MARK E. RENTSCHLER

Current Position

Professor
Department of Mechanical Engineering
University of Colorado at Boulder
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Education

University of Nebraska, Lincoln, NE
Ph.D., Biomedical Engineering, May 2006
Thesis: *In vivo Abdominal Surgical Robotics: Tissue Mechanics Modeling, Robotic Design, Experimentation and Analysis*
Advisor: Prof. Shane Farritor

Massachusetts Institute of Technology, Cambridge, MA
M.S., Mechanical Engineering, June 2003
Thesis: *Dynamic Simulation Modeling and Control of the Odyssey III Autonomous Underwater Vehicle*
Advisor: Prof. Franz Hover

University of Nebraska, Lincoln, NE
B.S., Mechanical Engineering, *Summa cum laude*, May 2001
Thesis: *Mobile Highway Construction Barrel Robots*
Advisor: Prof. Shane Farritor

University of Technology of Belfort-Montbéliard, Belfort, France
Automotive engineering exchange summer program
Curriculum of automotive engineering

Academic Positions

Professor	*08/2020-present*
Sylvia Norviel Cancer Research Faculty Fellow	*02/2018-06/2021*
Associate Professor	*07/2016-08/2020*
Founding Director, CU Boulder Faculty Innovation Ambassadors	*10/2017-07/2020*
Founding Director, Graduate Design Program	*08/2010-05/2020*
Founding Co-Director, Design Center Colorado	*06/2012-05/2020*
Associate Department Chair	*07/2017-09/2018*
Chair, Graduate Program	*07/2017-09/2018*
Founding Chair, External Relations Committee	*07/2014-06/2016*
Assistant Professor	*08/2008-06/2016*

Department of Mechanical Engineering
University of Colorado Boulder (CU-Boulder)

Professor (Secondary Appointment) *08/2020-present*
Medical Science Training Program (MSTP) – MD/PhD Training Faculty *10/2017-present*
Associate Professor (Secondary Appointment) *07/2016-06/2020*
Assistant Professor (Secondary Appointment) *08/2008-06/2016*
Department of Surgery in the Division of Cardiothoracic Surgery
University of Colorado Anschutz Medical Campus (CU-Anschutz)

Professor (Affiliate) *08/2020-present*
Associate Professor (Affiliate) *07/2016-06/2020*
Assistant Professor (Affiliate) *03/2010-06/2016*
Department of Bioengineering
University of Colorado Denver (CU-Denver)

Postdoctoral Researcher *06/2006-05/2007*
Department of Surgery in the Division of Vascular Surgery
University of Nebraska Medical Center, Omaha NE

Graduate Research Fellow *06/2003-05/2006*
Department of Mechanical Engineering
University of Nebraska, Lincoln NE

Graduate Research Fellow *08/2001-06/2003*
Department of Mechanical Engineering
National Defense Science and Engineering Graduate (NDSEG) Fellowship
Massachusetts Institute of Technology

Research Associate *06/2001-08/2001*
NASA Academy
Goddard Space Flight Center, Greenbelt MD

Industry Positions

Founding President and Chief Executive Officer *06/2018-present*
Aspero Medical, Inc., Boulder, CO

Guest Speaker, Workshop, and Lecturer *01/2017-present*
Industry consulting focused on "design thinking," including on-site guest speaking, workshops and interactive classroom lectures.

Product Liability and Patent Litigation *01/2016-present*
-Subject matter expert in mechanical and biomedical engineering
-Expert witness in matters involving mechanical design, medical devices & surgical robotics
-Claim chart preparation and claim construction analysis
-Patent validity and infringement analysis
-Expert reports, rebuttals, and declarations
-Deposition testimony experience
-Hearing and trial testimony experience

Engineering Consulting *01/2007-present*
Design Engineering
Biomedical Engineering
Surgical Robotics Expert
Biomedical Roboticist

Director of Operations *05/2007-07/2008*
Intellectual Property Portfolio Development
Virtual Incision Corporation, Boston MA

Senior Engineer *06/2006-05/2007*
Robot Design and Development
Virtual Incision Corporation, Omaha NE

Licensure/ Professional Societies

Licensed Professional Mechanical Engineer (State of Colorado - PE.0042566)	*2008-present*
American Society of Mechanical Engineers (ASME, #6116925)	*1997-present*
Member	*1997-2018*
Fellow	*2018-present*
National Academy of Inventors	*2021-present*
Senior Member	*2021-present*
Institute of Electrical and Electronics Engineers (IEEE, #90031996)	*2008-present*
Member	*2008-2018*
Senior Member	*2018-present*
Biomedical Engineering Society (BMES, #4011419)	*2018-present*

Honors and Awards

Finalist for BizWest IQ Award for Innovative Life Science Product	*2021*
New York Academy of Sciences *Innovators in Science Award* Nomination	*2021*
Elected *Senior Member*, National Academy of Inventors (NAI)	*2021*
University of Colorado *Excellence in Leadership Program* Member	*2019-2020*
National Academy of Engineering's *US Frontiers of Engineering Symposium*	*2019*
College of Engineering and Applied Science *Dean's Faculty Fellowship*	*2019*
University of Colorado Research & Innovation Office *Faculty Fellow*	*2019*
Graduate Engineering Annual Research & Recruitment Symposium (GEARRS) *Invited Faculty Banquet Speaker*	*2019*
University of Colorado *Provost's Faculty Leadership Institute* Member	*2018-2019*
University of Colorado *Academic Leaders Institute* Member	*2018-2019*
ASME Journal of Biomechanical Engineering *Editor's Choice Paper*	*2018*
Elected *Fellow*, American Society of Mechanical Engineers (ASME)	*2018*
Elected *Senior Member*, Institute of Electrical and Electronics Engineers (IEEE)	*2018*
University of Colorado representative at *Coalition for National Science Funding*	*2018*
University of Colorado *Sylvia Norviel Cancer Research Faculty Fellow*	*2018*
Department of Mechanical Engineering *Outstanding Graduate Educator Award*	*2017-2018*
IEEE ICRA Conference Paper – *a top five paper by IEEE Spectrum Magazine*	*2017*
MRS Spring Meeting Symposium noted as *Meeting Scientific Highlight*	*2017*
CEAS *Dean's Performance Award for Outstanding Junior Faculty* *Annual award based on prior year's performance evaluations*	*2016*
University of Colorado *Innovative Seed Grant Program Award*	*2016*
Department of Mechanical Engineering *Outstanding Undergraduate Educator*	*2015-2016*
University of Colorado *Provost's Faculty Achievement Award* for research	*2015*
Design of Medical Devices Conference *3-in-5 Presentation Award Winner* *Top ten paper authors present 3 slides in 5 minutes – top winner chosen by expert panel*	*2015*
Department of Mechanical Engineering *Woodward Outstanding Faculty Award*	*2014-2015*
Colorado Clinical and Translational Sciences Institute (CCTSI) *Novel Clinical and Translational Methods Pilot Program Award (Co-PI)*	*2014*
Department of Mechanical Engineering *Outstanding Graduate Educator Award*	*2013-2014*
University of Colorado College of Engineering and Applied Science *Charles Hutchinson Memorial Teaching Award*	*2013*
University of Colorado *Innovative Seed Grant Program Award (Co-PI)*	*2013*
Department of Mechanical Engineering *Outstanding Graduate Education Award*	*2011-2012*
University of Colorado *Outstanding Graduate Student Mentor Faculty Award*	*2011-2012*
Colorado Clinical and Translational Sciences Institute (CCTSI) *Junior Faculty Pilot Award*	*2011*
CU Engineering Alumni Magazine Feature	*2010*

University of Colorado Boulder Technology Transfer *New Inventor of the Year*	*2009*
University of Colorado Volleyball *Professor of the Match*	*2009*
CU-Boulder *Innovative Seed Grant Program Award*	*2009*
BMW Group International *Passion for Innovation* Scientific Award Finalist (5 finalists out of 241 applicants from 25 countries)	*2007*
University of Nebraska Outstanding Graduate Research Assistant Award for University-wide Best Research	*2006*
Nominated for the Construction Innovation Forum (CIF) NOVA Award for "Robotic Traffic Barrels"	*2005*
NASA Columbia Memorial Scholarship	*2004-2006*
National Defense Science and Engineering Graduate (NDSEG) Fellowship	*2001-2004*
Tau Beta Pi Centennial Graduate Fellowship	*2001-2002*
Goddard Award for Excellence for outstanding research efforts and overall NASA Academy commitment	*2001*

Invited Lectures

"Moving from Research to an Entrepreneurial Mindset," Lunch and Learn Invited Panelist, Boulder, CO, October 2022.

"Research to Market Founder Panel," R2M, Boulder, CO, October 2022.

"SBIR/STTR—Winning and Using an SBIR to Accelerate your Company," SBIR/STTR Week 2022 Invited Panelist, Boulder, CO, July 2022.

"Enabling Robotic Capsule Surgery: from *In vivo* Locomotion to Automated Procedures," Northern Arizona University, Invited Seminar Presentation, March 2022.

"Innovation in Research," 5th Annual Center for Children's Surgery Research Symposium, Surgical Innovation Invited Panelist, Aurora, CO, February 2022.

"Surgical Innovation Leading to Commercialization," 3rd Annual Center for Children's Surgery Research Symposium, Surgical Innovation Guest Speaker, Aurora, CO, February, 2020.

"Lunch Keynote: CEO's Speak – Founders Talk About Successful Lab Spinouts," 2nd Annual Destination Startup, Westminster, CO, February, 2020.

