

Exponent® Engineering & Scientific Consulting

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Professional Profile

Dr. Gleason is a mechanical engineer in Exponent's Mechanical Engineering Practice with a background in finite element analysis (FEA), collision welding mechanics, mechanics of materials, and pulsed laserbased manufacturing processes. He has extensive experience in the Abaqus software for solid mechanics analysis, including the use of Eulerian (volume-of-fluid) frameworks for modeling nonlinear impact deformation and adding experimentally acquired geometries using Python scripting.

During his research collaborations, Dr. Gleason prepared nanosecond-pulsed laser experiments for impact welding thin metallic parts, performed joint strength experiments on various samples, and implemented plasma pressure models in finite element simulations derived from optical measurements of pulsed laser beams. He has used MATLAB extensively, implementing the software to process digital images for surface profile characterization, impose inhomogeneous material properties in impact welding models, and model metallic plasticity.

As a Teaching Assistant at the University of Texas at Dallas, Dr. Gleason utilized various engineering modeling software including SolidWorks and Creo Parametric. For the University's project courses in statics and dynamics, Dr. Gleason supervised student teams and oversaw the production of their designs with Stratasys 3D printers. He was awarded teaching assistantships for courses in engineering dynamics and vibrations and served as a volunteer for his research group's annual Engineering Brighter Futures for Autism outreach event. Dr. Gleason also has experience working with the solid mechanics modeling software LS-DYNA and Ansys Workbench.

Dr. Gleason's experience prior to joining Exponent includes civil and municipal engineering consulting, where he made extensive design contributions for infrastructure projects in the North Texas area, including the development of a municipal utility design study. During this time, Dr. Gleason employed several civil engineering software packages such as AutoCAD and WaterCAD to analyze proposed municipal developments and model city water distribution. Additionally, he supported the construction consulting practice of his firm by inspecting construction sites for municipal contract compliance.

Academic Credentials & Professional Honors

Ph.D., Mechanical Engineering, University of Texas, Dallas, 2022

- M.S., Mechanical Engineering, University of Texas, Dallas, 2019
- B.S., Engineering, University of California, Berkeley, 2004

Outstanding Teaching Assistant Award, The University of Texas at Dallas, 2021

Prior Experience

Teaching Assistant, The University of Texas at Dallas Department of Mechanical Engineering, 2019-2022

Search Engine Evaluator, Raterlabs, 2011-2019

Engineering Associate, Bucher, Willis, & Ratliff Corporation, 2005-2011

Professional Affiliations

American Society of Mechanical Engineers (ASME) – Member

Publications

Journal Articles

Gleason G, Bailey K, Sunny S, Malik A, Bernal RA. Influence of surface roughness on transient phenomena occurring during laser impact welding. Journal of Manufacturing Processes 80 (2022); 480-490.

Gleason G, Sunny S, Mathews R, Malik A. Numerical investigation elucidating effects of microstructure on the transient thermomechanical phenomena during laser impact welding. Journal of Manufacturing Processes 79 (2022); 115-125.

Gleason G, Sunny S, Mathews R, Malik A. Numerical investigation of the transient interfacial material behavior during laser impact welding. Scripta Materialia 208 (2022); 114325.

Gleason G*, Sunny S*, Mathews R, Malik A. Simulation of laser impact welding for dissimilar additively manufactured foils considering influence of inhomogeneous microstructure. Materials & Design 198 (2021); 109372. [*: Joint first author]

Sunny S, Mathews R, Gleason G, Malik A, Halley J. Effect of metal additive manufacturing residual stress on post-process machining-induced stress and distortion. International Journal of Mechanical Sciences 202 (2021); 106534.

Sunny S, Gleason G, Bailey K, Mathews R, Malik A. Importance of microstructure modeling for additively manufactured metal post-process simulations. International Journal of Engineering Science 166 (2021); 103515.

Sadeh S, Gleason G, Hatamleh MI, Sunny S, Yu H, Malik A, Qian D. Simulation and experimental comparison of laser impact welding with a plasma pressure model. Metals 9, no. 11 (2019); 1196.

Conference Proceedings

Sunny S, Gleason G, Sitaula K, Malik A. Predictive Modeling of Laser Shock Peening Induced Near-Surface Residual Stress in Alumina. Procedia Manufacturing 53 (2021); 80-91.

Gleason G, Sunny S, Sadeh S, Yu H, Malik A. Eulerian Modeling of Plasma-Pressure Driven Laser Impact Weld Processes. Procedia Manufacturing 48 (2020); 204-214.

Sunny S, Gleason G, Malik A. Comparison of numerical methods for fluid-structure interaction simulation of fused deposition modeled nylon components. Procedia Manufacturing 34 (2019); 516-527.

Presentations

Gleason G, Sunny S, Mathews R, Malik A. Numerical investigation elucidating effects of microstructure on

the transient thermomechanical phenomena during laser impact welding. 50th North American Manufacturing Research Conference, West Lafayette, IN, 2022.

Gleason G. Computational Analysis of Laser Impact Welding Processes. Summer Undergraduate Research Seminar, The University of Texas at Dallas, Richardson, TX, 2022.

Sunny S, Gleason G, Sitaula K, Malik A. Predictive Modeling of Laser Shock Peening Induced Near-Surface Residual Stress in Alumina. 49th North American Manufacturing Research Conference, Cincinnati, OH, 2021.

Peer Reviews

Metals

Manufacturing Letters