

Michael Cullinan

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EDUCATION

Massachusetts Institute of Technology Cambridge, MA
Ph.D., Mechanical Engineering Feb. 2008 – Feb. 2011
Thesis: Design and Fabrication of Precision Carbon Nanotube-based Flexural Transducers

Massachusetts Institute of Technology Cambridge, MA
S.M., Mechanical Engineering July 2006 – Jan. 2008
Thesis: Control of Carbon Nanotube Stiffness via Tunable Fabrication Process Parameters that Determine CNT Geometry

Swarthmore College Swarthmore, PA
B.S., Engineering, High Honors; B.A., Economics Sept. 2002 – June 2006
Thesis: Design of a Crossflow Turbine for a Hydroelectric Roller-Compacted Concrete Gravity Dam

Academic Employment

University of Texas at Austin Austin, TX
Assistant Professor, Department of Mechanical Engineering Aug. 2013 - Present
Director of Nanoscale Design and Manufacturing Laboratory

National Institute of Standards and Technology Gaithersburg, MD
National Research Council Postdoctoral Associate, Engineering Laboratory, Jan. 2012 – Aug. 2013
Intelligent Systems Division, Production Systems Group

Massachusetts Institute of Technology Cambridge, MA
Research Assistant, Department of Mechanical Engineering July 2006 – May 2011

Massachusetts Institute of Technology Cambridge, MA
Teaching Assistant, 2.72 Elements of Mechanical Design Jan. 2010 – May 2010

National Nanotechnology Infrastructure Network Santa Barbara, CA
NSF Research Experiences for Undergraduates at the University of California at Santa Barbara June 2005 – Aug. 2005

University of Minnesota, Department of Mechanical Engineering Minneapolis, MN
NSF Research Experiences for Undergraduates June – Aug. 2004

HONORS AND AWARDS

Walker Scholar, Department of Mechanical Engineering 2019
Experiential Learning Ambassador, University of Texas at Austin 2019
Best Poster Award, American Society for Precision Engineering Annual Meeting 2018
Outstanding Teaching by an Assistant Professor, Department of Mechanical Engineering 2017

2017 Rising Star Award, Sensors Expo and Conference	2017
Best Poster Award, American Society for Precision Engineering Annual Meeting	2017
Selected by UT-Austin College of Engineering to attend the National Effective Teaching Institute (NETI) hosted by the American Society for Engineering Education	2017
Outstanding Young Manufacturing Engineer Award, Society of Manufacturing Engineers	2016
Top Ranked Proposal in August 2011 NIST-NRC Postdoctoral Fellowship Review	2011
2 nd Prize, de Florez Award Competition, Graduate Science Division	2010
Best Student Poster, MIT Manufacturing Summit	2007
MIT Neil Pappalardo Fellowship	2006
Tau Beta Pi, National Engineering Honor Society	2006
Sigma Xi, The Scientific Research Society	2006

RESEARCH GRANTS RECIVED (Total since joining UT-Austin: \$1,587,937)

1. **Cullinan, M.** (PI), “Understanding the Mechanisms that Limit the Resolution and Throughput of μ -SLS,” Seed Grant, Department of Mechanical Engineering, UT-Austin, \$25,000, April 2019 – September 2019.
2. **Cullinan, M.** (PI), “Custom Designed Microelectromechanical Systems based Sensors for Direct Metrology of Additively Manufactured Parts,” Lawrence Livermore National Laboratory, \$23,171, October 18, 2018 – February 4, 2019.
3. **Cullinan, M.** (PI) “Exfoliation of Single Crystal Silicon Wafers,” NASCENT Center, UT-Austin, \$78,119, Sep. 2018 – Aug. 2019.
4. **Cullinan, M.** (PI) “Large-Area Probe-based Metrology Systems of Nanomanufacturing Applications,” NASCENT Center, UT-Austin, \$23,406, Sep. 2018 – Aug. 2019.
5. **Cullinan, M.** (PI) “Integration of NI Student Project Center into CSE Courses,” UT-Austin, \$63,858, Jan. 2018 – Dec. 2018.
6. **Cullinan, M.** (PI), “Custom Designed Microelectromechanical Systems based Sensors for Direct Metrology of Additively Manufactured Parts,” Lawrence Livermore National Laboratory, \$50,000, October 1, 2017 – September 30, 2018.
7. **Cullinan, M.** (PI) “Exfoliation of Single Crystal Silicon Wafers,” NASCENT Center, UT-Austin, \$29,471, Sep. 2017 – Aug. 2018.
8. **Cullinan, M.** (PI) “Large-Area Probe-based Metrology Systems of Nanomanufacturing Applications,” NASCENT Center, UT-Austin, \$86,848, Sep. 2017 – Aug. 2018.
9. **Cullinan, M.** (PI) “GOALI: Manufacturing USA: Determining the Role of Nanoscale Physics in the Microscale Selective Laser Sintering Process using a Multiscale Computational Modeling Approach,” National Science Foundation, \$391,354, Aug. 2017 – Jul. 2020.
10. **Cullinan, M.** (PI) “Exfoliation of Single Crystal Silicon Wafers,” NASCENT Center, UT-Austin, \$28,708, Apr. 2017 – Aug. 2017.
11. **Cullinan, M.** (PI) “Large-Area Probe-based Metrology Systems of Nanomanufacturing Applications,” NASCENT Center, UT-Austin, \$88,471, Sep. 2016 – Aug. 2017.
12. **Cullinan, M.** (PI), “Custom designed microelectromechanical systems based sensors for direct metrology of additively manufactured parts,” Lawrence Livermore National Laboratory, \$85,288, October 1, 2016 – September 30, 2017.
13. **Cullinan, M.** (PI), “Microelectromechanical Systems Based Sensors for Direct Metrology of Additively Manufactured Parts,” Lawrence Livermore National Laboratory, \$41,009, March 14, 2016 – September 30, 2016.
14. **Cullinan, M.** (PI), Crawford, R. (Co-PI), Bahadur, V. (Co-PI) “Development of Finite Element Modules for the Mechanical Engineering Undergraduate Curriculum,” Academic Development Funds, University of Texas at Austin, \$46,624, September 1, 2016 – August 31, 2017.

15. **Cullinan, M.** (PI) “Large-Area Probe-based Metrology Systems of Nanomanufacturing Applications,” NASCENT Center, UT-Austin, \$87,619, Sep. 2015 – Aug. 2016.
16. **Cullinan, M.** (PI), Crawford, R. (Co-PI), Rylander, N. (Co-PI) “Development of Finite Element Modules for the Mechanical Engineering Undergraduate Curriculum,” Academic Development Funds, University of Texas at Austin, \$47,199, September 1, 2015 – August 31, 2016.
17. **Cullinan, M.** (PI) “Selective Micro Laser Sintering for Packaging Applications,” Freescale Semiconductor Inc., \$289,581, January 23, 2015 - January 15, 2018.
18. **Cullinan, M.** (PI) “Large-Area Probe-based Metrology Systems of Nanomanufacturing Applications,” NASCENT Center, UT-Austin, \$81,346, Sep. 2014 – Aug. 2015.
19. **Cullinan, M.** (PI) “Development of Novel Nanomanufacturing Processes and Equipment,” Summer Research Assignment, University of Texas at Austin, \$19,862, Summer 2014.
20. **Cullinan, M.** (PI) “Wafer-Scale Nanomanufacturing of Graphene-Based Electromechanical Devices” Engineering Laboratory Exploratory Research Project, National Institute of Standards and Technology, \$140,000, Oct. 2012-Sep. 2013.

BOOK CHAPTERS

3. **Cullinan, M.** “Design and Fabrication of the Mechanical Systems for a Remote Control Car—A Design Project Case Study.” *Fundamentals of Machine Component Design*, Sixth Edition, Wiley, 2017.
2. **Cullinan, M.** “Micro/Nanoscale Machine Elements.” *Fundamentals of Machine Component Design*, Sixth Edition, Wiley, 2017.
1. **Cullinan, M.** “Nanoscale Sensors and Actuators for MEMS and NEMS.” *Dekker Encyclopedia of Nanoscience and Nanotechnology*, Third Edition, Taylor & Francis, 2013.

PUBLICATIONS IN REFEREED JOURNALS

* Paper with Student from Nanoscale Design and Manufacturing Laboratory as Lead Author

39. *Moser, D., **Cullinan, M.**, and Murthy, J., “Multi-Scale Computational Modeling of Residual Stress in Selective Laser Melting with Uncertainty Quantification.” (Under Review), 2019
38. *Yuksel, A., Yu, E., Murthy, J. and **Cullinan, M.**, “Thermal Transport in Nanoparticle Packings under Laser Irradiation.” (Under Review), 2019
37. *Yao, T.F., Connolly, L., and **Cullinan, M.**, “Expanded Area Metrology for Tip-based Wafer Inspection in the Nanomanufacturing of Electronic Devices.” (Under Review), 2019
36. *Ladner, I., **Cullinan, M.**, and Saha, S., “Processing-dependent tensile behavior of polymer nanowires fabricated via two-photon lithography.” *RSC Advances* (Under Review), 2019
35. *Roy, N., Behera, D., Dibua, O., Foong, C.S. and **Cullinan, M.**, “A Novel Microscale Selective Laser Sintering (μ -SLS) Process for the Fabrication of 3D Electronic Parts.” (Under Review), 2019
34. *Connolly, L., Yao, T.F., Chang, A., and **Cullinan, M.**, “A Tip-Based Metrology Framework for Real-Time Process Feedback of Roll-to-Roll Fabricated Nanopatterned Structures.” *Precision Engineering* (Accepted), 2019.