"Enabling Robotic Capsule Surgery: from *In vivo* Locomotion to Automated Procedures," Stanford University, Invited Seminar Presentation, Palo Alto, CA, August, 2019.

"Enabling Robotic Capsule Surgery: from *In vivo* Locomotion to Automated Procedures," University of Colorado, Seminar Presentation, Boulder, CO, February, 2019.

"Enabling Mobile *In vivo* Robotic Surgery: from Micro-Patterned Materials to Autonomous Navigation," University of Leeds, Seminar Presentation, Leeds, England, October, 2018.

"Enabling Mobile *In vivo* Robotic Surgery: From Micro-Patterned Materials to Autonomous Navigation," University of Utah, Seminar Presentation, Salt Lake City, UT, April, 2018.

"Enabling the Next Generation of Surgical Devices: From Micro-Patterned Materials to Autonomous *In vivo* Navigation," University of Washington, Seminar Presentation, Seattle, WA, March, 2018.

"Micro-Patterned Materials to Enable *In vivo* Robotic Capsule Endoscope Locomotion," MRS Spring Meeting, Invited Symposium Speaker on *A Soft Future – From Electronic Skin to Robotics and Energy Harvesting*, Phoenix, AZ, April, 2017. ***Noted as Scientific Highlight.***

"Towards Autonomous Robotic Capsule Endoscopy," IEEE International Conference on Intelligent Robots and Systems (IROS), Invited Symposium Speaker on *Frontiers of Endoluminal Robotic Surgery*, Daejeon, Korea, October, 2016.

"Achieving *In vivo* Robotic Mobility using Micropatterned Treads," Colorado School of Mines, Seminar Presentation, Golden, CO, September, 2014.

"Achieving *In vivo* Robotic Mobility: Design, Experimental Testing, Contact Mechanics Modeling and Robotic Implementation of Micropatterend Treads," Clarkson University, Seminar Presentation, Potsdam, NY, October, 2012.

"Robotic Capsule Endoscopy: Measuring and Modeling Tissue-Robot Interactions," Vanderbilt University, Joint Mechanical Engineering and Vanderbilt Initiative in Surgery and Engineering (VISE) Seminar Presentation, Nashville, TN, March, 2012.

"Robotic Mobility Inside of the Human Body," University of Colorado, Department of Mechanical Engineering Graduate Seminar Presentation, Boulder, CO, November, 2009.

"*In Vivo* Abdominal Surgical Robotics: Tissue Mechanics Modeling, Robotic Design, Experimentation, and Analysis," BMW Group International Passion for Innovation Scientific Award, Munich, Germany, September, 2007.

"Virtual Incision Corporation – A Revolution in Minimally-Invasive Surgery," LifeScience Alley Conference on Biomedical Science, Saint Paul, MN, December, 2006.

"Mobile Robotics for *In vivo* Surgical and Battlefield Applications," Army Research Office (ARO) Workshop on Mobility and Control in Challenging Environments, Olin College, Needham, MA, October, 2006.

"Mobile *In vivo* Robotics for Laparoscopic Surgery," University of Nebraska – Lincoln, Department of Mechanical Engineering, November, 2005.

Publications

Theses

Rentschler, M., *In Vivo Abdominal Surgical Robotics: Tissue Mechanics Modeling, Robotic Design, Experimentation, and Analysis*, Ph.D. Dissertation, University of Nebraska, Lincoln, NE, 2006.

Rentschler, M., *Dynamic Simulation Modeling and Control of the Odyssey III Autonomous Underwater Vehicle*, Master's Thesis, Massachusetts Institute of Technology, Cambridge, MA, 2003.

Rentschler, M., *Mobile Highway Construction Barrel Robots*, Bachelor's Thesis, University of Nebraska, Lincoln, NE, 2001.

Books, Book Chapters, and Magazine Articles

Rentschler, M., Oleynikov, D., "Will in vivo robotics be the future of minimally invasive surgery?" *Med Tech Business Review*. 1(4): 70-73, 2007.

Rentschler, M., "Undergraduates Benefit From Conducting Research," *Nebraska Blueprint*. Spring, 2001.

Journal Publications (peer-reviewed original articles)

Sundaram, V., Ly, K., Johnson, B., Naris, M., Anderson, M., Humbert, S., Correll, N., **Rentschler, M.**, "Embedded Magnetic Sensing for Feedback Control of Soft HASEL Actuator," *IEEE Transactions on Robotics*. 2022. Epub 9/10/2022, https://doi.org/10.1109/TRO.2022.3200164.

Calahan, K.N., Qi, Y., Johannes, K.G., **Rentschler, M.E.**, Long, R., "Local Lateral Contact Governs Shear Traction of Micropatterned Surfaces on Hydrogel Substrates," *Science Advances*, 8(25), 2022.

Ly, K., Mayekar, J., Manzano, S.A., Keplinger, C., **Rentschler, M.**, Correll, N., "Electro-hydraulic Rolling Soft Wheel: Design, Hybrid Dynamic Modeling, and Model Predictive Control," *IEEE Transactions on Robotics*. 38(5): 3044-3063, 2022.

Hoyer, B.K., Long, R., **Rentschler, M.E.**, "A Tribometric Device for the Rolling Contact of Soft Elastomers," *Tribology Letters*, 70: 39, 2022.

Johannes, K., Calahan, K., Bowen, L., Zuetell, E., Long, R., **Rentschler, M.E.**, "Mechanically Switchable Micro-Patterned Adhesive for Soft Material Applications," *Extreme Mechanics Letters*, 52: 101622, 2022.

Prendergast, J.M., Formosa, G.A., Fulton, M.J., Heckman, C., **Rentschler, M.E.**, "A Real-Time State Dependent Region Estimator for Autonomous Endoscope Navigation," *IEEE Transactions on Robotics.* 37(3): 918-934, 2021.

Zhang, Q., Prendergast, J.M., Formosa, G.A., Fulton, M.J., **Rentschler, M.E.**, "Enabling Autonomous Colonoscopy Intervention Using a Robotic Endoscope Platform," *IEEE Transactions on Biomedical Engineering.* 68(6): 1957-1968, 2021.

Formosa, G.A., Prendergast, J.M., Humbert, J.S., **Rentschler, M.E.**, "Nonlinear Dynamic Modeling of a Robotic Endoscopy Platform on Synthetic Tissue Substrates," *ASME Journal of Dynamic Systems, Measurement and Control.* 143(1): 011005 (11 pages), 2021.

Ly, K., Kellaris, N., McMorris, D., Johnson, B.K., Acome, E., Sundaram, V., Naris, M., Humbert, J.S., **Rentschler, M.E.**, Keplinger, C., Correll, N., "Miniaturized Circuitry for Capacitive Self-sensing and Closed-loop Control of Soft Electrostatic Transducers," *Soft Robotics.* Epub (https://doi.org/10.1089/soro.2020.0048).

Bowen, L.K., Johannes, K., Zuetell, E., Calahan, K., Edmundowicz, S.A., Long, R., **Rentschler, M.E.**, "Patterned Enteroscopy Balloon Design Factors Influence Tissue Anchoring," *Journal of the Mechanical Behavior of Biomedical Materials*. 111: 103966, 2020.

Johnson, B.K., Sundaram, V., Naris, M., Acome, E., Ly, K., Correll, N., Keplinger, C.M., Humbert, J.S., **Rentschler, M.E.**, "Identification and Control of a Nonlinear Soft Actuator and Sensor System," *IEEE Robotics and Automation Letters*. 5(3): 3783-3790, 2020.

Formosa, G.A., Prendergast, J.M., Edmundowicz, S.A., **Rentschler, M.E.**, "Novel Optimization-Based Design and Surgical Evaluation of a Treaded Robotic Capsule Colonoscope," *IEEE Transactions on Robotics*. 36(2): 545-552, 2020.

Qi, Y., Calahan, K.N., **Rentschler, M.E.**, Long, R., "Friction between a Plane Strain Circular Indenter and a Thick Poroelastic Substrate," *Mechanics of Materials*. 142: 103303, 2020.

Lauff, C., Knight, D., Kotys-Schwartz, D., **Rentschler, M.E.**, "The Role of Prototypes in Communication between Stakeholders," *Design Studies*. 66: 1-34, 2020.

Johannes, K.G., Calahan, K.N., Qi, Y., Long, R., **Rentschler, M.E.**, "Three-Dimensional Microscale Imaging and Measurement of Soft Material Contact Interfaces Under Quasi-Static Normal Indentation and Shear," *Langmuir.* 35: 10725-10733, 2019.

Sun, X., Yu, L., **Rentschler, M.E.**, Wu, H., Long, R., "Delamination of a Rigid Punch from an Elastic Substrate Under Normal and Shear Forces," *Journal of the Mechanics and Physics of Solids*. 122: 141-160, 2019.

Formosa, G., Prendergast, J.M., Peng, J., Kirkpatrick, D., **Rentschler, M.E.**, "A Modular Endoscopy Simulation Apparatus (MESA) for Robotic Medical Device Sensing and Control Validation," *IEEE Robotics and Automation Letters*. 3(4): 4054-4061, 2018.

Lauff, C., Weidler-Lewis, J., O'Connor, K., Kotys-Schwartz, D., **Rentschler, M.E.**, "Prototypes as Intermediary Objects for Design Coordination in First-Year Design Courses," *International Journal of Engineering Education*. 34(3): 1085-1103, 2018.

Prendergast, J.M., Formosa, G.A., **Rentschler, M.E.,** "A Platform for Developing Robotic Navigation Strategies in a Deformable, Dynamic Environment," *IEEE Robotics and Automation Letters*. 3(3): 2670-2677, 2018.

