

JERZY T. SAWICKI, Ph.D., P.E., Fellow ASME

Senior Advisor to the Provost for External Partnerships

Vice President for Research (2012-2020)

Donald E. Bently and Agnes Muszynska Endowed Chair

Professor of Mechanical Engineering

Washkewicz College of Engineering

Cleveland State University

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216-280-5000



BIOGRAPHICAL SUMMARY

Dr. Jerzy Sawicki is currently a Professor of Mechanical Engineering and holder of the Donald E. Bently and Agnes Muszynska Endowed Chair at Cleveland State University (CSU). He is the founder and director of the Center for Rotating Machinery Dynamics and Control at the Washkewicz College of Engineering at CSU. He is an expert in structural dynamics, advanced control, rotordynamics, turbomachinery, and structural health monitoring. His most recent scholarship has focused on the development and control of wearable robotics.

Dr. Sawicki served as the Associate and Vice President for Research (VPR) at CSU between 2010 and 2020. Since 2020 he has been serving as Special Advisor to the Provost for Interdisciplinary Research and Industrial Partnerships and recently as a Senior Advisor to the Provost for External Partnerships. During his tenure as VPR, he has streamlined the Office of Research's operations to improve research administration functions and faculty support services, established the Technology Transfer Office and CSU Research Corporation (CSURC) to stimulate commercialization of research, launched new internal funding programs for faculty and students, and created new means of communication to publicize research accomplishments and promote collaborative research across campus. His leadership was crucial to the university's significant growth of extramural research funding and brought CSU research to a broader national prominence via its rising NSF ranking.

Since his arrival at CSU in 1993, he has authored more than 240 peer-reviewed journal papers and conference articles, one research monograph, and co-edited three books. Additionally, he has supervised more than 40 Ph.D. and M.S. students and mentored more than 10 post-doctoral researchers and visiting scholars. He has been the principal investigator and led sponsored research projects with a total budget of more than \$21M. He has frequently served as an expert reviewer for the U.S. Department of Energy, and has served on review panels for the National Science Foundation and various international agencies.

Dr. Sawicki is the Editor-in-Chief of the ASME *Journal of Engineering for Gas Turbines and Power* and currently serves on the board of several archival journals. He is the past chair and vice chair of the ASME International Gas Turbine Institute (IGTI) Structure and Dynamics Committee. He is a Fellow of ASME, U.S. representative to the ISO/TC 108/SC 2/WG 7 international committee, recipient of several Best Paper awards, the Siemens-Westinghouse Distinguished Speaker honor, the University Distinguished Faculty Award for Research and Dr. Jennie S. Wang Award for Faculty Excellence. He served as Chair of the Board, CEO and President of the CSURC, a 501(c)(3) entity supporting CSU by advancing the research and technology transfer, industrial partnerships, and commercialization efforts. In 2010, he was awarded the title of Professor of Technical Sciences by the President of the Republic of Poland.

Dr. Sawicki has also served as a research faculty fellow (1997-98, 2000-05) and Academic Visitor (2002-2015) at the NASA Glenn Research Center. From 2014 to 2017, he was a member of the Executive Committee of the Council on Research of the Association of Public and Land-Grant Universities (APLU). He is a member of several boards and advisory groups, including the Ohio Aerospace Institute and Cleveland Water Alliance. He is a registered Professional Engineer licensed in Ohio and an evaluator for engineering programs for the Accreditation Board for Engineering and Technology (ABET).

EDUCATION

2015	Certificate	Institute for Educational Management (IEM), Graduate School of Education, Harvard University
1992	Ph.D.	Mechanical Engineering, Case Western Reserve University
1986	B.Sc./M.Sc.	Applied Mathematics, University of Gdansk, Poland
1980	B.Sc./M.Sc.	Mechanical Engineering, Gdansk University of Technology, Poland

PROFESSIONAL EXPERIENCE

Administrative

Cleveland State University

2022-present Senior Advisor to the Provost for External Partnerships
 2020-2022 Special Advisor to the Provost for Interdisciplinary Research and Industrial Partnerships
 2013-2020 Vice President for Research
 2012-2013 Interim Vice President for Research
 2010-2012 Associate Vice President for Research
 2018-2020 President and CEO, Cleveland State University Research Corporation (CSURC)
 2013-2018 Executive Director and CEO, Cleveland State University Research Corporation (CSURC)
 2006-present Director, Center for Rotating Machinery Dynamics and Control (RoMaDyC),

Academic

2014 (May) Guest Professor, Technical University of Gdansk, Gdansk, Poland
 2004-present D.E. Bently and A. Muszynska Endowed Chair (perpetual appointment), CSU
 2001-present Professor, Department of Mechanical Engineering, CSU
 1997-2001 Associate Professor, Department of Mechanical Engineering, CSU
 1993-1997 Assistant Professor, Department of Mechanical Engineering, CSU
 1992-1993 Postdoctoral Research Associate, Department of Mechanical & Aerospace Engineering, CWRU
 1989-1992 Graduate Research/Teaching Assistant, Department of Mechanical & Aerospace Engineering, CWRU

Non-Academic

2002-2012 Academic Visitor, Instrumentation and Controls Division, NASA Glenn Research Center
 2000-present Professional Engineer (Ohio) License No. 65036
 1997, 1998 NASA Lewis Research Center Summer Faculty Fellow (also summers of 2000-2004)
 1993-1993 Sr. Rotor-Bearing Dynamics Research Engineer, Turbo Research Inc., Lionville, PA
 1981-1988 Sr. Research Fellow, Institute of Fluid-Flow Machinery, Polish Academy of Sciences, Gdansk, Poland
 1980-1981 Design Engineer, Control Division, ABB-Zamech Turbine Factory, Elblag, Poland

LEADERSHIP POSITIONS, RESPONSIBILITIES AND ACCOMPLISHMENTS (selected)

Vice President for Research

Cleveland State University (May 2013-May 2020; Interim Vice President for Research, June 2012 - May 2013)

Managing an administrative portfolio that includes:

- Sponsored Programs and Research Services (complete pre- and post-award services)
- Office of Technology Transfer
- Research and Proposal Development
- Animal Research Facility (and attending veterinarian)
- Oversight of all academic research centers and institutes
- Research integrity and compliance
- Export control
- CSU Research Corporation (CSURC)
- Industry partnerships and economic development
- Research communications
- Broad responsibility and oversight for the review, development, and implementation of policies related to the organization and execution of academic research, especially in the sciences and engineering, and to aspects of the University's relations with industry

Highlights of research development initiatives and accomplishments

- The total volume of research funding at CSU reached a record high of \$84M in FY 2018 and 2019, more than double increase in sponsored awards and research expenditures comparing to FY 2010.
- Established a new Sponsored Programs and Research Services (SPRS) by merging operations of the Grants Accounting of the Controller's Office with the Office of Sponsored Programs and Research, to better serve faculty by providing seamless support for pre- and post-award functions. The new office serves as the faculty "one-stop-shop" for all grant and research administration functions.