33. *Ward, M and **Cullinan, M.**, “Design of Tool for Exfoliation of Monocrystalline Micro-Scale Silicon Films.” *Journal of Micro and Nano-Manufacturing* (Accepted), 2019.
32. *Ward, M. and **Cullinan, M.**, “A Fracture Model for Exfoliation of Thin Silicon Films.” *International Journal of Fracture* (Accepted), 2019.
31. *Cho, J., Na, S., Park, S, Akinwande, D., Liechti, K., and **Cullinan, M.**, “Controlling the Number of Layers in Graphene using the Growth Pressure.” *Nanotechnology* (Accepted), 2019.
30. *Yuksel, A., Yu, E., Murthy, J., and **Cullinan, M.** “Effect of Particle Size and Distribution on Near-Field Thermal Energy Transfer within the Nanoparticle Packings.” *Journal of Photonics for Energy*, Vol.6, 2019, pp. 032707.
29. *Roy, N., Behera, D., Dibua, O. Foong, C.S., and **Cullinan, M.**, “Experimental Study of the Subsystems in a Microscale Additive Manufacturing Process.” *JOM*, Vol. 71, 2019, pp 974–983.
28. *Dibua, O., Yuksel, A., Roy, N., Foong, C.S., and **Cullinan, M.**, “Nanoparticle Sintering Model, Simulation and Calibration Against Experimental Data.” *Journal of Micro and Nanomanufacturing*, Vol. 6, 2018, pp. 041004.
27. *Roy, N. and **Cullinan, M.**, “Fast Trajectory Tracking of a Flexure-based, Multi-Axis Nanopositioner with 50 mm Travel.” *IEEE/ASME Transactions on Mechatronics*, Vol 23, 2018, pp. 2805 - 2813.
26. *Roy, N., Behera, D., Dibua, O., Foong, C.S., and **Cullinan, M.**, “Single shot, large area metal sintering with micrometer level resolution.” *Optics Express*, Vol. 26, 2018, pp. 25534-25544
25. *Moser, D., Yuksel, A., **Cullinan, M.**, and Murthy, J., “Use of detailed particle melt modeling to calculate effective melt properties for powders.” *Journal of Heat Transfer*, Vol. 140, 2018, pp. 052301.
24. *Roy, N., Dubia, O., and **Cullinan, M.**, “Effect of Bed Temperature on the Laser Energy Required to Sinter Copper Nanoparticles.” *JOM*, Vol. 70, 2018, pp 401–406.
23. *Roy, N., Foong, C.S., and **Cullinan, M.** “Effect of Size, Morphology, and Synthesis Method on the Thermal and Sintering Properties of Copper Nanoparticles for use in Microscale Additive Manufacturing Processes.” *Additive Manufacturing*, Vol. 21, 2018, pp. 17-29.
22. *Roy, N. and **Cullinan, M.** “Design and characterization of a two-axis, flexure-based nanopositioning stage with 50 mm travel and reduced higher order modes.” *Precision Engineering*, Vol. 53, 2018 pp. 236-247.
21. Jeong, J.,Chen, K., Walker, E., Roy, N., He, F., Liu, P., Willson, C., **Cullinan, M.**, Bank, S. and Wang, Y., “In-plane Thermal Conductivity Measurement with Nanosecond Grating Imaging Technique.” *Nanoscale and Microscale Thermophysical Engineering*, Vol. 22, 2018, pp. 83-96.
20. *Roy, N., Dibua, O., Jou, W., He, F., Jeong, J. Wang, Y, and **Cullinan, M.** “A Comprehensive Study of Copper Nanoparticles using Femtosecond, Nanosecond and Continuous Wave Lasers.” *Journal of Micro and Nanomanufacturing*, Vol. 6, 2018, pp. 010903.

19. *Yuksel, A., Yu, E., Murthy, J., and **Cullinan, M.** “Effect of Substrate and Nanoparticle Spacing on Plasmonic Enhancement in 3D Nanoparticle Structures.” *Journal of Micro and Nanomanufacturing*, Vol. 5(4), 2017, pp. 040903.
18. *Cho, J and **Cullinan, M.** “Graphene Growth on and Transfer from Platinum Thin Films.” *Journal of Micro and Nanomanufacturing*, Vol. 6, 2017, pp. 024501.
17. *Cho, J.H., Gorman, J., Na, S., and **Cullinan, M.** “Growth of monolayer graphene on nanoscale copper-nickel alloy thin films.” *Carbon*, Vol. 118, 2017, pp. 441–448.
16. *Yao, T.F., Duenner, A., and **Cullinan, M.** “In-Line Metrology of Nanoscale Features in Semiconductor Manufacturing Systems.” *Precision Engineering*, Vol. 47, 2017, pp. 147-157.
15. *Yao, T.F., Duenner, A., and **Cullinan, M.** “In-Line Dimensional Metrology for Nanomanufacturing Systems Enabled By a Passive Semiconductor Wafer Alignment Mechanism.” *Journal of Micro and Nano-Manufacturing*, Vol. 5, 2017, pp. 011001.
14. *Duenner, A. Yao, T.F., De Hoyos, B., Gonzales, M. Riojas, N. and **Cullinan, M.** “A Low-Cost, Automated Wafer Loading System with Sub-Micron Alignment Accuracy for Nanomanufacturing and Nanometrology Applications.” *Journal of Micro and Nano-Manufacturing*, Vol. 4, 2016, pp. 041006.
13. *Yuksel, A. and **Cullinan, M.** “Modeling of Nanoparticle Agglomeration and Powder Bed Formation in Microscale Selective Laser Sintering Systems.” *Journal of Additive Manufacturing*, Vol. 12, 2016, pp. 204-215.
12. **Cullinan, M.** and Culpepper, M. “Nanomanufacturing Methods for the Reduction of Noise in Carbon Nanotube-Based Piezoresistive Sensor Systems.” *Journal of Micro and Nano-Manufacturing*, Vol. 1, 2013, pp. 011011.
11. **Cullinan, M.** and Culpepper, M. “Effects of Chirality and Impurities on the Performance of Carbon Nanotube-Based Piezoresistive Sensors.” *Carbon*, Vol. 51, 2013, pp. 59.
10. **Cullinan, M.**, Panas, R., and Culpepper, M. “A Multi-Axis MEMS Sensor with Integrated Carbon Nanotube-Based Piezoresistors for Nanonewton Level Force Metrology.” *Nanotechnology*, Vol. 23, 2012, pp. 325501.
9. **Cullinan, M.**, Panas, R., DiBiasio, C., and Culpepper, M. “Scaling Electromechanical Sensors Down to the Nanoscale.” *Sensors and Actuators A*, Vol. 187, 2012, pp. 162.
8. Panas, R., **Cullinan, M.**, and Culpepper, M. “Design of Piezoresistive-based MEMS Sensor Systems for Precision Microsystems.” *Precision Engineering*, Vol. 36, 2012, pp. 44.
7. Eusner, T., **Cullinan, M.**, Ruggiero, C., Zarrouati, N., and Chepko, A. “Measurement of Human Response to Tactile Temperature Sensing Using Stochastic System Identification.” *Measurement*, Vol. 44, 2011, pp. 965.
6. **Cullinan, M.** and Culpepper, M. “Carbon Nanotubes as Piezoresistive Microelectromechanical Sensors: Theory and Experiment.” *Physical Review B*, Vol. 82, 2010, pp. 115428.

5. Howell, L.L., DiBiasio, C.M., **Cullinan, M.A.**, Panas, R., Culpepper, M.L. "A Pseudo-Rigid-Body Model for Large Deflections of Fixed-Guided Carbon Nanotubes." *Journal of Mechanisms and Robotics*, Vol. 2, 2010, pp. 034501.
4. **Cullinan, M.** and Culpepper, M. "Control of Carbon Nanotube Geometry via Tunable Process Parameters." *Applied Physics Letters*, Vol. 93, 2008, pp. 103106.
3. DiBiasio, C., **Cullinan, M.**, and Culpepper, M. "Difference Between Bending and Stretching Moduli of Single-Walled Carbon Nanotubes that are Modeled as an Elastic Tube." *Applied Physics Letters*, Vol. 90, 2007, pp. 203116.
2. Hafiz, J., Mukherjee, R., Wang, X., **Cullinan, M.**, Heberlein, J., McMurry, P., and Girshick, S. "Nanoparticle-Coated Silicon Nanowires." *Journal of Nanoparticle Research*, Vol. 8, 2006, pp. 995.
1. Hafiz, J., Mukherjee, R., Wang, X., Marshall, M., Twesten, N., **Cullinan, M.**, Heberlein, J., McMurry, P., and Girshick, S. "Effect of process Parameters on the Structure of Si-Ti-N Nanostructured Coatings Deposited by Hypersonic Plasma Particle Deposition." *Surface and Coatings Technology*, Vol. 200, 2005, pp. 1524.

CONFERENCE PUBLICATIONS

* Paper with Student from Nanoscale Design and Manufacturing Laboratory as Lead Author

62. *Cayll, D., Ladner, I., Hyung C., and **Cullinan, M.**, "MEMS-based Graphene Resonant Gas Sensor for Health Monitoring." *Proceedings of the American Society for Precision Engineering*, Las Vegas, NV, November 7, 2018.
61. *Ward, M., and **Cullinan, M.**, "Wafer Scale Exfoliation of Monocrystalline Micro-scale Silicon Films." *Proceedings of the American Society for Precision Engineering*, Las Vegas, NV, November 7, 2018.
60. *Connolly, L., Garcia, J., and **Cullinan, M.**, "A Roll-to-roll System for In-line, Tip Based Nanometrology of Patterned Materials and Devices." *Proceedings of the American Society for Precision Engineering*, Las Vegas, NV, November 7, 2018.
59. *Roy, N., Behera, D., and **Cullinan, M.**, "Sub-system Level Overview of Micro-scale Selective Laser Sintering Tool." *Proceedings of the American Society for Precision Engineering*, Las Vegas, NV, November 7, 2018.
58. *Yuskel, A, Yu, E., Murthy, J, and **Cullinan, M.** "Effect of Interfacial Thermal Conductance between the Nanoparticles." 2018 International Technical Conference and Exhibition on Packaging and Integration of Electronic and Photonic Microsystems (InterPACK), San Francisco CA, August 29, 2018.
57. *Dibua, O., Yuksel, A., Roy, N., Foong, C., and **Cullinan, M.** "Experimental Calibration of Nanoparticle Sintering Simulation." 2018 Annual International Solid Freeform Fabrication Symposium, Austin, TX, August 14, 2018.

