

Robert L. Jackson
Professor, Auburn University
SUMMARY (Updated July, 2026)

TEACHING

Advised as Major Professor:

Ph.D. Students Graduated	12
Masters Students Graduated	23
Undergraduate Honors Thesis	2

Advised as Committee Member:

Ph.D. Students Graduated	30+
Masters Students Graduated	30+

Courses Taught:

Number of Different Courses Taught	6
New courses Developed	4

Teaching Awards:

- 2014 STLE Recognition for Commitment to the Advancement of the Science of Tribology
- 2013 Mark A. Spencer Creative Mentorship Award (with Ryan Whitmore)

New Program

Created Undergraduate Minor in Tribology (*first in USA*) in 2012.

SERVICE and OUTREACH

Professional Organizations:

Chair, Prev., STLE Conf. Planning Cmte.
 Director, Prev., STLE Board
 Chair, Prev. IEEE Holm Conference Program
 Chair, Prev. ASME Tribology Division
 Chair, Prev. Chattahoochee Section, ASME
 Chair, Prev. STLE Steering Committee
 Chair/Co-Chair of over 40 Tech. Sessions

Auburn University:

Chair: Mech. Eng. Design and Man. Group
 Director, IDEAS Program
 Director, Tribology Minor
 ASME Faculty Advisor 2005-2014
 STLE Faculty Advisor 2012-
 Judge, Research Week, GERS, GSF

Journal Service:

Editor-in-Chief, ASME J. of Tribol., 2024-
 Technical Editor, STLE Tribology and
 Lubrication Technology, 2014, 2015, 2016
 Reviewed over 300 papers for 30+ journals

Other Service and Outreach:

Propoosal Review, NSF, DoE
 Started Tribology Minor in 2012
 Received over \$100k in external funds
 Donated test equipment (10+)
 Taught 30+ Distance Learning Courses

RESEARCH

Publications:

Refereed Journal Publications	130+
Publication citations	
Citations of top paper	900+
Total Citations	10,000+
H Index	50
Chapters in Books	4
Other Publications (discussions, etc.)	3
Conf. Presentations (Papers)	170+ (80+)
Invited Lectures	25+

Patents: Patent Disclosures Submitted 3

Research Related Awards:

- Fellow, ASME
 - Fellow, STLE
 - 2022 AU Undergraduate Research Award
 - 2022: IPC APEX EXPO Conference, Honorable Mention
 - 2021 NLGI Ralph Beard Memorial Academic Award
 - 2011 ASME Burt L. Newkirk Award for notable contributions to the field of tribology before reaching the age of 40.
 - 2009 Erle Shobert Prize Paper Award at the 55th IEEE Holm Conference on Electrical Contacts.
 - 2009 STLE Hunt Award: Best paper published in the field of lubrication for Jackson, R. L., Green, I., 2008, *Trib. Trans*, 51, 1, pp. 19–32.
 - Best Oral Presentation, 2020 International Tribology Research Symposium
 - 2008, 2009 Best Reviewer for the ASME Journal of Tribology
- Other Recent Student Awards*
- 2025 NLGI Author Award (Jack Janik)
 - 2015 UKC Conference Best Poster Award (Hyeon Lee)
 - First Place, 2013 Graduate Engineering Research Showcase (Hamed Ghaednia) –First time Mech. Eng. won.
 - 2013, 2015, 2016 STLE Booser Fellowship (H. Neuffer, C. Jaudon, Z. Tucker)

Robert L. Jackson
A. J. Smith Jr. Chaired Professor
Director, Tribology Minor Program
Department of Mechanical Engineering
Auburn University
(334)663-5999
jacksr7@auburn.edu
1418 Wiggins Hall
Auburn, AL 36849

Professional Preparation

Ph.D. Mechanical Engineering, Georgia Institute of Technology,
 Thesis Title: *The Wear and Thermo-elastohydrodynamic Behavior of Thrust Washer Bearings Under Non-Axisymmetric Loads*
 Major: Friction, Lubrication and Wear Minor: Dynamics and Vibrations
 Advisor: Itzhak Green

M.S. Mechanical Engineering, Georgia Institute of Technology

B.S. Mechanical Engineering, Georgia Institute of Technology

Appointments

Professor, Oct. 1, 2015-
 Auburn University – Department of Mechanical Engineering
 Description: Education and research in Mechanical Engineering, specifically multi-scale tribology and machine design.

Associate Professor, Oct. 2009-Oct. 2015
 Auburn University – Department of Mechanical Engineering

Assistant Professor, July 2004-Oct. 2009
 Auburn University – Department of Mechanical Engineering

Graduate Research Assistant, 1998-2004
 The Center for Surface Engineering and Tribology – Georgia Institute of Technology
 Description: Design, maintenance and operation of thrust washer bearing test rig. Construction and implementation of numerical simulation of thrust washer bearing system.

Undergraduate Research Position, Summer 1997
 Georgia Institute of Technology – The Woodruff School of Mechanical Engineering

Engineering Intern, Summer 1996
 Raytheon E-Systems Communications Division

Honors and Awards

- 2024 Best Paper in Lubricants for: “Jackson, R. L., & Angadi, S. (2022). Modelling of lubricated electrical contacts. *Lubricants*, 10(3), 32.”
- 2022 Fellow of the American Society of Mechanical Engineers
- 2018 Fellow of the Society of Tribologists and Lubrication Engineers
- 2022 Auburn University Undergraduate Research Mentorship Award
- 2021 National Lubricating Grease Institute (NLGI) Ralph Beard Memorial Academic Award
- 2022: IPC APEX EXPO Conference, Honorable Mention
- Best Oral Presentation, 2020 International Tribology Research Symposium for **ITRS081**: Jackson, R. L., Xu, K., Chu, N., An Investigation of the Elastic Cylindrical Line Contact Equations for Plane Strain and Stress Considering Friction.
- 2014 Society of Tribologists and Lubrication Engineers (STLE) Recognition for Commitment to the Advancement of the Science of Tribology (via the Auburn University Tribology Minor)
- 2013 Mark A. Spencer Creative Mentorship Award (with Ryan Whitmore)
- 2011 American Society of Mechanical Engineers (ASME) Burt L. Newkirk Award
- 2009 Erle Shobert Prize Paper Award at the 55th IEEE Holm Conference on Electrical Contacts for Jackson, R. L., Malucci, R. D., Angadi, S., Polchow, J. R., A Simplified Model of Multiscale Electrical Contact Resistance and Comparison to Existing Closed Form Models, *The 55th IEEE Holm Conference on Electrical Contacts*, Vancouver, BC, Canada, September 14-16, 2009.
- 2009 STLE Hunt Award: Best paper published in the field of lubrication for Jackson, R. L., Green, I., The Thermoelastic Behavior of Thrust Washer Bearings Considering Boundary Lubrication, Asperity Contact and Thermoviscous Effects, 2008, *Trib. Trans*, 51, 1, pp. 19–32.
- 2015 Conference Best Poster Award for H. Lee, R. L. Jackson, R. R. Hanson, Equine Articular Cartilage Hyperelastic Properties Differ Between Joints, US-Korea Conference 2015, Atlanta, GA, July 29 - August 1, 2015.
- First Place, 2013 Graduate Engineering Research Showcase, Hamed Ghaednia –First time Mechanical Engineering had won.
- Best Presentation, Jack Janik Janik, J. R., Saha, S., Jackson, R. L., Bond, S., Mills, G., 2023 Research Grant Report, Electric Vehicle Rolling Element Damage and the Influence of Test Conditions and Contact Nanoparticle Grease Additives, *91st Annual NLGI Meeting*, San Antonio, TX, USA, June 10-13, 2024.
- 2025 STLE Annual Meeting Silver Best Poster Award, Sudip Saha (PhD Student), Janik, J. R., Jackson, R. L., Effect of Oil Viscosity and Nanoparticle Additives on Electrically Induced Pitting in Rolling Element Contacts, *STLE 79th Annual Meeting and Exhibition*, Atlanta, GA, May 18-22, 2025.
- 2013 STLE Annual Meeting Best Poster Award, Hamed Ghaednia (PhD Student), “The Effect of Nanoparticle Additives in the Elasto-hydrodynamic Lubrication Regime”, *STLE 68th Annual Meeting*, Detroit, MI, May 5-9, 2013.
- 2019 Auburn University Masters Thesis Award (Alex Locker)
- 2024 Auburn University Masters Thesis Award (Jack Janik)
- 2023, 2015 ILMA R. F. Jackson Award (Jack Janik, Masters student; Xiaohan Zhang, PhD student)
- 2013, 2016, 2017 Merriwether Fellowship (Hamed Ghaednia, Hamid Ghaednia, Yang Xu)

- 2013 Outstanding Auburn University Masters Student (Hyeon Lee)
- 2013, 2015, 2016, 2026 STLE Booser Fellowship (Moises Munoz Paredes, Hannah Neuffer, Chris Jaudon, Zoe Tucker, Tribology Minor students)
- 2011 Level 3 Grant via AU's Intramural Grant Program on "Articular Cartilage Mechanical Behavior with Respect to the Various Operating Conditions of Specific Joints"
- 2008, 2009 Best Reviewer for the ASME Journal of Tribology (Twice)
- NSF Fellowship (Summer Course)–July 2004, July 2006
- 2006, 2010, 2012, 2013, 2016, 2025 Auburn Undergraduate Research Fellowship - Christine Taylor, Patrick Smyth, Ryan Whitmore, William Campbell, Zoe Tucker, Moises Munoz Paredes

Research/Creative Work

Book Chapters

Jackson, R. L., Schulze, K. D., Hossain, M. S., Rahman, M. A., Jones, P. D., "Tribology of Biomimetic Surfaces," in *Encyclopedia of Tribology and Lubrication* Edited by Jun Qu, Stefanie Hanke, Amsterdam, Netherlands, Elsevier, 2026. <https://doi.org/10.1016/B978-0-443-30138-4.00074-1>

Jackson, R. L., "Electrical Contact of Rough Surfaces," in *Encyclopedia of Tribology and Lubrication* Edited by Jun Qu, Stefanie Hanke, Amsterdam, Netherlands, Elsevier, 2026. <https://doi.org/10.1016/B978-0-443-30138-4.00008-X>

Janik, J. R., Jackson, R. L., Saha, S., "Electrified Pin-on-Disk Testing of Greases," in *Electric Vehicle Fluid Testing* Edited By Farfan Cabrera, L.I., Lee, P., and Erdemir, A., Boca Raton, FL, USA, Imprint/CRC Press, 2025.

