

TIMOTHY J. TRUSTER, Ph.D., P.E. (OH, TN)

Research Professor University of Tennessee – Dept. of Civil & Environmental Engineering
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EDUCATION

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN URBANA, IL
Doctor of Philosophy in Civil Engineering, *May 2010 – May 2013*
Dissertation Title: “A Variational Multiscale Computational Framework for Nonlinear
Interfacial Solid Mechanics” <http://hdl.handle.net/2142/44348>
Master of Science in Civil Engineering *Aug. 2008 – May 2010*
Thesis Title: “A Variational Multiscale A-Posteriori Error Estimation Method for Nearly
Incompressible Elasticity” <http://hdl.handle.net/2142/15985>

UNIVERSITY OF DAYTON DAYTON, OH
Bachelor of Civil Engineering *Aug. 2004 – May 2008*

APPOINTMENTS

University of Tennessee	Civil Engineering	Research Professor	2025 – Present
University of Tennessee	Mechanical Engineer.	Adjunct Professor	2022 – 2025
University of Tennessee	Civil Engineering	Associate Professor	2019 – 2025
University of Tennessee	Civil Engineering	Assistant Professor	2013 – 2019
University of Illinois at Urbana-Champaign	Postdoctoral Researcher		2013
University of Illinois at Urbana-Champaign	Graduate Research Assistant		2008 – 2013

RESEARCH INTERESTS

Computational mechanics	Composite material modeling
Crystal plasticity	Texture modeling
High performance computing	Stabilized methods
Interface mechanics	Nonlinear solid mechanics
Discontinuous Galerkin method	A-posteriori error estimation

PUBLICATIONS

REFEREED JOURNALS AND REVIEWED CONFERENCES

1. Paul D., Arwood Z., Mulon P.-Y., Penumadu D., Truster T.J., Phase field modeling for fracture prediction in goat tibia using an open-source quantitative computer tomography based finite element framework, *Biomedical Engineering Advances*, 9 (2025) 100164.
2. Adediran I., Fritz J., Truster T.J., Comparative analysis of different adhesive model representations in single lap joints using finite element analysis, *Applied Sciences*, 15 (2025), 2661.
3. Huang C., Aduloju S., Fritz J., Joseph, V.R., Messner M., Truster T.J., Calibration of RAFM micromechanical model for creep using Bayesian optimization for functional output, *Journal of Computing and Information Science in Engineering*, 25 (2025) 031007.

4. Truster T.J., Moslehy A., Alshibli K.A., Effects of crystal orientation, temperature, deviatoric stress, and confining stress on creep of rock salt, *International Journal of Rock Mechanics and Mining Sciences*, 183 (2024) 105913.
5. Paul D., Arwood Z., Mulon P.-Y., Penumadu D., Truster T.J., Method for Computer Tomography voxel-based finite element analysis and validation with digital image correlation system, *MethodsX*, 13 (2024) 102879.
6. Giudicelli G., Lindsay A., Harbour L., Icenhour C., Li M., Hansel J. E., German P., Behne P., Marin O., Stogner R.H., Miller J.M., Schwen D., Wang Y., Munday L., Schunert S., Spencer B.W., Yushu D., Recuero A., Prince Z.M., Nezdur M., Hu T., Miao Y., Jung Y.S., Matthews C., Novak A., Langley B., Truster T.J., Nobre N., Alger B., Andrs D., Kong F., Carlsen R., Slaughter A.E., Peterson J.W., Gaston D, Permann C., 3.0 - MOOSE: Enabling massively parallel multiphysics simulations, *SoftwareX*, 26 (2024) 101690.
7. Vemparala B., Imseeh W.H., Pai S., Nagarajan A., Truster T.J., Soghrati S., Automated reconstruction and conforming mesh generation for polycrystalline microstructures from imaging data, *Applied Sciences*, 14 (2024) 407.
8. Behnam A., Truster T.J., Tipireddy R., Messner M.C., Gupta V., Uncertainty quantification framework for predicting material response with large number of parameters: application to creep prediction in ferritic-martensitic steels using combined crystal plasticity and grain boundary models, *Integrating Materials and Manufacturing Innovation*, 11 (2022) 516–531.
9. Moslehy A., Alshibli K.A., Truster T.J., Influence of temperature and crystal orientation on compressive strength of rock salt using a newly developed high-pressure thermal cell, *Rock Mechanics and Rock Engineering*, 55 (2022) 91–108.
10. Imseeh W.H., Ma R., Truster T.J., Moslehy M., Alshibli K.A., 3D dislocation density–based crystal plasticity model for rock salt under different temperatures and strain rates, *Journal of Engineering Mechanics*, 148 (2022) 04021166.
11. Moslehy A., Alshibli K.A., Truster T.J., Kenesei P., Imseeh W.H., Jarrar Z., Sharma H., Evolution of texture and internal stresses within polycrystalline rock salt using in situ 3D synchrotron computed tomography and 3D X-ray diffraction, *Journal of Applied Crystallography*, 54 (2021) 1379 – 1393.
12. Kulkarni S., Gupta V., Senor D., Truster T.J., Soulami A., Devanathan R., A microstructure-based modeling approach to predict the mechanical properties of Zr alloy with hydride precipitates, *Computational Materials Science*, 197 (2021) 110654.
13. Kulkarni S., Truster T.J., Das H., Gupta V., Soulami A., Upadhyay P., Herling D., Microstructure based modeling of friction stir welded joint of dissimilar metals using crystal plasticity, *Journal of Manufacturing Science and Engineering*, 143 (2021) 121008.
14. Aduloju S.C., Truster T.J., Primal interface debonding formulation for finite strain isotropic plasticity, *Mechanics Research Communications*, 112 (2021) 103606.
15. Grutzik S.J., Aduloju S.C., Truster T.J., Reedy E.D., Residually stressed bimaterial beam specimen for measuring environmentally assisted crack growth, *Experimental Mechanics*, 61 (2020) 411–418.

16. Aduloju S.C., Truster T.J., A primal formulation for imposing periodic boundary conditions on conforming and nonconforming meshes, *Computer Methods in Applied Mechanics and Engineering*, 359 (2020) 112663.
17. Messner M.C., Nassif O., Ma R., Truster T.J., Cochran K., Parks D.M., Sham T.-L., Combined crystal plasticity and grain boundary modeling of creep in Ferritic-Martensitic Steels, part 2: The effect of stress and temperature on Engineering and microstructural properties, *Modelling and Simulation in Materials Science and Engineering*, 27 (2019) 075010.
18. Nassif O., Truster T.J., Ma R., Cochran K., Parks D.M., Messner M.C., Sham T.-L., Combined crystal plasticity and grain boundary modeling of creep in Ferritic-Martensitic Steels, part 1: Theory and implementation, *Modelling and Simulation in Materials Science and Engineering*, 27 (2019) 075009.
19. Ma R., Truster T.J., A hierarchical multiscale modeling investigation on the behavior of microtextured regions in Ti-6242 α/β processing, *Metals*, 9 (2019) 233.
20. Ma R., Truster T.J., FFT-based homogenization of hypoelastic plasticity at finite strains, *Computer Methods in Applied Mechanics and Engineering*, 349 (2019) 499–521.
21. Aduloju S.C., Truster T.J., On topology-based cohesive interface element insertion along periodic boundary surfaces, *Engineering Fracture Mechanics*, 205 (2019) 10–13.
22. Aduloju S.C., Truster T.J., A variational multiscale discontinuous Galerkin formulation for both implicit and explicit dynamic modeling of interfacial fracture, *Computer Methods in Applied Mechanics and Engineering*, 343 (2019) 602–630.
23. Truster T.J., DEIP, discontinuous element insertion Program — Mesh generation for interfacial finite element modeling, *SoftwareX*, 7 (2018) 162–170.
24. Ma R., Pilchak A.L., Semiatin S.L., Truster T.J., Modeling the evolution of microtextured regions during α/β processing using the crystal plasticity finite element method, *International Journal of Plasticity*, 107 (2018) 189–206.
25. Ma R., Truster T.J., Puplampu S., Penumadu D., Investigating mechanical degradation due to fire exposure of aluminum alloy 5083 using crystal plasticity finite element method, *International Journal of Solids and Structures*, 134 (2018) 151–160.
26. Chen P., Truster T.J., Masud A., Interfacial stabilization at finite strains for weak and strong discontinuities in multi-constituent materials, *Computer Methods in Applied Mechanics and Engineering*, 328 (2018) 717–758.
27. Puplampu S., Penumadu D., Ma R., Truster T.J., Woracek R., Payzant E.A., Bunn J.R., Degradation and onset of plastic anisotropy in marine aluminum alloy due to fire exposure by bulk neutron diffraction and in situ loading, *Materials Science and Engineering: A*, 700 (2017) 583–591.
28. Truster T.J., Masud A., A unified mixture formulation for density and volumetric growth of multi-constituent solids in tissue engineering, *Computer Methods in Applied Mechanics and Engineering*, 314 (2017) 222–268.
29. Khorsandi F., Ayers P.D., Truster T.J., Developing and evaluating a finite element model for predicting the two-posts rollover protective structure nonlinear behaviour using SAE J2194 static test, *Biosystems Engineering*, 156 (2017) 96–107.