Lauff, C., Kotys-Schwartz, D., **Rentschler, M.E.**, "What is a prototype? What are the roles of prototypes in companies?" *ASME Journal of Mechanical Design*. 140(6): 061102 (12 pages), 2018.

Kern, M.D., Long, R., **Rentschler, M.E.**, "A Representative Volume Element Model for the Adhesion between a Micro-Pillared Surface and a Compliant Substrate," *Mechanics of Materials*. 119: 65-73, 2018.

Fankell, D.P., Regueiro, R.A., Kramer, E.A., Ferguson, V.L., **Rentschler, M.E.**, "A Small Deformation Thermo-Poromechanics Finite Element Model and its Application to Arterial Tissue Fusion," *ASME Journal of Biomechanical Engineering.* 140(3): 031007 (11 pages), 2018.
Editor's Choice Paper (less than 10% receive this honor)

Prendergast, J.M., Perry, A., Patel, V., Lindley, E., **Rentschler, M.E.**, "Positioning Performance of Power and Manual Drivers in Posterior Spinal Fusion Procedures," *Applied Bionics and Biomechanics*. 2017: 7262841 (9 pages), 2017.

Han, F., Yang, X., Deng, Y., **Rentschler, M.**, Yang, D., Zhang, H., "SRAL: Shared Representative Appearance Learning for Long-Term Visual Place Recognition," *IEEE Robotics and Automation Letters*. 2(2): 1172-1179, 2017.

Kern, M., Qi, Y., Long, R., **Rentschler, M.E.**, "Characterizing Adhesion between a Micro-Patterned Surface and a Soft Synthetic Tissue," *Langmuir*. 33(4): 854-864, 2017.

Kramer, E.A., Cezo, J., Fankell, D. P., Taylor, K.D., **Rentschler, M.E.**, Ferguson, V.L., "Strength and Persistence of Energy-Based Vessel Seals Rely on Tissue Water and Glycosaminoglycan Content," *Annals of Biomedical Engineering*. 44(11): 3421-3431, 2016.

Fankell, D., Kramer, E., Cezo, J., Ferguson, V.L., Taylor, K.D., **Rentschler, M.E.**, "A Novel Parameter for Predicting Arterial Fusion and Cutting in Finite Element Models," *Annals of Biomedical Engineering.* 44(11): 3295-3306, 2016.

Sliker, L.J., Ciuti, G., **Rentschler, M.E.**, Menciassi, A., "Frictional Resistance Model for Tissue-Capsule Endoscope Sliding Contact in the Gastrointestinal Tract," *Tribology International*. 102: 472-484, 2016.

Kleck, C.J., Cullimore, I., LaFleur, M., Lindley, E., **Rentschler, M.E.**, Burger, E.L., Cain, C.M.J., Patel, V.V., "A New 3-Dimensional Method for Measuring Precision in Surgical Navigation and Methods to Optimize Navigation Accuracy," *European Spine Journal*. 25(6): 1764-1774, 2016.

Francisco, M., Terry, B.S., Schoen, J.A., **Rentschler, M.E.**, "An Intestinal Manometry Force Sensor for Robotic Capsule Endoscopy: An Acute, Multi-Patient *In vivo* Animal and Human Study," *IEEE Transactions on Biomedical Engineering.* 63(5): 943-951, 2016.

Anderson, N., Kramer, E., Cezo, J.D., Ferguson, V., **Rentschler, M.E.**, "Bond Strength of Thermally Fused Vascular Tissue Varies with Apposition Force," *ASME Journal of Biomechanical Engineering.* 137(12): 121010 (6 pages), 2015.

Sliker, L.J., Kern, M.D., **Rentschler, M.E.**, "An Automated Traction Measurement Platform and Empirical Model for Evaluation of Rolling Micro-Patterned Wheels," *IEEE/ASME Transactions on Mechatronics*. 20(4): 1854-1862, 2015.

Cezo, J., Kramer, E., Schoen, J.A., Ferguson, V., Taylor, K., **Rentschler, M.E.**, "Tissue Storage *Ex Vivo* Significantly Increases Vascular Fusion Bursting Pressure," *Surgical Endoscopy*. 29(7): 1999-2005, 2015.

Terry, B.S., Wang, X., Schoen, J.A., **Rentschler, M.E.**, "A Preconditioning Protocol and Biaxial Mechanical Measurement of the Small Intestine," *International Journal of Experimental and Computational Biomechanics.* 2(4): 293-309, 2014.

Kern, M., Ortega, J., **Rentschler, M.E.**, "Soft Material Adhesion Characterization for *In vivo* Locomotion of Robotic Capsule Endoscopes: Experimental and Modeling Results," *Journal of Mechanical Behavior of Biomedical Materials*. 39: 257-269, 2014.

Zimkowski, M.M., **Rentschler, M.E.**, Schoen, J.A., Mandava, N., Shandas, R., "Biocompatibility and Tissue Integration of a Novel Shape Memory Surgical Mesh for Ventral Hernia: *In vivo*

Animal Studies," *Journal of Biomedical Materials Research, Part B Applied Biomaterials.* 102(5): 1093-1100, 2014.

Beccani, M., Di Natali, C., Sliker, L.J., Schoen, J., **Rentschler, M.E.,** Valdastri, P. "Wireless Tissue Palpation for Intraoperative Detection of Lumps in Soft Tissue," *IEEE Transactions on Biomedical Engineering.* 61(2): 353-361, 2014. ***Cover Article***

Cezo, J.D., Passernig, A., Ferguson, V., Taylor, K., **Rentschler, M.E.**, "Evaluating Temperature and Duration in Arterial Tissue Fusion to Maximize Bond Strength," *Journal of Mechanical Behavior of Biomedical Materials.* 30: 41-49, 2014.

Lyle, A.B., Terry, B.S., Schoen, J.A., **Rentschler, M.E.**, "Preliminary Friction Force Measurements on Small Bowel Lumen when Eliminating Sled Edge Effects," *Tribology Letters.* 51(3): 377-383, 2013.

Cezo, J.D., Kramer, E., Taylor, K., Ferguson, V., **Rentschler, M.E.**, "Temperature Measurement Methods during Direct Heat Arterial Tissue Fusion," *IEEE Transactions on Biomedical Engineering.* 60(9): 2552-2558, 2013.

Wang, X., Sliker, L.J., Qi, H., **Rentschler, M.E.**, "A Quasi-static Model of Wheel-Tissue Interaction for Surgical Robotics," *Medical Engineering and Physics.* 35(9): 1368-1376, 2013.

Zimkowski, M.M., **Rentschler, M.E.**, Schoen, J.A., Rech, B.A., Mandava, N., Shandas, R., "Integrating a Novel Shape Memory Polymer into Surgical Meshes Decreases Placement Time in Laparoscopic Surgery: An *In vitro* and Acute *In vivo* Study," *Journal of Biomedical Materials Research Part A.* 101(9): 2613-2620, 2013.

Lyle, A.B., Luftig, J.T., **Rentschler, M.E.**, "A Tribological Investigation of the Small Bowel Lumen Surface," *Tribology International.* 62: 171-176, 2013.

Wang, X., Schoen, J.A., **Rentschler, M.E.**, "A Quantitative Comparison of Soft Tissue Compressive Viscoelastic Model Accuracy," *Journal of Mechanical Behavior of Biomedical Materials.* 20: 126-136, 2013.

Terry, B.S., Schoen, J.A., **Rentschler, M.E.**, "Measurements of the Contact Force from Myenteric Contractions on a Solid Bolus," *Journal of Robotic Surgery.* 7(1): 53-57, 2013.

Lindley, E., Zimkowski, M., Patel, V., **Rentschler, M.**, "Pain Sensitivity Testing Using a Novel Computer-Controlled Pressure Algometer that Simultaneously Records Sympathetic Nervoous System Responses to Pain Stimuli," *Journal of Pain.* 13(4): S9, 2012.

Terry, B.S., Passernig, A.C., Hill, M., Schoen, J.A., **Rentschler, M.E.**, "Small Intestine Mucosal Adhesivity to *In vivo* Capsule Robot Materials," *Journal of Mechanical Behavior of Biomedical Materials.* 15: 24-32, 2012.

Sliker, L.J., **Rentschler, M.E.**, "The Design and Characterization of a Testing Platform for Quantitative Evaluation of Tread Performance on Multiple Biological Substrates," *IEEE Transactions on Biomedical Engineering.* 59(9): 2524-2530, 2012.

Sliker, L., Kern, M., Schoen, J.A., **Rentschler, M.E.**, "Surgical Evaluation of a Novel Tethered Robotic Capsule Endoscope using Micro-Patterned Treads," *Journal of Surgical Endoscopy*. 26(10): 2862-2869, 2012.

Terry, B.S., Schoen, J.A., **Rentschler, M.E.**, "Characterization and Experimental Results of a Novel Sensor for Measuring the Contact Force from Myenteric Contractions," *IEEE Transactions on Biomedical Engineering.* 59(7): 1971-1977, 2012.

Terry, B.S., Schoen, J.A., Mills, Z., **Rentschler, M.E.**, "Single Port Access Surgery with a Novel Port Camera System," *Surgical Innovation*. 19(2): 123-129, 2012.

Rentschler, M.E., Hart, K.D., Mitchell, M.B., "Initial Design and Evaluation of a Pediatric Intra-Cardiac Camera System for Ventricular Septal Defects," *ASME Journal of Medical Devices.* 6(1): 011001-1-011001-9, 2012.

Terry, B.S., Mills, Z., Schoen, J.A., **Rentschler, M.E.**, "Single-Port-Access Surgery with a Novel Magnet Camera System," *IEEE Transactions on Biomedical Engineering*. 59(4): 1187-1193, 2012.