Jackson, R. L., "Modelling of Electrical Resistance of Lubricated Contacts," In *Electric Vehicle Tribology: Challenges and Opportunities for a Sustainable Transportation Future*, edited by Farfan Cabrera, L.I. and Erdemir, A., Elsevier, Amsterdam, Netherlands, 2024.

Jackson, R. L., "Stochastic Contact Theories: Other Theories Based on the Greenwood-Williamson Model." Chap. 514 In *Encyclopedia of Tribology*, edited by Wang, Q. J. and Chung, Y.-W., P. 3299-306: Springer US, 2013.

Jackson, R. L., Ghaednia, H., Lee, H., Rostami, A., Wang, X., "Contact Mechanics." In *Tribology for Scientists and Engineers*, edited by Menezes, P.L.; Ingole, S.; Nosonovsky, M.; Kailas, S.V.; Lovell, M.R., p. 946: Springer US, 2013.

Jackson, R. L., "Chapter 14: Lubrication," in *Handbook of Lubrication and Tribology*, Volume II: Theory and Design, edited by Bruce, R.W., pp. 14.1-14.14 Boca Raton, FL, USA, CRC Press, 2012.

Article-length Publications

Dr. Jackson has helped to author over 130 journal articles. These publications have been accepted to a wide range of well-respected technical journals, including Applied Physics Letters, ASME Journal of Tribology, ASME Journal of Applied Mechanics, Mechanics of Materials, ASME Journal of Heat Transfer, STLE Tribology Transactions, Wear, IEEE Transactions on Components and Packaging Technologies, Tribology International, Tribology Letters, Engineering Failure Analysis, and IMECHE Part J. Journal of Engineering Tribology. This shows that Dr. Jackson's work is not only making impacts in the field of tribology, but also in heat transfer and electronics.

Refereed Journal Publications:

-Note that a * indicates that an author is a graduate or undergraduate student.

Published or Accepted

134. Morris, N., Yang Xu , Sudip Saha*, Yue Wu and Robert L. Jackson, Role of Electrical Discharge Pits in Accelerating Electrical Wear in Elastohydrodynamic Contacts, 2027, *Tribology International*, 226, 1, <https://doi.org/10.1016/j.triboint.2026.112492>
133. Fatima, N.*; Jahromi, H.; Saha, S.*; Adhikari, S.; Jackson, R. L., Comparative analysis of biolubricants produced via transesterification, epoxidation, and a novel Friedel Crafts acylation-based process, 2026, *Fuel*, 422, p.139172. <https://doi.org/10.1016/j.fuel.2026.139172>
132. Saha, S.* , Munoz Paredes, M.* , Luo, H., Mill, G., Qu, J., Jackson, R.L, Effect of oil viscosity and impact of ionic liquid additive on electrically induced pitting in rolling contact, 2026, *ASME Journal of Tribology*, 148(8): 081108. <https://doi.org/10.1115/1.4070924>
131. Baugh, L. E.*; Mahmood, S.*; Ahmad, N.*; Shamsaei, N.; Schulze, K. D.; Jackson, R. L.; Using Spectral Extrapolation to Resolve Surface Characterization from Limited Rough Surface Data of Additively Manufactured Parts, 2026, *IOP Engineering Express*, 8 (3), 035505. <https://doi.org/10.1088/2631-8695/ae388a>
130. Henry, K.* , Himmelman, H. K.* , Chu, N. R.* , Hanson R. R., Schulze, K., Jackson, R. L., The Influence of Probe Diameter on Articular Cartilage Friction Measurements, 2026, *ASME Journal of Tribology*, 148(5): 051111. <https://doi.org/10.1115/1.4070804>
129. Jackson, R. L., Liu, S., Chu, N. R.* , An Investigation of Axisymmetric Spheroidal Indentation, 2025, *ASME Journal of Applied Mechanics*, 92(12): 124502 (6 pages) <https://doi.org/10.1115/1.4070024>
128. Mahmood, S.* , Baugh, L.* , Lee, S.* , Ahmad, N.* , Silva, D. F., Vinel, A., Liu, J., Shao, S., Shamsaei, N., Jackson, R. L., Shulze, K., A comparative analysis of non-destructive surface roughness measurement techniques for additively manufactured metal parts, *Additive Manufacturing*, 2025, 105 (5): 104791. <https://doi.org/10.1016/j.addma.2025.104791>
127. Nikfar, M.* , Irfan, S., Baugh, L., Mahmood, S., Ahmad, N., Liu, J., Jackson, R.L., Shulze, K., Shao, S., Vinel, A., Shamsaei, N., On extreme value theory-based estimation of surface quality for metal additive manufacturing, *Progress in Additive Manufacturing*, 2025, **10**, 6657–6672. <https://doi.org/10.1007/s40964-025-00998-6>
126. Xu, Y., Wu, Y., Jackson, R. L., Electrical contact with dielectric breakdown of 2 interfacial gap, 2025, *ASME J. Tribol.* 147(5): p. 051109. <https://doi.org/10.1115/1.4067373>

125. Janik, J. R.*, Saha, S.*, Jackson, R.L., Rheological and Electro-Pitting Performance of Electric Vehicle Motor Greases with Various Nanoparticle Greases, 2025, *ASME J. Tribol.*, 147(5): p. 051110. <https://doi.org/10.1115/1.4067489>
124. Jackson, R.L., Saha, S.*, Janik, J. R.*, A Statistical Prediction of Electrical Discharge Initiation and Semi-Analytical Transient Mixed Lubrication Model of a Rolling Element, 2025, *ASME J. Tribol.*, 147(5): p. 051103. <https://doi.org/10.1115/1.4066520>
123. Janik, J. R.*, Saha, S.*, Jackson, R.L., Exploring the Boundaries of Electrically Induced Bearing Damage in Grease Lubricated Rolling Contacts, 2024, *Lubricants*, 12, 8, p. 268. <https://doi.org/10.3390/lubricants12080268>
122. Xu, Y., Wu, S., Jackson, R. L., A simplified formulation for Bush, Gibson and Thomas (BGT) model, 2024, *ASME J. of Tribol.*, 146(7), p. 074502. <https://doi.org/10.1115/1.4065103>
121. Bond, S.*, Jackson, R. L., Mills, G., The Influence of Various Grease Compositions and Silver Nanoparticle Additives on Electrically Induced Rolling-element Bearing Damage, 2024, *Friction*, 12, pp. 796–811. <https://doi.org/10.1007/s40544-023-0837-4>
120. Wu, Z., Zhang, Y., Xu, Y., Jie, D., Jackson, R. L., Modeling of Flash Temperature for Elastic Sliding Contact of Single Micro-Asperity Pair, 2024, *ASME J. Tribol.*, 146 (1), p.011702. <https://doi.org/10.1115/1.4063334>
119. Pope, S.*, Jackson, R. L., The Effect of Sand on the Wear of Anodized Aluminum, 2023, *Industrial Lubrication and Tribology*, 75 (9), pp. 1002-1013. <https://doi.org/10.1108/ILT-06-2023-0189>
118. Jackson, R. L., Jacobs, T. D. B., Which asperity scales matter for true contact area? A multi-scale and statistical investigation, 2023, *Mechanics of Materials*, 184, p.104746. <https://doi.org/10.1016/j.mechmat.2023.104746>
117. Roy, P.*, Rahman, T., Jackson, R. L., Jahromi, H., Adhikari, S., Hydrocarbon biolubricants from hydrotreated renewable and waste derived liquid intermediates, 2023, *Journal of Cleaner Production*, 409, p.137120. <https://doi.org/10.1016/j.jclepro.2023.137120>
116. Chu, N. R.*, Jackson, R. L., Ghaednia, H., Gangopadhyay, A., A Mixed Lubrication Model of Piston on Ring Contacts Considering Temperature Dependent Shear Thinning and Elastic-Plastic Contact, 2023, *Lubricants*, 11(5), p.208; <https://doi.org/10.3390/lubricants11050208>
115. Jackson, R. L., Crandall, E. R., Electro-thermal Modeling of One-Dimensional Conductors, Whiskers, and Wires including Convection, 2023, *Thermal Science and Engineering Progress*, 41(1), p.101831. <https://doi.org/10.1016/j.tsep.2023.101831>
114. Jackson, R. L., Angadi, S., Electrical Contact During a Rolling Vibratory Motion Considering Mixed Lubrication, 2023, *ASME J. Tribol.*, 145(8), p.082201. <https://doi.org/10.1115/1.4062295>
113. Michalec, M., Ondraa, M., Svobodaa, M., Chmelíka, J., Zemana, P., Svobodaa, P., Jackson, R. L., A novel geometry optimization approach for multi-recess hydrostatic bearing pad operating in static and low-speed conditions using CFD simulation, 2023, *Tribology Letters*, 71(2), p.52. <https://doi.org/10.1007/s11249-023-01726-3>
112. Locker IV, A. J.*, Jackson, R. L., Ghaednia, H., Gangopadhyay, A., Flow factor modeling of combustion engine ring and cylinder components in mixed hydrodynamic lubrication, 2023, *IMECHE, Part J: J. of Eng. Tribol*, 237(1), pp.210-221. <https://doi.org/10.1177/13506501221091456>