30. Truster T.J., Nassif O., Variational projection methods for gradient crystal plasticity using Lie algebras, *International Journal for Numerical Methods in Engineering*, 110 (2017) 303–332.
31. Truster T.J., Masud A., Discontinuous Galerkin method for frictional interface dynamics, *Journal of Engineering Mechanics*, 142:11 (2016) 04016084.
32. Truster T.J., On interface element insertion into three-dimensional meshes, *Engineering Fracture Mechanics*, 153 (2016) 171–174.
33. Truster T.J., A stabilized, symmetric Nitsche method for spatially localized plasticity, *Computational Mechanics*, 57 (2016) 75–103.
34. Truster T.J., Chen P., Masud A., On the algorithmic and implementational aspects of a discontinuous Galerkin method at finite strains, *Computers and Mathematics with Applications*, 70 (2015) 1266-1289.
35. Truster T.J., Chen P., Masud A., Finite strain primal interface formulation with consistently evolving stabilization, *International Journal for Numerical Methods in Engineering*, 102 (2015) 278-315.
36. Hlepas G., Truster T.J., Masud A., A heterogeneous modeling method for porous media flows, *International Journal for Numerical Methods in Fluids*, 75 (2014) 487-518.
37. Truster T.J., Masud A., Primal interface formulation for coupling multiple PDE: A consistent derivation through the variational multiscale method, *Computer Methods in Applied Mechanics and Engineering* 268 (2014) 194-224.
38. Masud A., Truster T.J., A framework for residual-based stabilization of incompressible finite elasticity: Stabilized formulations and F-bar methods for linear triangles and tetrahedra, *Computer Methods in Applied Mechanics and Engineering* 267 (2013) 359-399.
39. Truster T.J., Eriten M., Polycarpou A.A., Bergman L.A., Masud A., Stabilized interface methods for mechanical joints: Physics-based models and variationally consistent embedding, *International Journal of Solids and Structures* 50 (2013) 2132-2150.
40. Truster T.J., Masud A., A discontinuous/continuous Galerkin method for modeling of interphase damage in fibrous composite systems, *Computational Mechanics* 52 (2013) 499-514.
41. Masud A., Truster T.J., Bergman L.A., Unified formulation for interface coupling and frictional contact modeling with embedded error estimation, *International Journal for Numerical Methods in Engineering* 92 (2012) 141-177.
42. Masud A., Truster T.J., Bergman L.A., A variational multiscale a-posteriori error estimation method for mixed-form of nearly incompressible elasticity, *Computer Methods in Applied Mechanics and Engineering* 200 (2011) 3453-3481.

CONFERENCE PROCEEDINGS

1. Kulkarni S.S., Truster T.J., Senor D.J., Devanathan R., “A Crystal Plasticity Finite Element Method Modeling of Zircaloy with Hydride Phases Based on Scanning Electron Micrographs.” Manufacturing Science and Engineering Conference 2022, West Lafayette, IN, June 27 – 30, 2022, vol. 85819, pp. V002T05A002.
2. Moslehy A., Alshibli K.A., Truster, T.J., Investigating single-crystal rock salt's mechanical behavior under cyclic and unloading-reloading loading condition,

Proceedings of 55th U.S. Rock Mechanics/Geomechanics Symposium, American Rock Mechanics Association, Alexandria, Virginia, June 18 – 25, 2021.

3. Aduloju S., Gu W., Truster T.J., Emery J., Reedy D., Grutzik S.J., Designing brittle fracture specimens to investigate environmentally assisted crack growth, *Fracture, Fatigue, Failure and Damage Evolution* 7 (2018) 25-33.
4. Flicek, R. C., Moore, K. J., Castelluccio, G. M., Brake, M. R. W., Truster, T.J., Hammetter, C. I., Stress waves propagating through bolted joints, Proceedings of IMAC Conference & Exposition on Structural Dynamics, Orlando, Florida, January 25 – 28, 2016.
5. Truster T.J., Stabilized Nitsche method for combining dissimilar PDEs: Application to spatially localized plasticity, Proceedings of 17th U.S. National Congress on Theoretical and Applied Mechanics, East Lansing, Michigan, June 15 – 20, 2014.
6. Truster T.J., Masud A., Bergman L.A., Variational formulation for frictional interface dynamics, Proceedings of ASME 2012 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference, Chicago, Illinois, August 12 – 15, 2012.
7. Masud A., Bergman L.A., Polycarpou A.A., Truster T.J., Eriten M., Modeling of contact interfaces: A novel computational framework, Proceedings of 2011 NSF Engineering Research and Innovation Conference, Atlanta, Georgia, January 4 – 7, 2011.
8. Masud A., Bergman L.A., Polycarpou A.A., Patrick J., Truster T.J., A Variational Multiscale a posteriori error estimation method, Proceedings of 2009 NSF Engineering Research and Innovation Conference, Honolulu, Hawaii, June 22 – 25, 2009.

TECHNICAL REPORTS

1. Truster T.J., Pore closure and microtextured region micromechanical modeling in Ti-6242, *Pratt & Whitney*, 2023.
2. Messner M.C., Truster T.J., Cochran K.B., Parks D.M., Sham T.L., FY17 Status Report on the Micromechanical Finite Element Modeling of Creep Fracture of Grade 91 Steel, *Argonne National Laboratory*, Report ANL-ART-95, 2017.
3. Dodds R.H. Jr., Truster T.J., Cochran K.B., Parks D.M., Sham T.L., Modeling of Creep Deformation and Fracture of Grade 91 Steel through Crystal Plasticity and Grain Boundary Cavitation, *Argonne National Laboratory*, Report ANL-ART-52, 2016.
4. Truster T.J., Discontinuous Element Insertion Algorithm, *University of Tennessee*, November 2015.
5. Truster T.J., Parks D.M., Dodds R.H. Jr., Sham T.L., Progress report on the modeling of deformation behavior in the prior austenite grains, *Oak Ridge National Laboratory*, Report ORNL/LTR-2015/354, 2015.
6. Truster T.J., Sham T.L., Preliminary report on creep deformation simulation using dislocation-based crystal plasticity model, *Oak Ridge National Laboratory*, Report ORNL/LTR-2014/369, 2014.