- Established Research and Proposal Development service to assist faculty, staff, and students to seek and secure external funding for research, scholarship, and creative activities through the submission of competitive grant and contract applications.
- Led as PI successful operation and completion of the Wright Center for Sensor Systems Engineering (WCSSSE), the \$24 million Ohio Third Frontier program. The program created a network of commercialization partners in Ohio with goals of reducing time to market for sensor products and supporting job creation. The Wright Center collaborative helped spur the creation of several start-up companies with sensor technology in Ohio.
- Lunched annual Research Magazine @CSU Research to highlight the latest outstanding research and scholarly activities at Cleveland State University (since 2016).
- Directed the process of conducting a strategic audit on innovation and economic development at CSU, which led to the APLU designation for Cleveland State as an Innovation and Economic Prosperity (IEP) University in 2016.
- Diversified beyond traditional funding sources by developing comprehensive partnerships with foundations, local/regional universities, and seeking new funding streams from the state of Ohio to support academic priorities and assisting with the university's role in economic development and social betterment of our community.
- Led development of three high-profile inter-disciplinary and partnership-driven research centers:
 - Center for Human-Machine Systems (2015) focused on rehabilitation techniques and prosthetic technology, based on the partnership and funding from Parker-Hannifin Corporation; led the university-level committee to hire Parker-Hannifin Endowed Chair in Human Motion & Control.
 - Center for Behavioral Health Sciences (2016), in partnership with St. Vincent Charity Medical Center and faculty representing four colleges and six disciplines. The Center aims to improve mental health and addiction outcomes for individuals and their families. The breadth of research focuses on multiple dimensions of addiction and behavioral health including prevention, intervention, and treatment.
 - CSU T.E.C.H. Hub (2020), transdisciplinary center with the purpose to serve as an anchor and beacon for research and education related to advanced technology in society. The center is the outgrowth of a multi-million-dollar grant from The Cleveland Foundation to both Case Western Reserve University and Cleveland State University to create the IoT Collaborative.
- Led, collaboratively with the leadership of the Cleveland Clinic Lerner Research Institute, the efforts to strengthen CSU's partnership in research and in offering of joint doctoral programs in Regulatory Biology, Bioanalytical Chemistry, and Applied Biomedical Engineering.
- Led the development and implementation of the CSU Innovation Portal, to help streamline access to innovation in the areas of technology transfer, educational opportunities, and collaboration at the university and to promote economic engagement within the region.
- Defined and implemented new technology-based platforms to reduce administrative burden and increase productivity of faculty and staff in the research space by transitioning from a largely paper environment to a digital environment.
- Lunched an Undergraduate Student Research Award (USRA) program to engage annually hundreds of undergraduate students in research and creative activities, along with faculty-mentors across all colleges.
- Established CLASS Scholarship Advisory Board – representation of 13-faculty from the College of Liberal Arts and Social Sciences (CLASS) to discuss scholarship and creative activities priorities, and to create deeper and more *purposeful* partnership between the STEM disciplines and the liberal arts disciplines.
- Created new research and scholarship development initiatives (FRD, FSI, RTRF, MIRP, FIF):

Highlights of development

- Deeply engaged in advancement efforts. Set tone and expectations for advancement activities at the Office of Research level as well as for key academic and research centers.
- Major/principle gift solicitations have been focused on student (scholarships and fellowships) and faculty support, and selected strategic initiatives (programs, facilities).
- Secured \$400K funding from Parker Hannifin Corp. to establish the Parker Hannifin Graduate Research Fellowship Program (GRFP) to attract a high quality and diverse pool of graduate students to the Washkewicz College of Engineering to pursue doctoral degree in the area of human motion and control. Secured similar funding from other companies (e.g., Lubrizol Corp., Federal Mogul Corp.).

- Meetings with CEO, VPs and other corporate senior management to develop industry partnerships with the University, the College of Engineering, and a range of collaborative programs.

President and Chief Executive Officer

Cleveland State University Research Corporation (CSURC) (February 2019-May 2020; Executive Director and Chief Operating Officer, April 2013 - Feb 2019)

Cleveland State University Research Corporation (CSURC) is an independent nonprofit 501(c)(3) entity supporting CSU by advancing the research and technology transfer operations and activities of the University. In particular, the primary purpose of CSURC is to connect CSU experts to industry partners, facilitate commercialization of research and enhance cooperative and experiential learning experiences and opportunities for CSU students interested in working with industry.

- Provided strategic leadership for all aspects of corporation and administrative and fiscal oversight of all contracts and operations.
- Provided management oversight for all grants and contract pre- and post-award portfolio.
- Provided management oversight for the university's patent portfolio and commercialization strategies.
- Provided fiduciary oversight and participated in defining strategies for the CSU Research Corporation.

Associate Vice President for Research

Cleveland State University (May 2010 – June 2012)

Working with the President and Provost to foster and promote innovation and entrepreneurship across the campus. Efforts particularly focused on alleviating the challenges facing faculty engaged in research and creating effective research infrastructure that support faculty research and innovation.

- Provided the VPR with early visioning to grow the research and entrepreneurial environment across the university community.
- Established the Cleveland State University Research Corporation (CSURC), nonprofit 501(c)(3) corporation supporting Cleveland State University (CSU) by advancing the research and technology transfer operations and activities of the University.
- Established Technology Transfer Office to provide better support for faculty and students for intellectual property and commercialization of the University's research.
- Lunched monthly Research Newsletter containing information and updates on research and research administration from the Office of Research (since Jan. 2014).
- Established special committee, Research Challenge Committee, focused on alleviating the challenges facing faculty engaged in research, whether related to university policies, or to financial or administrative systems.
- Developed research incentive programs to support and stimulate a diversified portfolio of graduate faculty scholarship, creative activity, and research in fields that are disadvantaged in terms of external funding and to facilitate multidisciplinary research and partnerships between faculty in STEM and liberal arts disciplines.

HONORS AND AWARDS

- CSU Faculty Senate Resolution "*Recognition of the Vice President for Research Professor Jerzy T. Sawicki*" for his "... remarkable contributions to enhance the Cleveland State University research reputation and environment, and for ... unstinting service to the faculty of Cleveland State University.", September 9, 2020
- Best Paper Award ("Pumping Loss of Shrouded Meshed Spur Gears," GT2020-14943), Structures & Dynamics Committee, ASME IGTI, June 2020.
- ASME International Gas Turbine Institute Outstanding Service Award, June 2019
- Fellow, Collegium of Eminent Scientists, The Kosciuszko Foundation, New York, 2017
- Keynote Speaker, 12th International Conference on Vibration Engineering & Technology of Machinery (VETOMAC XII), Jablonna, Warsaw, Poland, September 2016
- Keynote Speaker, 16th International Symposium on Transport Phenomena and Dynamics of Rotating Machinery (ISROMAC 16), Honolulu, HI, USA, April 2016
- Keynote Speaker, 15th International Symposium on Transport Phenomena and Dynamics of Rotating

Machinery, Honolulu, HI, USA, February 2014

- Keynote Speaker, 8th International Conference “Mechatronic Systems and Materials 2012” MSM 2012, Bialystok, Poland, 2012
- NASA Program Manager’s Commendation in of Commitment to Excellence and Achievements in Support of the Space Shuttle Program, 2011
- Title of Professor of Technical Sciences, President of the Republic of Poland, 2010
- Best Paper Award, (“Smart Properties of AMB Supported Machines for Rotor Crack Detection: Experimental and Analytical Study”) The 8th IFToMM Conference on Rotor Dynamics, Seoul, Korea, 2010
- Keynote Speaker, 3rd International Conference “Mechatronic Systems and Materials” (MSM 2007), Kaunas, Lithuania, 2007
- Keynote Speaker, Westinghouse Reactor Coolant Pump and Motor Workshop (RCPM 2007), Las Vegas, NV, 2007
- Siemens-Westinghouse Distinguished Speaker, Siemens Westinghouse Power Corp., Orlando, FL, 2006
- D.E. Bently and A. Muszynska Endowed Chair (perpetual appointment), Cleveland State University, 2004
- University Distinguished Faculty Award for Research, Cleveland State University, 2004
- Dr. Jennie S. Wang Award for Faculty Excellence, Cleveland State University, 2004
- Invited NFFP Lecture Series, Ohio Aerospace Institute, Brookpark, OH, 2003
- Fellow of the American Society of Mechanical Engineers (ASME), 2002
- Best Paper Award (“Vibration-Based Crack Diagnosis in Rotating Shafts During Acceleration Through Resonance”), Smart Structures & Materials NDE for Health Monitoring and Diagnostics, SPIE, San Diego, CA, 2002
- Keynote Speaker, Japan Society of Mechanical Engineers (JSME), University of Tokyo, Tokyo, Japan, Sept. 2002
- Outstanding Engineering Educator of Ohio Award, Ohio Society of Professional Engineers, Columbus, Ohio, 2001
- Peter von Hermann Award, Advanced Manufacturing Center, Cleveland, 1999
- Allied Signal Corporation, Monetary Award for “significant contributions in product development and applied Technical Publication”, 1998, 1999
- Cleveland Advanced Manufacturing Program (CAMP) Applied Research Program Award, 1998
- NASA Lewis Research Center Fellowship, Summers 1997-98, 2000-05
- NASA Certificate of Recognition for Research Contributions, 1997
- Most Outstanding Faculty – Seniors Survey, Fenn College of Engineering, 1997
- ASME Comparative Motion & Control Design Engineering Contest, Advisor of an undergraduate student design project (4th place nationwide, student Jeff Svec, award \$3,000), 1996
- Certificate of Appreciation for 1995-96, Mentor Program, CSU, 1996
- Cleveland State University, Mechanical Engineering Department’s Exceptional Educator Award, 1995-96
- ASME International Board of Governors, ASME, Certificate awarded “*in deep appreciation of the Society for valued services in advancing the engineering profession as Faculty Advisor at Cleveland State University*”, 1994- 98, 1999-2000, 2000-2001