111. Li, Q., Gao, J., Flowers, G. T., Yi, W., Jackson, R. L., Hamilton, M., Investigation on vibration induced fretting in degraded contact interface, 2022, *Microelectronics Reliability*, 139, p.114794. <https://doi.org/10.1016/j.microrel.2022.114794>
110. Crilly, L.*, Jackson, R. L., Bond, S., Mills, G., Bhargava, S., An exploration of the friction, wear, and electrical effects of nanoparticle enhanced and conventional lubricants, 2022, *IEEE Transactions of Components, Packaging and Manufacturing Technology*, 12, 11, pp.1757-1770. <https://doi.org/10.1109/TCPMT.2022.3225069>
109. Jackson, R. L., “Discussion of “Ghaednia, H., Wang, X., Saha, S., Xu, Y., Sharma, A., & Jackson, R. L. (2017). A review of elastic–plastic contact mechanics. *Applied Mechanics Reviews*, 69(6). *Appl. Mech. Rev.*, 2022, 74(4), p.045501 (4 pages) <https://doi.org/10.1115/1.4055137>
108. Angadi, S. V., Jackson, R. L., A Critical Review on the Solenoid Valve Reliability, Performance and Remaining Useful Life Including its Industrial Applications, 2022, *Engineering Failure Analysis*, 136, p.106231. <https://doi.org/10.1016/j.engfailanal.2022.106231>
107. Jackson, R. L., Angadi, S. V., A Model of Contact in Lubricated Sliding Rough Electrical Contacts, 2022, *Lubricants*, 10(3), p.32. <https://doi.org/10.3390/lubricants10030032>
106. Yin, H.*, Yang J.*, Zhang, Y.*, Crilly, L.*, Jackson, R. L., Lou, X., Carbon nanotubes (CNTs) reinforced 316L stainless steel composites made by laser powder bed fusion: microstructure and wear response, 2022, *Wear*, 496-497: p. 204281. <https://doi.org/10.1016/j.wear.2022.204281>
105. Marian, M., Berman, D., Rota, A., Jackson, R. L., Rosenkranz, A., Layered 2D Nanomaterials to Tailor Friction and Wear in Machine Elements - A Review, 2022, *Applied Materials Today*, 9 (3), p.2101622. <https://doi.org/10.1002/admi.202101622>
104. KC, S.*, Adhikari, S., Jackson, R. L., An investigation of the friction and wear properties of high oleic soybean and other vegetable and mineral oils, 2021, *Int. J. of Ag. Env. Bioresearch*, 6, 5, p. 1-20. <https://doi.org/10.35410/IJAEB.2021.5679>
103. KC, S.*, Adhikari, S., Jackson, R. L., Jain, N., Friction and wear properties of biomass-derived oils via thermochemical conversion processes, 2021, *Biomass and Bioenergy*, 155, p. 106269. <https://doi.org/10.1016/j.biombioe.2021.106269>
102. Chu, N. R.*, Jackson, R. L., Ghaednia, H., Gangopadhyay, A., Evaluating Elastic-Plastic Wavy and Spherical Asperity Based Statistical & Multi-Scale Rough Surface Contact Models with Deterministic Results, 2021, *Materials*, 14, 14, p. 3864. <https://doi.org/10.3390/ma14143864>
101. Castellano, V. K.*, Jackson, R. L., Zabala, M. E., Contact Mechanics Modeling of the Semmes-Weinstein Monofilament on the Plantar Surface of the Foot, 2021, *International Journal of Foot and Ankle*, 5, p. 055. <https://doi.org/10.23937/2643-3885/1710055>
100. Zhang, X.*, Jackson, R. L., A mixed lubrication analysis of a flat-land thrust bearing with a surface optimization method, 2021, *Lubrication Science*, p. 1-12. <https://doi.org/10.1002/lc.1556>
99. Jackson, R. L., Xu, Y.*, Saha, S.*, Schulze, K. D., Elastic Rough Surface Contact and the Root Mean Square Slope of Measured Surfaces over Multiple Scales, 2021, *Fractal and Fractional*, 5, 2, p. 44. <https://doi.org/10.3390/fractalfract5020044>
98. Xu, K.*, Chu, N. R.*, Jackson, R. L., An Investigation of the Elastic Cylindrical Line Contact Equations for Plane Strain and Stress Considering Friction, 2021, *IMECHE Part J: Journal of Eng. Trib.* <https://doi.org/10.1177/1350650121992178>

97. Angadi, S., Jackson, R. L., Pujar, V., M. R., Tushar, A Comprehensive Review on the Finite Element Modelling of Electrical Connectors including their Contacts, 2020, *IEEE Transactions on Components, Packaging and Manufacturing Technology*, 10, 5, pp. 836-844. DOI: 10.1109/TCPMT.2020.2982207
96. Xu, Y.*, Chen, Y.*, Zhang, A.*, Jackson, R.L., Prorok, B. C., A Comparison of Nanoscale Measurements with Models of Real and Nominal Contact Areas, 2020, *IMECHE J. of Eng. Tribology*, 234, 11, pp.1735-1745. DOI: 10.1177/1350650120905184
95. Wang, X.*, An, B.*, Xu, Y.*, Jackson, R. L., The Effect of Resolution on the Elastic-plastic Rough Surface Contact under Combined Normal and Tangential Loading, 2020, *Tribology International*, 144, p.106141. DOI: 10.1016/j.triboint.2019.106141
94. KC, S.*, Nezhadfar, P.D.*, Phillips, C.*, Kennedy, M. S., Shamsaei, N., Jackson, R. L., 2019, Tribological Behavior of 17-4 PH Stainless Steel Fabricated by Traditional Manufacturing and Laser-based Additive Manufacturing Methods, *Wear*, 440-441, 15, pp. 203109. DOI: 10.1016/j.wear.2019.203100
93. Saha, S.*, Jackson, R. L., Elastic and Elastic-Plastic Analysis of an Axisymmetric Sinusoidal Surface Asperity Contact, 2020, *Tribology – Materials, Surfaces & Interfaces*, 14(1), pp.1-21. <https://doi.org/10.1080/17515831.2019.1663396>
92. Li, Q.*, Gao, J., Flowers, G. T., Xie, G., Jackson, R. L., Effect of Electrical Contact Degradation on Analog Signal Transmission, 2019, *IEEE Transactions on Components, Packaging and Manufacturing Technology*, 9(12), pp.2374-2382. <https://doi.org/10.1109/TCPMT.2019.2931890>
91. Zhang, X.*, Xu, Y.*, Jackson, R. L., A Mixed Lubrication Analysis of a Thrust bearing with Fractal Rough Surfaces, 2020, *IMECHE J. of Eng. Trib.*, 234(4), pp. 608-621. DOI: 10.1177/1350650119867242
90. Lee, H.*, Campbell, W. D.*, Theis, K. M.*, Canning, M. E.*, Young, H. E.*, Jackson, R. L., Hanson, R. R., Comparison on Hyperelastic Behavior between Fresh and Frozen Equine Articular Cartilage in Various Joints, 2020, *Journal of Biomechanical Engineering*, 142, 2, pp. 024501. DOI: 10.1115/1.4044031
89. Hayden, L.*, Escaro, S.*, Wilhite, D. R., Hanson, R. R., Jackson, R. L., A Comparison of Friction Measurements of Intact Articular Cartilage in Contact with Cartilage, Glass, and Metal, 2019, *J. of Biomech. Biomat. Biomed. Eng.*, 41, pp. 23-35. DOI: 10.4028/www.scientific.net/JBBBE.41.23
88. An*, B., Wang*, X., Xu*, Y., Jackson, R. L., Deterministic Elastic-Plastic Modelling of Rough Surface Contact including Spectral Interpolation and Comparison to Theoretical Models, 2019, *Tribology International*, 135, pp. 246-258. DOI: 10.1016/j.triboint.2019.02.039
87. Jackson, R. L., Coker, A.*, Tucker, Z.*, Hossain, M.*, Mills, G., An Investigation of Silver Nanoparticle Laden Lubricants for Electrical Contacts, 2019, *IEEE Trans. on Components, Packaging, and Manufacturing Tech*, 9(2), p.193-200. DOI:10.1109/TCPMT.2018.2887402
86. Wang, X.*, Xu, Y*., Jackson, R. L., Theoretical and Finite Element Analysis of Static Friction Between Multi-Scale Rough Surfaces, 2018, *Tribology Letters*, 66, 4, p. 146. DOI: 10.1007/s11249-018-1099-6
85. Ghaednia, H., Brake, M. R. W., Berryhill, W., Jackson, R. L., Strain Hardening from Elastic-Perfectly Plastic to Perfectly Elastic Flattening Single Asperity Contact, 2019, *ASME J. of Tribology*, 141(3), p.031402. DOI: 10.1115/1.4041537