PRESENTATIONS

ORAL CONFERENCE PRESENTATIONS

- Truster T.J., “Coupling of Scalar and Field Variables in MOOSE Using the Scalar Augmentation Class System.” MOOSE Workshop, Idaho National Laboratory, Idaho Falls, ID, March 10 – 13, 2025.
- Truster T.J., Behnam A., “Computation Infrastructure for Modeling Discontinuities within Materials: DEIP, BEAVER and MOOSE.” 16th World Congress on Computational Mechanics, Vancouver, British Columbia, Canada, July 21 – 26, 2024.
- Surovi, A.G., Kulkarni S.S., Truster T.J., “Rate-dependent adhesion and suction effects in contact modeling of poroelastic materials using finite element method.” 16th World Congress on Computational Mechanics, Vancouver, British Columbia, Canada, July 21 – 26, 2024.
- Paul D., Arwood Z., Mulon P.Y., Penumadu D., Truster T.J., “Development and Validation of an Open-Source QCT-Based Analysis and Phase Field Modeling for Fracture Prediction in Goat Tibia.” 16th World Congress on Computational Mechanics, Vancouver, British Columbia, Canada, July 21 – 26, 2024.
- Adediran I., Truster T.J., “A 3-D Comprehensive Analysis of Adhesive Models in a Single Lap Joint.” 2024 Engineering Mechanics Institute/ Probabilistic Mechanics & Reliability Joint Conference, University of Illinois at Urbana-Champaign, May 28 – 31, 2024, Chicago, IL.
- Truster T.J., Behnam A., “Comparative Analysis of Formulations for Periodic Boundary Conditions in Solid Mechanics.” 2024 Engineering Mechanics Institute/ Probabilistic Mechanics & Reliability Joint Conference, University of Illinois at Urbana-Champaign, May 28 – 31, 2024, Chicago, IL.
- Truster T.J., Huang C., Joseph R., Aduloju S.C., “Calibration of RAFM Steel Micro Mechanical Model for Creep Using Bayesian Optimization and Design of Experiments.” The Minerals, Metals, & Materials Society 2024 Annual Meeting, Orlando, FL, March 3 – 7, 2024.
- Truster T.J., Behnam A., “Thermodynamically consistent derivation of variational multiscale DG crystal plasticity and finite element implementation.” 17th U.S. National Congress on Computational Mechanics, Albuquerque, NM, July 24 – 27, 2023.
- Truster T.J., Behnam A., Gupta V., Tipireddy R., Messner M.C., “Assessing Uncertainty in Creep Life of Grade 91 Steel Using Crystal Plasticity and Grain Boundary Microstructural Models.” 15th International Conference on Fracture, Atlanta, GA, June 11 – 16, 2023.
- Hasan M., Truster T.J., “Novel Lagrange Multiplier Formulation for Imposing Displacement and Traction Discontinuities in Material Microstructures.” 2023 Engineering Mechanics Institute Conference, Georgia Institute of Technology, Atlanta, GA, June 6 – 9, 2023.
- Kulkarni S.S., Truster T.J., Gharaibeh I., Casem D., Alshibli K.A., “Modeling of high strain rate impact of single crystal silica using phase field fracture formulation.” 2023 Engineering Mechanics Institute Conference, Georgia Institute of Technology, Atlanta, GA, June 6 – 9, 2023.

- Truster T.J., Behnam A., “Computation Infrastructure for Modeling Discontinuities within Materials: DEIP, BEAVER and MOOSE.” 2023 Engineering Mechanics Institute Conference, Georgia Institute of Technology, Atlanta, GA, June 6 – 9, 2023.
- Behnam A., Truster T.J., “Thermodynamically consistent derivation of variational multiscale DG crystal plasticity and finite element implementation.” 2022 Society of Engineering Science Conference, Texas A&M University, College Station, TX, October 16 – 21, 2022.
- Truster T.J., Imseeh W.I., Ma R., Moslehy A., Alshibli K.A., “Dislocation Density-Based Crystal Plasticity Modeling of Halite at Different Temperatures and Orientations.” 2022 Society of Engineering Science Conference, Texas A&M University, College Station, TX, October 16 – 21, 2022.
- Kulkarni S.S., Truster T.J., Senor D.J., Devanathan R., “A Crystal Plasticity Finite Element Method Modeling of Zircaloy with Hydride Phases Based on Scanning Electron Micrographs.” Manufacturing Science and Engineering Conference 2022, West Lafayette, IN, June 27 – 30, 2022.
- Truster T.J., Imseeh W.I., Ma R., Moslehy A., Alshibli K.A., “Dislocation Density-Based Crystal Plasticity Modeling of Halite at Different Temperatures and Orientations.” ECCOMAS 2022 Congress, Oslo, Norway, June 5 – 9, 2022.
- Truster T.J., Behnam A., Gupta V., Tipireddy R., “Low Dimensional Polynomial Chaos Expansion Performance at Assessing Uncertainty in Creep Life Prediction of Grade 91 Steel.” 16th U.S. National Congress on Computational Mechanics, Chicago, IL, July 26 – 29, 2021.
- Aduloju S., Truster T.J., “Primal Interface Debonding Formulation for Finite Strain Plasticity.” 2021 Engineering Mechanics Institute Conference, Columbia University, New York, NY, May 25 – 28, 2021.
- Truster T.J., Behnam A., Gupta V., Tipireddy R., “Low Dimensional Polynomial Chaos Expansion Performance at Assessing Uncertainty in Creep Life Prediction of Grade 91 Steel.” The Minerals, Metals, & Materials Society 2021 Annual Meeting, Orlando, FL, March 15 – 18, 2021.
- Truster T.J., Aduloju S., “Primal Interface Debonding Formulation for Finite Strain Plasticity.” 14th World Congress on Computational Mechanics, Paris, France, January 11 – 15, 2021.
- Truster T.J., “Hierarchical Multiscale Modeling of Microtextured Regions in Ti-6242 during Alpha/Beta Processing.” The Minerals, Metals, & Materials Society 2020 Annual Meeting, San Diego, CA, February 23-27, 2020.
- Truster T.J., Ma R., “Hierarchical multiscale modeling of microtextured regions in Ti-6242 during alpha/beta processing.” 15th U.S. National Congress on Computational Mechanics, Austin, TX, July 28 – August 1, 2019.
- Aduloju S., Truster T.J., “A Variational Multiscale Discontinuous Galerkin Method for Periodic Boundary Condition Modeling of RVE.” 2019 Engineering Mechanics Institute Conference, CalTech, Pasadena, CA, June 18 – 21, 2019.
- Truster T.J., Cochran K.B., Messner M.C., Nassif O., Parks D.M., Sham T.L., “Creep Life Prediction of Ferritic-Martensitic Steels at High and Low Stresses Through Crystal

- Plasticity and Grain Boundary Modeling.” 13th World Congress on Computational Mechanics, New York, New York, July 22 – 27, 2018.
- Ma R., Truster T.J., “Modeling the Evolution of Microtextured Regions in Ti-6242 using Crystal Plasticity Finite Element Method.” 2018 Engineering Mechanics Institute Conference, MIT, Cambridge, MA, May 29 – June 1, 2018.
- Aduloju S., Gu W., Truster T.J., Emery J., Reedy D., Grutzik S., “Novel Bi-beam Specimen Design for Studying Stress Corrosion Cracking.” 2018 Engineering Mechanics Institute Conference, MIT, Cambridge, MA, May 29 – June 1, 2018.
- Truster T.J., Aduloju S., “Insertion of Cohesive Interface Elements Along Periodic Boundary Surfaces.” 2018 Engineering Mechanics Institute Conference, MIT, Cambridge, MA, May 29 – June 1, 2018.
- Truster T.J., Nassif O., “Combined Crystal Plasticity and Grain Boundary Modeling of Creep in Ferritic-Martensitic Steels at Moderate and Low Stresses.” Mach Conference 2018, Annapolis, Maryland, April 4 – 6, 2018.
- Truster T.J., “A stabilized, symmetric Nitsche method for spatially localized plasticity.” 14th U.S. National Congress on Computational Mechanics, Montreal, Ontario, July 17 – 20, 2017.
- Aduloju S.C., Gu W., Reedy E.D., Emery J., Truster T.J., Grutzik S.J., “Designing brittle fracture specimens to investigate environmentally assisted crack growth.” Conference and Exposition on Experimental and Applied Mechanics, Indianapolis, IN, June 12 – 15, 2017.
- Ma R., Truster T.J., “Crystal plasticity based investigation on the mechanical degradation caused by fire exposure.” 2017 Engineering Mechanics Institute Conference, San Diego, CA, June 4 – 7, 2017.
- Nassif O., Truster T.J., “Microstructure-based modeling of ferritic-martensitic steels including crystal plasticity and grain boundary effects.” 2017 Engineering Mechanics Institute Conference, San Diego, CA, June 4 – 7, 2017.
- Truster T.J., “Discontinuous element insertion algorithm.” 2017 Engineering Mechanics Institute Conference, San Diego, CA, June 4 – 7, 2017.
- Truster T.J., Masud A., “Stabilized interface formulation for frictional dynamics.” 2016 Engineering Mechanics Institute/ Probabilistic Mechanics & Reliability Joint Conference, Vanderbilt University, Nashville, TN, May 22 – 25, 2016.
- Nassif O., Truster T.J., “Primal method for GND-based kinematic hardening model.” 2016 Engineering Mechanics Institute/ Probabilistic Mechanics & Reliability Joint Conference, Vanderbilt University, Nashville, TN, May 22 – 25, 2016.
- Flicek, R. C., Moore, K. J., Castelluccio, G. M., Brake, M. R. W., Truster, T.J., Hammett, C. I., “Stress waves propagating through bolted joints.” IMAC Conference & Exposition on Structural Dynamics, Orlando, Florida, January 25 – 28, 2016.
- Truster T.J., Hicks W., “Modeling Delamination in Composites under Dynamic Loading using a Stabilized Discontinuous Galerkin Approach.” 13th U.S. National Congress on Computational Mechanics, San Diego, CA, July 27 – 30, 2015.

