). Tucson, Arizona. October 2019.
3. "A Semi-Lagrangian, constitutive correspondence model for peridynamics." (with J.T. Foster). 15th U.S. National Congress on Computational Mechanics (USNCCM15). Austin, Texas. August 2019.
4. "Dynamic ductile fracture characterization with peridynamics: A Sandia Fracture Challenge study." (with J.T. Foster). The Fourteenth Pan American Conference on Applied Mechanics (PACAM XVI). Ann Arbor, Michigan. May 2019.
5. "A stabilized hypoelastic constitutive correspondence model for peridynamics." (with J.T. Foster). 2019 Minerals, Metals & Materials Society Annual Meeting & Exhibition (TMS 2019). San Antonio, Texas. March 2019.
6. "On the stability of the generalized, ordinary, finite deformation constitutive correspondence model of peridynamics." (with J.T. Foster). ASME's International Mechanical Engineering Congress & Exposition (IMECE 2018). Pittsburgh, Pennsylvania, November 2018.
7. "A peridynamic study of predicting ductile fracture in additively manufactured metal." (with J.T. Foster). The 1st Annual Meeting of SIAM Texas-Louisiana Section. Baton Rouge, Louisiana. October 2018. Invited talk.
8. "Peridynamic modeling of dynamic fracture in metallic materials." (with J.T. Foster). USACM Thematic Conference on Meshfree and Particle Methods: Applications and Theory (MFPM 2018). Santa Fe, New Mexico. September 2018.
9. "Dynamic fracture modeling of ductile materials with peridynamics." (with J.T. Foster). 13th World Congress on Computational Mechanics / 2nd Pan American Congress on Computational Mechanics (WCCM 2018). New York, New York. July 2018.
10. "Ductile fracture modeling with peridynamics" (with J.T. Foster). 18th US National Congress of Theoretical and Applied Mechanics (USNC/TAM 2018). Chicago, Illinois. June 2018.

11. "Modeling perturbed shock wave decay in granular materials with intra-granular fracture." (with T.J. Vogler and J.T. Foster). 20th Biennial Conference of the APS Topical Group on Shock Compression of Condensed Matter (SCCM 2017). St. Louis, Missouri. July 2017.
12. "Large-scale granular material simulations using Peridigm." (with J.T. Foster). MURI workshop on material failure prediction through peridynamics. Tucson, Arizona. February 2017.

Posters

1. "Peridynamic Modeling of Large Deformation and Ductile Fracture." (with J.T. Foster and Y. Bazilevs). Workshop on Experimental and Computational Fracture Mechanics 2020 (WFM2020). Baton Rouge, Louisiana. February 2020. Invited poster.
2. "A Peridynamic Framework for Simulation of Large Deformation and Ductile Fracture." (with J.T. Foster). ASME's International Mechanical Engineering Congress & Exposition (IMECE 2019). Salt Lake City, Utah. November 2019.
3. "A stabilized, hypoelastic constitutive correspondence framework for peridynamics." (with J.T. Foster). SIAM Conference on Computational Science and Engineering 2019 (SIAM-CSE19). Spokane, Washington. February 2019.
4. "Sandia Fracture Challenge 2017: peridynamic blind prediction of dynamic crack growth in ductile materials." (with J.T. Foster). USACM Thematic Conference on Meshfree and Particle Methods: Applications and Theory (MFPM 2018). Santa Fe, New Mexico. September 2018.
5. "Sandia Fracture Challenge 2017: Peridynamics blind prediction of dynamic crack growth." (with J.T. Foster). 13th World Congress on Computational Mechanics / 2nd Pan American Congress on Computational Mechanics (WCCM 2018). New York, New York. July 2018.
6. "Prediction of dynamic fracture growth in metallic alloys with peridynamics." (with J.T. Foster). Graduate And Industry Networking 2018. The University of Texas at Austin. Austin, Texas. January 2018.
7. "Peridynamics modeling of perturbation decay experiments in granular materials with intra-granular fracture." (with T.J. Vogler and J.T. Foster). 20th Biennial Conference of the APS Topical Group on Shock Compression of Condensed Matter. St. Louis, Missouri. July 2017.
8. "Fracture and frictional effects in granular materials under pressure." (with J.T. Foster). Graduate And Industry Networking 2017. The University of Texas at Austin. Austin, Texas. January 2017.

Webinars

1. "Modeling ductile fracture with peridynamics". MURI webinar on peridynamic models of fracture mechanics. December 2017.

Teaching Experience

1. UT Austin ME 330, Fluid Mechanics (2 semesters)

Reviewer For

Journals

International Journal of Solids and Structures, International Journal of Fracture, Computer Methods in Applied Mechanics and Engineering, Computational Mechanics, Engineering Fracture Mechanics, International Journal for Numerical Methods in Engineering, International Journal for Multiscale Computational Engineering, Computational Geosciences, Journal of Natural Gas Science and Engineering, Mathematical Problems in Engineering

Conferences

Proceedings of the 53rd US Rock Mechanics/Geomechanics Symposium

Professional Memberships

U.S. Association for Computational Mechanics, American Society of Civil Engineers, American Society of Mechanical Engineers, Society for Industrial and Applied Mathematics, American Physical Society, Material Advantage, Society of Petroleum Engineers