84. Xu, Y.*, Jackson, R.L., Boundary element method (BEM) applied to the rough surface contact vs. BEM in computational mechanics, 2019, *Friction*. DOI: 10.1007/s40544-018-0229-3
83. Ciavarella, M., Xu, Y.*, Jackson, R.L., The generalized Tabor parameter for adhesive rough contacts near complete contact, 2019, *J. of the Mechanics and Physics of Solids*, 122, p. 126-140. DOI: 10.1016/j.jmps.2018.08.011
82. Xu, Y.*, Chen, Y.*, Zhang, A.*, Jackson, R.L., Prorok, B. C., A New Method for the Measurement of Real Area of Contact by the Adhesive Transfer of Thin Au film, 2018, *Tribology Letters*, 66, 1, p.32; DOI: 10.1007/s11249-018-0982-5.
81. Jackson, R.L., A Solution of Rigid Plastic Cylindrical Indentation in Plane Strain, 2018, *ASME Journal of Applied Mechanics*, 85, 2 ,p. 024501; DOI: 10.1115/1.4038495
80. Wang, X.*, Xu, Y.*, Jackson, R.L., The contact between elastic sinusoidal surfaces in full stick, 2017, *Tribology Letters*, 65, 156; DOI: 10.1007/s11249-017-0937-2.
79. Muser, M., et al., Meeting the Contact-mechanics Challenge, 2017, *Tribology Letters*, 65, 118 (R. L. Jackson is one of 34 authors); DOI: 10.1007/s11249-017-0900-2
78. Ghaednia, H.*, Wang, X.*, Saha, S.*, Xu, Y.*, Sharma, A.*, Jackson, R. L., A Review of Elastic-Plastic Contact Mechanics, 2017, *Applied Mechanics Reviews*, 69, 6, p. 060805; DOI: 10.1115/1.4038187.
77. Sharma, A.*, Jackson, R. L., A Finite Element Study of an Elasto-Plastic Disk or Cylindrical Contact Against a Rigid Flat in Plane Stress with Bilinear Hardening, 2017, *Tribology Letters*, 65, 3, p. 112. DOI: 10.1007/s11249-017-0894-9
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56. Jackson, R. L., Saha, S., Xu, Y., The influence of single asperity models on predicting contact between elastic rough surfaces using statistical methods, *STLE Tribology Frontiers Conference*, Denver, CO, Oct. 25-27, 2015.
55. Lee, H., Jackson, R. L., Hanson, R. R., Equine Articular Cartilage Hyperelastic Properties Differ Between Joints, *US-Korea Conference 2015*, Atlanta, GA, July 29-August 1, 2015.
54. Saha, S., Xu, Y., Jackson, R. L., The pressure to cause complete contact for a perfectly elastic axisymmetric sinusoidal surface under loading, *STLE 70th Annual Meeting*, Dallas, TX, May 17-21, 2015.
53. Jackson, R., Ghaednia, H., Pope, S., A Solution of Rigid Perfectly Plastic Deep Spherical Indentation based on Slip Line Theory, *STLE Tribology Frontiers Conference*, Rosemont, IL, Oct. 26-28, 2014.
52. Jackson, R., Rostami, A., An Analysis of the Surface Separation and Stiffness between Contacting Rough Surfaces with Multiple Scales of Asperities, *STLE Tribology Frontiers Conference*, Rosemont, IL, Oct. 26-28, 2014.
51. Ghaednia, H., Zhao, Y., Jackson, R. L., Experimental Analysis of the Tribological Properties of a Fully Formulated Lubricant with Diamond Nanoparticles Additives, *STLE Tribology Frontiers Conference*, Rosemont, IL, Oct. 26-28, 2014.
50. Canning, M. E., Theis, K. M., Lee, H., Campbell, W., Young, H. E., Hanson, R. R., Jackson, R. L., Metacarpal III Cartilage Thickness – A Comparison of Imaging Modalities, *Merital-NIH National V Scholars Symposium*, Cornell University, NY, July 31 – Aug. 3, 2014.
49. McGinnis, W. D., Pope, S., Beale, D., Jackson, R., Griffin, B., Missile Launch System Wear Study and Wear Modeling, *Joint Army-Navy-NASA-Air Force 61st Propulsion Meeting*, Charleston, SC, May 19-22, 2014.
48. Zhang, X., Jackson, R. L., An Analysis of the Multiscale Structure of Surfaces with Various Finishes, *STLE 69th Annual Meeting*, Orlando FL, May 18-22, 2014.
47. Pope, S., McGinnis, W., Jackson, R. L., Beale, D., The Effect of Sand on the Wear of Aluminum Surfaces, *STLE 69th Annual Meeting*, Orlando FL, May 18-22, 2014.
46. Ghaednia, H., Jackson, R. L., The Role of Nanoparticles in Nano-lubricants; Performing Lubricated and Dry Friction Tests, *STLE 69th Annual Meeting*, Orlando FL, May 18-22, 2014.
45. Ghaednia, H., Jackson, R. L., On Nanoparticles' Tribology: Reducing the Real Area of Contact to Reduce Friction and Control Wear, Southern Aerosol Technical Association (SATA) Fall Meeting, Destin, FL, Sept. 26-29, 2013 (invited seminar).

44. Smyth, P., Green, I., Jackson, R. L., A Strain-Dependent, Linear Viscoelastic Model of Articular Cartilage, 5th World Tribology Congress, Torino, Italy, September 8-13, 2013.
43. Rostami, A., Jackson, R. L., Predictions of the Average Surface Separation and Stiffness between Contacting Elastic and Elastic-Plastic Sinusoidal Surfaces, 5th World Tribology Congress, Torino, Italy, September 8-13, 2013.
42. Williams, M.E., Theis, K. M., Young, H. E., Lee, H., Campbell, W. D., Wright, J. C., Jackson, R. L., Hanson, R. R., The Variations in Articular Cartilage Material Properties of Fresh Equine Limb Joints, NIH/Merial Veterinary Scholars Symposium, Michigan State University, East Lansing, MI, August 1-4, 2013.
41. Theis, K. M., Williams, M.E., Young, H. E., Lee, H., Campbell, W. D., Wright, J. C., Jackson, R. L., Hanson, R. R., The Effect of Freezing on Biomechanical Characteristics of Equine Articular Cartilage, NIH/Merial Veterinary Scholars Symposium, Michigan State University, East Lansing, MI, August 1-4, 2013.
40. Lee, H., Hanson, R. R., Jackson, R. L., Comparison of Equine Articular Cartilage Stiffness in Various Joints, *UKC (US-KOREA Conference) 2013*, East Rutherford, NJ, August 7-11, 2013.
39. Rostami, A., Yang, X., Jackson, R. L., Elastic Contact Between a Geometrically-Anisotropic Bi-Sinusoidal Surface and a Rigid Base, *SES 50th Annual Technical Meeting and ASME-AMD Annual Summer Meeting* Providence, RI, July 28 - 31, 2013.
38. Yang, X., Jackson, R. L., Marghitu, D. B., Statistical Model on Nearly Complete Elastic Rough Surface Contact, *SES 50th Annual Technical Meeting and ASME-AMD Annual Summer Meeting* Providence, RI, July 28 - 31, 2013.
37. Lee, H., Hanson, R. R., Jackson, R. L., Comparison of Equine Articular Cartilage Properties between Various Joints using Two Indentation Methods, *STLE 68th Annual Meeting*, Detroit, MI, May 5-9, 2013.
36. Ghaednia, H., Jackson, R. L., Experimental Analysis of Silver Nanoparticle-Enhanced Polyethylene Glycol Lubricants, *STLE 68th Annual Meeting*, Detroit, MI, May 5-9, 2013.
35. Malpass, Chad A., Theis, Kelcie M., Young, Hannah E., Lee, Hyeon, Smyth, Patrick A., Kirkland, W. Grant, Whitmore, Ryan N., Richardson, Ashton J., Green, Itzhak, Wright, James C., Jackson, Robert L., Hanson, R. Reid, The effect of joint type on the stiffness of equine articular cartilage, *Merial-NIH National Veterinary Scholars Symposium*, Loveland, Colorado, USA, August. 2-5, 2012.
34. Theis, Kelcie M., Malpass, Chad A., Young, Hannah E., Lee, Hyeon, Smyth, Patrick A., Kirkland, W. Grant, Whitmore, Ryan N., Richardson, Ashton J., Green, Itzhak, Wright, James C., Jackson, Robert L., Hanson, R. Reid, The variation of articular cartilage thickness in equine limb joints, *Merial-NIH National Veterinary Scholars Symposium*, Loveland, Colorado, USA, August. 2-5, 2012.
33. Lee, H., Jackson, R. L., Adamson, A., Hamond, M., Hong, J., The Experimental Evaluation of Models for Contact between a Sphere and a Layered Foundation, *The ASME/STLE 2012 International Joint Tribology Conference*, Denver, Colorado, USA, Oct. 7-10, 2012.