- Masud A., Hlepas G., Truster T.J., "A heterogeneous modeling method with embedded interfaces for porous media flows." 13th U.S. National Congress on Computational Mechanics, San Diego, CA, July 27 – 30, 2015.
- Truster T.J., Nassif O., "Variational Projection and Implicit Integration for Gradient Crystal Plasticity." 2015 Conference of the ASCE Engineering Mechanics Institute, Stanford University, Stanford, CA, June 16 – 19, 2015.
- Truster T.J., Masud A., "A computational approach for modeling growth of cross-linking in tissue mechanics using mixture theory." 2014 Conference of the ASCE Engineering Mechanics Institute, McMaster University, Hamilton, Ontario, August 5 – 8, 2014.
- Masud A., Truster T.J., Chen P., "Interface Damage in Composites under Finite Strains." 17th U.S. National Congress on Theoretical and Applied Mechanics, Michigan State University, East Lansing, Michigan, June 15 – 20, 2014.
- Truster T.J., "Stabilized Nitsche method for combining dissimilar PDEs: Application to spatially localized plasticity." 17th U.S. National Congress on Theoretical and Applied Mechanics, Michigan State University, East Lansing, Michigan, June 15 – 20, 2014.
- Truster T.J., Chen P., Masud A., "Discontinuous Galerkin method and Variational Multiscale formulation for interphase damage evolution at finite strains." 2013 Conference of the ASCE Engineering Mechanics Institute, Northwestern University, Evanston, IL, August 4 – 7, 2013.
- Truster T.J., Masud A., "Modeling of nearly incompressible composite materials using a new stabilized mixed method for tetrahedral elements." 12th U.S. National Congress on Computational Mechanics, Raleigh, NC, July 22 – 25, 2013.
- Masud A., Truster T.J., "Unified interface formulation combining Discontinuous Galerkin and Variational Multiscale methods." Advances in Computational Mechanics with Emphasis on Fracture and Multiscale Phenomena, workshop honoring Prof. Ted Belytschko's 70th birthday, Northwestern University, Evanston, IL, April 18 – 20, 2013.
- Truster T.J., Masud A., Bergman L., "Variational formulation for frictional interface dynamics." ASME 2012 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference, Chicago, IL, August 12 – 15, 2012.
- Truster T.J., Masud A., "A unified framework for modeling of interphase damage in fibrous composite systems." EMI 2012: Engineering Mechanics Inst. Conference/ PMC 2012: 11th ASCE Joint Specialty Conference on Probabilistic Mechanics & Structural Reliability, South Bend, IN, June 17 – 20, 2012.
- Truster T.J., Masud A., Bergman L.A., "Unified interface formulation combining discontinuous Galerkin and variational multiscale methods." 11th U.S. National Congress on Computational Mechanics, Minneapolis, MN, July 25 – 28, 2011.
- Truster T.J., Masud A., Bergman L.A., "Unified formulation for interface coupling and frictional contact." American Society of Mechanical Engineers: 2011 Applied Mechanics and Materials Conference, Chicago, IL, May 30 – June 1, 2011.
- Truster T.J., Eriten M., Polycarpou A.A., Bergman L.A., Masud A., "Modeling of contact interfaces: A novel computational framework." 2010 International Joint Tribology Conference, San Francisco, CA, October 18 – 20, 2010.

POSTER CONFERENCE PRESENTATIONS

- Surovi A.G., Kulkarni S.S., Truster T.J., “Modeling of Contact in Biphase Soft Material.” 2023 International Mechanical Engineering Congress & Exposition, New Orleans, LA, October 29 – November 2, 2023.
- Adediran I., Ahn J.H., Truster T.J., Muhlstein C., Yao D., “A Finite Element Method for Evaluating Disbonds and their Impact on Single Lap Joints.” 15th International Conference on Fracture, Atlanta, GA, June 11 – 16, 2023.
- Truster T.J., Aduloju S., Geut E., “Multi-Resolution Discontinuous Galerkin Method for Microstructure Modeling.” 2019 Society of Engineering Science Conference, Washington University, Clayton, MO, October 13-15, 2019.
- Truster T.J., Moslehy A., Aduloju S., Alshibli K., “Modeling the Anisotropic Behavior of Natural Rocksalt during Creep Tests using Dislocation Density-based Crystal Plasticity.” 2019 Engineering Mechanics Institute Conference, CalTech, Pasadena, CA, June 18 – 21, 2019.
- Ma R., Truster T.J., “Modeling the Evolution of Microtextured Regions in Ti-6242 using Crystal Plasticity Finite Element Method.” 2018 Engineering Mechanics Institute Conference, May 29 – June 1, 2018.
- Aduloju S., Gu W., Truster T.J., Emery J., Reedy D., Grutzik S., “Novel Bi-beam Specimen Design for Studying Stress Corrosion Cracking.” 2018 Engineering Mechanics Institute Conference, May 29 – June 1, 2018.
- Groß J., Armand J., Lacayo R.M., Schwingshackl, C.W., Reuß P., Truster T.J., Salles L., Kuether R., Brake M.R., "Numerical Round Robin for Predicting the Dynamics of Jointed Structures." ASME 2015 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference, Boston, MA, August 2 – 5, 2015.
- Flicek R., Moore K., Truster T.J., Hammett C., Castelluccio G., Brake M.R., "Stress Wave Propagation through Jointed Interfaces." ASME 2015 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference, Boston, MA, August 2 – 5, 2015.
- Truster T.J., Masud A., "Modeling of nearly incompressible composite materials using a new stabilized mixed method for tetrahedral elements." 12th U.S. National Congress on Computational Mechanics, Raleigh, NC, July 22 – 25, 2013.
- Truster T.J., Masud A., Bergman L.A., "Unified interface formulation combining discontinuous Galerkin and variational multiscale methods." 11th U.S. National Congress on Computational Mechanics, Minneapolis, MN, July 25 – 28, 2011.

INVITED PRESENTATIONS AND SEMINARS

- Truster T.J., “Framework for Microstructural Modeling using Crystal Plasticity and Interface Finite Element Methods with Parametric Uncertainty,” Mechanical Engineering Seminar, University of Wyoming, Laramie, WY, April 3, 2025.
- Truster T.J., “Framework for Multi-Phase Material Modeling using Stabilized Interface and Crystal Plasticity Finite Element Methods,” Mechanical Engineering Seminar, Delft University of Technology, Delft, Netherlands, June 23, 2022.