56. *Behera, D., Roy, N., Foong, C., and **Cullinan, M.** “Powder Bed Deposition by Slot Die Coating for Microscale Selective Laser Sintering,” 2018 Annual International Solid Freeform Fabrication Symposium, Austin, TX, August 14, 2018.
55. *Dibua, O., Yuksel, A., Roy, N., Foong, C., and **Cullinan, M.** “Nanoparticle Sintering Model, Simulation, and Calibration Against Experimental Data.” ASME Manufacturing Science and Engineering Conference, College Station, TX, June 20, 2018
54. *Ladner, I, Cho, J., Cayll, D., Nguyen, V., **Cullinan, M.**, and Saha, S. “Mechanical Characterization of Additively Manufactured Microstructures using a Process Integrated MEMS Tensile Tester.” Solid-State Sensors, Actuators and Microsystems Workshop Hilton Head, SC, June 6, 2018.
53. *Yuskel, A, Yu, E., Murthy, J, and **Cullinan, M.** “Uncertainty Analysis of Near-Field Thermal Energy within Nanoparticle Packings.” The Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems, San Diego CA, May 30, 2018.
52. *Yao, T-F., and **Cullinan, M.**, “Large Area Inspection Using a Multi-point, Tip-Based Nanometrology System.” *Proceedings of the American Society for Precision Engineering*, Charlotte, NC, October 31, 2017.
51. *Connolly, L., and **Cullinan, M.**, “In-Line, Tip Based Nanometrology for Roll-to-Roll Manufactured Materials and Electronic Devices.” *Proceedings of the American Society for Precision Engineering*, Charlotte, NC, October 31, 2017.
50. *Ward, M., and **Cullinan, M.**, “Wafer Scale Exfoliation of Monocrystalline Micro-Scale Silicon Films.” *Proceedings of the American Society for Precision Engineering*, Charlotte, NC, October 31, 2017.
49. *Zhao, C., Ladner, I., Song, A., Hopkins, J., and **Cullinan, M.**, “Design and Modelling of a Bidirectional MEMS Thermal Actuator.” *Proceedings of the American Society for Precision Engineering*, Charlotte, NC, October 31, 2017.
48. *Ladner, I., Cao, A., Saha, S., and **Cullinan, M.**, “Design of High Resolution and High Force MEMS Tensile Testers for Direct Metrology of Submicron Polymer Features.” *Proceedings of the American Society for Precision Engineering*, Charlotte, NC, November 1, 2017.
47. *Roy, N., and **Cullinan, M.**, “Design of a Long-Travel, Flexure-Based Nanopositioner with Reduced Higher Order Resonant Modes.” *Proceedings of the American Society for Precision Engineering*, Charlotte, NC, November 2, 2017.
46. *Roy, N. Dubia, O. Foong, C.S. and **Cullinan, M.** “Preliminary Results on the Fabrication of Interconnect Structures using Microscale Selective Laser Sintering.” *Proceedings of the ASME 2017 International Technical Conference and Exhibition on Packaging and Integration of Electronic and Photonic Microsystems*, San Francisco, CA, August 30, 2017.
45. *Cho, J., Ladner, I., Hong, N. and **Cullinan, M.** “Design and Fabrication of a Strain-Based Tunable Graphene NEMS Resonator.” *Proceedings of the Napa Microsystems Workshop*, Napa, CA, August 22, 2017.

44. *Dubia, O. Yuksel, A., Roy, N., Foong, C.S. and **Cullinan, M.** “Modelling Nanoparticle Sintering in a Microscale Selective Laser Sintering Process.” *Proceedings of the Solid Freeform Fabrication Symposium*, Austin, TX, August 8, 2017.
43. *Yuksel, A, Yu, E., Murthy, J., and **Cullinan, M.** “Analysis of Near-Field Thermal Energy Transfer within Nanoparticles.” *Proceedings of SPIE Optics + Photonics*, San Diego, CA, August 9, 2017.
42. *Yuksel, A. Murthy, J., and **Cullinan, M.** “Thermal Energy Transport below the Diffraction Limit in Closed-Packed Metal Nanoparticles.” *Proceedings of the ASME Summer Heat Transfer Conference*, Bellevue, WA, July 10, 2017.
41. *Roy, N., Jou, W., He, F., Jeong, J., Wang, Y., and **Cullinan, M.** “Laser Sintering of Copper Nanoparticles: A Simplified Model for Fluence Estimation and Validation.” *Proceedings of the ASME Manufacturing Science and Engineering Conference*, Los Angeles, CA, June 6, 2017
40. *Cho, J and **Cullinan, M.** “Graphene Growth on and Transfer from Platinum Thin Films.” *Proceedings of the ASME Manufacturing Science and Engineering Conference*, Los Angeles, CA, June 6, 2017
39. *Connolly, L. and **Cullinan, M.** “Design of a Tip Based, In-Line Metrology System for Roll-to-Roll Manufactured Flexible Electronic Devices.” *Proceedings of the ASME Manufacturing Science and Engineering Conference*, Los Angeles, CA, June 6, 2017
38. *Yuksel, A., Murthy, J. and **Cullinan, M.** “Effect of Substrate and Nanoparticle Spacing on Plasmonic Enhancement in 3D Nanoparticle Structures.” *Proceedings of the ASME Manufacturing Science and Engineering Conference*, Los Angeles, CA, June 6, 2017
37. Panas, R, Saha, S., **Cullinan, M.**, and Hopkins, J. “Micro-Nano TLC Overview of Research in Precision Micro- and Nano-Technology.” *Proceedings of the American Society for Precision Engineering*, Portland, OR, October 26, 2016.
36. *Yao, T-F., Duenner, A. and **Cullinan, M.**, “Quick Approach Mechanism For Tip-Based In-line Nanometrology Systems.” *Proceedings of the American Society for Precision Engineering*, Portland, OR, October 26, 2016.
35. *Roy, N. and **Cullinan, M.**, “Design of a Flexure Based XY Precision Nanopositioner with a Two Inch Travel Range for Micro-Scale Selective Laser Sintering.” *Proceedings of the American Society for Precision Engineering*, Portland, OR, October 26, 2016.
34. *Duenner, A., DeHoyos, B., Gonzales, M., Riojas, N., and **Cullinan, M.**, “Low-Cost, Automated Wafer Handling System for High-Throughput Nanometrology.” *Proceedings of the American Society for Precision Engineering*, Portland, OR, October 26, 2016.
33. *Moser, D., **Cullinan, M.**, and Murthy, J., “Particle-Scale Melt Modeling of the Selective Laser Melting Process.” *International Solid Freeform Fabrication Symposium*, Austin, Texas, August 8, 2016.
32. *Yuskel, A. and **Cullinan, M.**, “The Effect of Nanoparticle Clustering on Optoelectronic Property.” *International Solid Freeform Fabrication Symposium*, Austin, Texas, August 8, 2016.

31. *Roy, N., Foong, C.S., and **Cullinan, M.** “Design of a Micro-scale Selective Laser Sintering System.” *International Solid Freeform Fabrication Symposium*, Austin, Texas, August 8, 2016.
30. *Roy, N., Yuksel, A., and **Cullinan, M.** “Design and Modeling of a Microscale Selective Laser Sintering System.” *ASME Manufacturing Science and Engineering Conference*, Blacksburg, VA, June 27, 2016.
29. *Cho, J., Sun, G., and **Cullinan, M.** “A Method to Manufacture Repeatable Graphene-Based NEMS Devices at the Wafer Scale.” *ASME Manufacturing Science and Engineering Conference*, Blacksburg, VA, June 27, 2016.
28. *Yao, T-F., Duenner, A., and **Cullinan, M.** “In-Line Dimensional Metrology for Nanomanufacturing Systems.” *ASME Manufacturing Science and Engineering Conference*, Blacksburg, VA, June 27, 2016.
27. *Cho, J., Gorman, J. and Cullinan, M. “Growth of High Quality Graphene on Sub-300 nm Thick Copper Thin Films.” *The 60th International Conference on Electron, Ion, and Photon Beam Technology and Nanofabrication*, Pittsburg, PA June 1, 2016.
26. *Yao, T-F. and **Cullinan, M.** “In-line, Wafer-Scale Inspection in Nano-Fabrication Systems.” *Proceedings of the American Society for Precision Engineering*, Austin, TX, November 5, 2015.
25. *Duenner, A. and **Cullinan, M.** “Passive Semiconductor Wafer Alignment Mechanism to Support In-line Atomic Force Microscope Metrology.” *Proceedings of the American Society for Precision Engineering*, Austin, TX, November 5, 2015.
24. *Sun, G. and **Cullinan, M.** “Design of a MEMS-Based Tunable Graphene Resonator System with Precision Strain and Force Metrology.” *Proceedings of the American Society for Precision Engineering*, Austin, TX, November 5, 2015.
23. *Ladner, I. and **Cullinan, M.** “Carbon Nanotube Growth Force Detection on Multi-Axis MEMS Sensor with Integrated Microheater.” *Proceedings of the American Society for Precision Engineering*, Austin, TX, November 5, 2015.
22. *Ladner, I. and **Cullinan, M.** “Design of a Multi-Axis MEMS Force Sensor for Evaluating the Effectiveness of Drug Coatings for Implantable Devices.” *Workshop on Enabling Nanofabrication for Rapid Innovation*, Napa, CA, August 22, 2015.
21. *Roy, N., Yuksel, A., and **Cullinan, M.** “ μ -SLS of Metals: Physical and Thermal Characterization of Cu Nanopowders.” *International Solid Freeform Fabrication Symposium*, Austin, Texas, August 12th, 2015.
20. *Roy, N. and **Cullinan, M.** “Design of the Powder Spreading System and the Powder Bed Actuation.” *International Solid Freeform Fabrication Symposium*, Austin, Texas, August 11th, 2015.
19. *Ladner, I. and **Cullinan, M.** “Localized Growth and Force Detection of Carbon Nanotubes on Multi-axis MEMs Sensor.” *Proceedings of the American Society for Precision Engineering*, Boston, MA, November 11, 2014.