Terry, B.S., Lyle, A., Schoen, J.A., **Rentschler, M.E.**, "Preliminary Mechanical Characterization of the Small Bowel for *In vivo* Robotic Mobility," *ASME Journal of Biomechanical Engineering*. 133(9): 091010-1-091010-7, 2011.

Zimkowski, M., Lindley, E., Patel, V., **Rentschler, M.E.**, "Design and Evaluation of a Computer-Controlled Pressure Algometer," *ASME Journal of Medical Devices.* 5(3): 031002-1-031002-6, 2011.

Sliker, L.J., Wang, X., Schoen, J.A., **Rentschler, M.E.**, "Micropatterned Treads for *In vivo* Robotic Mobility," *ASME Journal of Medical Devices.* 4(4): 041006-1-041006-8, 2010.

Rentschler, M.E., Macdonald, S.A., "Design and Preliminary Evaluation of a Novel Brace for Boutonniere Deformity," *ASME Journal of Medical Devices.* 4(2): 021002-1-021002-7, 2010.

Terry, B.S., Ruppert, A.D., Steinhaus, K.R., Schoen, J.A., **Rentschler, M.E.**, "An Integrated Port Camera and Display System for Laparoscopy," *IEEE Transactions on Biomedical Engineering*. 57(5): 1191-1197, 2010.

Platt, S.R., Hawks, J.A., **Rentschler, M.E.**, "Vision and Task Assistance using Modular Wireless *In Vivo* Surgical Robots," *IEEE Transactions on Biomedical Engineering*. 56(6): 1700-1710, 2009.

Rentschler, M., Reid, J., "The Development of a Material Model and Wheel-Tissue Interaction for Simulating Wheeled Surgical Robot Mobility," *Computer Methods in Biomechanics and Biomedical Engineering*. 12(2): 239-248, 2009.

Joseph, J.V., Oleynikov, D., **Rentschler, M.**, Dumpert, J., Patel, H.R., "Microrobot Assisted Laparoscopic Urological Surgery in a Canine Model," *Journal of Urology.* 180(5): 2202-2205, 2008.

Rentschler, M., Baxter, B.T., "Screening Aortic Drug Treatments through Arterial Compliance Measurements," *Current Vascular Pharmacology.* 6(4): 250-257, 2008.

Soares, R.F., Allen, D.H., Kim, Y.R., Berthelot, C., Soares, J.B, **Rentschler, M.E.**, "A Computational Model for Predicting the Effect of Tire Configuration on Asphaltic Pavement Life," *International Journal on Road Materials and Pavement Design*. 9(2): 271-289, 2008.

Lehman, A.C., Berg, K.A., Dumpert, J., Wood, N.A., Visty, A.Q., **Rentschler, M.E.**, Platt, S.R., Farritor, S.M., Oleynikov, D., "Surgery with Cooperative Robots," *Computer Aided Surgery*. 13(2): 95-105, 2008.

Rentschler, M., Platt, S., Berg, K., Dumpert, J., Oleynikov, D., Farritor, S., "Miniature *In vivo* Robots for Remote and Harsh Environments," *IEEE Transactions on Information Technology in Biomedicine*. 12(1): 66-75, 2008.

Rentschler, M., Baxter, B.T., "Medical Therapy Approach for Treating Abdominal Aortic Aneurysm," *Vascular*. 15(6): 361-365, 2007.

Rentschler, M., Iagnemma, K., Farritor, S., "Mechanical Design of Robotic *In vivo* Wheeled Mobility," *ASME Journal of Mechanical Design*. 129(10): 1037-1045, 2007.

Rentschler, M., Dumpert, J., Platt, S., Farritor, S., Oleynikov, D., "Natural Orifice Surgery with an Endoluminal Mobile Robot," *Journal of Surgical Endoscopy*. 21(7): 1212-1215, 2007.

Rentschler, M., Dumpert, J., Platt, S., Iagnemma, K., Oleynikov, D., Farritor, S., "An *In vivo* Mobile Robot for Surgical Vision and Task Assistance," *ASME Journal of Medical Devices*. 1(1): 23-29, 2007.

Rentschler, M., Baxter, B.T., "Pharmacological Approaches to Prevent Abdominal Aortic Aneurysm Enlargement and Rupture," *Annals of the New York Academy of Sciences*. 1085: 39-46, 2006.

Rentschler, M., Dumpert, J., Platt, S., Iagnemma, K., Oleynikov, D., Farritor, S., "Modeling, Analysis, and Experimental Study of *In Vivo* Wheeled Robotic Mobility," *IEEE Transactions on Robotics*. 22(2): 308-321, 2006.

Rentschler, M., Hover, F., Chryssostomidis, C., "System Identification of Open Loop Maneuvers Leads to Improved AUV Flight Performance," *IEEE Journal of Oceanic Engineering*. 31(1): 200-208, 2006.

Rentschler, M., Dumpert, J., Platt, S., Ahmed, S., Farritor, S., Oleynikov, D., "Mobile *In Vivo* Robots Provide Sole Visual Feedback for Abdominal Exploration and Cholecystectomy," *Journal of Surgical Endoscopy.* 20(1): 135-138, 2006.

Oleynikov, D., **Rentschler, M.**, Hadzialic, A., Dumpert, J., Platt, S., Farritor, S., "Miniature Robots Can Assist in Laparoscopic Cholecystectomy," *Journal of Surgical Endoscopy*. 19(4): 473-476, 2005.

Technical Briefs (peer-reviewed original articles)

Prendergast, J.M., Perry, A., **Rentschler, M.E.**, "*Benchtop Testing of a Novel Robotic Capsule with Differential Drive Capabilities.*" *ASME Journal of Medical Devices.* 9(3): 030935(2 pp), 2015. ****Selected as a Top Ten Paper***

Anderson, N., Kramer, E., Cezo, J., Ferguson, V., **Rentschler, M.E.**, "Tissue Bond Strength as a Function of Applied Fusion Pressure," *ASME Journal of Medical Devices*. 8(3): 030925(2 pp), 2014.

Terry, B.S., Francisco, M., Schoen, J.A., **Rentschler, M.E.** "Sensor for Measuring the Contact Force from Human Myenteric Contractions for *In vivo* Robotic Capsule Endoscope Mobility," *ASME Journal of Medical Devices*. 7(3): 030911(2 pp), 2013.

Beccani, M., Di Natali, C., **Rentschler, M.E.**, Valdastri, P. "Uniaxial Wireless Tissue Palpation Device for Minimally Invasive Surgery," *ASME Journal of Medical Devices*. 7(2): 020919(3 pp), 2013.

Journal Publications (peer-reviewed review articles)

Kramer, E.A., **Rentschler, M.E.**, "Energy-Based Tissue Fusion for Sutureless Closure: Applications, Mechanisms, and a Potential for Functional Recovery," *Annual Review of Biomedical Engineering.* 20: 1-20, 2018.

Prendergast, J.M., **Rentschler, M.E.**, "Towards Autonomous Motion Control in Minimally Invasive Robotic Surgery," *Expert Review of Medical Devices*. 13(8): 741-748, 2016.

Sliker, L.J., Ciuti, G., **Rentschler, M.E.**, Menciassi, A., "Magnetically-driven Medical Devices: A Review," *Expert Review of Medical Devices*. 12(6): 737-752, 2015.

Rentschler, M., Oleynikov, D., "Recent *In vivo* Surgical Robot and Mechanism Developments," *J. of Surgical Endoscopy*. 21(9): 1477-1481, 2007.

Lehman, A.C., **Rentschler, M.E.**, Farritor, S.M., Oleynikov, D., "The Current State of Miniature *In vivo* Laparoscopic Robotics," *Journal of Robotic Surgery*. 1(1): 45-49, 2007.

Lehman, A.C., **Rentschler, M.E.**, Farritor, S.M., Oleynikov, D., "Endoluminal Minirobots for Transgastric Peritoneoscopy," *Minimally Invasive Therapy and Allied Technologies*. 15(6): 384-388, 2006.

Rentschler, M., Platt, S., Dumpert, J., Farritor, S., Oleynikov, D., "*In Vivo* Laparoscopic Robotics," *International Journal of Surgery*. 4(3): 167-171, 2006.

Oleynikov, D., **Rentschler, M.E.**, Dumpert, J., Platt, S.R., Farritor, S.M., "*In Vivo* Robotic Laparoscopy," *Surgical Innovation*. 12(2): 177-181, 2005.

Conference Presentations with Publication (peer-reviewed original paper)

Ly, K., Mayekar, J., Manzano, S.A., Keplinger, C., **Rentschler, M.**, Correll, N., "*Electro-hydraulic Rolling Soft Wheel: Design, Hybrid Dynamic Modeling, and Model Predictive Control*," IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Kyoto, Japan, October, 2022.

Fulton, M.J., Heckman, C.R., **Rentschler, M.E.**, (2022) "*Deformable Bayesian Convolutional Networks for Disease-Robust Cardiac MRI Segmentation*," In: Puyol Antón E. et al. (eds) Statistical Atlases and Computational Models of the Heart. Multi-Disease, Multi-View, and Multi-Center Right Ventricular Segmentation in Cardiac MRI Challenge. STACOM 2021. Lecture Notes in Computer Science, vol 13131. Springer, Cham. https://doi.org/10.1007/978-3-030-93722-5_32

Fulton, M.J., Heckman, C.R., **Rentschler, M.E.**, "*Deformable Bayesian Convolutional Networks for Disease-Robust Cardiac MRI Segmentation*," International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI), September, 2021. ***Paper placed 1st in the M&Ms-2 Challenge*

Prendergast, J.M., Formosa, G.A., Fulton, M.J., Heckman, C., **Rentschler, M.E.**, "*A Real-Time State Dependent Region Estimator for Autonomous Endoscope Navigation*," IEEE International Conference on Intelligent Robots and Systems (IROS), Prague, Czech Republic, September, 2021.