- Truster T.J., “Framework for Microstructural Modeling using Crystal Plasticity and Interface Finite Element Methods with Parametric Uncertainty,” Mechanical Engineering Seminar, UCLouvain, Louvain, Belgium, May 31, 2022.
- Truster T.J., “Variational Multiscale DG: A Stabilized Framework for Modeling Slip and Fracture at Interfaces,” Solid Mechanics Seminar Series, KTH Royal Institute of Technology, Stockholm, Sweden, May 19, 2022.
- Truster T.J., “Variational Multiscale DG: A Stabilized Framework for Modeling Evolving Weak and Strong Discontinuities,” Institute for Applied Mathematics Seminar, Leibniz University, Hanover, Germany, May 12, 2022.
- Truster T.J., “Framework for Multi-Phase Material Modeling using Stabilized Interface and Crystal Plasticity Finite Element Methods,” Materials Science Department, MINES ParisTech, Paris, France, May 3, 2022.
- Truster T.J., “Framework for Microstructural Modeling using Crystal Plasticity and Interface Finite Element Methods with Parametric Uncertainty,” Mechanical Engineering Seminar, Karlsruhe Institute of Technology, Karlsruhe, Germany, April 26, 2022.
- Truster T.J., “Framework for Multi-Phase Material Modeling using Stabilized Interface and Crystal Plasticity Finite Element Methods,” MA Group Seminar, Max-Planck-Institut für Eisenforschung, Düsseldorf, Germany, March 16, 2022.
- Truster T.J., “Framework for Multi-Phase Material Modeling using Stabilized Interface and Crystal Plasticity Finite Element Methods,” Materials Science Seminar, University of Florida, October 19, 2021.
- Truster T.J., “Framework for Multi-Phase Material Modeling using Stabilized Interface and Crystal Plasticity Finite Element Methods,” Mechanical Engineering Seminar, Georgia Institute of Technology, September 9, 2021.
- Truster T.J., Aduloju S., “A Variational Multiscale Discontinuous Galerkin Method for Imposing Periodic Boundary Conditions on Nonconforming Meshes.” G.I. Taylor Medal Symposium in Honor of Prof. Arif Masud, 2019 Society of Engineering Science Conference, Washington University, Clayton, MO, October 13-15, 2019.
- Truster T.J., “Framework for Process and Performance Modeling at High Temperatures using Crystal Plasticity and Interface Finite Element Methods,” Computational Mechanics Seminar, Oak Ridge National Laboratory, August 22, 2019.
- Truster T.J., “Framework for Process and Performance Modeling at High Temperatures using Crystal Plasticity and Interface Finite Element Methods,” Advanced Computing, Mathematics and Data Division, Pacific Northwest National Laboratory, May 15, 2019.
- Truster T.J., “Framework for Process and Performance Modeling at High Temperatures using Crystal Plasticity and Interface Finite Element Methods,” Mechanical and Aerospace Engineering Department, The Ohio State University, March 20, 2019.
- Truster T.J., “Creep Life Prediction of Ferritic-Martensitic Steels at High and Low Stresses Through Crystal Plasticity and Grain Boundary Modeling,” Materials and Manufacturing Directorate, Air Force Research Laboratory, August 14, 2018.
- Truster T.J., “A Stabilized Finite Element Framework for Modeling Slip and Fracture at Interfaces,” Civil Engineering Departmental Seminar, Purdue University, February 6, 2018.

Truster T.J., “Crystal Plasticity Finite Element Modeling of Microtextured Regions in Ti-6242 at High Temperatures,” Materials and Manufacturing Directorate, Air Force Research Laboratory, August 9, 2017.

Truster T.J., “A Stabilized Finite Element Framework for Modeling Slip and Fracture at Interfaces,” Civil Engineering Departmental Seminar, Notre Dame University, July 28, 2017.

Truster T.J., “A Stabilized Finite Element Framework for Modeling Slip and Fracture at Interfaces,” Civil Engineering Departmental Seminar, Vanderbilt University, November 15, 2016.

Truster T.J., “A Stabilized Finite Element Framework for Modeling Interfacial Failure in Fiber-Reinforced Composites,” Materials and Manufacturing Directorate, Air Force Research Laboratory, November 10, 2016.

Truster T.J., “Crystal Plasticity Finite Element Modeling of Microtextured Regions in Ti-6242 at High Temperatures,” Materials and Manufacturing Directorate, Air Force Research Laboratory, August 2, 2016.

Truster T.J., “Crystal Plasticity Finite Element Method Coupled with Imaging Techniques for Texture Modeling,” Joint Institute for Neutron Sciences Seminar, Oak Ridge National Laboratory, December 15, 2015.

Truster T.J., “A Stabilized Finite Element Framework for Modeling Slip and Fracture at Interfaces,” Civil Engineering Departmental Seminar, Duke University, September 28, 2015.

Truster T.J., Continuing Education Seminar, “Computational Modeling of Failure at Interfaces in Structures and Materials,” ASCE Knoxville Branch, March 28, 2014.

OTHER RESEARCH ACTIVITIES

SOFTWARE DEVELOPMENT (OPEN SOURCE)

Lead: Discontinuous Element Insertion Program (DEIP): Mesh modification with interface elements, MATLAB, 2015-present.

Lead: BEAVER: MOOSE application for interface modeling, C++, 2022-present.

Contributor: WARP3D: Computational fracture mechanics and crystal plasticity, Fortran, 2014-present.

Contributor: Multiphysics Object-Oriented Simulation Environment (MOOSE): enhancement to interface modeling and scalar variable treatment, C++, 2022-present.

Contributor: Düsseldorf Advanced Materials Simulation Kit (DAMASK): phase field module for Fast Fourier Transform mechanics modeling, Fortran, 2022.

WORKSHOPS

NSF Workshop: Engineering Mechanics Education, Georgia Institute of Technology, June 6, 2023.

Workshop on Experimental and Computational Fracture Mechanics, Louisiana State University, February 26-28, 2020.

NSF Computational Mechanics Vision Workshop, University of Michigan, October 31 – November 1, 2019

- Scoping workshop for priority directions of NSF related to machine learning, manufacturing, risk/uncertainty-based engineering, and medicine

AFRL/Industry Titanium Processing Workshop, Wright Bros. Institute Tec^Edge, Dayton, OH, March 26-27, 2018.

- Participated in academic/laboratory/industry discussion groups, recorded minutes for the meeting

Nonlinear Mechanics and Dynamics Summer Research Institute, Sandia National Laboratory and University of New Mexico, Albuquerque, NM, June 20 – July 29, 2016.

- Mentored one group of two students (including own student) on project related to subcritical crack growth in glass

Truster T.J., “Stabilized Interface Method for High Velocity Fracture in Three Dimensions,” Workshop on Brittle Hard Rocks Exposed to High Energetic Cyclic Loads: Experimental and Numerical Discussions, Caterpillar Corporation, November 9, 2015.

Nonlinear Mechanics and Dynamics Summer Research Institute, Sandia National Laboratory and University of New Mexico, Albuquerque, NM, June 23 – July 31, 2015.

- Mentored two groups of three students on projects related to computational modeling of bolted mechanical joints

PROFESSIONAL DEVELOPMENT

Sabbatical, Microstructure Physics and Alloy Design Department, Max-Planck-Institut für Eisenforschung, Düsseldorf, Germany March - June, 2022. Host: Prof. Dr.-Ing. habil. Dierk Raabe.

Sabbatical, Mechanical Engineering Department, Georgia Institute of Technology, August – November 2021. Host: Drs. David McDowell and Surya Kalidindi.

RESEARCH PROPOSALS

ACCEPTED PROPOSALS

Scalable Predictions and Analytics of Rare events in Titanium Alloys (SPARTA)

Pratt & Whitney contract through Air Force Research Laboratory, 2024-2027

Research Experiences of Undergraduates supplement

National Science Foundation, IUCRC Program, 2024-2025

Tertiary Creep Modeling of RAFM Steel

UT-Battelle contract through Oak Ridge National Laboratory, 2023-2024

(Continuation) Integrated Methodology for Evaluating Kissing Bonds and Their Impact on Affected Composite Panel

Center for Composite and Hybrid Materials Interfacing, 2023-2024, co-PI with PI Donggang Yao (GT) and co-PI Christopher Muhlstein (GT)

Research Experiences of Undergraduates supplement

National Science Foundation, Mechanics of Materials and Structures Program, 2023-2024

Pore Closure and Microtextured Region Modeling in Ti64

Pratt & Whitney, 2023

Center for Advanced Materials & Manufacturing (CAMM)

National Science Foundation, Division of Materials Research – Materials Research Science and Engineering Center, 2023-2030, senior personnel with PI David A. Tennant

Finite Element Simulations for Creep Life of RAFM Steel

UT-Battelle contract through Oak Ridge National Laboratory, 2022-2023

Collaborative Research: Validated Complementarity Contact Conditions for Suction-Friction of Multiphase Soft Materials