18. **Cullinan, M.**, Cheng, G., Sperling, B., Hight Walker, A., Davydov, A., and Gorman, J., "Transfer-Free Wafer-Scale Growth of Graphene on Thin-Film Copper." *The 58th International Conference on Electron, Ion, and Photon Beam Technology and Nanofabrication*, Washington, D.C., May 28th, 2014.
17. **Cullinan, M.** and Gorman, J., "Transfer-Free, Wafer-Scale Fabrication of Suspended Graphene Nanoelectromechanical Structures." *Workshop on Enabling Nanofabrication for Rapid Innovation*, Napa, CA, August 20, 2013.
16. **Cullinan, M.** and Gorman, J., "Transfer-Free, Wafer-Scale Fabrication of Graphene-Based Nanoelectromechanical Resonators." *Microsystems for Measurement and Instrumentation*, Gaithersburg, MD, May 14, 2013.
15. Panas R. M., **Cullinan, M.A.**, and Culpepper, M.L. "Non-Lithographically-Based Microfabrication of Precision MEMS Nanopositioning Systems." *Proceedings of the 2011 Annual Meeting of the American Society for Precision Engineering*. Denver, CO, November 13-18, 2011.
14. **Cullinan, M.**, Panas, R., Daniel, C., Gafford, J., and Culpepper, M. "Non-Cleanroom Fabrication of Carbon Nanotube-Based MEMS Force and Displacement Sensors." Accepted in the *Proceedings of the ASME 2011 International Design Engineering Technical Conferences*. Washington D.C., August 29-31, 2011.
13. **Cullinan, M.** and Culpepper, M. "Design and Fabrication of Single Chirality Carbon Nanotube-Based Sensors." Accepted in the *Proceedings of the 11th International Conference on Nanotechnology* (IEEE NANO 2011). Portland, OR, August 15-18, 2011.
12. **Cullinan, M.**, Panas, R., and Culpepper, M. "Design and Fabrication of a Multi-Axis MEMS Force Sensor with Integrated Carbon Nanotube Based Piezoresistors." *Proceedings of the Nanotech 2011 Conference and Expo*. Boston, MA, June 13-16, 2011.
11. **Cullinan, M.**, Panas, R., and Culpepper, M. "A Multi-Axis MEMS Sensor with Integrated Carbon Nanotube-Based Piezoresistors for Precision Force Metrology." *Proceedings of the 11th International Conference of the European Society for Precision Engineering and Nanotechnology*. Lake Como, Italy, May 23-27, 2011.
10. **Cullinan, M.** and Culpepper, M. "Noise Mitigation Techniques for Carbon Nanotube-based Piezoresistive Sensor Systems." *Proceedings of the 2010 Fall Meeting of the Materials Research Society*. Boston, MA, November 29 – December 3, 2010.
9. Gafford, J., Panas, R., **Cullinan, M.** and Culpepper, M. "Design Principles and Best Practices for Rapid Prototyping of Meso- and Micro-scale Flexures via Micromilling." *Proceedings of the 2010 Annual Meeting of the American Society for Precision Engineering*. Atlanta, GA, October 31 – November 5, 2010.
8. **Cullinan, M.**, Panas, R., Daniel, C., and Culpepper, M. "Carbon Nanotube-Based Sensors for Small-scale Force and Displacement Sensors." *Proceedings of the 2010 Annual Meeting of American Society for Precision Engineering*. Atlanta, GA, October 31 – November 5, 2010.
7. Panas R. M., **Cullinan, M.A.**, and Culpepper, M.L. "A Systems Approach to Modeling of Piezoresistive MEMS Sensors." *Proceedings of the 2010 American Society for Precision Engineering Control of Precision Systems Conference*. Boston, MA, April 10-13, 2010.

6. **Cullinan, M.**, Panas, R., and Culpepper, M. “Design of Micro-Scale Multi-Axis Force Sensors for Precision Applications.” *Proceedings of the 2009 Annual Meeting of the American Society for Precision Engineering*. Monterey, CA, October 4-9 2009.
5. **Cullinan, M.** and Culpepper, M. “Controlling the Stiffness of Carbon Nanotube Based Compliant Mechanisms.” *Proceedings of the 5th International Symposium on Nanomanufacturing*. Singapore, January 23-25, 2008, pp. 47.
4. **Cullinan, M.**, DiBiasio, C., Howell, L., Culpepper, M., and Panas, R. “Modeling of a Clamped-Clamped Carbon Nanotube Flexural Element for use in Nanoelectromechanical Systems.” *The 13th National Conference on Mechanisms and Machines*, Bangalore, India, December 12, 2007.
3. Culpepper, M., DiBiasio, C., Panas, R., and **Cullinan, M.** “Modeling and Design of Carbon Nanotube-based Flexures and Compliant Mechanisms for Nanomechanical Devices.” *Proceedings of the 4th International Symposium on Nanomanufacturing*, Cambridge, MA, November 1-4, 2006, pp. 253.
2. Hafiz, J., Mukherjee, R., Wang, X., Marshall, M., Twesten, N., **Cullinan, M.**, Heberlein, J., McMurry, P., and Girshick, S. “Effect of Process Parameters on the Structure of Si-Ti-N Nanostructured Coatings Deposited by Hypersonic Plasma Particle Deposition.” *Proceedings of the International Conference on Metallurgical Coatings and Thin Films*. San Diego, CA, February 5, 2005.
1. **Cullinan, M.**, Ward, M., and MacDonald, N. “Porous Nanostructured Titania.” *NNIN REU Research Accomplishments*, Vol. 8, August 11, 2005, pp. 24.

PRESENTATIONS

Invited Talks

17. **Cullinan, M.** “Challenges and Opportunities in the Packaging and Integration of Next Generation Electronic Devices,” University of Michigan, Ann Arbor, MI, April 19, 2019
16. **Cullinan, M.** “High Throughput, Tip-based Nanometrology for Roll-to-Roll Manufactured Flexible Electronics,” 3M, St. Paul, MN, November 11, 2018
15. **Cullinan, M.** “Engineering Mechanics Challenges and Opportunities in Micro and Nanomanufacturing,” University of Texas at Austin, Austin, TX, April 24, 2018
14. **Cullinan, M.** “Design and Modeling of a Microscale Selective Laser Sintering System.” University of Texas at San Antonio, San Antonio, TX, October 10th, 2017
13. **Cullinan, M.** “Microscale Selective Laser Sintering of Copper Nanoparticles,” Sandia National Laboratory, Albuquerque, NM, May 16, 2016.

12. **Cullinan, M.** “Additive Manufacturing for Microelectronics Packaging Applications,” Central Texas Electronics Association Electronics Design, Manufacturing & Test Symposium, Austin, TX, May 10, 2016
11. **Cullinan, M.** “Opportunities and Changes in Micro and Nanomanufacturing,” 3M Lunch and Learning Lecture Series, Austin, TX, September 18, 2015.
10. **Cullinan, M.** “Nanomanufacturing of Carbon-based Materials for Nanoelectromechanical Sensor Systems,” Center for Nano- and Molecular Science, University of Texas, Austin, TX, November 19, 2014.
9. **Cullinan, M.** “Nanomanufacturing of Carbon-based Materials for Nanoelectromechanical Sensor Systems” Department of Mechanical Engineering, University of Illinois, Urbana, IL, April, 2013.
8. **Cullinan, M.** “Nanomanufacturing of Carbon-based Materials for Nanoelectromechanical Sensor Systems” Department of Mechanical Engineering, University of Texas, Austin, TX, March 25, 2013.
7. **Cullinan, M.** “Nanomanufacturing of Carbon-based Materials for Nanoelectromechanical Sensor Systems” Department of Mechanical Engineering, University of California, Berkeley, CA, March 12, 2013.
6. **Cullinan, M.** “Carbon Nanotube-Based Piezoresistive Sensors for Precision Force and Displacement Measurements.” Department of Mechanical and Industrial Engineering Seminar Series, University of Massachusetts, Amherst, MA, February 28, 2011.
5. **Cullinan, M.** “Design and Fabrication of Carbon Nanotube-Based Piezoresistive Sensors for Precision Force Measurements” Department of Mechanical Engineering and Mechanics, Drexel University, Philadelphia, PA, February 23, 2011.
4. **Cullinan, M.** “Precision Force and Displacement Metrology Using Carbon Nanotube-Based Piezoresistive Sensors” Department of Mechanical Engineering, University of Utah, Salt Lake City, UT, February 11, 2011.
3. **Cullinan, M.** “Design of High-Precision Carbon Nanotube-Based Flexural Transducers.” Presentation, Laboratory for Manufacturing and Productivity Student Seminar Series, Cambridge, MA, February 16, 2010.
2. **Cullinan, M.** “Challenges in Incorporating Carbon Nanotubes into MEMS and NEMS Devices.” Presentation, MIT Micro/Nano Seminar Series, Cambridge, MA, November 4, 2009.
1. **Cullinan, M.** “Controlling the Stiffness of Carbon Nanotube-Based Compliant Mechanisms.” Presentation, Laboratory for Manufacturing and Productivity Student Seminar Series, Cambridge, MA, August 12, 2008.

Contributed Oral Presentations

***Presented by Student in NDML**

40. **Cullinan, M.** “Overview from Winter Topical Meeting.” *Proceedings of the American Society for Precision Engineering*, Las Vegas, NV, November 7, 2018.

39. *Ward, M., and **Cullinan, M.**, “Wafer Scale Exfoliation of Monocrystalline Micro-scale Silicon Films.” *Proceedings of the American Society for Precision Engineering*, Las Vegas, NV, November 7, 2018.
38. *Connolly, L., Garcia, J., and **Cullinan, M.**, “A Roll-to-roll System for In-line, Tip Based Nanometrology of Patterned Materials and Devices.” *Proceedings of the American Society for Precision Engineering*, Las Vegas, NV, November 7, 2018.
37. *Roy, N., Behera, D., and **Cullinan, M.**, “Sub-system Level Overview of Micro-scale Selective Laser Sintering Tool.” *Proceedings of the American Society for Precision Engineering*, Las Vegas, NV, November 7, 2018.
36. *Yuskel, A, Yu, E., Murthy, J, and **Cullinan, M.** "Effect of Interfacial Thermal Conductance between the Nanoparticles." 2018 International Technical Conference and Exhibition on Packaging and Integration of Electronic and Photonic Microsystems (InterPACK), San Francisco CA, August 29, 2018.
35. *Dibua, O., Yuksel, A., Roy, N., Foong, C., and **Cullinan, M.** “Experimental Calibration of Nanoparticle Sintering Simulation.” 2018 Annual International Solid Freeform Fabrication Symposium, Austin, TX, August 14, 2018.
34. *Behera, D., Roy, N., Foong, C., and **Cullinan, M.** “Powder Bed Deposition by Slot Die Coating for Microscale Selective Laser Sintering,” 2018 Annual International Solid Freeform Fabrication Symposium, Austin, TX, August 14, 2018.
33. *Roy, N., Behera, D., Dibua, O., Foong, C., and **Cullinan, M.** “Experimental Study of the Sub-Systems in a Microscale Additive Manufacturing Process,” 2018 Annual International Solid Freeform Fabrication Symposium, Austin, TX, August 14, 2018.
32. *Dibua, O., Yuksel, A., Roy, N., Foong, C., and **Cullinan, M.** “Nanoparticle Sintering Model, Simulation, and Calibration Against Experimental Data.” ASME Manufacturing Science and Engineering Conference, College Station, TX, June 20, 2018
31. *Yuskel, A, Yu, E., Murthy, J, and **Cullinan, M.** “Uncertainty Analysis of Near-Field Thermal Energy within Nanoparticle Packings.” The Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems, San Diego CA, May 30, 2018.
30. *Ladner, I., Cao, A., Saha, S., and **Cullinan, M.**, “Design of High Resolution and High Force MEMS Tensile Testers for Direct Metrology of Submicron Polymer Features.” *Proceedings of the American Society for Precision Engineering*, Charlotte, NC, November 1, 2017.
29. *Roy, N., and **Cullinan, M.**, “Design of a Long-Travel, Flexure-Based Nanopositioner with Reduced Higher Order Resonant Modes.” *Proceedings of the American Society for Precision Engineering*, Charlotte, NC, November 2, 2017.
28. *Roy, N. Dubia, O. Foong, C.S. and **Cullinan, M.** “Preliminary Results on the Fabrication of Interconnect Structures using Microscale Selective Laser Sintering.” ASME 2017 International Technical Conference and Exhibition on Packaging and Integration of Electronic and Photonic Microsystems, San Francisco, CA, August 30, 2017.