Fulton, M.J., Prendergast, J.M., DiTommaso, E.R., **Rentschler, M.E.**, "*Comparing Visual Odometry Systems in Actively Deforming Simulated Colon Environments*," IEEE International Conference on Robotics and Automation, Las Vegas, NV, October, 2020.

Formosa, G.A., Prendergast, J.M., Edmundowicz, S.A., **Rentschler, M.E.**, "*Novel Optimization-Based Design and Surgical Evaluation of a Treaded Robotic Capsule Colonoscope*," IEEE International Conference on Robotics and Automation, Paris, France, June, 2020.

Johnson, B.K., Sundaram, V., Naris, M., Acome, E., Ly, K., Correll, N., Keplinger, C.M., Humbert, J.S., **Rentschler, M.E.**, "*Identification and Control of a Nonlinear Soft Actuator and Sensor System*," IEEE International Conference on Soft Robotics (RoboSoft), Yale University, April, 2020.

Schunk, C., Pearson, L., Acome, E., Morrissey, T., Correll, N., Keplinger, C.M., **Rentschler, M.E.**, Humbert, J.S., "*System Identification and Closed-Loop Control of a Hydraulically Amplified Self-Healing Electrostatic (HASEL) Actuator*," IEEE International Conference on Intelligent Robots and Systems, Madrid, Spain, October, 2018.

Prendergast, J.M., Formosa, G.A., Heckman, C.R., **Rentschler, M.E.**, "*Autonomous Localization, Navigation and Haustral Fold Detection for Robotic Endoscopy*," IEEE International Conference on Intelligent Robots and Systems, Madrid, Spain, October, 2018.

Lauff, C.A., Kotys-Schwartz, D., **Rentschler, M.E.**, *"Prototyping Canvas: Building Purposeful Prototypes During Early Stage Design,"* ASME International Design and Engineering Technical Conference, Quebec City, Canada, August, 2018.

Lauff, C.A., Kotys-Schwartz, D., **Rentschler, M.E.**, *"Design Methods used during Early Stages of Product Development: Three Company Cases,"* ASME International Design and Engineering Technical Conference, Quebec City, Canada, August, 2018.

Schunk, C., Pearson, L., Acome, E., Morrissey, T., Correll, N., Keplinger, C.M., **Rentschler, M.E.**, Humbert, J.S., "*System Identification and Closed-Loop Control of a Hydraulically Amplified Self-Healing Electrostatic (HASEL) Actuator*," IEEE International Conference on Intelligent Robots and Systems, Madrid, Spain, October, 2018.

Prendergast, J.M., Formosa, G.A., Heckman, C.R., **Rentschler, M.R.**, "*Autonomous Localization, Navigation and Haustral Fold Detection for Robotic Endoscopy*," IEEE International Conference on Intelligent Robots and Systems, Madrid, Spain, October, 2018.

Lauff, C.A., Kotys-Schwartz, D., **Rentschler, M.E.**, *"What is a Prototype? Emergent Roles of Prototyping from Emperical Work in Three Diverse Companies,"* ASME International Design and Engineering Technical Conference, Cleveland, OH, August, 2017.

Lauff, C.A., Kotys-Schwartz, D., **Rentschler, M.E.**, *"Perceptions of Prototypes: Pilot Study Comparting Students and Professionals,"* ASME International Design and Engineering Technical Conference, Cleveland, OH, August, 2017.

Han, F., Yang, X., Deng, Y., **Rentschler, M.**, Yang, D., Zhang, H., "*SRAL: Shared Representative Appearance Learning for Long-Term Visual Place Recognition*," IEEE International Conference on Robotics and Automation (ICRA), Singapore, June, 2017.

Ortega Alcaide, J., Pearson, L., **Rentschler, M.**, "*Design, Modeling and Control of a SMA-Actuated Biomimetic Robot with Novel Functional Skin*," IEEE International Conference on Robotics and Automation (ICRA), Singapore, June, 2017. ***Noted as one of the top five papers by IEEE Spectrum.***

Han, F., Yang, X., Deng, Y., **Rentschler, M.**, Yang, D., Zhang, H., "*Life-Long Place Recognition by Shared Representative Appearance Learning*," Robotics: Science and Systems Conference, Ann Arbor, MI, June, 2016.

O'Connor, K., Lauff, C., Kotys-Schwartz, D., **Rentschler, M.E.**, *"Learning and Identity at the Nexus of Practice: Mediated Discourse Analysis as a Methodology for Engineering Education Research,"* ASEE Annual Conference and Exposition, Seattle, WA, June, 2015.

Lauff, C., O'Connor, K., Kotys-Schwartz, D., **Rentschler, M.E.**, *"Engineering Design Process: More than the 'Standardized Loop',"* ASEE Annual Conference and Exposition, Seattle, WA, June, 2015.

Prendergast, J.M., Dunn, C., Sliker, L.J., Wheeler, C.M., **Rentschler, M.E.** *"Magnetic Localization of a Novel Wheeled Robotic Capsule,"* IEEE International Conference on Robotics and Automation, Seattle, WA, May, 2015.

Lauff, C., O'Connor, K., Kotys-Schwartz, D., **Rentschler, M.E.**, *"How is Design Organized? A Preliminary Study of Spatiotemporal Organization in Engineering Design,"* IEEE Frontiers in Education Conference, Madrid, Spain, October, 2014.

Lauff, C., Weidler-Lewis, J., O'Connor, K., Kotys-Schwartz, D., **Rentschler, M.E.**, *"Undergraduate to Professional Engineering Design: A Disconnected Trajectory?,"* American Society for Engineering Education Zone IV Conference, Long Beach, CA, April, 2014.

Wang. X., Di Natali, C., Beccani, M., Kern, M., Valdastri, P., **Rentschler, M.E.** *"Novel Medical Wired Palpation Device: A Validation Study of Material Properties,"* International Conference on Solid-State Sensors, Actuators and Microsystems – *Transducers 2013 and Eurosensors XXVII*, Barcelona, Spain, June, 2013.

Beccani, M., Di Natali, C., **Rentschler, M.E.**, Valdastri, P. *"Wireless Tissue Palpation: Proof of Concept for a Single Degree of Freedom,"* IEEE International Conference on Robotics and Automation, Karlsruhe, Germany, May, 2013.

Sliker, L.J., Kern, M.D., **Rentschler, M.E.** *"Preliminary Experimental Results and Modeling for a Four Degree of Freedom Automated Traction Measurement Platform for Quantitative Evaluation of In Vivo Robotic Capsule Colonoscopy Mobility Effectiveness,"* IEEE International Conference on Robotics and Automation, Karlsruhe, Germany, May, 2013.

Beccani, M., Di Natali, C., **Rentschler, M.E.**, Valdastri, P. *"Uniaxial Wireless Tissue Palpation Device for Minimally Invasive Surgery,"* ASME Design of Medical Devices Conference, Minneapolis, MN, April, 2013.

Terry, B.S., Francisco, M., Schoen, J.A., **Rentschler, M.E.** *"Sensor for Measuring the Contact Force from Human Myenteric Contractions for In vivo Robotic Capsule Endoscope Mobility,"* ASME Design of Medical Devices Conference, Minneapolis, MN, April, 2013.

Terry, B.S., Lyle, A., Schoen, J.A., **Rentschler, M.E.**, "*Preliminary Mechanical Characterization of the Small Bowel for In vivo Mobility*," ASME International Mechanical Engineering Congress and Exposition, Vancouver, British Columbia, Canada, November, 2010.

Wang, X., Qi, H., **Rentschler, M.E.**, "*Analysis of Wheel-Tissue Interaction for In vivo Robotic Mobility*," ASME International Mechanical Engineering Congress and Exposition, Vancouver, British Columbia, Canada, November, 2010.

Hart, K.D., Mitchell, M.B., **Rentschler, M.E.**, "*Initial Design and Evaluation of an Intra-Cardiac Camera System for Ventricular Septal Defects*," ASME DETC and CIE Conference – Mechanisms and Robotics Conference, Montreal, Quebec, Canada, August, 2010.

Sliker, L.J., Schoen, J.A., **Rentschler, M.E.**, "*Preliminary In vivo Capsule Crawler Mobility*," ASME DETC and CIE Conference – Mechanisms and Robotics Conference, Montreal, Quebec, Canada, August, 2010.

Rentschler, M.E., Zable, J.A., *"Beyond Capstone Design – Developing a New Graduate Design Pedagogy and Program,"* National Capstone Conference, Boulder, CO, June, 2010.

Platt, S.R., Hawks, J.A., **Rentschler, M.E.**, Redden, L., Oleynikov, D., Farritor, S., "*Modular Wireless Wheeled In vivo Surgical Robots*," ASME DETC and CIE Conference - 30th Biennial Mechanisms and Robotics Conference, vol. 2, pp. 727-736, Brooklyn, NY, August, 2008.

Rentschler, M., Dumpert, J., Platt, S., Oleynikov, D., Iagnemma, K., Farritor, S. *"Mobile In Vivo Biopsy Robot*," IEEE International Conference on Robotics and Automation, pp. 4155-4160, Orlando, FL, May, 2006.