National Science Foundation, Mechanics of Materials and Structures Program, 2023-2025, PI with PI Melih Eriten (UWM) and co-PI Alejandro Roldan-Alzate

Physics-Based and Machine-Learning Models for Goat Tibia Fracture

University of Tennessee One Health Initiative Seed Program, 2022-2023, PI with Pierre-Yves Mulon and David Anderson

(CHMI-1) Integrated Methodology for Evaluating Kissing Bonds and Their Impact on Affected Composite Panel

Center for Composite and Hybrid Materials Interfacing, 2022-2023, co-PI with PI Donggang Yao (GT) and co-PI Christopher Muhlstein (GT)

IUCRC Phase I: University of Tennessee: Center for Composite and Hybrid Materials Interfacing (CHMI)

National Science Foundation, 2021-2026, contributing investigator with Uday Vaidya and team

Tertiary Creep Modeling of RAFM Steel

UT-Battelle contract through Oak Ridge National Laboratory, 2021

Influence of Morphology and Crystallographic Orientation on Strength and Fracture Behavior of Silica Sand at High-Strain Rate (HSR) Loading

Army Research Office, 2020-2023, co-PI with Khalid Alshibli (UTK)

Supplement for Data Science Activities for the CMMI Communities: A Machine Learning Classification Approach for Understanding the Relationship Between Aggregate Microstructure Statistics and Fatigue Crack Growth Threshold

National Science Foundation, Mechanics of Materials and Structures Program, 2020-2023, PI with Hugh Medal (UTK)

Research Experiences of Undergraduates supplement

National Science Foundation, Mechanics of Materials and Structures Program, 2019-2020

Transient Coupling of Peridynamics and Classical Continuum Mechanics for Dynamic Fracture Modeling

University of Tennessee Research Seed Program, 2019-2020

Travel Supplement for Program Review Conference

National Science Foundation, Mechanics of Materials and Structures Program, 2019

Research Experiences of Undergraduates supplement

National Science Foundation, Mechanics of Materials and Structures Program, 2018-2019

CAREER: Predictive Fatigue Behavior of Structural Materials Through Computationally-Informed Textural and Microstructural Influences

National Science Foundation, Mechanics of Materials and Structures Program, 2018-2023

Modeling of Microtextured Region Breakdown in Ti-6242 Alloy

Air Force Research Laboratory, Summer Faculty Fellowship Program, 2017

Extension: Creep-Rupture Modeling Using Crystal Plasticity in WARP3D

UCHICAGO ARGONNE contract extension through Argonne National Laboratory, project DE-AC05-000R22725, 2017

3D Experimental and Computational Studies of Crystallographic Effects on Creep and Fracture in Salt Rock

National Science Foundation, Geotechnical Engineering and Materials Program, 2016-2019, co-PI with Khalid Alshibli (UTK)

Crystal Plasticity Modeling of Microtextured Regions in Ti-6242 Alloy

Air Force Research Laboratory, Summer Faculty Fellowship Program, 2016

Creep-Rupture Modeling Using Crystal Plasticity in WARP3D

UCHICAGO ARGONNE contract through Argonne National Laboratory, project DE-AC05-000R22725, 2015-2016

Implementation of Crystal Plasticity in WARP3D – Phase II

UT-Battelle contract through Oak Ridge National Laboratory, project DE-AC05-000R22725, 2014-2015

Implementation of Crystal Plasticity in WARP3D

UT-Battelle contract through Oak Ridge National Laboratory, project DE-AC05-000R22725, 2014

Numerical Analysis of Fatigue Characteristics of Materials under Engineered and Natural Loadings

Sub-award through University of Illinois at Urbana-Champaign from BP America, 2013-2014

MENTORING EXPERIENCE

UNIVERSITY OF TENNESSEE

Research Associates: 2020 – present

Wadi Imseeh (August 2020-2021)

Shank Kulkarni (Feb. 2023-present)

PhD. Graduate Students: 2014 – present

Omar Nassif (2014-May 2019) Dissertation Title: Modeling Creep in Ferritic-Martensitic Steels Accounting for Dislocation Creep and Void Growth along Grain Boundaries

Ran Ma (2016-Dec. 2018): Dissertation Title: Modeling the Processing and Micromechanical Degradation of Polycrystalline Materials using a Multiscale Crystal Plasticity Framework

Sunday Aduloju (2018-Dec. 2019) Dissertation Title: Stabilized Variational Interface Formulation for Dynamic Damage and Microscale Modeling: Methods Development and Applications

Amirfarzad Behnam (2020-Dec. 2023) Dissertation Title: Variational Multiscale Discontinuous Galerkin Interface Method for Crystal Plasticity of Grade 91 Steel

MdAriful Hasan (a.k.a. John Fritz) (2020-May 2025) Dissertation Title: Material Microstructure Based Multiresolution Discontinuous Galerkin Framework – Towards Machine Learning Based Multiscale Finite Element Analysis

Ibrahim Adediran (2021-present) Dissertation Title: Multiscale Interface Modeling for Structural Health Monitoring and Failure Prediction in Adhesive Joints and Directionally Dependent Materials

Debangshu Paul (2022-present)

Agnila Ghosh Surovi (2023-present)

Munireach Nannory (2023-present)

M.S. Graduate Students:

2014 – present

Wesley Hicks (2014-2015); M.S. with thesis: Modeling of Debonding and Crack Propagation in Fibrous Composites Using a Discontinuous Galerkin Approach

Russell Hollman (2015-2017); M.S. with thesis: Mixed-Mode Dynamic Crack Propagation using the Discontinuous Galerkin Method

Sunday Aduloju (2015-2018); M.S. with thesis: BiBeam Specimen Design for investigating Stress Corrosion Cracking in Brittle Materials

Elina Geut (2018-2020); M.S. with thesis: Modeling Stress Distribution within Structural Materials Through Multi-Resolution Discontinuous Galerkin Method

Debangshu Paul (2022-Aug. 2024) M.S. with thesis: Development and validation of an open-source QCT-based finite element analysis and phase field modeling for fracture prediction in goat tibia

MdAriful Hasan (Jan.-Aug. 2024) M.S. in Mathematics with project: Generalized Interface Modeling with Weighted Tensors

Undergraduate Students: Research Experience for Undergraduates

2014 – present

Cameron Snook (2014-2015): Translation of crystal plasticity subroutines from FORTRAN to MATLAB; numerical studies on Variational Multiscale stabilized elastodynamics formulation

Russell Hollman (2015): Dynamic debonding modeling with Discontinuous Galerkin method

Jack Rymer (2018): Polycrystalline microstructure generation; representative volume element statistical sensitivity

Francis Nunez (2019): Finite element mesh format transitions to optimize representation of fatigue cracks.

Daniel Pledger (2019): Implementation of HDF5 data output scheme into WARP3D

Ahmed Elnasri (2020): Calibration of crystal plasticity model for AA5083 and halite using Dakota software

Ethan McCutcheon (2020-2021): Uncertainty quantification of creep in Grade 91; revising microstructure generation workflows

Kevin Schnadelbach (2021): Developing manual for microstructure generation workflow

Robin Schlimm (2023-2024): Simulation of suction between soft materials; developing high school laboratory module on soft contact

Derry Li (2024): visiting REU student in summer SMaRT program; simulation of nanoindentation in refractory alloys

Elijah Stage (2024-2025): Simulations of adhesively bonded lap joints with defects of various sizes using cohesive zone interface elements

Harris Neu (2024-2025): Simulation of nanoindentation in refractory alloys at low indentation depth to recover stress-strain behavior