27. *Roy, N., Dubia, O., and **Cullinan, M.**, “Effect of Bed Temperature on the Laser Energy Required to Sinter Copper Nanoparticles.” Solid Freeform Fabrication Symposium, Austin, TX, August 9, 2017.
26. *Dubia, O. Yuksel, A., Roy, N., Foong, C.S. and **Cullinan, M.**, “Modelling Nanoparticle Sintering in a Microscale Selective Laser Sintering Process.” Solid Freeform Fabrication Symposium, Austin, TX, August 8, 2017.
25. Yuksel, A. Murthy, J. and Cullinan, M. “Experimental and Analytical Analysis of Nanoparticle Assemblies for High-throughput Nanomanufacturing.” Solid Freeform Fabrication Symposium, Austin, TX, August 8, 2017.
24. *Yuksel, A. Murthy, J., and **Cullinan, M.** “Thermal Energy Transport below the Diffraction Limit in Closed-Packed Metal Nanoparticles.” ASME Summer Heat Transfer Conference, Bellevue, WA, July 10, 2017.
23. Roy, N., Jou, W., He, F., Jeong, J., Wang, Y., and **Cullinan, M.** “Laser Sintering of Copper Nanoparticles: A Simplified Model for Fluence Estimation and Validation.” ASME Manufacturing Science and Engineering Conference, Los Angeles, CA, June 6, 2017
22. Cho, J and **Cullinan, M.** “Graphene Growth on and Transfer from Platinum Thin Films MSEC.” ASME Manufacturing Science and Engineering Conference, Los Angeles, CA, June 6, 2017
21. Connolly, L. and **Cullinan, M.** “Design of a Tip Based, In-Line Metrology System for Roll-to-Roll Manufactured Flexible Electronic Devices.” ASME Manufacturing Science and Engineering Conference, Los Angeles, CA, June 6, 2017
20. *Yuksel, A., Murthy, J. and **Cullinan, M.** “Effect of Substrate and Nanoparticle Spacing on Plasmonic Enhancement in 3D Nanoparticle Structures.” ASME Manufacturing Science and Engineering Conference, Los Angeles, CA, June 6, 2017
19. *Yao, T-F., Duenner, A. and **Cullinan, M.**, “Quick Approach Mechanism For Tip-Based In-line Nanometrology Systems.” American Society for Precision Engineering, Portland, OR, October 26, 2016.
18. *Moser, D., **Cullinan, M.**, and Murthy, J., “Particle-Scale Melt Modeling of the Selective Laser Melting Process.” International Solid Freeform Fabrication Symposium, Austin, Texas, August 8, 2016.
17. *Yuskel, A. and **Cullinan, M.**, “The Effect of Nanoparticle Clustering on Optoelectronic Property.” International Solid Freeform Fabrication Symposium, Austin, Texas, August 8, 2016.
16. *Roy, N., Foong, C.S., and **Cullinan, M.** “Design of a Micro-scale Selective Laser Sintering System.” International Solid Freeform Fabrication Symposium, Austin, Texas, August 8, 2016.
15. Roy, N., Yuksel, A., and **Cullinan, M.** “Design and Modeling of a Microscale Selective Laser Sintering System.” ASME Manufacturing Science and Engineering Conference, Blacksburg, VA, June 27, 2016.

14. Cho, J., Sun, G., and **Cullinan, M.** "A Method to Manufacture Repeatable Graphene-Based NEMS Devices at the Wafer Scale." ASME Manufacturing Science and Engineering Conference, Blacksburg, VA, June 27, 2016.
13. Yao, T-F., Duenner, A., and **Cullinan, M.** "In-Line Dimensional Metrology for Nanomanufacturing Systems." ASME Manufacturing Science and Engineering Conference, Blacksburg, VA, June 27, 2016.
12. *Sun, G. and **Cullinan, M.** "Design of a MEMS-Based Tunable Graphene Resonator System with Precision Strain and Force Metrology." American Society for Precision Engineering, Austin, TX, November 5, 2015.
11. *Ladner, I. and **Cullinan, M.** "Carbon Nanotube Growth Force Detection on Multi-Axis MEMS Sensor with Integrated Microheater." Proceedings of the American Society for Precision Engineering, Austin, TX, November 5, 2015.
10. *Roy, N., Yuksel, A., and **Cullinan, M.** "μ-SLS of Metals: Physical and Thermal Characterization of Cu Nanopowders." International Solid Freeform Fabrication Symposium, Austin, Texas, August 12th, 2015.
9. **Cullinan, M.** and Gorman, J., "Transfer-Free, Wafer-Scale Manufacturing of Graphene-Based Electromechanical Resonant Devices." March Meeting of the American Physical Society, Baltimore, MD, March 20, 2013.
8. **Cullinan, M.**, "Carbon Nanotube-Based Piezoresistive Sensors for Precision Force and Displacement Measurements." Intelligent Systems Division Seminar, National Institute of Standards and Technology, Gaithersburg, MD, March 12, 2012.
7. **Cullinan, M.**, Panas, R., Daniel, C., Gafford, J., and Culpepper, M. "Non-Cleanroom Fabrication of Carbon Nanotube-Based MEMS Force and Displacement Sensors." ASME 2011 International Design Engineering Technical Conferences. Washington D.C., August 29, 2011.
6. **Cullinan, M.** and Culpepper, M. "Design and Fabrication of Single Chirality Carbon Nanotube-Based Sensors." 11th International Conference on Nanotechnology (IEEE NANO 2011). Portland, OR, August 16, 2011
5. **Cullinan, M.** and Culpepper, M. "Effects of Chirality and Impurities on the Performance of Carbon Nanotube-Based Piezoresistive Sensors" International Conference on the Science and Application of Nanotubes 2011. Cambridge, England, July 12, 2011.
4. **Cullinan, M.** "Design and Fabrication of a Multi-Axis MEMS Force Sensor with Integrated Carbon Nanotube Based Piezoresistors." Nanotech 2011 Conference and Expo. Boston, MA, June 15, 2011.
3. **Cullinan, M.** "A Multi-Axis MEMS Sensor with Integrated Carbon Nanotube-Based Piezoresistors for Precision Force Metrology." 11th International Conference of the European Society for Precision Engineering and Nanotechnology. Lake Como, Italy, May 24, 2011.
2. **Cullinan, M.** "Controlling the Stiffness of Carbon Nanotube-Based Compliant Mechanisms." Presentation, 5th International Symposium on Nanomanufacturing, Singapore, January 25, 2008.

1. **Cullinan, M.** “Porous Nanostructured Titania.” Presentation, 2005 NNIN REU Convocation, Stanford University, August 11, 2005.

Poster Presentations

*Presented by Student in NDML

41. *Cayll, D., Ladner, I., Hyung C., and **Cullinan, M.**, “MEMS-based Graphene Resonant Gas Sensor for Health Monitoring.” *Proceedings of the American Society for Precision Engineering*, Las Vegas, NV, November 7, 2018.
40. *Ladner, I., Cho, J., Cayll, D., Nguyen, V., **Cullinan, M.**, and Saha, S. “Mechanical Characterization of Additively Manufactured Microstructures using a Process Integrated MEMS Tensile Tester.” Solid-State Sensors, Actuators and Microsystems Workshop Hilton Head, SC, June 6, 2018.
39. *Yao, T-F., and **Cullinan, M.**, “Large Area Inspection Using a Multi-point, Tip-Based Nanometrology System.” *Proceedings of the American Society for Precision Engineering*, Charlotte, NC, October 31, 2017.
38. *Connolly, L., and **Cullinan, M.**, “In-Line, Tip Based Nanometrology for Roll-to-Roll Manufactured Materials and Electronic Devices.” *Proceedings of the American Society for Precision Engineering*, Charlotte, NC, October 31, 2017.
37. *Ward, M., and **Cullinan, M.**, “Wafer Scale Exfoliation of Monocrystalline Micro-Scale Silicon Films.” *Proceedings of the American Society for Precision Engineering*, Charlotte, NC, October 31, 2017.
36. *Zhao, C., Ladner, I., Song, A., Hopkins, J., and **Cullinan, M.**, “Design and Modelling of a Bidirectional MEMS Thermal Actuator.” *Proceedings of the American Society for Precision Engineering*, Charlotte, NC, October 31, 2017.
35. *Cho, J., Ladner, I., Hong, N. and **Cullinan, M.** “Design and Fabrication of a Strain-Based Tunable Graphene NEMS Resonator.” Napa Microsystems Workshop, Napa, CA, August 22, 2017.
34. *Yuksel, A, Yu, E., Murthy, J., and **Cullinan, M.** “Analysis of Near-Field Thermal Energy Transfer within Nanoparticles.” SPIE Optics + Photonics, San Diego, CA, August 9, 2017.
33. *Roy, N. and **Cullinan, M.**, “Design of a Flexure Based XY Precision Nanopositioner with a Two Inch Travel Range for Micro-Scale Selective Laser Sintering.” American Society for Precision Engineering, Portland, OR, October 26, 2016.
32. *Duenner, A., DeHoyos, B., Gonzales, M., Riojas, N., and **Cullinan, M.**, “Low-Cost, Automated Wafer Handling System for High-Throughput Nanometrology.” American Society for Precision Engineering, Portland, OR, October 26, 2016.
31. *Cho, J., Sun, G., and **Cullinan, M.** “A Method to Manufacture Repeatable Graphene-Based NEMS Devices at the Wafer Scale.” ASME Manufacturing Science and Engineering Conference, Blacksburg, VA, June 27, 2016.