Rentschler, M., Dumpert, J., Hadzialic, A., Platt, S., Oleynikov, D., Iagnemma, K., Farritor, S., "*Theoretical and Experimental Analysis of In Vivo Wheeled Mobility*," Proceedings of the ASME DETC and CIE Conference - 28th Biennial Mechanisms and Robotics Conference, vol. 2, pp. 1241-1249, Salt Lake City, UT, October, 2004.

Rentschler, M., Hover, F., Chryssostomidis, C., "*Modeling and Control of an Odyssey III AUV through System Identification Tests*", 13th International Symposium on Unmanned Untethered Submersible Technology, Durham, NH, August, 2003.

Farritor, S., **Rentschler, M.**, "*Robotic Highway Safety Markers*", American Society of Mechanical Engineers, Dynamic Systems and Control Division DSC, vol. 71, pp. 833-839, New Orleans, LA, November, 2002.

Conference Presentations with Publication (paper with peer-reviewed original abstract)

Calahan, K., Qi, Y., Johannes, K., **Rentschler, M.**, Long, R., "*Lateral Contact Governs the Shear Response between Micropatterned Surfaces and Hydrogel Substrates*," Adhesion Society Annual Meeting, San Diego, CA, February, 2021.

Johannes, K., Bowen, L., Zuetell, E., Calahan, K., Long, R., **Rentschler, M.**, "*Bulk Experimental Data and Micro Scale Contact Modeling of Adhesion Mechanics of Highly Strained Silicone Micro-Patterned Surfaces in Contact With Soft Polyvinyl Chloride (PVC) Material*," ASME Verification and Validation Symposium, Baltimore, MD, May, 2020.

Fankell, D., Regueiro, R., **Rentschler, M.**,"*Simulating Arterial Tissue Fusion with a Large Deformation Thermo-Poromechanics Finite Element Model*," Engineering Mechanics Institute Conference, Cambridge, MA, May, 2018.

Lauff, C., O'Connor, K., Kotys-Schwartz, D., **Rentschler, M.E.**, "*Engineering Design Process: More than the 'Standardized Loop'*," American Society for Engineering Education Rocky Mountain Section Conference, Denver, CO, April, 2015.

Kramer, E.A., Anderson, N.S. Taylor, K.D., Ferguson, V.L., **Rentschler, M.E.**, "*The Role of Glycosaminoglycans in Tissue Adhesion during Energy-Based Vessel Sealing*," International Society for Optics and Photonics (SPIE) Photonics West, San Francisco, CA, February, 2015.

Fankell, D., Kramer, E.A., Taylor, K.D., Ferguson, V.L., **Rentschler, M.E.**, "*A Novel Parameter for Predicting Arterial Fusion and Ablation in Finite Element Models*," International Society for Optics and Photonics (SPIE) Photonics West, San Francisco, CA, February, 2015.

Cezo, J., Kramer, E., Taylor, K., Ferguson, V., **Rentschler, M.E.**, "*Tissue Fusion Bursting Pressure and the Role of Tissue Water Content*," International Society for Optics and Photonics (SPIE) Photonics West, San Francisco, CA, February, 2013.

Hawks, J., **Rentschler, M.**, Farritor, S., Oleynikov, D., Platt, S., *"A Modular Wireless In Vivo Surgical Robot with Multiple Surgical Applications,"* Studies in Health Technology and Informatics - Medicine Meets Virtual Reality, vol. 142, pp. 117-121, IOS Press, Long Beach, CA, January, 2009.

Hawks, J., **Rentschler, M.**, Redden, L., Infanger, R., Dumpert, J., Farritor, S., Oleynikov, D., Platt, S., *"Towards an In Vivo Wireless Mobile Robot for Surgical Assistance,"* Studies in Health Technology and Informatics - Medicine Meets Virtual Reality, vol. 132, pp. 153-158, IOS Press, Long Beach, CA, January, 2008.

Joseph, J.V., Boczko, J., Capello, S., Oleynikov, D., Dumpert, J., **Rentschler, M.**, Patel, H.R., "Microrobots in Urology: Video Demonstration of Microrobot-Assisted Laparoscopic Prostatectomy and Nephrectomy in a Canine Model," *Journal of Endourology*. 20: A311, 2006.

Joseph, J.V., Oleynikov, D., Boczko, J., **Rentschler, M.**, Dumpert, J., Patel, H.R., "Microrobots in urologic surgery: The next step in the evolution of robotic surgery," *Journal of Urology*, 175(4): 344, 2006.

Rentschler, M., Dumpert, J., Platt, S., Farritor, S., Oleynikov, D., *"Mobile In Vivo Biopsy and Camera Robot,"* Studies in Health Technology and Informatics - Medicine Meets Virtual Reality, vol. 119, pp. 449-454, IOS Press, Long Beach, CA, January, 2006.

Rentschler, M., Dumpert, J., Platt, S., Farritor, S., Oleynikov, D., "*Toward In Vivo Mobility*," Studies in Health Technology and Informatics - Medicine Meets Virtual Reality, vol. 111, pp. 397-403, IOS Press, Long Beach, CA, January, 2005.

Rentschler, M., Oleynikov, D., Hadzialic, A., Dumpert, J., Platt, S., Farritor, S., "*In Vivo Camera Robots Provide Improved Vision for Laparoscopic Surgery*," International Congress Series - Proceedings of Computer Assisted Radiology and Surgery Conference, vol. 1268, pp. 787-792, Chicago, IL, June, 2004.

Rentschler, M., Hadzialic, A., Dumpert, J., Platt, S., Farritor, S., Oleynikov, D., "*In Vivo Robots for Laparoscopic Surgery*," Studies in Health Technology and Informatics - Medicine Meets Virtual Reality, vol. 98, pp. 316-322, IOS Press, Newport Beach, CA, January, 2004.

Conference Presentations without Publication (peer-reviewed original abstract)

Calahan, K., Qi, Y., Long, R., **Rentschler, M.E.**, "*Mapping Three-Dimensional Micromechanics for Investigation of Soft Tribology Mechanisms*," Gordon Research Conference – Science of Adhesion, Mount Holyoke College, MA, July, 2019.

Calahan, K., Johannes, K., Long, R., **Rentschler, M.**, "*Mapping Three-dimensional Micro-mechanics between Micro-pillars and Soft Gel Substrates for Biomedical Application*," World Congress on Biomechanics, Dublin, Ireland, July, 2018.

Johannes, K.G., **Rentschler, M.**, "*A Tunable Bio-Inspired Micro-Pillared Surface*," World Congress on Biomechanics, Dublin, Ireland, July, 2018.

Rentschler, M., "*Micro-Patterned Materials to Enable In vivo Robotic Capsule Endoscope Locomotion*," MRS Spring Meeting, Invited Symposium Speaker on A Soft Future - From Electronic Skin to Robotics and Energy Harvesting, Phoenix, AZ, April, 2017. ***Noted as a Scientific Highlight of MRS Spring Meeting.***

Rentschler, M., "*Towards Autonomous Robotic Capsule Endoscopy*," IEEE International Conference on Intelligent Robots and Systems (IROS), Invited Symposium Speaker on Frontiers of Endoluminal Robotic Surgery, Daejeon, Korea, October, 2016.

Kramer, E., Ferguson, V. L., **Rentschler, M.E.**, "*Biothermomechanics of Thermal Tissue Fusion: A Multi-Faceted Interaction*," World Congress on Biomechanics, Boston, MA, July, 2014. (14-A-5404-WCB).

Cezo, J., Kramer, E., Schoen, J.A., Ferguson, V., **Rentschler, M.E.**, *"Tissue Storage Ex vivo Significantly Increases Vascular Fusion Bursting Pressure,"* The Society of American Gastrointestinal Endoscopic Surgeons, Salt Lake City, UT, April, 2014.

Lindley, E.M., Spiegel, B., Zimkowski, M., **Rentschler, M.E.**, Blount, T., Milligan, K., Burger, E.L., Patel, V.V., "*A New Method For Clinically Assessing Pain*," American Academy of Orthopaedic Surgeons Annual Meeting, New Orleans, LA, March, 2014.

Kleck, C.J., LaFleur, M., Lindley, E.M., Clark, M., Burger, E.L., Cain, C.M.J., **Rentschler, M.E.**, Razavi-Shearer, D., Patel, V.V., "*Pedicle Screw Precision with 3-Dimensional Imaging, Navigation, and Measurement*," SICOT Orthopaedic World Congress, Hyderabad, India, October, 2013.

Lindley, E.M., Spiegel, B., Milligan, K., Zimkowski, M., **Rentschler, M.E.**, Burger, E.L., Patel, V.V., "*A New Method For Clinically Assessing Pain*," SICOT Orthopaedic World Congress, Hyderabad, India, October, 2013.

Lindley, E., Zimkowski, M., Patel, V., **Rentschler, M.E.**, "*Pain Sensitivity Testing Using A Novel Computer-Controlled Pressure Algometer That Simultaneously Records Sympathetic Nervous System Responses to Pain Stimuli*," American Pain Society Annual Scientific Meeting, Honolulu, HI, May, 2012.

Mills, Z., Terry, B., Schoen, J.A., **Rentschler, M.E.**, "*Single Port Access Surgery with a Novel Magnet Camera System*," ASME International Mechanical Engineering Congress and Exposition, Denver, CO, November, 2011 (IMECE2011-63963).

Lyle, A., Terry, B., Schoen, J.A., **Rentschler, M.E.**, "*An Experimental Evaluation of Small Bowel Friction Forces when Eliminating Edge Effects*," ASME International Mechanical Engineering Congress and Exposition, Denver, CO, November, 2011 IMECE2011-63943).