TEACHING EXPERIENCE

UNIVERSITY OF TENNESSEE, KNOXVILLE

Course No.	Course Name	Semester	No. of Students	Instructor Effectiveness of Teaching (out of 5)
CE472	Steel Design	S14	25	4.08
CE538 CE561	Finite Element Applications for Structural and Geotechnical Engineering	F14	18	3.56
CE371	Structural Engineering I	S15	28	4.54
CE472	Steel Design	S15	19	4.21
CE538 CE561	Finite Element Applications for Structural and Geotechnical Engineering	F15	18	3.46
CE472	Steel Design	S16	28	4.68
CE595	Advanced Structural Mechanics	F16	15	4.10
CE472	Steel Design	S17	15	4.93
CE538 CE561	Finite Element Applications for Structural and Geotechnical Engineering	S17	14	3.6
CE691	Nonlinear Finite Element Methods	F17	7	5.00
CE262	Structural Mechanics	S18	56	4.80
CE472	Steel Design	S18	22	4.95
CE538 CE561	Finite Element Applications for Structural and Geotechnical Engineering (Distance Education)	F18	20	4.10
CE262	Structural Mechanics	S19	42	4.67
CE560	Advanced Structural Mechanics	S19	6	4.33
CE262	Structural Mechanics	F19	26	4.73
CE538 CE561	Finite Element Applications for Structural and Geotechnical Engineering	F19	14	4.46
CE661	Nonlinear Finite Element Methods	S20	6	4.50
CE538 CE561	Finite Element Applications for Structural and Geotechnical Engineering	F20	12	4.08
CE262	Structural Mechanics	S21	42	4.72
CE560	Advanced Structural Mechanics	S21	9	4.78
CE691	Computational Hyperelasticity	S21	3	5.00

CE538 CE561	Finite Element Applications for Structural and Geotechnical Engineering	F22	12	4.57
CE262	Structural Mechanics	S23	42	4.72
CE595	Elasticity and Mixed Methods	S23	2	5.00
AE660 CE661 ME660	Nonlinear Finite Element Methods	S23	6	4.80
CE538 CE561	Finite Element Applications for Structural and Geotechnical Engineering	F23	14	4.62
CE262	Structural Mechanics	S24	66	4.52
CE560	Advanced Structural Mechanics	S24	4	4.50
CE538 CE561	Finite Element Applications for Structural and Geotechnical Engineering	F24	20	4.70
CE262	Structural Mechanics	S25	70	
AE660 CE661 ME660	Nonlinear Finite Element Methods	S25	9	

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Teaching Assistant: Department of Civil and Environmental Engineering 2009 – present

Structural Mechanics (2011): Assessed graduate and undergraduate student progress; conducted discussion sessions with question/answer and supplemental lecture components; assisted in development of quiz and exam questions; gave class-time lectures on isolated occasions

Linear Finite Elements (2010): Assessed graduate and undergraduate student progress; developed MATLAB subroutines to supplement assignments; assisted in development of homework and exam questions; gave class-time lectures on isolated occasions

Nonlinear Finite Elements (2009,2010,2012): Assessed graduate student progress; conducted individualized discussion sessions; provided baseline linear code for students lacking a personal one; assisted in development of homework and exam questions

UNIVERSITY OF DAYTON

Workshop Facilitator: School of Engineering 2005 – 2008

Tutored math, science, and mechanics to first and second year engineering students
Mentored students and answered questions concerning college life and coursework
Conducted in-depth instruction for individual students on an as-needed basis

Teaching Assistant: Department of Civil and Environmental Engineering 2007 – 2008

Design of Steel Structures: Assessed performance and provided feedback to undergraduate students; worked with two separate faculty members in the spring and fall semesters

WORK EXPERIENCE PRIOR TO ACADEMIA

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Postdoctoral Researcher: Air Force Research Laboratory May 2013 – August 2013

Developed computational models of manufacturing process of ceramic matrix composites using mixture theory accounting for depositional and thermal effects

Doctoral Student: Department of Civil and Environmental Engineering 2010 – 2013

Developed a *computational framework* for simulating *anisotropic nonlinear incompressible* materials with naturally built-in error estimation techniques

Introduced a *theoretical framework* for a unified treatment of *interface and contact mechanics* problems

Developed a computational technique for simulating *debonding of fibrous composites*

Implemented formulations and performed simulations using *parallel analysis libraries* FEAP and PETSc

Graduate Research Assistant: A Computational/Experimental Multiscale Approach to the Analysis of Structures Containing Mechanical Joints 2009 – 2012

Collaborated with experimentalists in the study of *frictional behavior of mechanical joints*

Implemented a *physics-based, statistical model* for friction and simulated fretting response of a lap joint

CONTECH Construction Products West Chester, OH Summers 2006, 2007, 2008

- Created and edited various types of engineering spreadsheet programs
- Performed an array of office organizational tasks

Bayer Becker Fairfield, OH; Mason, OH Summer 2005

- Conducted preliminary property traverses and topographical studies
- Set stakes on worksites for various elements of residential site development

Carson Enterprises Fairfield, OH Summer 2004

- Conversion of various wrapping materials
- Packaged customer orders

OUTREACH ACTIVITIES

COMMUNITY ENGAGEMENT

High School Introduction to Engineering Systems for Twelfth Graders 2018, '19, '21, '23

Hosted between two to four rising high school seniors from under-represented backgrounds for one week during the summer as a part of the Tickle College of Engineering office of diversity programs. Students conducted research on materials modeling and computer programming

Physics Workshop: Vector Concepts, Technologies, & Geometrical Nature '19 – '21, '23, '24

Three six-hour workshops hosted at Oak Ridge Associated Universities' classroom facilities during the summer for middle and high school teachers on recent pedagogies and technologies for topics involving vectors and mechanics

2020 workshops hosted online with teachers from multiple states

2023 workshops hosted online and in-person with teachers from multiple states

2024 workshops hosted online and in-person with teachers from multiple states

A two-part seminar and laboratory entitled “Acquaintance with Suction and Adhesion in Soft Materials” was presented to high school science students at Webb School of Knoxville. Agnila Ghosh Surovi and Robin Schlimm primarily developed the seminar slides and the laboratory involving indentation and liftoff of force sensors from gelatin hydrogel samples. More than 10 students attended some or both hour-long sessions.

GENERAL PRESENTATIONS

Truster T.J., “Graduate School and Beyond in Civil & Environmental Engineering – Perspectives from a UD Alumnus,” Department of Civil and Environmental Engineering, University of Dayton, November 11, 2016.

Truster T.J., “From Civil Engineering Graduate Studies to Interfacial Materials Modeling as a Professor,” Society for Advancement of Material and Process Engineering, University of Tennessee, February 23, 2022.

LICENSURES

Professional Engineering Licensure: Tennessee, 2017-present; Ohio, 2025-present

HONORS

Faculty Service Recognition Award, Department of Civil & Environmental Engineering, *University of Tennessee – Knoxville*, 2024

Outstanding Teaching Award, Department of Civil & Environmental Engineering, *University of Tennessee – Knoxville*, 2023

Teaching Fellow, Tickle College of Engineering, *University of Tennessee – Knoxville*, 2020

Faculty Service Recognition Award, Department of Civil & Environmental Engineering, *University of Tennessee – Knoxville*, 2019

Professional Promise in Research Award, Tickle College of Engineering, *University of Tennessee – Knoxville*, 2019

Research Recognition Award, Department of Civil & Environmental Engineering, *University of Tennessee – Knoxville*, 2018

Outstanding Teaching Award, Department of Civil & Environmental Engineering, *University of Tennessee – Knoxville*, 2017

Finalist, Twenty-Fifth Annual Robert J. Melosh Medal Competition for the Best Student Paper on Finite Element Analysis, *Duke University*, 2014

Scholar Recognition Award, Department of Civil & Environmental Engineering, *University of Tennessee – Knoxville*, 2014

Award for the Best Mathematically Oriented Poster, Computers & Mathematics with Applications, *12th U.S. National Congress on Computational Mechanics*, 2013

ACADEMIC SERVICE

COMMITTEE MEMBERSHIP

Computational Mechanics Committee, ASCE/Engineering Mechanics Institute (2014-present); Student Poster Competition Judge, 2015 Conference of the ASCE Engineering Mechanics Institute

Mechanical Behavior Committee and Titanium Committee, The Minerals, Metals, & Materials Society (TMS) (2020-present)

ORGANIZATION SERVICE

Postdoctoral Researcher Teaching Statement Workshop, Professional Development Committee, Oak Ridge National Laboratory, Oak Ridge, TN, November 4, 2016.