30. Sun, G., Cho, J, and **Cullinan, M.**, “Design and Fabrication of a Highly Tunable Graphene-Based Nanoelectromechanical Resonator System.” Solid-State Sensors, Actuators, and Microsystems Workshop, Hilton Head, SC, June 8, 2016.
29. *Yao, T-F. and **Cullinan, M.** “In-line, Wafer-Scale Inspection in Nano-Fabrication Systems.” Proceedings of the American Society for Precision Engineering, Austin, TX, November 5, 2015.
28. *Duenner, A. and **Cullinan, M.** “Passive Semiconductor Wafer Alignment Mechanism to Support In-line Atomic Force Microscope Metrology.” Proceedings of the American Society for Precision Engineering, Austin, TX, November 5, 2015.
27. *Roy, N. and **Cullinan, M.** “Design of the Powder Spreading System and the Powder Bed Actuation.” International Solid Freeform Fabrication Symposium, Austin, Texas, August 11th, 2015.
26. Ladner, I. and **Cullinan, M.** " Design of a Multi-Axis MEMS Force Sensor for Evaluating the Effectiveness of Drug Coatings for Implantable Devices." Workshop on Enabling Nanofabrication for Rapid Innovation, Napa, CA, August 22, 2015.
25. Ladner, I., Sun, J., and **Cullinan, M.** "Design and Fabrication of a MEMS Transducer for In-Situ Force Spectroscopy of CVD Growth Processes." Transducers 2015, Anchorage, AK, June 22, 2015.
24. *Ladner, I. and **Cullinan, M.** “Localized Growth and Force Detection of Carbon Nanotubes on Multi-axis MEMS Sensor.” Proceedings of the American Society for Precision Engineering, Boston, MA, November 11, 2014.
23. Ladner, I. and **Cullinan, M.**, “Direct Printing of Carbon Nanotubes: Tool Design and Fabrication.” Solid-State Sensors, Actuators, and Microsystems Workshop, Hilton Head, SC, June 8, 2014.
22. **Cullinan, M.** and Gorman, J., "Transfer-Free, Wafer-Scale Fabrication of Suspended Graphene Nanoelectromechanical Structures." Workshop on Enabling Nanofabrication for Rapid Innovation, Napa, CA, August 20, 2013
21. **Cullinan, M.** and Gorman, J., "Transfer-Free, Wafer-Scale Manufacturing of Graphene-Based Nanoelectromechanical Resonant Devices." Workshop on Nano and Micro Manufacturing, Dearborn, MI, May 22, 2013.
20. **Cullinan, M.** and Gorman, J., "Transfer-Free, Wafer-Scale Fabrication of Graphene-Based Nanoelectromechanical Resonators." Microsystems for Measurement and Instrumentation, Gaithersburg, MD, May 14, 2013.
19. **Cullinan, M.** and Gorman, J. “Transfer-Free, Wafer-scale Manufacturing of Graphene-Based Nanoelectromechanical Resonant Devices.” NIST Sigma Xi 20th Annual Postdoctoral Poster Presentation, Gaithersburg, MD, February, 27, 2013.
18. **Cullinan, M.** and Culpepper, M. “Carbon Nanotube-Based Piezoresistive Transducers for MEMS Sensing Applications.” Solid-State Sensors, Actuators, and Microsystems Workshop Hilton Head, SC, June 6, 2012.

17. **Cullinan, M.** and Culpepper, M. “Noise Mitigation Techniques for Carbon Nanotube-Based Piezoresistive Sensor Systems.” 2010 Fall Meeting of the Materials Research Society, Boston, MA, December 1, 2010.
16. Gafford, J., Panas, R., **Cullinan, M.**, and Culpepper, M. “Design principles and Best Practices for Rapid Prototyping of Meso- and Micro-scale Flexures via Micromilling.” 2010 Annual Meeting of the American Society for Precision Engineering, Atlanta, GA, November 2, 2010.
15. **Cullinan, M.**, Panas, R., Garcia, L., and Culpepper, M. “Carbon Nanotube-Based Sensors for Small-scale Force and Displacement Sensors.” 2010 Annual Meeting of American Society for Precision Engineering, Atlanta, GA, November 2, 2010.
14. **Cullinan, M.** and Culpepper, M. “Carbon Nanotube-Based Piezoresistive MEMS Sensors.” De Florez Award Competition, Cambridge, MA, May 5, 2010. (2nd Place)
13. **Cullinan, M.**, Panas, R., and Culpepper, M. “CNT-Based Piezoresistive MEMS Sensors.” MIT Manufacturing Summit, Cambridge, MA, April 22, 2010.
12. Panas, R., **Cullinan, M.**, and Culpepper, M. “Design of Multi-Axis MEMS Force Sensors.” MIT Manufacturing Summit, Cambridge, MA, April 22, 2010.
11. **Cullinan, M.**, Panas, R., and Culpepper, M. “Design of Micro-Scale Multi-Axis Force Sensors for Precision Applications.” 2009 Annual Meeting of the American Society for Precision Engineering, Monterey, CA, October 4, 2009.
10. **Cullinan, M.**, Panas, R., and Culpepper, M. “CNT Printing with Force Feedback.” MIT Manufacturing Summit, Cambridge, MA, April 23, 2009.
9. **Cullinan, M.** and Culpepper, M. “Controlling the Stiffness of Carbon Nanotube-Based Compliant Mechanisms.” MIT Manufacturing Summit, Cambridge, MA, September 28, 2007.
8. **Cullinan, M.**, DiBiasio, C., Panas, R. and Culpepper, M. “Modeling and Design of Carbon Nanotube-Based Compliant Mechanisms.” MIT Manufacturing Summit, Cambridge, MA, September 28, 2007. (First Prize)
7. **Cullinan, M.** and Culpepper, M. “Controlling the Stiffness of Carbon Nanotube-Based Compliant Mechanisms.” MIT Precision Engineering Center Open House, Cambridge, MA, August 15, 2007.
6. **Cullinan, M.**, Ward, M., and MacDonald, N. “Porous Nanostructured Titania.” 2005 Swarthmore Summer Research Convocation, Swarthmore, PA, October 10, 2005.
5. **Cullinan, M.**, Ward, M., and MacDonald, N. “Porous Nanostructured Titania.” 2005 NNIN REU Convocation, Stanford University, August 12, 2005.
4. **Cullinan, M.**, Ward, M., and MacDonald, N. “Porous Nanostructured Titania.” 2005 University of California - Santa Barbara Summer Research Convocation, Santa Barbara, CA, August 3, 2005.
3. **Cullinan, M.**, Hafiz, J., Wang, X., Mukherjee, R., McMurry, P., Heberlein, J., and Girshick, S. “Analysis of Superhard Nanostructured Thin Films.” Swarthmore Summer Research Convocation, Swarthmore, PA, November 8, 2005.

2. **Cullinan, M.**, Hafiz, J., Wang, X., Mukherjee, R., McMurry, P., Heberlein, J., and Girshick, S. "Analysis of Superhard Nanostructured Thin Films." University of Minnesota Summer Research Convocation, Minneapolis, MN, August 10, 2004.
1. **Cullinan, M.**, Hafiz, J., Wang, X., Mukherjee, R., McMurry, P., Heberlein, J., and Girshick, S. "Analysis of Superhard Nanostructured Thin Films", University of Minnesota Department of Mechanical Engineering Summer Research Summit, Minneapolis, MN, August 10, 2004.

FEATURED ARTICLES

1. Nanotechweb.org "In Depth" featured article. "Controlling Carbon Nanotube Geometry via Tunable Process Parameters." October 13, 2008.
2. Sensors Magazine. "Rising Star Engineer Rounds The Bases When It Comes To Research And Discovery." August 4, 2017.

PATENT FILINGS

8. Saha, S., Panas, R., **Cullinan, M.**, and Ladner, I., "Microscale Sensors for Direct Metrology of Additively Manufactured Features." Application Number: 15/910,604, Filing Date: March 2, 2018.
7. **Cullinan, M.**, Cho, J., Cayll, D. and Ladner, I., "Graphene Microelectromechanical System (MEMS) Resonant Gas Sensor." Application Number: 62/563,389, Filing Date: September 26, 2017.
6. **Cullinan, M.**, and Connolly, L., "Coupled Multiscale Positioning of Arrays of Parallel, Independently Actuated and Simultaneously Driven Modular AFM Probes for Nanoscale Measurement of Flexible, Large Area, and Roll-to-Roll Processes." Application Number: 62/538,091, Filing Date: July 28, 2017.
5. **Cullinan, M.**, Roy, N., Yuksel, A., and Foong, C.S. "Micro-Selective Sintering Laser Systems and Methods Thereof," Application Number: 15/475,794, Filing Date: March 31, 2017
4. **Cullinan, M.**, Yuksel, A., and Roy, N. "Modeling of Nanoparticle Agglomeration and Powder Bed Formation in Microscale Selective Laser Sintering Systems," Application Number: 15/475,807, Filing Date: March 31, 2017
3. **Cullinan, M.** and Duenner, A. "Systems and Methods for Passive Alignment of Semiconductor Wafers," Provisional Application Number: US16/60236, Filing Date: November 3, 2016
2. **Cullinan, M.** and Yao, T.F. "A Plurality of Sensing Probes," Provisional Application Number: US16/60235, Filing Date: November 3, 2016
1. **Cullinan, M.** and Yao, T.F, Duenner, A. "Metrology Devices for Rapid Specimen Setup," Provisional Application Number: US16/60233, Filing Date: November 3, 2016

INVENTION DISCLOSURES

9. **Cullinan, M.**, Sun, G., Cho, J., Cayll, D. and Ladner, I. "Graphene MEMS Resonant Gas Sensor." Patent Disclosure, July 19, 2017.
8. Connolly, L, and **Cullinan, M.** "Coupled Multiscale Positioning of Arrays of Parallel, Independently Actuated and Simultaneously Driven Modular AFM Probes for Nanoscale Measurement of Flexible, Large Area, and Roll-to-Roll Processes." Patent Disclosure, April, 25, 2017.
7. Roy, N., Foong, C.S. and **Cullinan, M.** "Microscale Selective Laser Sintering on Flexible substrates and with Multi-material Capabilities" Patent Disclosure, July 14, 2016.
6. Yao, T-F., Duenner, A., and **Cullinan, M.** "A Method for Rapid Specimen-Setup in Wafer Inspection Systems" Patent Disclosure, October 24, 2015.