32. Lee, H., Jackson, R. L., Hanson, R. R., Smyth, P. A., Green, I., Equine Articular Cartilage Stiffness Determination using Indentation, The ASME/STLE 2012 International Joint Tribology Conference, Denver, Colorado, USA, Oct. 7-10, 2012.
31. Rostami, A., Goedecke, A., Mock, R., Jackson, R. L., Three-dimensional Modeling of Elasto-plastic Sinusoidal contact Including Creep, ASME/STLE International Joint Tribology Conference, Denver, Colorado, USA, October. 7-10, 2012
30. Xu, Y., Jackson, R.L., Marghitu, D.B., Comparison of Statistical, Multiscale and Numerical Models of Elastic Rough Surfaces, ASME/STLE 2012 International Joint Tribology Conference, Denver, Colorado, USA, Oct. 7-10, 2012.
29. Ghaednia, H., Jackson, R. L., On the Effect of Nano-particles on Real Area of Contact, *2012 STLE Annual Meeting*, St. Louis, MO, May 6-10, 2012.
28. Jackson, R. L., Ghaednia, H., Bhavnani, S., Knight, R., An Experimental Evaluation of a Closed-Form Multiscale Thermal Contact Resistance Model, *2011 ASME/STLE International Joint Tribology Conference*, Los Angeles, CA, October 24-26, 2011.
27. Ghaednia, H., Jackson, R. L., An Analysis of the Adhesion of Contacting Three-dimensional Wavy or Sinusoidal Surfaces, *2011 ASME/STLE International Joint Tribology Conference*, Los Angeles, CA, October 24-26, 2011.
26. Ghaednia, H., Jackson, R. L., A Contact Model for Rough Surfaces Separated by Nano Particle Laden Lubricants, *2011 ASME/STLE International Joint Tribology Conference*, Los Angeles, CA, October 24-26, 2011.
25. Ghaednia, H., Jackson, R. L., Khodadadi, J., Experimental Analysis of Stable CuO Nanoparticle-Enhanced Lubricants, *2011 STLE Annual Meeting*, Atlanta, GA, May 15-19, 2011.
24. Jackson, R. L., A Multi-scale Method for Calculating the Plasticity Index, *2011 STLE Annual Meeting*, Atlanta, GA, May 15-19, 2011.
23. Xu, Y., Marghitu, D., Jackson, R. L., The Impact of Two Link Chain with a Flat Surface, *2011 STLE Annual Meeting*, Atlanta, GA, May 15-19, 2011.
22. Smyth, P., Rifkin, R., Jackson, R. L., Hanson, R., The Fractal Structure of Equine Cartilage, *2011 STLE Annual Meeting*, Atlanta, GA, May 15-19, 2011.
21. Rifkin, R., Smyth, P., Jackson, R. L., Hanson, R., Surface Roughness Comparison of Synovial Joints, *2011 STLE Annual Meeting*, Atlanta, GA, May 15-19, 2011.
20. Vadgama, B., Harris, D., Jackson, R. L., Molecular Dynamics Simulations of Dry Sliding Copper Asperities to Study Friction and Frictional Energy Dissipation, *2011 STLE Annual Meeting*, Atlanta, GA, May 15-19, 2011.
19. Fu, R., Angadi, S., Shah, S., Jackson, R. L., Choe, S.-Y., An Analysis of Electro-Thermo-Mechanical Asperity Contact, *STLE/ASME International Joint Tribology Conference*, San Francisco, CA, October 17-20, 2010.
18. Ibrahim, R., Jackson, R., Flowers, G. Measurement of Static Friction Coefficients and Comparison to Theoretical Models, *2010 STLE Annual Meeting*, Las Vegas, NV, May 16-20, 2010.
17. Jackson, R.L., Hanson, R., Jackson, R. L., A Study of the Mechanical Self Adapting Ability of Lubricated Biological Joint Surfaces, *Third International Conference on Mechanics of Biomaterials and Tissues*, Clearwater, FL, December, 13-17, 2009.

16. Wadwalker, S. S., Jackson, R. L., A Spherical Contact Model Including Severe Plastic Deformation, *ASME/STLE International Joint Tribology Conference*, Memphis, TN, October 19-21, 2009.
15. Jackson, R. L., Wilson, W. E., Multiscale Contact Modeling Using the Fourier Series and Some Recent Findings, *Gordon Research Conference on Tribology*, Colby College, ME, July 6-11, 2008.
14. Jackson, R.L., A Micro to Nano-scale Simulation of Liquid Lubricated Textured Surfaces, *2008 STLE Annual Meeting*, Cleveland, OH, May 18-22, 2008.
13. Taylor, C.L., Came, D.G., Zabala, M., and Jackson, R.L., A High Temperature Test Rig to Evaluate Bearings Using in Food Baking Applications, *2008 STLE Annual Meeting*, Cleveland, OH, May 18-22, 2008.
12. Jackson, R. L., A Multiscale Study of the Average Real Contact Pressure between Rough Surfaces, *ASME Chattahoochee Symposium on Contact Mechanics*, Auburn, AL, April 17, 2008.
11. Lei, J., Jackson, R. L., A Numerical Simulation of Lubricated Grooved Self Adapting Surfaces, *2007 STLE Annual Meeting*, Philadelphia, PA, May 6-10, 2007.
10. Duvvuru, R. S., Jackson, R. L., Hong, J. W., Novel Micro Scale Surface Textures For Hydrodynamic Lubrication, *2007 STLE Annual Meeting*, Philadelphia, PA, May 6-10, 2007.
9. Jackson, R. L., Bhavnani, S. H., Ferguson, T. P., A Multi-scale Model of Thermal Contact Resistance between Rough Surfaces, *2006 ASME International Mechanical Engineering Congress and Exposition*, Chicago, IL, USA – Nov. 5-10, 2006.
8. Jackson, R. L., Investigating the Lubricating Properties of Biofuels, *Alternative Energy Solutions From Alabama's Natural Resources*, Auburn, AL, October 23-24, 2006.
7. Jackson, R. L., Green, I., An Experimental Investigation of Various Materials on Thrust Washer Bearing Operation, *2006 STLE Annual Meeting*, Calgary, Canada, May 7-11, 2006.
6. Mahajan, M., Jackson, R. L., Flowers, G. T., Experimental and Analytical Investigation of a Dynamic Gas Squeeze Film Bearing, *2006 STLE Annual Meeting*, Calgary, Canada, May 7-11, 2006.
5. Jackson, R. L., A Micro to Nano-scale Simulation of Liquid Lubricated Textured Surfaces, *2006 ECI Frontiers of Boundary Lubrication Conference*, Lyon, France, April 9-14, 2006.
4. L. Almeida, K. Ishikawa, Q. Yu, R. Jackson, and R. Ramadoss, "Reliability Study of Ohmic contact type MEMS Relay Fabricated Using MetalMUMPS Process," *IEEE International Microwave Symposium 2005*, Long Beach, California, June 11-17, 2005.
3. Jackson, R. L., Green, I., An Investigation of a Tilted Thrust Washer Bearing Including TEHD, Asperity Contact and Boundary Lubrication Part 2: Experimental Results, *2004 STLE Annual Meeting*, Toronto, Ontario, Canada, May 16 – 20, 2004, pp. 1-29.
2. Jackson, R. L., Chusoipin, I., Green, I., A Finite Element Study of the Residual Stress and Strain Formation in Spherical Contacts, *2004 ASME/STLE International Tribology Conference*, Long Beach, California, October 24-27, 2004.
1. Jackson, R. L., Green, I., Study of the Tribological Behavior of a Thrust Washer Bearing, *56th STLE Annual Meeting*, Orlando, Florida, USA, May 20-24, 2001.

Invited Lectures, Keynotes, and Seminars:

1. "Nanoparticle and MXene Lubricant Additives for Reduction of Friction, Wear and Electrical Discharge Damage," TMS Annual Meeting, San Diego, CA, March 16, 2026
2. "The Electro-Mechanical Tribology of Rough Lubricated Interfaces," SETCOR Tribology International Conference, Albufeira, Portugal, April 23-25, 2025.
3. "Introduction to Tribology and Lubrication with Applications to Space and EV Systems," Space-X, Hawthorne, California, USA, Mar. 21, 2025
4. "How Scale Affects Roughness, Material Properties, and Electro-Mechanical Tribology," Bosch Global, Renningen, Germany, Virtual Webinar, Feb. 16, 2024
5. "Keynote: Education of the Next Workforce in Tribology," 6th International Metalworking Fluids Conference, Atlanta, GA, Jan. 8-10, 2024.
6. "Multiphysics Modeling of the Resistance across Rough Lubricated Contacts," Tribomechodynamics Conference, Rice University, August 4th, 2023.
7. "Electrical Contacts and Lubrication," ASME Tribology Division Webinar, January 25th, 2023.
8. "Electrical Contact Across Bearing Surfaces and Nanoparticle Lubricants," July 12th, 2022, Timken Quarterly Innovation Forum, Canton, OH (Virtual).
9. "Multiscale Surface Roughness Modeling of Lubricated Contacts," April 22, 2022, STLE Houston Section, Houston, TX (Virtual).
10. "Modeling of Mixed-lubrication in Machine Components," Feb. 19, 2020, Afton Chemical, Richmond, Virginia.
11. "Metal and Metal-oxide Nanoparticle Lubricant Additives," Feb. 19, 2020, Virginia Section of Society of Tribologists and Lubrication Engineers.
12. "A Comparison of Various Statistical and Multiscale Elastic-plastic Rough Surface Contact Models to Nanoscale Measurements and Deterministic Models," Feb. 11-12, 2019, International Workshop on Surface Treatment for Metallic Materials, University of Sydney, Australia.
13. "Surface and Friction Engineering," Oct. 2-3, 2016, 14th Annual Elements of Mechanical Engineering Conference, Auburn University.
14. "High Power Electrical Connector and Tribology Research," July 22, 2016, Silicon Valley Technical Seminar Series, Tyco Electronics, Harrisburg, PA
15. "Multiscale Contact Mechanics," November 13, 2015, Department of Materials Engineering Seminar Series, Clemson University.
16. "From Transmissions to Graphene: Leading Friction and Wear Research and Education into the Digital Age," March 5, 2015, Department of Mechanical Engineering Seminar Series, Clemson University.
17. "Introduction to Friction, Wear and Lubrication," Nov. 4-5, 2012, 10th Annual Elements of Mechanical Engineering Conference, Auburn University.
18. "An Introduction to Tribology and Related Research at Auburn University," July 20, 2011, Renewable Fuels Workshop, Auburn University.
19. "Multiscale Electrical and Thermal Contact Resistance," Feb. 18, 2010, Physics Department, Auburn University.
20. "Hydraulic Solenoid Valve Reliability and Modeling Study," May 29, 2008, *Korea Testing Laboratory*, Seoul, Korea.