Kern, M., Sliker, L.J., Schoen, J.A., **Rentschler, M.E.**, "*Preliminary In vivo Capsule Endoscopic Mobility Using Micro-Patterned Treads*," ASME International Mechanical Engineering Congress and Exposition, Denver, CO, November, 2011 (IMECE2011-63723)

Sliker, L.J., Schoen, J.A., **Rentschler, M.E.**, "*The Design and Experimental Evaluation of Micro-Patterned Treads for In vivo Robotic Mobility*," ASME International Mechanical Engineering Congress and Exposition, Denver, CO, November, 2011 (IMECE2011-63766).

Cezo, J., Ferguson, V., **Rentschler, M.E.**, "*Computational Modeling of Direct Heat Tissue Fusion*," ASME International Mechanical Engineering Congress and Exposition, Denver, CO, November, 2011 (IMECE2011-62134).

Terry, B.S., Schoen, J.A., **Rentschler, M.E.**, "*Development and Characterization of a Novel Sensor for Measuring the Radial Force from Myenteric Contractions*," ASME International Mechanical Engineering Congress and Exposition, Denver, CO, November, 2011 (IMECE2011-62121).

Wang, X., Qi, H.J., **Rentschler, M.E.**, "*A Theoretical Study of Friction for In vivo Surgical Robotic Wheel-Tissue Interaction*," ASME International Mechanical Engineering Congress and Exposition, Denver, CO, November, 2011 (IMECE2011-62386).

Wood, N., Lehman, A., **Rentschler, M.**, Farritor, S., Oleynikov, D., *"A Robotic Assistant for Surgical Dissection,"* Medicine Meets Virtual Reality, Long Beach, CA, January, 2009.

Lehman, A., Dumpert, J., Visty, A., **Rentschler, M.**, Farritor, S., Oleynikov, D., "Towards Cooperative Miniature Robots for Natural Orifice Translumenal Endoscopic Surgery," Minimally Invasive Robotic Association (MIRA) Congress, Rome, Italy, January, 2008.

Berg, K., **Rentschler, M.**, Dumpert, J., Lehman, A., Platt, S., Oleynikov, D., Farritor, S., "*Surgery with Cooperative Robots*," Medicine Meets Virtual Reality Conference, Long Beach, CA, February, 2007.

Rentschler, M., Berg, K., Dumpert, J., Platt, S., Oleynikov, D., Farritor, S., "*In vivo Robotics during the NEEMO 9 Mission*," Medicine Meets Virtual Reality Conference, Long Beach, CA, February, 2007.

Rentschler, M., Dumpert, J., Lehman, A., Berg, K., Platt, S., Oleynikov, D., Farritor, S., *"In Vivo Robots for Tele-Surgery During Long-Term Space Flight,"* American Institute of Aeronautics and Astronautics Space Conference, San Jose, CA, September, 2006.

Boczko, J., Capello, S., Oleynikov, D., **Rentschler, M.**, Dumpert, J., Patel, H.R., Joseph, J.V., "*Microrobots in Urology: Video Demonstration of Microrobot-Assisted Laparoscopic Prostatectomy and Nephrectomy in a Canine Model*," The 24th World Congress of Endourology, Cleveland, OH, August, 2006.

Rentschler, M., Reid, J., *"LS-DYNA Simulation of In vivo Surgical Robot Mobility,"* The 9th International LS-DYNA Users Conference, Dearborn, MI, June, 2006.

Rentschler, M., Dumpert, J., Platt, S., Farritor, S., Oleynikov, D., *"Natural Orifice Surgery with an Endoluminal Mobile Robot,"* The Society of American Gastrointestinal Endoscopic Surgeons, Dallas, TX, April 2006.

Rentschler, M., Dumpert, J., Platt, S., Iagnemma, K., Oleynikov, D., Farritor, S., "*In vivo Mobile Surgical Robotic Task Assistance*," Design of Medical Devices Conference, Minneapolis, MN, April, 2006.

Rentschler, M., Dumpert, J., Platt, S., Farritor, S., Oleynikov, D., "*Mobile In Vivo Robots Can Assist In Abdominal Exploration*," The Society of American Gastrointestinal Endoscopic Surgeons, Fort Lauderdale, FL, April, 2005.

Dumpert, J., **Rentschler, M.**, Platt, S., Farritor, S., Oleynikov, D., "*Improving In Vivo Robot Vision Quality*," Medicine Meets Virtual Reality, Long Beach, CA, January, 2005.

Narazaki, K., Oleynikov, D., DiMartino, A., **Rentschler, M.**, Stergiou, N., "*Objective Quantification of Proficiency in Robotic Laparoscopy with Bimanual Inanimate Tasks*," Medicine Meets Virtual Reality, Long Beach, CA, January, 2005.

Oleynikov, D., **Rentschler, M.**, Hadzialic, A., Dumpert, J., Platt, S., Farritor, S., "*Miniature Robots Can Assist in Laparoscopic Cholecystectomy*," The Society of American Gastrointestinal Endoscopic Surgeons, Denver, CO, March, 2004.

Conference Posters (peer-reviewed original paper)

Prendergast, J.M., Perry, A., **Rentschler, M.E.**, "*Benchtop Testing of a Novel Robotic Capsule with Differential Drive Capabilities.*" ASME Design of Medical Devices Conference. Minneapolis, MN, April, 2015. ***Selected as a Top Ten Paper and 3-in-5 Presentation Award***

Lauff, C., Weidler-Lewis, J., O'Connor, K., Kotys-Schwartz, D., **Rentschler, M.**, *"Cognitive Ethnographies of Heterogeneous Engineering Design,"* International Conference of the Learning Sciences (ICLS), Boulder, CO, June, 2014.

Anderson, N., Kramer, E., Cezo, J., Ferguson, V., **Rentschler, M.E.**, *"Tissue Bond Strength as a Function of Applied Fusion Pressure,"* ASME Design of Medical Devices Conference, Minneapolis, MN, April, 2014.

Conference Posters (peer-reviewed original abstract)

Calahan, K., Qi, Y., **Rentschler, M.**, Long, R., "*Mapping Three-Dimensional Micromechanics between Micro-Pillars and Soft Gel Substrates*," Society of Engineering Science Technical Meeting, St. Louis, MO, October, 2019.

Johannes, K., Bowen, L., Calahan, K., Zuetell, E., Long, R., **Rentschler, M.E.**, "*Tunable Contact Properties of Highly Strained Hyperelastic Micro-Patterned Surfaces Contacting Soft Substrates*," Gordon Research Conference – Science of Adhesion, Mount Holyoke College, MA, July, 2019.

Bowen, L., Johannes, K., Zuetell, E., **Rentschler, M.E.**, "*Identifying Friction Mechanisms of Deformable Microtextured Surfaces for Improved Anchoring during Balloon Endoscopy*," Gordon Research Conference – Science of Adhesion, Mount Holyoke College, MA, July, 2019.

Anderson, N., Kramer, E., Cezo, J.D., Ferguson, V. L., **Rentschler, M.E.**, "*Tissue Bond Strength and Intraluminal Temperature as a Function of Applied Fusion Pressure*," World Congress on Biomechanics, Boston, MA, July, 2014.

Kern, M., Ortega, J., **Rentschler, M.E.**, "*Soft Material Adhesion Characterization for In vivo Locomotion: Experimental and Modeling Results*," World Congress on Biomechanics, Boston, MA, July, 2014.

Fankell, D., Ferguson, V.L., Taylor, K.D., **Rentschler, M.E.**, "*Impact of Heater Location and Ambient Conditions on Fusion Strength during Direct Heat Fusion*," World Congress on Biomechanics, Boston, MA, July, 2014.

Cezo, J., Anderson, N., Kramer, E., Taylor, K., **Rentschler, M.**, Ferguson, V., "*Tissue Hydration Influences Bursting Pressure of Fused Arteries*," ASME Summer Bioengineering Conference, Sunriver, Oregon, June, 2013.

Cezo, J., Ferguson, V., Taylor, K., **Rentschler, M.**, "*Measurement of Bond Strength of Direct Heat Tissue Fusion in Arteries*," ASME Summer Bioengineering Conference, Fajardo, Puerto Rico, June, 2012.

Zimkowski, M.M., Lanning, C., Rech, B., Glang, R., Mandava, N., Mandava, N., Schoen, J., **Rentschler, M.**, Shandas, R., "*Mechanical Evaluation of Surgical Meshes Integrated with New Shape-Memory Polymer for Abdominal Wall Defect Repair*," American Hernia Society, March, 2012.

Sliker, L., Kern, M.D., Schoen, J.A., **Rentschler, M.E.**, "*Biologically Inspired Micro-Patterned Treads for Robotic Capsule Endoscope Mobility*," Covidien R&D Summit, Westminster, CO, October, 2011.

Terry, B.S., Schoen, J.A., **Rentschler, M.E.**, "*Experimental Measurements of the Radial Force from Myenteric Contractions on a Solid Bolus*," Covidien R&D Summit, Westminster, CO, October, 2011.

Schoen, J.A., Mills, Z., Terry, B.S., **Rentschler, M.E.**, "*A SILS-Specific Camera System*," The Society of American Gastrointestinal Endoscopic Surgeons, San Antonio, TX, April, 2011.

Schoen, J.A., Sliker, L., **Rentschler, M.E.**, "*A Locomotion System for Capsule Mobility*," The Society of American Gastrointestinal Endoscopic Surgeons, San Antonio, TX, April, 2011.

Schoen, J.A., Terry, B.S., Mills, Z., **Rentschler, M.E.**, "*Single Incision Laparoscopic Surgery with a Novel Port Camera System*," The Society of American Gastrointestinal Endoscopic Surgeons, Landover, MD, April, 2010.