5. Yao, T-F, and **Cullinan, M.** “Simultaneously-and-Separately Driving of Multiple AFM Tips” Patent Disclosure, October 23, 2015.
4. Duenner, A. and **Cullinan, M.** “Method for Passive Alignment of Semiconductor Wafers” Patent Disclosure, October 23, 2015.
3. Yuksel, A. and **Cullinan, M.** “Powder-to-Parts Predictive Modeling of Microscale Selective Laser Sintering” Patent Disclosure, October 23, 2015.
2. Ladner, I. and **Cullinan, M.** “MEMS Apparatus for Multi-Axis Characterization, Active Force Controlled Growth, and Assembly of Nanostructures” Patent Disclosure, September 17, 2015.
1. Roy, N. and **Cullinan, M.** “Micro- Selective Laser Sintering System” Patent Disclosure, September 9, 2015.

TEACHING EXPERIENCE

ME338: Machine Elements - Fall 2013, Spring 2014, Fall 2014, Spring 2017, Spring 2018, Spring 2019

- Core junior level course including the design and analysis of mechanical systems using both analytical methods and CAD modeling
- Developed a new project for the course that involves the design and fabrication of an RC car using the analysis tools developed in the course

ME397: Precision Machine Design - Spring 2015, Spring 2016, Spring 2017, Spring 2018, Fall 2018

- Graduate level course including the design and analysis of precision mechanical systems using both analytical methods and CAD modeling
- Develop tools for modeling error motions in mechanical systems
- Students design, build, and measure the error motions of a desktop lathe over the course of the semester

ME350: Machine Tool Operation for Engineers - Fall 2015, Fall 2016, Fall 2017, Fall 2018, Spring 2019

- Undergraduate level elective course including the principles of machine tool operation, the role of machine tools in manufacturing and manufacturing systems
- Develop hands on skills in using manual and CNC machine tools
- Students build several complex parts from raw materials in accordance with tight tolerance specifications

ME266K: Senior Design (Project Advisor) - Fall 2013, Spring 2014, Fall 2014, Spring 2015

Fall 2015, Spring 2016, Fall 2016, Spring 2017, Summer 2017, Fall 2017, Spring 2018, Fall 2018, Spring 2019

- “Design of a Stapleless Paper Stapler”, Phillip Le, Michael Lowder, Mr. Dan Nguyen; Fall 2013
- “NASA Telescope Focuser” Hanna Yancy, Eric Bishop, Jared Imm, Chelsea Kaplun; Spring 2014
- “NASA Enclosure”, Karina Bonin, Richard North, James Kendrick, Vineet Raman; Spring 2014
- “Collector for Electrospinning of Nano Fibers”, John Kramer, Li He, Luke Nicolini, Keh Farn Tan; Spring 2014
- “O-Ring Groove Designs for Face Seals” Federico Cueva, Daniel Carrizales, Arnold Hechanova, Javier Martinez; Spring 2014
- “Wheelchair Mount for iPhone or iPad” Colton Kolaja, Patrick Creamer, Trinidad Gaytan, Spencer Huble; Spring 2014
- “Design and CAD Validation of a Novel Shutter System for an Infrared Camera” Mason Davidson, Logan Herbort, Leland Konstanty, David Strickland; Spring 2014
- “Design of a Single Turn Multi-valve System” Cody Rigg, Kathyn Leahy, William Rogers, Nurbolat Yerlanov; Fall 2014
- “Static Friction in Telescopes” Austin Davis, Greg Kline, Mathew Nagle, Jillian Wurz; Fall 2014
- “Trunnion Ball Valve Bearing Redesign” Hannah Jones, Jonathan Parsons, Enakshi Wikramanayake, Nuryasmin Yusri; Spring 2015
- “Metal Seal Acceptance Criteria Basis and Testing” Rose Anthraper, Mudeer Habeeb, Harun Hersi, Seyedsivash Zamani; Spring 2015
- “Design of an excel based design/calculation macro and prototype assemblies” Maimouna Diop, Maimouna Diop, Luis Alejandro Arias, Robert Noriega; Fall 2015

- “Design of a Rotating Sonar Test Structure” Brittany Barker, Adam Bowers, Wynn Cary, Blake Hamilton; Spring 2016
- “Design of a Glove Cut Resistance Demonstration Device” Claire Campbell, Monica Karlins, Eder Medina, Thomas Myers; Spring 2016
- “Design of a High Frequency Torque Sensor for Drilling Rigs” Eishaan Gakhar, Matthew Howsmon, Kent Jaco, Kevin Kuney; Spring 2016
- “Automation of Wafer Handling to Support In-Line Metrology in Semiconductor Manufacturing” Bruno De Hoyos, Andrew Duenner, Marianna Gonzales, Nathan Riojas, Spring 2016
- Applied Materials - Luis Machado, Matthew Milan, Andrew Myers, Austin Simon; Fall 2016
- Provenance - Matthew Ashorn, Ashley Gripka, Kyle Ray, McKenzie Teeters; Fall 2016
- “Design of Automatic Push-Button, Self-Wringing Microfiber Sponge” Yu-Chuen Chang, Eysa Lee, Eley Ng, Tram Nguyen, Adam Pettinger, Spring 2017
- Dell Inc. - Yu-Chuen Chang, Olisemeke Amudo, Parker Blome, Nicholas Esrock, Hayden Messamore, Spring 2017
- “Design of a Progressive Cavity Pump Element Core Deflection Measurement Tool” - Adrian Hawk, Madhukar Mantravadi, Camilo Neira, Mihail Sturca, Summer 2017
- “Design of PCP Elastomer Internal Diameter Measurement Tool” - Jack Beadle, Christopher Bellows, Wesam Khawaji, Dillon Schmidt, Summer 2017
- “Design of Flange Seal Setup” - Andre Abraham, Christian Benjamin, Neel Bhatt, Diego Hernandez, Summer 2017
- “Design of Six DOF Robotic Manipulator” - Hammad Afzal, John Griffith, Michael Hentrich, Ryan Menz, Summer 2017
- “Accessory Mounting System for Picatinny Rail” - Jessie Baicy, Kyle Lottinville, Kevin Oram, Marc Pichon, Fall 2017
- “Design of Internal Wind Turbine Hoisting Device for Lifting Parts and Tools” - Arturo Cantu-Chavez, Emily Crowell Yuen, Forrest Hopkins, Megan Wooley, Fall 2017
- “Gland Redesign for a Dynamic O-Ring Sealing Assembly” - Derek Orji, Kevin Song, EJ Uzor, Fall 2017
- “Development of Single Axis Solar Tracker for Solar Soiling Measurement” - Ryan Clegg, Peter Haloulos, Adil Moosani, John Vorsten, Fall 2017
- “Tension Control in Roll-to-Roll Nanometrology” - Ribka Balakrishnan, Alexia Bohannon, Sophia Davis, Breanna Simpson, Spring 2018
- “Design of Optical Polarizer Mount” - Benjamin Graber, Viola Holman, Charles Tindall, Sara Witz, Spring 2018
- “Automated Manufacturing Technologies” - Michael Bettati, Ezekiel Hsieh, Allison Huynh, Vaidehi Narayan, Spring 2018
- “Design of Modular Tool Connection Device for Teleoperated Robotic Manipulator” - Luis Fernandez, Andrea Gibke, Chao An Huang, Andy Yi, Spring 2018
- “Design of Interchangeable Steering Wheel for FSAE Racecars” - Frederick Cook, Kyle Scott, Evan Thomason, Spring 2018
- “Design of One-Wheeled Pull Behind Motorcycle Trailer” - Kielor Bjerga, Benjamin Summers, Tina Tran, Annie Ung, Spring 2018
- “Design and Execution of Flange Seal Experiments” - Christopher Palmer, Mohammd Radwan, Blake Simon, Matthew Webb, Spring 2018
- “Adjustable Center of Gravity Rack Loading Mechanism” - Paulo de Souza, Justin Liu, Matthew Millman, and Ahmed Wael, Fall 2018
- “Design of the Punching Pillow” - Levi Downing, Patrick Lyons, Evan McCall, Trevor Taimuty, Fall 2018

UGS 303: How Things Work

- Guest lecture on semiconductor manufacturing processes

ME 302: Introduction to Engineering Design and Graphics

- Guest lecture on geometric dimensioning and tolerancing

2.72: Elements of Mechanical Design at MIT (Teaching Assistant)

- Responsibilities: Advising students on class project (design of a desktop lathe), helping students measure runout of lathe spindle and crossfeed, teaching lab component of class, designing and fabricating setup to measure runout of lathe spindle and crossfeed

GRADUATE RESEARCH STUDENTS SUPERVISED

Ph.D. Students Graduated

Daniel Moser, “Multi-Scale Computational Modeling of Selective Laser Sintering for Process Improvements” Ph.D. Student; University of Texas at Austin; 2015 – 2017

Anil Yuksel, “Modeling of the Microscale Selective Laser Sintering Process,” Ph.D. Student; University of Texas at Austin; 2014-2017

Nilabh Roy, “Design of a Nanoscale Selective Laser Sintering System,” Ph.D. Student; University of Texas at Austin; 2014-2018.

Tsung-Fu Yao, “Large-Area Probe-based Metrology Systems of Nanomanufacturing Applications,” Ph.D. Student; University of Texas at Austin; 2014-2018.

Ian Ladner, “Mechanical Characterization of Two-photon Polymerization Submicron Features,” Ph.D. Student; University of Texas at Austin; 2013-2018.

Masters Students Graduated:

Guoao Sun, “Design and Fabrications of Tunable Graphene Resonators,” Masters Student; University of Texas at Austin; 2014-2016.