21. “Multiscale Contact Modeling: Incorporating Micro and Nano-scale Surface Contact Effects into Larger Scale Component Models,” *2008 Materials Engineering Seminar Series*, Auburn University.
22. “Multiscale Modeling of Contact and Friction,” May 22, 2007, *Korea Institute of Science and Technology*, Seoul, Korea.
23. “Multiscale Contact Modeling: Incorporating Micro and Nano-scale Surface Contact Effects into Larger Scale Component Models,” Symposium on Virtual Tribology, *2007 STLE/ASME International Joint Trib. Conference*.
24. “Multi-scale ‘Smart’ Surfaces for Bearing and Machine Interfaces,” March 31, 2006, *NASA Glenn Research Center*, Cleveland, OH.
25. “Multi-scale ‘Smart’ Surfaces for Bearing and Machine Interfaces,” March 23, 2006, *Caterpillar Inc.*, Peoria, IL
26. “Compressible Squeeze Film Damping,” January 24, 2006, *Qualcomm, MEMS Technologies*, San Jose, CA.
27. “Multi-scale ‘Smart’ Surfaces for Bearing and Machine Interfaces,” December 14, 2005, *Hughes Christensen*, Houston, TX.
28. “The Behavior of Thrust Washer Bearings Considering the Effects of Thermoelastic Deformation and Asperity Contact,” *March 30, 2005, Oak Ridge National Laboratory*.
29. “The Behavior of Thrust Washer Bearings Considering the Effects of Thermoelastic Deformation and Asperity Contact,” *February 11, 2005, Society of Tribologists and Lubrication Engineers, Ohio Section*, Dayton, Ohio.
30. Jackson, R. L., Contact and Friction: From Asperity Interaction to Hardness Testing, *Chemical Engineering Seminars at Auburn University*, September 10th, 2004.

Patent Disclosures

Technology Disclosure submitted to the Auburn University Technology Transfer Office on “Silver Nanoparticle Additive for Lubricants.”

Technology Disclosure submitted to the Auburn University Technology Transfer Office on “Controlled Surface Texture and Profile via Microfluidics.”

Technology Disclosure submitted to the Auburn University Technology Transfer Office on “Self Adapting Mechanical Smart Bearings for Variations in Load.”

Scholarly Contributions

Dr. Jackson’s scholarly contributions are outlined in the following sections. There is a section dedicated to each area of contribution (teaching, research, and service/outreach).

Teaching

Required Courses Taught:

MECH 3130/3120 Mechanics of Materials

MECH 3230 Machine Design

Electives Taught (All Original Courses Created by Prof. Jackson):

MECH 5230/6230 Friction, Wear and Lubrication

MECH 5240/6240 Boundary and Full-film Lubrication

MECH 5250/6250 Multiscale Contact Mechanics

MECH 7970-009 Multiphysics Modeling

Graduated Advised Students (12 PhD students, 23 Masters Students)

Graduated M. S. Students

1. Manoj Mahajan, M.S. (Graduated, Fall 2006)
Thesis Title – “Experimental and Analytical Investigation of a Dynamic Gas Squeeze Film Bearing Including Asperity Contact Effects”
Current Position: Technical Team Lead at Schlumberger
2. Ravi Duvvuru, M.S. (Graduated, Fall 2007)
Thesis Title – “Novel Self-Adapting Microscale Surface Textures for Hydrodynamic Lubrication”
Current Position: Senior Oracle Programmer/Analyst at The World Bank
3. Vijaykumar Krithivasan, M.S. (Graduated, Spring 2008)
Thesis Title – “Finite Element Analysis of Three-Dimensional Elasto-Plastic Sinusoidal Contact and Inclusion in a Multi-Scale Rough Surface Contact Model”
Current Position: Packaging R&D Engineer at Intel Corporation
4. Santosh Angadi, M. S., (Graduated, Fall 2008)
Thesis Title – “Hydraulic Solenoid Valve Reliability and Modeling Study”
5. W. Everett Wilson, M. S., (Graduated, Fall 2008)
Thesis Title – “Surface Separation and Contact Resistance Considering Sinusoidal Elastic-Plastic Multi-Scale Rough Surface Contact”
Current Position: Mechanical Engineer at L-3 Communications
6. Saurabh Wadwalkar, M. S., (Graduated, Fall 2009)
Thesis Title – “A Study of Elastic Plastic Deformation of Heavily Deformed Spherical Surfaces”
Current Position: Senior Project Engineer at Nextant
7. J. Robert Polchow, M. S., (Graduated, Spring 2010)
Thesis Title – “A Multi-Physics Finite Element Analysis of Round Pin High Power Connectors”
Current Position: Field Engineer at Schlumberger
8. Rujian Fu, M. S., (Graduated, Spring 2011)
Thesis Title – “Experimental and Theoretical Analysis of High Power Connectors for Hybrid Vehicles”
Current Position: Battery Simulation Engineer at A123 Systems
9. Russell Green, M. S., (Graduated, Summer 2011)
Thesis Title – “A Non-contact Method for Sensing Tire Contact Patch Deformation Using a Monocular Vision System and Speckled Image Tracking”
Current Position: Engineer, Advanced R&D, John Deere
10. Yang Xu, M. S. (Graduated, Summer 2012)
Thesis Title – “An Analysis of Elastic Rough Contact Models”
Current Position: PhD Student at Auburn Univ.
11. James Gatherer, M. S. (Graduated, Summer 2013)
Thesis Title – “A Study of the Effect of Various Material Combinations on the Bolted Contacts of Busbars”
Current Position: Process Engineer at Intel Corporation
12. Amir Rostami, M. S. (Graduated, Summer 2013)
Thesis Title – “Three-Dimensional Modeling of Elasto-Plastic Sinusoidal Contact Under Time Dependent Deformation Including Both Stress Relaxation and Creep Analysis”

- Current Position: PhD Student, Georgia Tech
13. Hyeon Lee, M. S. (Graduated, Summer 2013)
Thesis Title – “A Comparison between the Mechanical Behaviors of Different Equine Articular Cartilage Surfaces”
Current Position: PhD Student, Virginia Tech
 14. Sara Pope, M. S. (Graduated Fall 2014)
Thesis Title – “The Effect of Sand on the Wear of Anodized Aluminum”
Current Position: Huntsville, AL.
 15. Xiaohan Zhang, M. S. (Graduated Fall 2014)
Thesis Title – “An Analysis of the Multi-scale Structure of Rough Surfaces”
Current Position: PhD student at Auburn University
 16. Yang Zhao, M. S. (Graduated Summer 2015)
Thesis Title – “Experimental Analysis of the Wear of Rubber Against Harder Materials in Reciprocating Motion”
Current Position: PhD student at the University of Arkansas
 17. Bowen An, M. S., (Graduated Fall 2017)
Thesis Title – “Deterministic Elastic-Plastic Modelling of Rough Surface Contact including Spectral Interpolation and Comparison to Theoretical Models”
 18. Geetanaj Bhandari, M. S., (Graduated Spring 2018)
Thesis Title – “A Finite Element Study of an Elastic- Plastic Axisymmetric Sinusoidal Surface Asperity in Contact Against a Rigid Flat with Strain Hardening”
 19. Alex Locker, M. S., (Graduated Spring 2018)
Thesis Title – “Use of Surface Specific Flow Factors in a Multi-Physical Model of Power Cylinder Components”
 20. Nolan Chu, M. S., (Graduated Spring 2018)
Thesis Title – “The Effect of Asperity Geometry on Elastic-Plastic Statistical and Multi-scale Rough Surface Contact Models”
 21. Larkin Crilly, M. S., (Graduated Spring 2021)
Thesis Title – “The Tribological and Electrical Effects of Nanoparticle and Proprietary Lubricants”
 22. Jack Janik, M. S., (Graduated Summer 2024)
Thesis Title – “Exploring Electrically Conductive Nanoparticle Additives in Greases for Electric Vehicle Applications”
 23. Loren Baugh, M. S., (Graduated Fall 2024)
Thesis Title – “Spectral Extrapolation from Limited Rough Surface Data of Additively Manufactured Parts”

Graduated PhD Students

1. Vijaykumar Krithivasan, Ph. D. (Graduated, Spring 2011)
Dissertation Title – “Theoretical and Experimental Analysis of Strain in a Tire Under Static Loading and Steady-State Free-Rolling Conditions”
Current Position: Project Integration and Design at Tesla
2. Santosh Angadi, Ph. D., (Graduated, Fall 2011)
Dissertation Title – “An Experimental Investigation and a Multiscale Electro-thermo-mechanical Model of a 40A High Power Electrical Connector”
Current Position: Associate Professor at Global Academy of Technology, Bangalore, India