PROFESSIONAL SERVICE AND LEADERSHIP

Professional Society Memberships

- American Society of Mechanical Engineers (ASME), Fellow
- Society of Tribologists and Lubrication Engineers (STLE)
- International Gas Turbine Institute (IGTI), Structures & Dynamics Committee (Chair)

Editorial Boards

- Editor-in-Chief, ASME *Journal of Engineering for Gas Turbines and Power* (2018-present)
- Special Editor, ASME *Journal of Turbomachinery*, 2020, 2021, 2022
- Associate Editor, ASME *Journal of Engineering for Gas Turbines and Power* (2012-18)
- Editorial Board, *Vibration*, MDPI (2017-2020)
- Editorial Board, *Vehicles*, MDPI (2017-present)
- Subject Editor (Automatic Control and Robotics), *Acta Mechanica et Automatica* (2016-present)
- Scientific Board, Transactions of the Institute of Aviation (2012-present)
- Associate Editor, *Advances in Tribology* (2007-present)
- Associate Editor, *International Journal of Rotating Machinery* (2002-17)
- Technical Editor, IEEE/ASME Transactions on Mechatronics (2003-04)

Leadership in Professional Societies

- Chair, ASME IGTI (International Gas Turbine Institute), Structure and Dynamics Committee (2018-2020); Vice Chair (2016-2018)
- US Representative for ISO/TC 108/WG 7: Magnetic Bearings Standards (2001-present)
- ASME/ABET (American Board for Engineering and Technology) Mechanical Engineering University Program Evaluator (2004-present)
- Vice Chair of STLE Technical Committee for Bearings and Bearing Lubrication (1999-2003)
- ASME Dynamic System and Control Division, Technical Committee on Mechatronics (2001-present)

External Boards Member

- CSU Research Corporation, (2022 – present)
- The Cleveland Water Alliance, (2018-2021)
- Ohio Aerospace Institute, Strategic Planning Committee (2014-2015)
- Ohio Aerospace Institute, Board of Trustees, Member (2013-2014, 2016-2021)
- LineStream Technologies, Board of Directors, Observer (2011-2018)
- Wright Center for Sensor Systems Engineering, Board of Directors (2011-2014)

International Conference and Technical Committee Organizer (last 5 years)

- International Advisory Committee, 18th International Symposium on Magnetic Bearings (ISMB18), Lyon, France, 18-21 July, 2023.
- Scientific Committee, 1st Workshop on Active Bearings in Rotating Machinery – ABROM 2022, 29/06-01/07 2022, Athens, Greece.
- Scientific Committee, 10th International Conference on Wave Mechanics and Vibrations, 4-6 July 2022, Lisbon, Portugal.
- International Advisory Committee, 17th International Symposium on Magnetic Bearings (ISMB17), Rio de Janeiro, Brazil, July 26-29, 2020.
- Chair, ASME TURBO EXPO, Structure and Dynamics Committee, London, UK, June 22-26, 2020.
- Chair, ASME TURBO EXPO, Structure and Dynamics Committee, Phoenix, AZ, June 17-21, 2019.
- International Advisory Committee, 15th International Symposium on Magnetic Bearings (ISMB15), Kitakyushu, Japan, August 3-6, 2016.
- International Scientific Committee, Vibrations in Rotating Machinery (VIRM 11), 13-15 September 2016, Manchester, UK.
- Scientific Committee, 9th IFToMM International Conference on Rotor Dynamics, September 22-25, 2014, Milan, Italy.

PLUS: Chair, Vanguard Chair, and/or Organizer of many technical sessions.

Faculty Promotion Reviews (recent)

- Case Western Reserve University, Department of Mechanical and Aerospace Engineering, 2012
- University of Virginia, Department of Mechanical and Aerospace Engineering, 2018, 2022
- LUT University, Department of Electrical Engineering, Lappeenranta, Finland, 2020
- Virginia Tech, Mechanical Engineering Department, 2022

Journals Reviewer

AIAA Journal, AIAA Journal of Guidance, Control and Dynamics, ASME Journal of Tribology, ASME Journal of Engineering for Gas Turbines and Power, ASME Journal of Vibrations and Acoustics, ASME Journal of Applied Mechanics, ASME Journal of Dynamic Systems, Measurement and Control, ASME Quarterly Transactions Journal of Vibrations and Acoustics, ASME/IEEE Transactions on Mechatronics, ASME Journal of Turbomachinery, IEEE Transactions on Neural Systems & Rehabilitation Engineering, Comptes rendus Mecanique, IET Control Theory and Application, IEEE Control System Society, International Journal of Rotating Machinery, Journal of Applied Mechanics and Engineering, Journal of Intelligent Material Systems and Structures, Journal of Sound and Vibration, Journal of System Design and Dynamics (Japan), Journal of The Franklin Institute, Meccanica, Mechanical Systems and Signal Processing, Mechatronics, Nonlinear Dynamics, STLE Tribology Transactions, Tribology International, Acta Mechanica et Automatica, Advances in Tribology, Shock and Vibration Institute, Advances in Tribology, Automatika, Journal of Biomechanical Engineering, Journal of Intelligent & Robotic Systems.

Grant Proposal and Book Reviewer (selected)

- U.S. Department of Energy, NETL, (Advanced Turbines, Modeling, Simulation, and Analysis)
- U.S. Department of Energy, SBIR/STTR Program
- U.S. Department of Energy Solar Energy Technologies Office (SETO)
- NSF Faculty Early Career Development Program (CAREER)
- NSF (Civil, Mechanical and Manufacturing Innovation)
- NASA SBIR
- DARPA
- Ohio Aerospace Institute (OAI), Cleveland, Ohio
- Ohio Federal Research Network, Technical Review Committee
- Ohio Supercomputer Center, Columbus, Ohio
- Italian Space Agency, Rome, Italy
- Academy of Finland, Research Council for Natural Sciences and Eng., Helsinki, Finland
- City University of Hong Kong, Hong Kong
- Research Committee, European Union
- Springer Verlag, John Wiley & Sons, Ltd., CRC Press, Elsevier

ACADEMIC SERVICE AND LEADERSHIP

National and State Level

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| 2014-2018 | Executive Committee of the Association of Public and Land-Grant Universities (APLU) Council on Research (CoR) |
| 2012-2020 | Research Officers Council, Ohio Department of Higher Education, Columbus, Ohio |

Cleveland State University (selected)