Macdonald, S., **Rentschler, M.**, "*An Improved Splint Design for Boutonniere Deformity*," ASME Summer Bioengineering Conference, Lake Tahoe, CA, June, 2009.

Ruppert, A., Terry, B., **Rentschler, M.**, "*A Laparoscopic Camera-Enabled Cannula Port*," ASME Summer Bioengineering Conference, Lake Tahoe, CA, June, 2009.

Lehman, A., Dumpert, J., Visty, A., **Rentschler, M.**, Farritor, S., Oleynikov, D., "*Toward Natural Orifice Surgery with Cooperative Miniature Robots*," The Society of American Gastrointestinal and Endoscopic Surgeons, Philadelphia, PA, April, 2008.

Rentschler, M., Baxter, B.T., "*Preliminary Murine Aortic Tissue Material Properties from Pressure-Diameter Experiments*," ASME Summer Bioengineering Conference, Keystone, CO, June, 2007.

Platt, S., **Rentschler, M.**, Dumpert, J., Farritor, S., Oleynikov, D., "*In Vivo Robotic Cameras Can Enhance Imaging Capability During Laparoscopic Surgery*," The Society of American Gastrointestinal Endoscopic Surgeons, Fort Lauderdale, FL, April, 2005.

Issued Patents

United States

U.S. Patent No: 11,179,027; Issued November 23, 2021, "Endoscopic Devices and Methods Using Same"

U.S. Patent No: 11,089,944; Issued August 17, 2021, "Medical Devices Including Textured Inflatable Balloons"

U.S. Patent No: 10,959,790; Issued March 30, 2021, "Multifunctional Operational Component for Robotic Devices"

U.S. Patent No: 10,695,137; Issued June 30, 2020, "Methods, Systems, and Devices for Surgical Access and Procedures"

U.S. Patent No: 10,376,323; Issued August 13, 2019, "Multifunctional Operational Component for Robotic Devices"

U.S. Patent No: 10,335,024; Issued July 2, 2019, "Medical Inflation, Attachment and Delivery Devices and Related Methods"

U.S. Patent No: 10,307,199; Issued June 4, 2019, "Robotic Surgical Devices and Related Methods"

U.S. Patent No: 9,956,043; Issued May 1, 2018, "Methods, Systems, and Devices for Surgical Access and Procedures"

U.S. Patent No: 9,883,911; Issued February 6, 2018, "Multifunctional Operations Component for Robotic Devices"

U.S. Patent No: 9,579,088; Issued February 28, 2017, "Methods, Systems, and Devices for Surgical Visualization and Device Manipulation"

U.S. Patent No: 9,403,281; Issued November August 2, 2016, "Robotic Devices with Arms and Related Methods"

U.S. Patent No: 9,339,169; Issued May 17, 2016, "Robotic Capsule Endoscope for Minimally Invasive Surgical Procedures, Micro-Patterned Treads for Friction Enhancement of a Robotic Capsule Endoscope in a Biological Environment, and Process for Fabrication of Micro-Treads"

U.S. Patent No: 9,179,981; Issued November 10, 2015, "Multifunctional Operational Component for Robotic Devices"

U.S. Patent No: 8,974,440; Issued March 10, 2015, "Modular and Cooperative Medical Devices and Related Systems and Methods"

U.S. Patent No: 8,968,332; Issued March 3, 2015, "Magnetically Coupleable Robotic Surgical Devices and Related Methods"

U.S. Patent No: 8,894,633; Issued November 25, 2014, "Modular and Cooperative Medical Devices and Related Systems and Methods"

U.S. Patent No: 8,834,488; Issued September 16, 2014, "Magnetically Coupleable Robotic Surgical Devices and Related Methods"

U.S. Patent No: 8,828,024; Issued September 9, 2014, "Methods, Systems, and Devices for Surgical Access and Procedures"

U.S. Patent No: 8,679,096; Issued March 25, 2014, “Multifunctional Operational Component for Robotic Devices”

U.S. Patent No: 8,604,742; Issued December 10, 2013, “Robotic Devices with Arms and Related Methods”

U.S. Patent No: 8,343,171; Issued January 1, 2013, “Methods and Systems of Actuation In Robotic Devices”

U.S. Patent No: 8,179,073; Issued May 15, 2012, “Robotic Devices with Agent Delivery Components and Related Methods”

U.S. Patent No: 7,960,935; Issued June 14, 2011, “Robotic Devices with Agent Delivery Components and Related Methods”

U.S. Patent No: 7,772,796; Issued August 10, 2010, “Robotic Devices with Agent Delivery Components and Related Methods”

U.S. Patent No: 7,372,229; Issued May 13, 2008, “Robot for Surgical Applications”

U.S. Patent No: 7,339,341; Issued March 4, 2008, “Surgical Camera Robot”

U.S. Patent No: 7,126,303; Issued October 24, 2006, “Robot for Surgical Applications”

Canada

Canada Patent No: 2,991,346; Issued March 30, 2020, “Magnetically Coupleable Robotic Devices and Related Methods”

Canada Patent No: 2,861,159; Issued February 27, 2018, “Magnetically Coupleable Robotic Devices and Related Methods”

Canada Patent No: 2,690,808; Issued September 27, 2016, “Methods and Systems of Actuation in Robotic Devices”

Canada Patent No: 2,695,619; Issued November 24, 2015, “Modular and Cooperative Medical Devices and Related System and Methods”

Canada Patent No: 2,678,610; Issued July 7, 2015, “Methods, Systems, and Devices for Surgical Visualization and Device Manipulation”

Canada Patent No: 2,655,964; Issued October 28, 2014, “Magnetically Coupleable Robotic Devices and Related Methods”

Europe

European Patent No: 3,078,344; Issued February 26, 2020, “Methods and Systems of Actuation In Robotic Devices”

European Patent No: 3,072,640; Issued February 14, 2018, “Systems for Surgical Visualization and Device Manipulation”

European Patent No: 2,178,456; Issued October 31, 2018, “Modular and Cooperative Medical Devices and Related Systems and Methods”

European Patent No: 2,397,101; Issued June 13, 2018, “Magnetically Coupleable Robotic Devices”

European Patent No: 2,034,922; Issued March 15, 2017, “Magnetically Coupleable Robotic Devices”

European Patent No: 2,132,007; Issued March 30, 2016, “Systems for Surgical Visualization, and Device Manipulation”

Japan

Japan Patent No: 5,946,784; Issued June 10, 2016, “Method, System, and Device for Surgical Visualization and Device Manipulation”

Japan Patent No: 5,864,634; Issued January 8, 2016, “Modular and Cooperative Medical Devices and Related Systems”

Japan Patent No: 5,864,628; Issued January 8, 2016, “Magnetically Coupleable Robotic Devices and Related Methods”

Japan Patent No: 5,753,570; Issued May 29, 2015, “Medical Delivery or Removal Apparatus

Japan Patent No: 5,591,696; Issued August 8, 2014, “Methods and Systems of Actuation in Robotic Devices”

Japan Patent No: 5,475,662; Issued February 14, 2014, “Modular and Cooperative Medical Devices and Related Systems”

Japan Patent No: 5,466,004; Issued January 31, 2014, “Magnetically Coupleable Robotic Devices and Related Methods”

Japan Patent No: 5,378,236; Issued October 4, 2013, “Methods, Systems, and Devices for Surgical Visualization and Device Manipulation”

Teaching Experience

Course Instructor

University of Colorado Boulder
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MCEN 3025 Component Design

Instructor	*Fall, 2015*
Instructor	*Fall, 2014*
Instructor	*Spring, 2014*

MCEN 4045 ME Design Project 1 (Senior Design I)

Faculty Advisor for three teams	*Fall, 2022*
Faculty Advisor for three teams	*Fall, 2021*
Faculty Advisor for three teams	*Fall, 2020*
Faculty Advisor for three teams	*Fall, 2010*
Faculty Advisor for three teams	*Fall, 2009*
Faculty Advisor for three teams	*Fall, 2008*

MCEN 4085 ME Design Project 2 (Senior Design II)

Faculty Advisor for three teams	*Spring, 2023*
Faculty Advisor for three teams	*Spring, 2022*
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Faculty Advisor for three teams	*Spring, 2011*
Faculty Advisor for three teams	*Spring, 2010*
Faculty Advisor for three teams	*Spring, 2009*

MCEN 5055 Advanced Product Design

Instructor	*Spring, 2013*
Instructor	*Spring, 2012*
Course Developer & Lead Instructor	*Spring, 2011*
Course Developer & Co-Instructor	*Spring, 2010*

MCEN 5065 Graduate Design I (Projects Course 1)

Instructor	*Fall, 2019*
Instructor	*Fall, 2018*
Instructor	*Fall, 2017*
Instructor	*Fall, 2015*
Instructor	*Fall, 2014*
Instructor and Faculty Advisor for one team	*Fall, 2012*
Course Developer & Co-Instructor and Faculty Advisor for one team	*Fall, 2010*

MCEN 5075 Graduate Design II (Projects Course 2)

Instructor	*Spring, 2020*
Instructor	*Spring, 2019*
Instructor	*Spring, 2018*
Instructor	*Spring, 2016*
Instructor	*Spring, 2015*
Instructor and Faculty Advisor for one team	*Spring, 2014*
Instructor and Faculty Advisor for one team	*Spring, 2013*
Instructor and Faculty Advisor for one team	*Spring, 2012*
Course Developer & Co-Instructor and Faculty Advisor for one team	*Spring, 2011*

MCEN 5228 Medical Device Design

Instructor	*Spring, 2011*
Course Developer & Instructor	*Spring, 2010*