3. Jeremy J. Dawkins, Ph. D. (Graduated Fall 2011)
Dissertation Title – “Terrain Characterization and Roughness Estimation for Simulation and Control of Unmanned Ground Vehicles”
Current Position: Professor at the U.S. Naval Academy
4. Bhavin N. Vadgama, Ph. D. (Graduated Spring 2014)
Dissertation Title – “Molecular Dynamics Simulations of Dry Sliding Asperities to Study Friction and Frictional Energy Dissipation”
Current Position: Engineering Project Director at Accurate Engineering Inc.
5. Hamed Ghaednia, Ph. D. (Graduated Fall 2014)
Dissertation Title – “An Analytical and Experimental Investigation of Nanoparticle Lubricants”
Current Position: Gehring L. P. (Director of Research and Advanced Manufacturing)
6. Hamid Ghaednia, Ph. D. (Graduated Fall 2017)
Dissertation Title – “Analytical and experimental analysis of the permanent deformation after collisions”
Current Position: Postdoc at Harvard University
7. Yang Xu, Ph. D., (Graduated Fall 2017)
Thesis Title – “Statistical Models of Nominally Flat Rough Surface Contact”
Current Position: Postdoc and Glasgow University
8. Xianzhang Wang, Ph. D., (Graduated Fall 2017)
Thesis Title – “Static Friction and Junction Growth of Contacting Three-dimensional Sinusoidal Asperities and Rough Surfaces”
Current Position: Assistant Professor at Guangdong Ocean University
9. Xiaohan Zhang, Ph. D. (Graduated Summer 2017)
Thesis Title – “An Analysis of Surface Roughness and its Influence on a Thrust Bearing”
Current Position: Assistant Professor at Qingdao University of Technology
10. Swarna Saha, Ph. D. (Graduated Summer 2020)
Thesis Title – “Development of the Contact Models to Determine Electrical Contact Resistance Including a Coupled Electro-thermo-mechanical Analysis Considering Temperature-Dependent Material Properties”
Current Position: Product Quality and Reliability Engineer, Applied Materials
11. Sanjeev KC, Ph. D., (Graduated Fall 2020)
Thesis Title – “Study of Friction and Wear Behavior Based on Different Lubricants and Materials”
Current Position: Field Engineer, Amazon Web Services
12. Nolan Chu, Ph. D., (Graduated Spring 2023)
Thesis Title – “A Rough Surface Mixed Lubrication Model of Machine Component Interfaces with an Experimental Evaluation”

Undergraduate Honors Thesis:

Patrick Austin Smyth, “An Exploration of Equine Cartilage Considering Statistical and Fractal Mathematics,” Spring, 2011

Christine Louise Taylor, “Testing of Food Grade Bearings Under Severe Conditions,” Spring, 2007

Current Students

Masters Students

1. Charles Koenig, Masters (Began Summer 2026)

Ph. D. Students

1. Sudip Saha, PhD (Began Fall 2023)

Served as a thesis committee member for the following students:

1. Rujian Fu (ME PhD to Completion)
2. Chase Wortman (Masters to Completion)
3. Patrick Smyth (Masters to Completion, Georgia Tech)
4. Dan Clary (Chemistry PhD to Completion)
5. Prajwal Swamy Sripathi (Masters to Completion)
6. Aimee Poda (ChemE PhD to Completion)
7. Rahul Jhaver (Masters to Completion)
8. Darshanuday Shinde (Masters to Completion)
9. Jordan Roberts (Masters to Completion)
10. Darrell Krueger (Masters to Completion)
11. Chris Johnson (Masters to Completion)
12. Piyush-chunilal Savalia (Masters to Completion)
13. Lia Almeida (EE Masters to Completion)
14. Paul Pearson (Masters to Completion)
15. Prakriti Choudhary (Masters to Completion)
16. Liwei Wang (Mat. Eng. PhD to Completion)
17. Kendall Hurst (ChemE PhD to Completion)
18. Dhananjay Panchagade (ME PhD to Completion)
19. Sameep U. Gupte, (ME Masters to Completion)
20. Chen Chen (ME PhD to Completion)
21. Eliza Banu (ME PhD to Completion)
22. Sakthivael Kandaswaamy (ME PhD to Completion)
23. Namu Pankaj Vijayakumar (ME Masters to Completion)
24. Namu Vijayakumar (ISYE PhD to Completion)
25. Harideepan Ravindran (ME Masters to Completion)
26. Naveed Ansari (ChemE PhD to Completion)
27. Vishnuvardhan Chandrasekaran (ME PhD to Completion)
28. Haoyue Yang (ME Masters to Completion)
29. Naved Siddiqui (Mat. Eng. PhD to Completion)
30. Melissa Peacock (ME Masters to Completion)
31. Mattie A. McMaster (Masters to Completion, Vet. Med.)
32. Francis Duggan (Masters to Completion, Department of Mechanical Engineering
National University of Ireland, Galway)
33. Hamid Ghaednia (ME Masters)
34. HongLong Wang (Mat. Eng. PhD to Completion)
35. Raj Krishna Abhiram Pasumarthy (ME Masters)

36. Patrick Smyth (PhD Georgia Tech to Completion)
37. Amir Rostami (PhD Georgia Tech to Completion)
38. Andrea Bigi (ME PhD to Completion)
39. Jeffrey Gaddes (ME Masters)
40. Jonathan Patillo (ME PhD)
41. Wesley Hunko (ME PhD)
42. Bryan Griffith (MME)
43. Pratik Deokar (ME PhD to Completion)
44. Ozdes Cermik (ME PhD to Completion)
45. Naresh Chinimilli (MME)
46. Sanjeev KC (BSE Masters to Completion)
47. Anqi Zhang (MatE PhD to completion)
48. Chongpu Zu (PhD, University of Sydney)
49. Conyours Coupland (ME Masters to Completion)
50. Anthony Owens (PhD)
51. Huaidong Yang (PhD GT)
52. Michael Carter (ME Masters to Completion)
53. Kaylee Wynn (ME Masters to Completion)
54. Taylor Owens (MME)
55. Andrea Bigi (ME PhD to Completion)
56. Pratil Deokar (PhD)
57. Ahmet Akhan (ME Masters to Completion)
58. Pu Deng (MatE PhD to Completion)
59. Vitale Castellano (ME Masters to Completion)
60. Colin Holtkamp (ME Masters to Completion)
61. Vitale Castellano (PhD to Completion)
62. Poulami Roy (PhD Biosystems Eng. to Completion)
63. Samuel Snell (PhD Ind.Eng.)
64. Houshang Yin (PhD Mat. Eng. to Completion)
65. Anthony Owens (PhD to Completion)
66. Arash Soltani Tehrani (PhD to Completion)
67. Pooriya Dastranjy Nezhadfar (PhD to Completion)
68. Nabeel Ahmad (PhD)
69. Arun Poudel (PhD)
70. Samuel Bond (PhD Chemistry to Completion)
71. Elizabeth New (ME Masters)
72. Samsul Mahmoud (ME PhD to Completion)

Courses and Curricula Developed

Dr. Jackson has created a minor in Tribology in 2012. Coinciding with the formation of the new Tribology Minor, several new courses were created. They are listed below. Some of them were actually created prior to the minor.

MECH 5230/6230/6236 – Friction, Wear and Lubrication

This course was developed by Dr. Jackson as an introductory course into friction, wear and lubrication (tribology) to senior level undergraduate students and graduate students. The course covers the theory and techniques for considering friction, wear, and lubrication in the design of machine components, and other surface interactions. The course includes a group design project on optimizing the tribological performance of a component. This course provides both very practical and very fundamental knowledge in an important area of engineering.

MECH 5240/6240/6246: Boundary and Full-film Lubrication

This course was developed to be a part of the new Tribology Minor and Auburn University. It covers the field of lubrication more thoroughly than 5230 and includes more advanced topics such as boundary film lubrication, elasto-hydrodynamic lubrication, and compressible fluid (gas) bearings. Students are taught the theory and techniques for the design and modeling of the different regimes of lubrication between surfaces and machine components in order to control friction and wear. Students will be taught how to classify the different regimes of lubrication and how mechanics and chemistry affect each of them differently.

MECH5270: Metalworking and Manufacturing Tribology

Dr. Jackson helped to create this course, but it is actually usually taught by Dr. Lewis Payton. The course includes the theory and optimization techniques for tool life and surface finish considering friction, wear and lubrication in manufacturing processes including both metalworking fluids and hard/dry machining. Students will understand the basic concepts of friction, wear, and tool life prediction. They will become familiar with all the modern manufacturing processes used throughout the southeastern United States in the marine, aerospace and automotive industries. Heavy emphasis will be placed on use of dry cutting, hard turning and water based additives as environmentally friendly alternatives to traditional metal working fluids. Students will learn the various predictive models for tool wear and apply them to case studies.

MECH 5/6970-009 – Multiscale Contact Mechanics

Dr. Jackson designed this course to give students a thorough understanding of contact mechanics while also incorporating very recent findings and methodologies. For instance, the course is organized to cover the field of contact mechanics over many different length scales. The scales covered by the course span from the macroscale for large machine components such as bearings and gears, all the way down to nanoscale contact which governs friction and is also important for the growing areas of Micro Electro Mechanical Systems (MEMS) and nanotechnology. Students are taught contact theories based on both continuum mechanics and atomistic simulations. It also includes an individual project on modeling a real contact situation.