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| 2022-present | Member, University Peer Review Committee |
| 2021-present | Member, Faculty Senate |
| 2019-2021 | Member, Higher Learning Commission (HLC) Steering Committee |
| 2012-2019 | Member, President's Executive Cabinet |
| 2012-2021 | Member, Provost Council |
| 2017 | Member, Presidential Search Committee |
| 2012-2018 | Advisory Task on Manufacturing, Chair |
| 2010-2012 | Member, Grants Management Project Steering Committee |
| 2008-2010 | Faculty Representative, CSU Board of Trustees |
| 2008-2010 | Member, Academic Affairs Standing Committee, CSU Board of Trustees |
| 2008-2010 | Member, Ohio Faculty Council, Columbus, Ohio |
| 2008-2010 | President, Faculty Senate |
| 2007-2008 | Vice President, Faculty Senate |
| 2007-2010 | Member, Faculty Senate |
| 2006-2007 | Chair, University Peer Review Committee |
| 2006-2007 | Chair, Faculty Senate Nominating Committee |
| 2005-2008 | Member, Distinguished Faculty Award Committee |
| 2005-2006 | Member, Academic Steering Committee of Faculty Senate |
| 2007-2010 | Member, Academic Steering Committee of Faculty Senate |

2004-2006	Member, University Peer Review Committee
2000-2004	Member, Faculty Senate
1997-1999	Member, University Graduate Council
1999-2002	Member, University Research Council
1997-1999	Member, Graduate Faculty Review Committee
1994-1996	Member, Graduate College Petitions Committee

Washkewicz College of Engineering (selected)

2011-2012	Member, Parker Hannifin Endowed Chair Search Committee
2008-2011	Graduate Program Director, Engineering Mechanics, College of Engineering
1997-1999	Member, Fenn College Computing Committee
1997-1997	Member, Fenn College of Engineering Strategic Planning Committee
1995-1997	Member, Graduate Affairs Committee of the College of Engineering
1995-1997	Member, Faculty Affairs Committee of the College of Engineering

Department of Mechanical Engineering (selected)

2002-2004	Chair, Faculty Search Committee
1999-2001	Director, Graduate Program
1996-1997	Member, Graduate Affairs Committee
1993-2006	Faculty Advisor, ASME Student Section
1993-1995	Member, Undergraduate Affairs Committee
1993-1994	Member, Mechanical Engineering Department Laboratory Committee

GRADUATE AND POST-DOCTORAL ADVISING

Doctoral Dissertations Directed

1. Pranav Charjan, "AI-Driven MIMO Control of Active Magnetic Bearing Systems," expected completion Spring 2025.
2. Jason Wiebrecht, "A Remote-Actuated Cable-Driven Pediatric Orthosis for Gait Assistance and Rehabilitation," expected completion Spring 2024.
3. Jacob Strick, "IMU-Based Real-Time On-Board Gait Phase Detection for Lower Extremity Orthotics and Prosthetics," expected completion Fall 2024.
4. Anthony Goo, "Control and Implementation of a Powered Lower Limb Orthosis for Pediatric Gait Pathologies," October 2022 (Research Engineer, Sarcos Robotics, Salt Lake City, UT).
5. Alican Sahinkaya, "Computational Cost Reduction of Robust Controllers for Active Magnetic Bearing Systems," June 2020 (Design Engineer, Bright Society, Eindhoven, The Netherlands).
6. Curt Laubscher, "Design and Development of a Powered Pediatric Lower-Limb Orthosis," April 2020 (Postdoctoral Fellow, Department of Robotics, University of Michigan).
7. Michael Hurrell, "Shroud Effects on Load-Independent Power Loss of High-Speed Rotorcraft Gearing," March 2020 (Aerospace Engineer, NASA Glenn Research Center, Cleveland).
8. Ryan Madden, "Development of Robust Control Techniques Towards Damage Identification," March 2016 (Sr Systems Engineer, Autoliv, MI).
9. Alex H. Pesch, "Development of Chatter Attenuation Robust Control for an AMB Machining Spindle," September 2013 (Assistant Professor, Youngstown University, OH).
10. Adam Wroblewski, "Modeling and Identification of Active Magnetic Bearing High-Speed Machining Spindle for High-Speed Precision Machining Operation," August 2011 (Aerospace Engineer, NASA Glenn Research Center, Cleveland).
11. Albert Juhasz, "Analysis and Numerical Optimization Modeling of Closed Cycle Gas Turbine Space Power Systems with Nuclear Heat Sources," April 2005 (Senior Aerospace Engineer, NASA Glenn Research Center, Cleveland).
12. Xi Wu, "Vibration-Based Crack-Induced Damage Detection of Shaft-Disk Systems," April 2005 (Professor, CalPoly, San Luis Obispo, CA).

13. Kenneth R. Bischof, "Dynamics and Control of Magnetically Levitated High-Speed Rigid Rotor to Produce N-waved Orbits," June 2002 (Sr. Staff Engineer, BorgWarner Turbo Systems, NC).
14. Michael Engesser, "Development and Analysis of a New Hydrodynamic Spindle Support to Improve Manufacturing Performance of Precision Grinding Machines", April 2000 (CEO, Steyr-Mannlicher GmbH, Hanover, Germany).
15. Biao Yu, "*Lubrication Analysis in the Design of Reciprocating Machinery*", November 1999 (Application and Product Manager, Alfa Laval Inc., Decatur, IL).

Master Theses Directed

1. Justin Thompson, "Digital Controller Implementation for Disturbance Rejection in the Laser Tracking System," Fall 2022.
2. Alexander Michlberger, "Development of Test Methodology for Evaluation of Fuel Economy in Motorcycle Engine," April 2014.
3. Rosemarie Konerth, "Vibration Analysis – A Diagnostic Tool for Machinery Health Monitoring as Part of Predictive Maintenance," April 2012.
4. Volodymyr Mykhaylyshyn, "Application of Active Magnetic Force Actuator for Control of Flexible Rotor System Vibrations," December 2011.
5. Yunlu Li, "Modeling and Performance Investigation of A Rotor with Dissimilar Bearing Support System," April 2011.
6. Ryan Madden, "Identification of Unmodelled Dynamics in Rotor Systems using Mu-Synthesis Approach," December 2010.
7. Dmitry Storozhev, "Smart Rotating Machines for Structural Health Monitoring," December 2009.
8. Tim Obrzut, "Non-Collocation Problems in Dynamics and Control of Mechanical Systems," December 2009.
9. Alex H. Pesch, "Damage Detection of Rotors Using AMB – Analysis and Experimental Verification," November 2008.
10. Adam Wroblewski, "Health Monitoring of Cracked Rotor Systems Using External Excitation Techniques," October 2008.
11. Jeremy D. Pettinato, "Development of Effective Balancing Procedure for CT Scanner," August 2008.
12. John M. Jurns, "Flow of Sub-Cooled Metastable Cryogenics through a Joule Thomson Device," December, 2007.
13. Robert S. Tekesky, "Rim Stresses due to Clutch Torques and Centrifugal Loading at High Speeds," M.S. Project, December 2006.
14. Samuel Andreas Johansson, "Fatigue Life Prediction for Large-Diameter and Elastically-Constrained Ball Bearings," April 2005.
15. Rahul Kallurwar, "Modeling and Performance Characteristics of Magnetically Suspended Machine Tool Spindle," March, 2005.
16. Alex Simon Tijo, "Experimental Study on Spray Evaporative Cooling of High Heat Flux Surfaces," December, 2004.
17. Yongfen Gao, "Dynamics and Stability Analysis of Jeffcott Rotor with Rubs", July 2004.
18. Subose Pai, "Development and Implementation of an Accurate Orbit Control of a Rigid Rotor Suspended in Active Magnetic Bearings," February 2004.
19. Azzam Quari, "Thermo-Mechanical Behavior of Rotors with Rubbing," June 2001.
20. Michael Hurrell, "Modeling and Control of Magnetically Levitated Flexible Rotors", April 2000.
21. Kenneth R. Bischof, "Theoretical and Experimental Studies in Flexible Rotor-Bearing Systems", June 1998.
22. Peter D. Spencer, "A Review of Bond Graph Analysis for the Modeling of Dynamic Physical Systems within one or more Energy Domains", May 1997.
23. Rabih Al-Khatib, "Parametric Study of Rubbing in Rotating Machinery", December 1997.
24. Alan W. Hewston, "Attitude Control Subsystem for the Advanced Communications Technology Satellite", June 1996.
25. Ismail Mapara, "*Balanced Modeling and Control of Mechanical Systems*", October 1995.

