

Robert L. Jackson
Professor, Auburn University
SUMMARY (Updated May, 2024)

TEACHING

Advised as Major Professor:

Ph.D. Students Graduated	12
Masters Students Graduated	21
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*)

SERVICE and OUTREACH

Professional Organizations:

Chair, STLE Conf. Planning Cmte.
Director, Prev., STLE Board
Chair, IEEE Holm Conference Program
Chair, Prev. ASME Tribology Division
Chair, Prev. Chattahoochee Section, ASME
Chair, Prev. STLE Steering Committee
Chair/Co-Chair of over 30 Tech. Sessions

Auburn University:

ASME Faculty Advisor 2005-2014
STLE Faculty Advisor 2012-
Member: Mech. Eng. E-Day Cmte.
Member: ME Graduate Prog. Cmte.
Director, Tribology Minor
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 400 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	120+
Publication citations	
Citations of top paper	800+
Total Citations	7900+
H Index	43
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

- 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)

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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 has won.
- 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)
- 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 STLE Booser Fellowship (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 Auburn Undergraduate Research Fellowship - Christine Taylor, Patrick Smyth, Ryan Whitmore, William Campbell, Zoe Tucker

Research/Creative Work

Book Chapters

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.

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., "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.

Article-length Publications

Dr. Jackson has written over 120 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 (122):

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

Published or Accepted

122. Xu, Y., Wu, S., Jackson, R. L., A Simplified Formulation for Bush, Gibson and Thomas (BGT) model, 2024, *ASME J. of Tribol.* <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 optimisation method, 2021, *Lubrication Science*, p. 1-12. <https://doi.org/10.1002/ls.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
76. Xu, Y.*, Jackson, R.L., Periodic Contact Problems in Plane Elasticity - the Fracture Mechanics Approach, 2017, *J. of Tribol., Trans. ASME*, 140, 1, p. 011404-011411. DOI: 10.1115/1.4036920
75. Ciavarella, M., Xu, Y.*, Jackson, R.L., Some closed form results for adhesive rough contacts near complete contact on loading and unloading in the JKR regime, 2018, *J. of Tribol., Trans. ASME*, 140, 1, p. 011402-011406

74. Wang, X.*, Xu, Y.*, Jackson, R.L., Elastic-Plastic Sinusoidal Waviness Contact under Combined Normal and Tangential Loading, 2017, *Tribology Letters*, 65, p.45; DOI: 10.1007/s11249-017-0827-7
73. Zhang, X.*, Xu, Y.*, Jackson, R. L., An Analysis of Generated Fractal and Measured Rough Surfaces in Regards to Their Multi-scale Structure and Fractal Dimension, 2017, *Tribology International*. 105, p. 94-101. DOI: 10.1016/j.triboint.2016.09.036
72. Zhang, X.*, Jackson, R. L., An Analysis of the Multi-scale Structure of Surfaces with Various Finishes, 2017, *STLE Tribology Transactions*, 60, 1, p.121-134; DOI: 10.1080/10402004.2016.1152620
71. Xu, Y.*, Jackson, R.L., Statistical Models of Nearly Complete Elastic Rough Surface Contact-Comparison with Numerical Solutions, 2017, *Tribology International*, 105, p. 274-291. DOI: 10.1016/j.triboint.2016.10.003
70. Jackson, R. L., Xu, Y.*, Mahajan, M., Fundamentals and Previous Experiments of the Squeeze Film Levitation Mechanism, 2016, *Proceedings of the National Academy of Sciences of the United States of America*, 113(45): E6906-E.
69. Lee, H.*, Campbell, W. D.*, Canning, M. E.*, Theis, K. M.*, Young, H. E.*, Jackson, R. L., Hanson, R. R., Correlation between Signalment and the Biphasic Hyperelastic Mechanical Properties of Equine Articular Cartilage, 2016, *Biotribology*, 7, p. 31-37 DOI: 10.1016/j.biotri.2016.07.001
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67. Ghaednia, H.*, Jackson, R. L., Tribological Performance of Silver Nanoparticle-Enhanced Polyethylene Glycol Lubricants, 2016, *Tribology Transactions*, 59, 4, p. 585-592; DOI: 10.1080/10402004.2015.1092623
66. Ghaednia, H.*, Pope, S.*, Jackson, R. L., A Comprehensive Study on the Elasto-Plastic Contact of a Sphere and a Flat, 2015, *Tribology International*, 93, pp. 78-90; DOI: 10.1016/j.triboint.2015.09.005
65. Jackson, R. L., Crandall, E. R., Bozack, M. J., Rough Surface Electrical Contact Resistance Considering Scale Dependent Properties and Quantum Effects, 2015, *J. of Appl. Phys.*, 117, pp. 195101; DOI: 10.1063/1.4921110
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63. Xu, Y.*, Rostami, A.*, Jackson, R. L., Elastic Contact Between A Geometrically-Anisotropic Bi-Sinusoidal Surface and A Rigid Base, 2015, *ASME J. of Tribology*, 137, 2, pp. 021401; DOI: 10.1115/1.4029537
62. Ghaednia, H.*, Marghitu, D. B., Jackson, R. L., Predicting the Permanent Deformation After the Impact of a Rod with a Flat Surface, 2015, *ASME J. of Tribology*, 137, 1, pp.011403; DOI: 10.1115/1.4028709
61. Ghaednia, H.*, Jackson, R. L., Khodadadi, J. M., Experimental Analysis of Stable CuO Nanoparticle-Enhanced Lubricants, 2015, *Journal of Experimental Nanoscience*, 10, 1, p. 1-18, DOI: 10.1080/17458080.2013.778424.
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58. Lee, H.*, Theis, K M.*, Malpass, C. A.*, Jackson, R. L., Hanson, R. R., Equine Articular Cartilage Stiffness Determination using Indentation, 2014, *ASME J. of Tribology*, 137, 1, pp. 011201; DOI: 10.1115/1.4028285
57. Vadgama, B. N.*, Harris, Daniel K., Jackson, R. L., Molecular Scale Analysis of Dry Sliding Copper Asperities, 2014, *Applied Nanoscience*, DOI: 10.1007/s13204-014-0339-9
56. Jackson, R. L., Lei, J., Hydrodynamically Lubricated and Grooved Biomimetic Self-Adapting Surfaces, 2014, *Journal of Functional Biomaterials*, 5, pp. 78-100; doi:10.3390/jfb5020078
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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, Paper No. , 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 and Seminars:

1. "How Scale Affects Roughness, Material Properties, and Electro-Mechanical Tribology," Bosch Global, Renningen, Germany, Virtual Webinar, Feb. 16, 2024
2. "Keynote: Education of the Next Workforce in Tribology," 6th International Metalworking Fluids Conference, Atlanta, GA, Jan. 8-10, 2024.
3. "Multiphysics Modeling of the Resistance across Rough Lubricated Contacts," Tribomechodynamics Conference, Rice University, August 4th, 2023.
4. "Electrical Contacts and Lubrication," ASME Tribology Division Webinar, January 25th, 2023.

5. "Electrical Contact Across Bearing Surfaces and Nanoparticle Lubricants," July 12th, 2022, Timken Quarterly Innovation Forum, Canton, OH (Virtual).
6. "Multiscale Surface Roughness Modeling of Lubricated Contacts," April 22, 2022, STLE Houston Section, Houston, TX (Virtual).
7. "Modeling of Mixed-lubrication in Machine Components," Feb. 19, 2020, Afton Chemical, Richmond, Virginia.
8. "Metal and Metal-oxide Nanoparticle Lubricant Additives," Feb. 19, 2020, Virginia Section of Society of Tribologists and Lubrication Engineers.
9. "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.
10. "Surface and Friction Engineering," Oct. 2-3, 2016, 14th Annual Elements of Mechanical Engineering Conference, Auburn University.
11. "High Power Electrical Connector and Tribology Research," July 22, 2016, Silicon Valley Technical Seminar Series, Tyco Electronics, Harrisburg, PA
12. "Multiscale Contact Mechanics," November 13, 2015, Department of Materials Engineering Seminar Series, Clemson University.
13. "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.
14. "Introduction to Friction, Wear and Lubrication," Nov. 4-5, 2012, 10th Annual Elements of Mechanical Engineering Conference, Auburn University.
15. "An Introduction to Tribology and Related Research at Auburn University," July 20, 2011, Renewable Fuels Workshop, Auburn University.
16. "Multiscale Electrical and Thermal Contact Resistance," Feb. 18, 2010, Physics Department, Auburn University.
17. "Hydraulic Solenoid Valve Reliability and Modeling Study," May 29, 2008, *Korea Testing Laboratory*, Seoul, Korea.
18. "Multiscale Contact Modeling: Incorporating Micro and Nano-scale Surface Contact Effects into Larger Scale Component Models," *2008 Materials Engineering Seminar Series*, Auburn University.
19. "Multiscale Modeling of Contact and Friction," May 22, 2007, *Korea Institute of Science and Technology*, Seoul, Korea.
20. "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*.
21. "Multi-scale 'Smart' Surfaces for Bearing and Machine Interfaces," March 31, 2006, *NASA Glenn Research Center*, Cleveland, OH.
22. "Multi-scale 'Smart' Surfaces for Bearing and Machine Interfaces," March 23, 2006, *Caterpillar Inc.*, Peoria, IL
23. "Compressible Squeeze Film Damping," January 24, 2006, *Qualcomm, MEMS Technologies*, San Jose, CA.
24. "Multi-scale 'Smart' Surfaces for Bearing and Machine Interfaces," December 14, 2005, *Hughes Christensen*, Houston, TX.

25. “The Behavior of Thrust Washer Bearings Considering the Effects of Thermoelastic Deformation and Asperity Contact,” *March 30, 2005, Oak Ridge National Laboratory.*
26. “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.*
27. 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 Mechanics of Materials

MECH 3230 Machine Design

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

MECH 5230/6230/6236 Friction, Wear and Lubrication

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

MECH 5970-009/6970-009/6976-009 Multiscale Contact Mechanics

MECH 7970-009 Multiphysics Modeling

Graduated Advised Students (11 PhD students, 21 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., (Graduate Spring 2021)
Thesis Title – “The Tribological and Electrical Effects of Nanoparticle and Proprietary Lubricants”

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”

Two 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. Loren Baugh, MS (Began Summer 2022)
2. Jack Janik, MS (Began Fall 2023)

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)

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, Oglethorpe 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-)
 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)
 Tribology and Lubrication Science Minor Director (2012-)
 Manufacturing and Design Stem Committee (2004-)
 MECH 3230 Course Coordinator (2009-)
 STLE Faculty Advisor (2012-)

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-)
 Chair, IEEE Holm Conference on Electrical Contacts (2024-2025)
 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, 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, 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

Proposal Reviewer

National Science Foundation
Department of Energy
Louisiana EPSCoR
Binational Research Foundation
Israel Science Foundation
University of Wisconsin-Milwaukee

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

Reviewer of Book Chapter on “Mechanical characterization and properties of DLC films”