MECH 5250 – Multi-physics Modeling: Students learn the theory and techniques for considering coupled thermal, mechanical, and electrical fields in the modeling and design of components such as MEMS, electronics, and connectors. Learn the fundamental techniques used to simultaneously solve the equations and also how to use commercial multiphysics finite element software. Includes a group design project on modeling a component using the software.

Service

Outreach

Mentor, Ogletree Elementary School, Science Olympiad, 2016-18
 Judge, Alabama Science and Engineering Fair, Spring 2022
 STLE STEM Camp 2015-2019

University Service

College of Engineering Faculty Awards Committee (2023-)
 Director, IDEAS Program (2023-)
 Chair, Manufacturing and Design Stem Committee (2024-)
 Director, Tribology and Lubrication Science Minor (2012-)
 MECH 3230 Course Coordinator (2009-)
 STLE Faculty Advisor (2012-)
 Intramural Grants Program Selection Committee (2018)
 Mechanical Engineering Faculty Search Committee (2015-19)
 Founding Member, College Engineering Faculty Research Colloquium (2014-2017)
 Mechanical Engineering Graduate Program Committee (2010-2020)
 College of Engineering Undergraduate Research Fellowship Selection Comm. (2014)
 Member, Mech. Eng. E –Day Planning Committee (2006-2014)
 ASME Faculty Advisor (2006-2014)
 Auburn Univ. Mentor Grant Selection Committee (2006, 2007)

Professional Service

Dr. Jackson has served in many positions for professional organizations such the American Society of Mechanical Engineers (ASME), the Society of Tribologists and Lubrication Engineers (STLE) and the Institute of Electrical and Electronics Engineers (IEEE).

Other held positions and service:

Professional

Editor-in-Chief, ASME Journal of Tribology (2024-)
 Conference Chair, IEEE Holm Conference on Electrical Contacts (2024-2025)
 Chair/Vice Chair, Contact Mechanics Technical Committee, STLE Annual Meeting (2024-26)
 Director, STLE Board of Directors (2018-21)
 Program Chairman, Technical Committee, IEEE Holm Conference (2019-2022)
 Program Vice Chairman, Technical Committee, IEEE Holm Conference (2017-2019)
 Intensive Course Instructor, IEEE Holm Conference on Electrical Contacts (2016-)
 Holm Conference on Electrical Contacts Prize Paper committee (2015-2018)
 STLE Annual Meeting Conference Planning Committee (2015-2022), Chair 2022
 Technical Editor, STLE Tribology and Lubrication Technology (2014-2019)
 Nomination and Oversight Committee, ASME Tribology Division (2014-2017)
 IEEE Holm Technical Program Committee (2009-)
 Chair, Executive Committee of the ASME Tribology Division, (2011-2013)
 Secretary, Executive Committee of the ASME Tribology Division (2010-2011)
 Education Chair, Executive Committee of the ASME Tribology Division (2008-2010)
 Associate Editor ASME Journal of Tribology (2010-2016)
 Founding Member of STLE Surface Engineering Tech. Cmte. (2005-2015)

Chair, PSC, STLE Surface Engineering Technical Committee (2007, 2011-2015)
 Chair, STLE Awards Committee (2004-2008)
 Chair, ASME Tribology Division Contact Mechanics Committee (2012-2013)
 Chair, STLE Steering Cmte. for Tech. Cmtes. and Ind. Boards (STLE) (2007-2009)
 Chair, ASME Chattahoochee Section (2006-2008)
 Vice Chair, ASME Chattahoochee Section (2009-2010)
 ASME 2007 Student Leadership Seminar
 Officer, ASME Nanotribology and Micro-/Nano-Systems Committee (2006-2008)
 ASME Tribology Division Membership Committee (2005-2007)

Conferences

Session Chair, Session 5: Texture/Surfaces 1, 50th Leeds-Lyon Symposium on Tribology
 Session Co-Chair, Fretting, Sliding, & Lubrication 2, 70th IEEE Holm Conference on Electrical Contacts
 Session Chair, Tribology International Conference, Albufeira, Portugal, April 23-25, 2025
 Session Chair, Surface Erosion and Wear, 2023 Holm Conference on Electrical Contacts
 Session Co-Chair, Modeling, 2023 Holm Conference on Electrical Contacts
 Session Co-Chair, Contactor and Switch Design, 2023 Holm Conference on Electrical Contacts
 Session Co-Chair, Reliability, 2023 Holm Conference on Electrical Contacts
 Session Chair, Contact Mechanics, 2023 STLE Annual Meeting
 Session Chair, Additive Manufacturing, 2021 STLE Annual Meeting (virtual)
 Session Chair, Tribotesting III, 2021 STLE Annual Meeting (virtual)
 Technical Reviewer, 2021 World Tribology Congress
 Session Chair, Young Investigator Session, 64th Holm Conference on Electrical Contacts
 Session Chair, Fluid Lubrication II, 2018 STLE Tribology Frontiers
 Session Chair, Contact Mechanics, 2018 STLE Annual Meeting
 Session Chair, Science of Tribology, Contact Mechanics V, 2017 World Tribology Congress
 Session Chair, Young Investigator Session, 63rd Holm Conference on Electrical Contacts
 Session Chair, Modeling, 2016 IEEE Holm Conference on Electrical Contacts
 Session Chair, Surfaces & Interfaces I, 2016 STLE Tribology Frontiers Conference
 Session Chair, Connectors, 2015 IEEE Holm Conference
 Session Chair, 2015 STLE Annual Meeting
 Session Chair, Advanced Methods II, 2014 STLE Tribology Frontiers Conference
 Session Chair, Macro Scales II, 2014 STLE Tribology Frontiers Conference
 Session Chair, The 60th IEEE Holm Conference on Electrical Contacts
 Chair, Contact Mechanics Symposium, SES/ASME Applied Mechanics Summer Conference
 Session Chair, MEMS, The 59th IEEE Holm Conference on Electrical Contacts
 Session Chair, Fundamentals, The 58th IEEE Holm Conference on Electrical Contacts
 Tribology Division Chair, Awards Luncheon, ASME/STLE 2012 International Joint Tribology Conference, Denver, Colorado, USA, Oct. 7-10, 2012.
 Session Chair, Contact Mechanics, 2011 STLE Annual Meeting
 Vice Chair, BioTribology Session, 2011 STLE Annual Meeting
 Contact Mechanics Joint Session (STLE Materials Technical Committee), 2011
 Co-chair of Session at the 56th IEEE Holm Conference
 Presented Awards at the International Joint Tribology Conference Awards Luncheon on behalf of ASME

Chair, Contact Mechanics I, 2009 International Joint Tribology Conference
 Chair, Surface Engineering I, 2008 STLE Annual Meeting
 Vice Chair, Surface Engineering III, 2008 STLE Annual Meeting
 Track Co-Chair, Nanotribology, 2008 International Joint Tribology Conference
 Chair, Nanotribology III - Tribofilms and Coatings, 2008 International Joint Tribology Conference
 Track Co-Chair, Nanotribology, ASME/STLE International Joint Tribology Conference, 2007.
 Chair, Surface Engineering, 2006 STLE Annual Meeting

Judging

Judge, 2026 ASEF (*Alabama Science and Engineering Fair*)
 Judge, 2026 Auburn University Research Symposium
 Judge, 2025 Dowson Prize at the Leeds-Lyon Symposium on Tribology, Leeds, UK
 Judge, 2024 Posters, Mechanical Engineering Conference
 Judge, 2022 ASEF (*Alabama Science and Engineering Fair*)
 Judge, 2022 Graduate Engineering Research Showcase
 Judge, 2020 Finish in Five Research Contest
 Judge, 2017 Graduate Engineering Research Showcase
 Judge, 2015 Graduate Engineering Research Showcase
 Judge, 2015 Elements of Mechanical Engineering Conference
 Judge, 2014 Graduate Engineering Research Showcase
 Judge, 2014 Elements of Mechanical Engineering Conference
 Judge, 2013 Graduate Engineering Research Showcase
 Judge, 2013 Graduate Scholars Forum
 Judge, 2013 IEEE Holm Young Investigator Award
 Judge, 2012 Graduate Engineering Research Showcase
 Judge, 2010 Undergraduate Research Forum
 Judge, 2007 South's BEST Regional Robotics Championship
 Judge, 2007 Undergraduate Research Forum
 Judge, 2006 Graduate Research Forum
 Judge, 2006 ASME Tribology Division Student Paper Competition

Journal Reviewer

Reviewer of over 200 papers for the following journals:

Nonlinear Dynamics, Materials Design, Fractals, Journal of Adhesion Science and Technology, Mechanics of Advanced Materials and Structures, Applied Surface Science, Philosophical Magazine, Acta Mechanica, IEEE Transactions on Components and Packaging Technologies, International Journal of Solids and Structures, ASME Journal of Vibrations and Acoustics, ASME Journal of Tribology, ASME Journal of Applied Mechanics, Powder Technology, STLE Tribology Transactions, IMechE Journal of Engineering Tribology – Part J, Journal of Colloid and Interface Science, Tribology Letters, Wear, Computers and Structures, Transactions on Mechatronics, Tribology International, Surface and Coatings Technology, Surface Review and Letters, Journal of Materials and Design