Postdoctoral Researchers and Visiting Scholars Mentorship

1. Curt Laubscher, Post-Doctoral Researcher, Cleveland State University, Human Machine Interaction, May 2020 – April 2022.
2. Leandro de Souza Leão, Visiting Scholar, Federal University of Uberlândia, Brazil; vibration control of cracked rotors using electromagnetic actuators, Mar. 15 – Sept. 15, 2017.
3. Dr. Artur Gmerek, Post-Doctoral Researcher, Technical University of Lodz, Poland; control of pediatric lower limb orthosis, Aug. 1 – Dec. 12, 2016.
4. Prof. Zbigniew Kulesza, Visiting Professor, Technical University of Bialystok, Poland; experimental study of cracked rotor, July 25 – Sept. 25, 2016.
5. Dr. Alexander H. Pesch, Post-Doctoral Researcher, Cleveland State University; suppression of fluid-film bearing instabilities using active control strategies, Sep. - Nov. 2013.
6. Dr. Alexander Smirnov, Post-Doctoral Researcher, Lappeenranta University of Technology, Finland; application of advanced control and modeling techniques for high-speed metal cutting using AMB machining spindle, Sept. – Dec., 2013.
7. Prof. Kyung Bin Yim, Visiting Professor, Dongyang University, Seoul, Korea; worked on design and implementation of high-precision electromagnetic actuator for rotating machinery applications, Jan. 2010 – Jan. 2011.
8. Gabriele Barbaraci, Visiting Scholar, Università di Palermo, Palermo, Italy; worked on automatic tuning of AMB controllers, Feb. 2010 – Aug. 2011.
9. Dr. Arkadiusz Mystkowski, Post-Doctoral Researcher, Technical University of Bialystok, Poland; worked on robust model updating techniques, June – Oct., 2009.
10. Dr. Zbigniew Kulesza, Post-Doctoral Researcher, Technical University of Bialystok, Poland; worked on detection technologies of cracked rotor, June – Oct., 2009.
11. Rita Mondelli, Visiting Scholar, Politecnico di Torino, Turin, Italy; worked on active vibration suppression of flexible rotors, Feb. – May, 2001.

Doctoral Dissertations Examiner

1. “Control of the internal damping of a rotor with a piezoelectrically activated structure,” Mateusz G. Koziol, AGH University of Science and Technology, Cracow, Poland, 2022.
2. “Tribological and Vibrational Studies of Textured Spur Gears,” Niharika Gupta, Indian Institute of Technology, Delhi, India, 2021.
3. “Analysis, Optimization and Design of a Modified Savonius Rotor,” Sonu Sharma, National Institute of Technology Hamirpur, India, 2018.
4. “*Investigations on the Influence of Texture/Roughness on the Performance of Porous Journal Bearing*,” Nitin Sharma, National Institute of Technology Hamirpur, India, 2016.
5. “*Tribological and Dynamics Studies of Lubricated Textured Point Contacts*,” Sudeep Ullattil, Indian Institute of Technology, Delhi, India, 2015.
6. “*Thermo-Elastic Analysis of Some Hydrodynamically Lubricated Pressure Dam Bearings*,” Rajiv Verma, National Institute of Technology, India, 2013.
7. External Examiner and “Opponent” for Ph.D. Dissertation “*AMB System for High-Speed Motors using Automatic Commissioning*,” Alexander Smirnov, Lappeenranta University of Technology, Finland, 2012.
8. “*The Influence of the Flow Underneath the Flexible Sleeve of an Active Journal Bearing on Stability and the Forced Response of a Rotor Bearing System*,” Xiaoping Yu, The University of Melbourne, Australia, 2009.
9. “*Studies of starved Lubrication in Concentrated Line Contacts*,” Natarajan Anandan, Indian Institute of Technology, Delhi, India, 2008.
10. “*Design and Implementation of FPGA-Based LQ Control of Active Magnetic Bearings*,” Rafal Jastrzebski, Lappeenranta University of Technology, Finland, 2007.
11. External Examiner for Ph.D. Dissertation “*Studies of the Hydrodynamic Bearings with Surface Profiling and Entrained Solid Particulate*,” Rajesh Kumar Sharma, Indian Institute of Technology, Delhi, India, 2007.
12. External Examiner for Ph.D. Dissertation “*Dynamic and Static Characteristics of Turbulent Flow Wavy Seals*,” Satyam Shivam Gautam, Banaras Hindu University, India, 2006.

Academic Courses Taught

Cleveland State University

Graduate courses:

- MCE 651/751 Robotics I
- MCE 652/752 Robotics II
- MCE 706 Applied Engineering Analysis III
- MCE 503 System Modeling
- MCE 512 Engineering Vibrations I
- MCE 545 Modern Control
- MCE 613 Engineering Vibrations II
- MCE 650/750 Nonlinear Dynamics
- MCE 670/770 Turbomachinery Rotordynamics
- MCE 698 Master Project
- MCE 699 Master Thesis
- MCE 696/796 Directed Study
- MCE 897 Doctoral Research
- MCE 899 Doctoral Dissertation

Undergraduate courses:

- MCE 395 CAD Laboratory
- MCE 451 Engineering Project Seminar
- MCE 359 Machine Analysis
- MCE 362 Machine Design I
- MCE 365 Design of Machine Components
- MCE 461 Vibrations
- MCE 495 Modern Control
- MCE 496 Independent Study (mechatronics)
- MCE 499 Special Topics
- MCE 499H Honors Thesis

Case Western Reserve University

- EMAE 370 Design of Mechanical Elements

Curriculum Development and Academic Outreach

- Founded multi-university *Center for Rotating Machinery Dynamics and Control* (RoMaDyC), 2006
- Established Rotor-Bearing Dynamics & Diagnostics Lab with support from OBOR, Allied Signal Corporation, General Electric, Federal Mogul Corp., IOTech, Honeywell Corp., and EATON Corp., 1997
- Established collaboration and research scholars exchange between the Rotor-Bearing Dynamics & Diagnostics Lab (RBDDL) and the Mechatronics Laboratory of Technical University of Turin, Italy, 1999
- Established Parker Hannifin Motion and Control Laboratory, Department of Mechanical Engineering (with Drs. Atherton, Flanagan and Rashidi), 1999
- Undergraduate/graduate course MCE 445/545 Modern Controls, 1994
- Graduate course MCE 670/770 Turbomachinery Rotordynamics, 1993
- Graduate course MCE 650/750 Nonlinear Dynamics, 1995

RESEARCH INTERESTS

Structural dynamics, automatic control, rotordynamics, turbomachinery, magnetic bearings, mechatronics, structural health monitoring, development and control of wearable robotics.

PATENTS

1. Actuating Device for Powered Orthosis, US Patent 11,207,234, 2021.
2. Computational Cost Reduction of Generalized MIMO Controllers via Defined Controller Perturbations, Provisional Patent Application, 2021.
3. Adjustability Mechanism for Powered Lower Limb Orthosis, U.S. Patent Application No. 27433.04124, 2022 (pending).

PUBLICATIONS

Books

1. “*Stability Control of Rotating Machinery*,” Sawicki, J.T. (Co-Editor), Published by A. Carlisle Printers, USA, 674 pages, 2005.
2. “*Stability Control of Rotating Machinery*,” Sawicki, J.T. (Co-Editor), Published by Carlisle Printers, USA, 486 pages, 2007.
3. “*Recent Advances in Rotor-Bearing Systems: Theory and Applications*,” Sawicki, J.T., Published by Printing House of Bialystok Technical University, Poland, 381 pages, 2009.
4. “*Vibration Problems ICOVP 2011: The 10th International Conference on Vibration Problems*,” Sawicki, J.T. (Co- Editor), Springer Proceedings in Physics 139, DOI 10.1007/978-94-007-2069-5 74, 2011.