Martin Ward, “Wafer Scale Exfoliation of Single Crystal Silicon Thin Films for Flexible Electronics,” Ph.D. Student; University of Texas at Austin; 2015-2018

Chang Zhao, “Design and Fabrication of a Multi-Directional MEMS Thermal Actuator,” Master’s Student; University of Texas at Austin; 2016-2018

Dipankar Behera, “Design of a Multilayer Slot Die Coating System,” Master’s Student; University of Texas at Austin; 2016-2018

Tiffany Varughese, “A Novel Surgical Tool for Stimulation Paddle Delivery to the Dorsal Root Ganglion of the Spine”, Master’s Student; University of Texas at Austin; 2016-2018

Obehi Dibua, “Simulation, Experimentation and Calibration of Nanoparticle Sintering for a Microscale Selective Laser Sintering Process.” Master’s Student; University of Texas at Austin; 2016-2018.

Ph.D. Students in Progress:

Joon Hyong Cho, “Wafer-scale fabrication of Graphene-based Nanoelectromechanical Resonators,” Ph.D. Student; University of Texas at Austin; 2014-Present.

David Cayll, “Graphene-based NEMS resonators for gas sensing.” Ph.D. Student; University of Texas at Austin; 2017 – present

Martin Ward, “Wafer Scale Exfoliation of Single Crystal Silicon Thin Films for Flexible Electronics,” Ph.D. Student; University of Texas at Austin; 2015-Present

Liam Connolly, “Design of a Roll-to-Roll Tip-based Nanometrology System,” Ph.D. Student; University of Texas at Austin; 2016 – Present

Dipankar Behera, “Additive Manufacturing of 3D Parts with Microscale Resolutions,” Ph.D. Student; University of Texas at Austin; 2018-Present

Chenyang Luo, “Mechanical Metamaterials with Tunable Stiffness,” Ph.D. Student; University of Texas at Austin; 2018-Present

Joshua Grose, “Thermal Properties of Nanoparticle Beds in microscale Selective Laser Sintering”, Ph.D. Student; University of Texas at Austin; 2018-Present

Obehi Dibua, “Analysis and Modeling of the Sintering Mechanism in Microscale Selective Laser Sintering.” Master’s Student; University of Texas at Austin; 2018 – Present

Masters Students in Progress:

Sridharan Thirumalai, “Optimization of a Multi-Axis Nanopositioning Stage” - Master’s Student; University of Texas at Austin; 2016 – Present

Ph.D. Committee Member

Yoonho Seo	University of Texas at Austin	2018 (Expected)
Paras Ajay	University of Texas at Austin	2018 (Expected)
Milo Holt	University of Texas at Austin	2018 (Expected)
Praveen Joseph	University of Texas at Austin	2017
Hao Xin	University of Texas at Austin	2017
Alvin Lee	University of Texas at Austin	2016
Bradley Camburn	University of Texas at Austin	2015
Bailey Yin	University of Texas at Austin	2015

UNDERGRADUATE RESEARCH STUDENTS SUPERVISED

David Sullivan, “Functional and User Friendly Breath Analysis Tool Design”, University of Texas at Austin; September 2018 – Present

Daniel Hernandez, “Acetone Gas Sensor Testing and Calibration”, University of Texas at Austin; September 2018 - Present

Zulema Jurado, “Project: Design Wafer Holder for Nickle Plating Bath,” University of Texas at Austin; June 2018 – August 2018

James Garcia, “Mounting Bracket Fabrication for a Roll-to-Roll Nanometrology System”, University of Texas at Austin; January 2018 – May 2018

George Zhou, “Data analysis: Created MATLAB Algorithm to Sort Through the Results of a Simulation and Present the Results in a Logical Manner”, University of Texas at Austin; January 2018 – May 2018

Danny Guo, “Initial Characterization of Silver Nanoparticle Inks”, University of Texas at Austin; January 2018 – May 2018

Michael Bettati, “Roller fabrication for a Roll-to-Roll Manufacturing System”, University of Texas at Austin; September 2017 – May 2018

Reid Goins, “Design and Fabrication of Mounting Brackets for a Two-Axis Flexure System”, University of Texas at Austin; June 2017 - August 2017

Williams Davenport, “Characterization of Exfoliated Silicon Wafers”, University of Texas at Austin; June 2017 - August 2017

Chukwubuikem Ume-Ugwa, “Data Visualization for Microscale SLS simulations”, University of Texas at Austin; June 2017 - August 2017

Luisa Espinosa “Design of a Stage Elevator for a Tip-based Nanometrology System”, University of Texas at Austin; June 2017 - August 2017

Alex Bohannon, “Fabrication of a Roll-to-Roll Tip-Based Nanometrology System,” University of Texas at Austin; April 2017 – Present

Cynthia Wu, “Electronic Circuit Design for Roll-to-Roll Tip-Based Nanometrology,” University of Texas at Austin; January 2017 – May 2017

Daniel Penley, “Mechatronics for Roll-to-Roll Tip-Based Nanometrology,” University of Texas at Austin; January 2017 – Present

James Butcher, “Metrology for Silicon Exfoliation,” University of Texas at Austin; January 2017 – May 2017

Godson Inikori, “Design of a Robotic Wafer Handling System,” University of Texas at Austin; September 2016 – May 2017

John Marshall, “Growth of Graphene on Platinum Thin Films.” University of Texas at Austin; September 2016 – May 2017

Jeff Hou, “Copper Nanoparticle Sintering using Ultrafast Lasers.” University of Texas at Austin; September 2016 – May 2017

William Jou, “Measurement of the Optical Properties of Copper Nanoparticles,” University of Texas at Austin; Summer 2016.

Phillip Wang, “Modeling of thermal Flows in MEMS Systems”; University of Texas at Austin; Summer 2016.

David Cayll, “Transfer of Graphene Grown on Thin Films” as part of NASCENT summer REU program; Summer 2016.

Amey Joshi, “Mechanical Modeling of Graphene-based NEMS Resonators,” University of Texas at Austin; Summer 2016.

Nan Hong, “Design of an Electronics Setup for Testing Graphene-based NEMS Resonators,” University of Texas at Austin; Summer 2016.

Andrew Duenner, “Design of a Passive Precision Wafer Alignment System,” University of Texas at Austin; January 2015 - May 2016

Jessica Sun, “Design and Fabrication of Polysilicon Piezoresistors,” as part of NASCENT summer REU program; Summer 2014

Cody Daniel, “Fabrication of Non-photolithographic MEMS Devices,” as part of the Undergraduate Research Opportunities Program at MIT; Summer 2010.

Lina Garcia, “Design of Non-photolithographic MEMS Devices,” as part of the Undergraduate Research Opportunities Program at MIT; Spring 2010.

Ming Leong, “Design and Fabrication of a Measurement Setup to Determine Error Motions of the Carriage in a Desktop Lathe,” as part of the Undergraduate Research Opportunities Program at MIT; Spring 2008.

HIGH SCHOOL STUDNETS SUPERVISED

Carolina Barboza, “Graphene Growth and Transfer onto Microelectromechanical Sensors for Application in Health Monitoring,” as part of the NASCENT High School Scholars Program; Summer 2018.

Guillermo Rodriguez, “Graphene Growth and Transfer onto Microelectromechanical Sensors for Application in Health Monitoring,” as part of the NASCENT High School Scholars Program; Summer 2018.

Briana Palacios, “Fabrication of Atomically Sharp Tips on MEMS Motion Stages,” as part of the NASCENT High School Scholars Program; Summer 2016.

Moises Arevalo Moran, “Fabrication of Atomically Sharp Tips on MEMS Motion Stages,” as part of the NASCENT High School Scholars Program; Summer 2016.

Ava Lindquist-Sher, “Fabrication of Atomically Sharp Tips on MEMS Motion Stages,” as part of the NASCENT High School Scholars Program; Summer 2016.

Krishna Sathyanarayan, “Design of a Robotic Lift Mechanism for the In-Line Tip-Based Nanometrology System,” Summer 2016.

HIGH SCHOOL TEACHERS SUPERVISED

Kirsten Cole Christopherson, “Project: Design of Experiments for Wafer Scale Exfoliation of Monocrystalline Silicon Films,” as part of the NASCENT summer RET program; Summer 2018.

Rikki Foster, “Design of a Robotic Lift Mechanism for the In-Line Tip-Based Nanometrology System,” as part of the NASCENT summer RET program; Summer 2016.

ACADEMIC AND PROFESSIONAL ACTIVITIES

Internal Service

Mechanical Engineering Faculty Search Committee, 2014, 2018-19
 Mechanical Engineering Computing Committee, 2014-Present
 Mechanical Engineering Graduate Admissions Committee, 2014-Present
 Mechanical Engineering Machine Shop Committee, 2015
 Mechanical Engineering Graphics Committee, 2018 - Present

External Service

Guest Editor for the ASME Journal of Micro- and Nano Manufacturing, Special Issue on Metrology for Micro- and Nanomanufacturing, 2018 – Present

Associate Editor for Precision Engineering - Journal of the International Societies for Precision Engineering and Nanotechnology, 2018 - Present

Co-Chair, American Society for Precision Engineering Micro- and Nano-Technologies Technical Leadership Committee, 2015 - Present

Member, American Society for Precision Engineering Annual Meeting Scientific Committee, 2015 - Present

Member, American Society for Precision Engineering Handbook Committee, 2015 - Present

Member, American Society for Precision Engineering Student Competition Committee, 2014 - 2017

Review Panelist:

- NSF Nanomanufacturing Peer Review Panel
- NIST Engineering Laboratory External Proposal Review Panel
- DOE Technology Commercialization Fund Proposal Review Panel

Referee for:

- IEEE Transactions on Electron Devices
- Smart Materials and Structures
- Advanced Functional Materials
- Journal of Heat Transfer
- ASME International Design Engineering Technical Conferences
- ASME Manufacturing Science and Engineering Conference
- ASME Journal of Micro and Nanomanufacturing
- Precision Engineering
- Carbon

- Sensors and Actuators: A
- Additive Manufacturing
- Kentucky Science and Technology Corporation
- Mechatronics
- CIRP

Organizer, MIT Laboratory for Manufacturing and Productivity Student Seminar Series, 2008-2010

Professional Society Memberships:

- American Society of Mechanical Engineers
- American Society for Engineering Education
- American Society for Precision Engineering
- Institute of Electrical and Electronics Engineers
- Society of Manufacturing Engineers
- Tau Beta Pi