- Served on panel with two other assistant professors to discuss applying to academic positions with 18 postdoctoral fellows at ORNL; reviewed 6 teaching statements

AGENCY SERVICE

NSF Proposal Review Panelist, 2015

NSF Proposal Review Panelist, 2017

NSF Proposal Ad-Hoc Review, 2019

NSF Proposal Review Panelist, 2020

AFOSR Proposal Ad-Hoc Review, 2020

NEUP Proposal Ad-Hoc Review, 2021

NSF Proposal Review Panelist, 2023

NSF Proposal Ad-Hoc Review, 2025

CONFERENCE ORGANIZATION

2023 Engineering Mechanics Institute Conference, Georgia Institute of Technology, June 6 – 9, 2023, Atlanta, GA: Panel member, “Career Path Panel.”

16th U.S. National Congress on Computational Mechanics, July 25 – 29, 2021, Chicago, IL: Technical Committee member, co-organizer and moderator of “Panel on the Role of Computational Mechanics in Industry.”

CONFERENCE SYMPOSIA

Session Co-Organizer: “Advances in Damage & Fracture Modeling of Multiphysics Materials,” 16th World Congress on Computational Mechanics, July 21 – 26, 2024, Vancouver, British Columbia, Canada.

Session Co-Organizer: “Modeling of Materials with Interfaces and Scales Using Physics-Based and Machine-Learning Methods.” 2024 Engineering Mechanics Institute/ Probabilistic Mechanics & Reliability Joint Conference, University of Illinois at Urbana-Champaign, May 28 – 31, 2024, Chicago, IL.

Session Organizer: “Data Science for Fracture and Failure Mechanics of Materials,” 17th U.S. National Congress on Computational Mechanics, July 23 – 27, 2023, Albuquerque, NM.

Session Co-Organizer: “Modeling of Materials with Interfaces and Scales Using Physics-Based and Machine-Learning Methods.” 2023 Engineering Mechanics Institute Conference, Georgia Institute of Technology, June 6 – 9, 2023, Atlanta, GA.

Session Organizer: “Industrial Perspectives on Computational Mechanics,” 16th U.S. National Congress on Computational Mechanics, July 25 – 29, 2021, Chicago, IL.

Session Organizer: “Computational Mechanics for Performance and Damage of Materials,” 16th U.S. National Congress on Computational Mechanics, July 25 – 29, 2021, Chicago, IL.

Session Organizer: “Computational Methods and Applications for Solid and Structural Mechanics,” 2021 Engineering Mechanics Institute Conference, June 25 – 28, 2021, New York, NY

Session Organizer: “Computational Mechanics for Performance and Damage of Materials,” 14th World Congress on Computational Mechanics, January 11 – 15, 2021, Virtual.

- Session Organizer: “Computational Mechanics for Performance and Damage of Materials,” 15th U.S. National Congress on Computational Mechanics, July 28 – August 1, 2019, Austin, TX.
- Session Organizer: “Mechanics of Rocks and Anisotropic Polycrystals,” 2019 Engineering Mechanics Institute Conference, California Institute of Technology, June 18 – 21, 2019, Pasadena, CA
- Session Organizer: “Computational Methods and Applications for Solid and Structural Mechanics,” 2019 Engineering Mechanics Institute Conference, California Institute of Technology, June 18 – 21, 2019, Pasadena, CA
- Session Organizer: “Integrated Computational Materials Engineering (ICME),” 13th World Congress on Computational Mechanics, July 22 – 27, 2018, New York, New York
- Session Organizer: “Computational Methods and Applications for Solid and Structural Mechanics,” 2018 Engineering Mechanics Institute Conference, May 29 – June 1, 2018, Cambridge, MA
- Session Organizer: “Stabilized and Multiscale Methods for Interface Mechanics,” 14th U.S. National Congress on Computational Mechanics, July 17 – 20, 2017, Montreal, Ontario
- Session Organizer: “Computational Methods and Applications for Solid and Structural Mechanics,” 2017 Engineering Mechanics Institute Conference, June 4 – 7, 2017, San Diego, CA
- Session Organizer: “Computational Methods and Applications for Solid and Structural Mechanics,” 2016 Engineering Mechanics Institute/ Probabilistic Mechanics & Reliability Joint Conference, May 22 – 25, 2016, Nashville, TN
- Session Co-Organizer: “Modeling the Mechanics of Material Surfaces and Interfaces,” 2016 Engineering Mechanics Institute/ Probabilistic Mechanics & Reliability Joint Conference, May 22 – 25, 2016, Nashville, TN
- Session Co-Organizer: “Stabilized and Multiscale Methods for Interface Mechanics,” 13th U.S. National Congress on Computational Mechanics, July 27 – 30, 2015, San Diego, CA
- Session Co-Organizer: “Computational Methods and Applications for Solid and Structural Mechanics,” 2015 Conference of the ASCE Engineering Mechanics Institute, June 16 – 19, 2015, Stanford, CA
- Session Co-Organizer: “Stabilized and Multiscale Methods for Interface Mechanics,” 17th U.S. National Congress on Theoretical & Applied Mechanics, June 15 – 20, 2014, East Lansing, MI

REVIEW ACTIVITIES

Journal of Engineering Mechanics (2013-present), Finite Elements in Analysis and Design (2014-present), Journal of Applied Mechanics (2014-present), Engineering Fracture Mechanics (2014, 2024), Advances in Applied Mathematics and Mechanics (2015), Computer Methods in Applied Mechanics and Engineering (2015-present), Mechanics Research Communications (2015-present), International Journal of Heat and Mass Transfer (2016), Materials (2016-present), International Journal of Mechanical Sciences (2016-present), International Journal for Numerical Methods in Engineering (2017-present), Crystals (2017), International Journal for Solids and Structures (2017-present), Journal of Pressure Vessel Technology (2018-present), International Journal for Fatigue (2018, 2022), Metals (2018-present), Journal of Computational and Applied Mathematics (2019), AIAA Journal (2019), International Journal of Plasticity (2019-present), Composites Part B (2020-present), Journal of Structural Engineering (2020-present),

Journal of Computational Physics (2020-present), SoftwareX (2022, 2024), Materials & Design (2022-2023), Materialia (2023), International Journal of Pressure Vessels and Piping (2023), Engineering Computations (2024), Friction (2024)

UNIVERSITY OF TENNESSEE

Departmental Library Representative, CEE, 2014 – Present
Search Committee, Assistant Professor of Structures, CEE, 2014-2015
Search Committee, Assistant Professor of Structures, CEE, 2015-2016
Awards Committee, CEE, 2016-2023
Search Committee, Assistant Professor of Construction, CEE, 2018-2019
2019 ASCE Southeast Student Conference, CEE, surveying competition co-chair, 2019
2019 Southeast Regional Student Steel Bridge Competition, CEE, co-chair, 2019
Chi Epsilon Chapter Faculty Advisor, 2019 – Present
Structures, Geotechnical and Construction Seminar Coordinator, CEE, 2022-2023
Faculty Senator, Tickle College of Engineering Caucus, 2022 – Present
Libraries and Information, 2022 – 2023
Research Council, 2023 – 2025
Ad-Hoc Committee on Faculty Mentoring, CEE, 2023-2024
Quality Enhancement Plan (QEP) Steering Committee, member: 2023 – 2024

- As part of the Southern Association of Colleges and Schools Commission on Colleges (SACSCOC) accreditation every 10 years, the university develops an initiative aimed at “improving student learning outcomes and/or student success”.
- By combining input from university students, faculty and staff; institutional data and research; and broader academic research and national trends, the steering committee is charged to develop this initiative for the upcoming accreditation cycle.

PROFESSIONAL AFFILIATIONS

American Society of Civil Engineers (ASCE), 2004 – Present
American Society of Mechanical Engineers (ASME), 2010 – Present
Structural Engineers Association (SEA), 2008 – Present
Chi Epsilon (XE), 2006 – Present
United States Association for Computational Mechanics (USACM), 2012 – Present
American Society of Engineering Education (ASEE), 2013 – Present
The Minerals, Metals, & Materials Society (TMS), 2020 – Present
Society of Engineering Science (SES), 2021 – Present

REFERENCES

Chris Cox
Department Head and Robert M. Condra Professor
Dept. of Civil and Environmental Engineering
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