Peer-Reviewed Journal Articles

1. Strick, J.A., Farris, R.J., and Sawicki, J.T., "A Novel Gait Event Detection Algorithm using a Thigh-worn Inertial Measurement Unit and Joint Angle Information," under review, *IEEE Transactions on Neural Systems & Rehabilitation Engineering*, 2023.
2. Goo, A., Laubscher, C.A., Wajda, D.A., and Sawicki, J.T., "Virtual Constraint-Based Control and Evaluation of a Pediatric Lower-Limb Exoskeleton," under review, Part C: *Journal of Mechanical Engineering Science*, 2023.
3. Laubscher, C.A., Goo, A., Farris, R.J., and Sawicki, J.T., "Adaptive Zero Dynamics Control with Optimal Phase Definition on a Lower-Limb Exoskeleton," under review, *Control Engineering Practice*, 2023.
4. Goo, A., Wiebrecht, J.J., Wajda, D.A., and Sawicki, J.T., "Human Factors Assessment of a Novel Pediatric Lower-Limb Exoskeleton," *Robotics*, 12(1), 26, 2023.
5. Goo, A., Laubscher, C.A., Wiebrecht, J.J. and Sawicki, J.T., "Hybrid Zero Dynamics Control for Gait Guidance of a Novel Adjustable Pediatric Lower-Limb Exoskeleton," *Bioengineering*, 9, 208, 2022.
6. Goo, A., Laubscher, C.A. and Sawicki, J.T., "Hybrid Zero Dynamics-Based Control of an Underactuated Lower-Limb Exoskeleton for Gait Guidance," *ASME Journal of Dynamic Systems, Measurement and Control*, 144(6): 061008, 2022.
7. Laubscher, C.A., Goo, A., Farris, R.J. and Sawicki, J.T., "Hybrid Impedance-Sliding Mode Switching Control of the Indego Explorer Lower-Limb Exoskeleton in Able-Bodied Walking," *Journal of Intelligent & Robotic Systems*, Springer, 104:76, 2022.
8. Laubscher, C.A., Farris, R.J., van den Bogert, A.J. and Sawicki, J.T., "Assistive Control of an Anthropometrically Parametrized Lower-Limb Exoskeleton," Design Innovation Paper, *ASME Journal of Biomechanical Engineering*, 143(10): 105001, 2021.
9. Laubscher, C.A. and Sawicki, J.T., "Robust Impedance Controller for Improved Safety in Human-Robot Interaction," Design Innovation Paper, *ASME Journal of Dynamic Systems, Measurement and Control*, 143 (9): 091004, 2021.
10. Sahinkaya, A. and Sawicki, J.T., "Robust Control of AMB Systems with an Add-on Controller to Cancel Gyroscopic Effects, Is It Worth It?," *Journal of Vibration Control*, Vol. 27(23-24), 2754–2764, 2021.
11. Goo, A., Laubscher, C.A., Farris, R.J. and Sawicki, J.T., "Design and Evaluation of a Pediatric Lower-Limb Exoskeleton Joint Actuator," *Actuators*, 9(4), 138, 2020.
12. Laubscher, C.A., Farris, R.J. and Sawicki, J.T., "Angular momentum-based control of an underactuated orthotic system for standing balance," *Autonomous Robots*, 44(8), 1469-1484, Springer 2020.
13. Sahinkaya, A., Hawkins, L. and Sawicki, J.T., "Computational Cost Reduction of MIMO Controllers for Active Magnetic Bearing Systems," *ASME Journal of Engineering for Gas Turbines and Power*, 142 (11): 111002, 2020.
14. Hurrell, M. and Sawicki, J.T., "Pumping Loss of Shrouded Meshed Spur Gears," *ASME Journal of Engineering for Gas Turbines and Power*, 142 (11): 111003, 2020 (2020 BEST Paper Award –ASME/IGTI).
15. Sahinkaya, A. and Sawicki, J.T., "Computationally Efficient Implementation of Robust Controllers in Active Magnetic Bearing Systems," *Mechanical Systems and Signal Processing*, vol. 144, 106902. Elsevier, 2020.
16. Pesch, A.H. and Sawicki, J.T., "Active Magnetic Bearing Online Levitation Recovery through μ -Synthesis Robust Control," Special Issue "Active Magnetic Bearing Actuators," *Actuators*, MDPI AG, 6(1), 2, 2017.
17. Kulesza, Z. and Sawicki, J.T., "Parametrically Induced Damping in a Cracked Rotor," *ASME Journal of Engineering for Gas Turbines and Power*, 139(1): 012505 (8 pages), Jan. 2017.
18. Kulesza, Z. and Sawicki, J.T., "Damping by parametric excitation in a set of reduced-order cracked rotor systems," *Journal of Sound and Vibration*, Vol. 354, pp. 167–179, 2015.
19. Sawicki, J.T. and Kulesza, Z., "Damping in a Parametrically Excited Cracked Rotor," *Mechanisms and Machine Science*, Vol. 21, pp. 335-345, Springer, 2015.
20. Madden, R.J., Pesch, A.H. and Sawicki, J.T., "Model Validation for Damage Identification and Determination of Local Damage Dynamics," *Proc. of the 9th IFToMM International Conference on Rotor Dynamics, Mechanisms and Machine Science*, Volume 21, pp 769-778, Springer, 2015.

21. Pesch, A.H., Smirnov, A., Pyrhönen, O., and Sawicki, J.T., "Magnetic Bearing Spindle Tool Tracking through μ -Synthesis Robust Control," IEEE Transactions on Mechatronics, Volume 20, Issue 3, pp. 1448-1457, June 2015.
22. Sawicki, J.T. and Kulesza, Z., "Stability of a Cracked Rotor Subjected to Parametric Excitation," ASME *Journal of Engineering for Gas Turbines and Power*, 137(5), 052508 (8 pages), May 2015.
23. Smirnov, A., Pesch, A.H., Pyrhönen, O., and Sawicki, J.T., "High-Precision Cutting Tool Tracking with a Magnetic Bearing Spindle, ASME *Journal of Dynamic Systems, Measurement and Control*, 137(5), 051017 (8 pages), May 2015.
24. Madden, R. and Sawicki, J.T., "Model Validation for Identification of Damage Dynamics," ASME *Journal of Engineering for Gas Turbines and Power*, 137(6), 062506 (7 pages), June 2015. doi:10.1115/1.4028845, 2015.
25. Wroblewski, A.C., Pesch, A.H., and Sawicki, J.T., "Structural Change Quantification in Rotor Systems Based on Resonance and Antiresonance Frequencies Extracted from Frequency Response Functions," ASME *Journal of Engineering for Gas Turbines and Power*, vol. 136(2), 2014.
26. Litak, G., and Sawicki, J.T., "Regular and chaotic vibrations in the rub impact model of a Jeffcott rotor with a fractional restore force," The European Physical Journal - Applied Physics, Volume 64, Number 3, December 2013.
27. Sawicki, J.T., "Control Driven Advances in Smart Rotating Machinery," *Solid State Phenomena*, Special Issue: *Mechatronic Systems and Materials*, Vol. 198, pp. 457-467, 2013.
28. Kulesza, Z. and Sawicki, J.T., "New Finite Element Modeling Approach of a Propagating Shaft Crack," ASME *Journal of Applied Mechanics*, JAM-12-1101, 120151 (18 pages), 2012.
29. Kulesza, Z. and Sawicki, J.T. and Gyekenyesi, A., "Robust fault detection filter using LMI approach for shaft crack diagnosis," *Journal of Vibration and Control*, JVC-11-0375, 2012.
30. Madden, R. and Sawicki, J.T., "Rotor Model Validation for an Active Magnetic Bearing Machining Spindle Using μ -Synthesis Approach," Paper GT2012-69943, ASME *Journal of Engineering for Gas Turbines and Power*, vol. 134(9), 092501 (6 pages), 2012.
31. Wroblewski, A.C., Sawicki, J.T. and Pesch, A.H., "Rotor Model Updating and Validation for an Active Magnetic Bearing Based High-Speed Machining Spindle," ASME *Journal of Engineering for Gas Turbines and Power*, 134(12) (6 pages), 2012.
32. Kulesza, Z. and Sawicki, J.T., "Controlled Deflection Approach for Rotor Crack Detection," ASME *Journal of Engineering for Gas Turbines and Power*, vol. 134(9), 092501 (13 pages), 2012.
33. Sawicki J.T. and Kulesza Z., "A New Rotor Crack Detection Method Based on Auxiliary State Observer," *Advances in Vibration Engineering*, 11(2) pp. 131-141, 2012.
34. Kulesza, Z. and Sawicki, J.T., "Rigid finite element model of a cracked rotor," *Journal of Sound and Vibration*, Vol. 331, Issue 18, pp. 4145-4169, Elsevier Ltd., 2012.
35. Sawicki, J.T., Storozhev, D. and Lekki, J.D., "Exploration of NDE Properties of AMB Supported Rotors for Structural Damage Detection," ASME *Journal of Engineering for Gas Turbines and Power*, Vol. 133, October 2011.
36. Sawicki, J.T. and Madden, R., "Identification of Missing Dynamics in Rotor Systems using Robust Control Theory Approach," *Vibration Problems ICOVP 2011*, Springer Proceedings in Physics, Vol. 330, pp. 581-587, 2011.
37. Sawicki, J.T., Friswell, M.I., Kulesza, Z., Wroblewski, A., and Lekki, J.D., "Detecting Cracked Rotors Using Auxiliary Harmonic Excitation," *Journal of Sound and Vibration*, Elsevier Ltd., Vol. 330, pp. 1365-1381, 2011.
38. Kulesza, Z. and Sawicki, J.T., "Auxiliary State Variables for Rotor Crack Detection," *Journal of Vibration and Control*, SAGE, 17 (6), 857-872, October 2010.
39. Gyekenyesi, A., Sawicki, J.T., and Haase W.C., "Modeling Disk Cracks in Rotors by Utilizing Speed Dependent Eccentricity," *Journal of Materials Engineering and Performance*, Springer New York, Vol. 19, No. 2, pp. 207- 212, 2010.
40. Litak, G., and Sawicki, J.T., "Crack Identification by Multifractal Analysis of a Dynamic Rotor Response," *ZAMM, Journal of Applied Mathematics and Mechanics*, Wiley InterScience, Vol. 89, No. 7, pp. 587-592, July 2009.

41. Sawicki, J.T., Sen, A.K., and Litak, G., "Multiresolution Wavelet Analysis of the Dynamics of a Cracked Rotor," *International Journal of Rotating Machinery*, Hindawi Publishing Company (2009), Article ID 265198, doi:10.1155/2009/265198.
42. Litak, G. and Sawicki, J.T., "Intermittent Behaviour of a Cracked Rotor in the Resonance Region, *Chaos, Solitons & Fractals*, Vol. 42, Issue 3, pp. 1495-1501, Nov. 2009.
43. Litak, G., Sawicki, J.T., and Kasperek, R., "Cracked Rotor Detection by Recurrence Plots," *Nondestructive Testing and Evaluation*, Vol. 24, Issue 4, pp. 347-351, December 2009.
44. Sawicki, J.T., "Rotor Crack Detection Using Active Magnetic Bearings," *Solid State Phenomena, Special Issue: Mechanical Systems and Materials*, Vol. 144, pp. 9-15, 2009.
45. Sawicki, J.T., "Rationale for Mu-Synthesis Control of Flexible Rotor – Magnetic Bearing Systems," *Acta Mechanica et Automatica*, Vol. 2, No. 2, pp. 67-74, 2008.
46. Sawicki, J.T., Johansson, S.A., Rumbarger, J.H., and Sharpless, R.B., "Fatigue Life Prediction for Large-Diameter Elastically-Constrained Ball Bearings," *ASME Journal of Engineering for Gas Turbines and Power*, Vol. 130 (2), pp. March 2008 (BEST PAPER Award).
47. Gosiewski, Z., Sawicki J.T., and Zabielski. R., "Excitation Signals for Rotating Machinery Vibration towards Shaft Crack Detection," *Acta Mechanica et Automatica*, Vol. 2, No. 1, pp. 27-33, 2008.
48. Gosiewski, Z. and Sawicki, J., „A New Vibroacoustic Method for Shaft Crack Detection," *Mechanics*, AGH University of Science and Technology, Vol. 26 (3), pp. 105-112, 2007.
49. Sawicki, J.T., "Rotordynamics," Book Review, *ASME Journal of Engineering for Gas Turbines and Power*, Vol 129, Issue 3, July 2007.
50. Sawicki, J.T., Maslen, E.H., and Bischof, K.R., "Modeling and Performance Evaluation of Machining Spindle with Active Magnetic Bearings," *Journal of Mechanical Science and Technology*, 21(6), pp. 847-850, 2007 (INVITED PAPER).
51. Friswell, M.I., Sawicki, J.T., Inman, D.J., and Lees, A.W., "The Response of Rotating Machines on Viscoelastic Supports," *International Review of Mechanical Engineering*, 1(1), January 2007, 32-40, 2006.
52. Sawicki, J.T., "Cavitation Effects on the Dynamics of Journal Bearings," *International Journal of Applied Mechanics and Engineering*, Vol. 10, No. 3, pp. 515-526, 2005, (INVITED PAPER, special issue dedicated to Professor Andrew Z. Szeri).
53. Kasarda, M., Quinn, D.D., Bash, T., Mani, G., Inman, D., Kirk, R.G., Sawicki, J.T., "Magnetic Bearings for Non- Destructive Health Monitoring of Rotating Machinery Supported in Conventional Bearings," *Key Engineering Materials*, Vols. 293-294, pp. 383-390, 2005.
54. Rao, N. and Sawicki, J.T., "Stability Analysis of a Rough Journal Bearing Considering Cavitation Effects," *ASME Journal of Tribology*, Vol. 127, pp. 112-119, 2005.
55. Sawicki, J.T., and Rao, N., "Cavitation Effects on the Stability of a Submerged Journal Bearing," *International Journal of Rotating Machinery*, Taylor & Francis, 10(3), pp. 227-232, May 2004.
56. Rao, N. and Sawicki, J.T., "Stability Characteristics of Herringbone Grooved Journal Bearings Incorporating Cavitation Effects," *ASME Journal of Tribology*, Vol. 126, pp. 281-287, April 2004.
57. Sawicki, J.T. and Rao, T., "A Nonlinear Model for Prediction of Dynamic Coefficients in a Hydrodynamic Journal Bearing," *International Journal of Rotating Machinery*, Taylor & Francis, 10(6), pp. 507-513, November 2004.
58. Rao, N., and Sawicki, J.T., "Stability Analysis of Floating Ball Bearing," *STLE TRIBOLOGY TRANSACTIONS*, Vol. 47(4), pp. 543-548, January 2004.
59. Sawicki, J.T., Montilla-Bravo, A., and Gosiewski, Z., "Thermo-Mechanical Behavior of Rotor with Rubbing," *International Journal of Rotating Machinery*, Taylor & Francis, 9(1), pp. 41-47, January 2003.
60. Rao, N. and Sawicki, J.T., "Dynamic Coefficients Prediction in Multi-lobe Journal Bearings Using a Mass Conservation Algorithm," *STLE TRIBOLOGY TRANSACTIONS*, Vol. 46(3), pp. 414-420, July 2003.
61. Baaklini, G., Gyekenyesi, A.L., Smith, K.D., Sawicki, J.T., and Brasche, L., "Tools for Engine Diagnostics under the NASA Aviation Safety Program," *Materials Evaluation, Journal of the American Society for Nondestructive Testing*, Vol. 60, No. 7, pp. 878-883, 2002.

62. Yu, B., and Sawicki, J.T., "Comparison of Mobility Method and Mass Conservation Method in a Study of Dynamically Loaded Journal Bearings," *International Journal of Rotating Machinery*, Taylor & Francis, 8(1), pp. 71-79, 2002.
63. Rao, T., and Sawicki, J.T., "Linear Stability Analysis for a Hydrodynamic Journal Bearing Considering Cavitation Effects," *STLE TRIBOLOGY TRANSACTIONS*, Vol. 45(4), pp. 450-456, October 2002.
64. Sawicki, J.T., "Some Advances in Diagnostics of Rotating Machinery Malfunctions," *Journal of the Japan Society of Mechanical Engineers*, pp. 138-144, September 2002 (Invited Paper).
65. Sawicki, J.T. and Genta, G., "Modal Uncoupling of Damped Gyroscopic Systems," *Journal of Sound and Vibration*, 244(3), pp. 431-451, Academic Press, 2001.
66. Sawicki, J.T. and Rao, T., "Nonlinear Prediction of Rotordynamic Coefficients for a Hydrodynamic Journal Bearing," *STLE TRIBOLOGY TRANSACTIONS*, Vol. 44(3), pp. 367-375, July 2001.
67. Dunaevsky, V., Sawicki, J.T., Frater, J.L., and Chen, H., "Analysis of Elastic Distortions of a Piston Ring in the Reciprocating Air Brake Compressor Due to the Installation Stresses," SAE Technical Publication # 1999-01-3769, 2000 SAE Transactions, *Journal of Commercial Vehicles*, ISBN 0-7680-0841-7.
68. Yu, B., Sawicki, J.T. and Dunaevsky, V., "Analytical Solution of Piston Ring Pack Lubrication Problem for Truck Air Brake Compressor," SAE Technical Publication # 1999-01-3769, 2000 SAE Transactions, *Journal of Commercial Vehicles*, ISBN 0-7680-0841-7.
69. Gawronski, W., and Sawicki, J.T., "Structural Damage Detection Using Modal Norms," *Journal of Sound and Vibration*, 229(1), pp. 194-198, Academic Press, 2000.
70. Sawicki, J.T. and Yu, B., "Analytical Solutions of Piston Ring Lubrication Using Mass Conserving Cavitation Algorithm," *STLE TRIBOLOGY TRANSACTIONS*, Vol. 43(3), pp. 419-426, July 2000.
71. Sawicki, J.T. and Padovan, J., "Frequency Driven Phasic Shifting and Elastic-Hysteretic Partitioning Properties of Fractional Mechanical System Representation Schemes," *Journal of the Franklin Institute*, Pergamon Ltd., 336, pp. 423-433, 1999.
72. Sawicki, J.T., Padovan, J., and Al-Khatib, R., "The Dynamics of Rotor with Rubbing," *International Journal of Rotating Machinery*, vol. 5, no. 4, pp. 295-304, Gordon and Breach Publishers, 1999.
73. Yu, B., Sawicki, J.T., Dunaevsky, V., "Static and Dynamic Analysis of Bearings for Truck Brake Compressor," Vol. 107, *Journal of Commercial Vehicles*, pp. 661-668, 1998.
74. Padovan, J. and Sawicki, J.T., "Non-Linear Vibrations of Fractionally Damped Systems," *Nonlinear Dynamics*, Kluwer Academic Publishers, 16, pp.321-336, 1998.
75. Gawronski, W.K., and Sawicki, J.T., "Comments on Response Errors of Non-proportionally Lightly Damped Structures," *Journal of Sound and Vibration*, 210(2), pp.285-285, Academic Press, 1998.
76. Padovan, J., and Sawicki, J.T., "Diophantinized Fractional Representations for Nonlinear Elastomeric Media," *Computers & Structures*, Vol. 66(2), pp. 613-626, 1998.
77. Sawicki, J.T., and Gawronski, W., "Balanced Model Reduction and Control of Rotor-Bearing Systems," *ASME Journal of Engineering for Gas Turbines and Power*, Vol. 119, April 1997.
78. Gawronski, W., and Sawicki, J.T., "Balanced Dissipative Controllers for Flexible Structures," *ASME Journal of Dynamic Systems, Measurement and Control*, Vol. 119, March 1997.
79. Padovan, J., and Sawicki, J.T., "Diophantine Type Fractional Derivative Representation of Structural Hysteresis, Part I: Formulation," *Computational Mechanics*, Springer, Vol. 19, Number 5, pp. 335-341, April 1997.
80. Sawicki, J.T., and Padovan, J., "Diophantine Type Fractional Derivative Representation of Structural Hysteresis, Part II: Fitting," *Computational Mechanics*, Springer, Vol. 19, Number 5, pp. 341-356, April 1997.
81. Gawronski, W., and Sawicki, J.T., "Error Bounds for Non-Proportionally Lightly Damped Structures," *Journal of Sound and Vibration*, Academic Press, 200(4), pp. 543-550, 1997.
82. Padovan, J., Sawicki, J.T., and Leonov, A., "Thermodynamic Properties of Fractional Differ-Integro Type Constitutive Relations," *Journal of Thermal Stresses*, 20(5), pp. 491-504, 1997.
83. Sawicki, J.T., Capaldi, R.J., and Adams, M.L., "Experimental and Theoretical Rotordynamic Characteristics of a Hybrid Journal Bearing," *ASME Journal of Tribology*, Vol. 118, January 1997.

84. Sawicki, J.T., Adams, M.L., and Capaldi, R.J., "System Identification Methods for Dynamic Testing of Fluid-Film Bearings," *International Journal of Rotating Machinery*, Gordon and Breach Publishers, Vol. 2, No. 4, pp. 237- 245, 1996.
85. Rashidi, M., Ebiana, A., Sawicki, J. T., and Sinnadurai, R., "Effects of Turbulence and Lubricant Inertia on Dynamics of Journal Bearings with Molten Zinc in Galvanizing Process," *ASM Journal of Materials Engineering and Performance*, Vol. 5, No. 6, pp. 710-728, 1996.
86. Sawicki, J.T., and Wittbrodt, E., "Optimization of Actively Controlled Mechanical Systems in a Presence of Harmonic Disturbances," *Scientific Journal of Institute of Fluid-Flow Machinery*, PAS, 302(1235), ISSN 0239-9091, 1990.
87. Sawicki, J., "Operational Calculus in Linear Spaces in Relation to Control Systems," *Scientific Journal of Institute of Fluid-Flow Machinery*, PAS, 249(1189), ISSN 0239-9091, 1987.

PLUS: 149 peer-reviewed conference proceedings and other peer-reviewed publications

SELECTED INVITED PRESENTATIONS AND LECTURES

- *Cutting-Edge Technologies and Research Frontiers in Rotating Machinery Dynamics and Control*, Shanghai Jiao Tong University, Shanghai, China, April 19-24, 2020 (invited by Prof. Dong Han, cancelled due to pandemic)
- *Recent Progress in Control of Advanced Rotordynamical Systems*, Invited Lecture, College of Engineering, University of Chile, Santiago, Chile, Sept. 3, 2019 (invited by Prof. Viviana Meruane)
- *Advances in Smart Rotating Machinery*, School of Mechanical Engineering, National Technical University of Athens, May 27, 2019, (invited by Prof. Nikolaos Marmaras)
- *Model Validation Applications in Robust Control*, Keynote Speaker, The Twelve International Conference on Vibration Engineering and Technology of Machinery (VETOMAC-XII), Warsaw, Jablonna Palace, Poland, 7-9 September 2016
- *Structural Health Monitoring Advances for Propulsion Systems*, Invited Speaker, Turbine Engine Division, Propulsion Directorate, Air Force Research Laboratory, Wright-Patterson, Ohio, April 12, 2012 (invited by Dr. Al Behbahani)
- *Control Driven Advances in Smart Rotating Machinery*, Keynote Speaker, Eighth International Conference "Mechatronic Systems and Materials 2012" MSM 2012, Bialystok, Poland, July 8-13, 2012
- *SHM of Rotating Machinery*, Invited Seminar, Robotics and Mechatronics, University of Science and Technology AGH, Cracow, Poland, June 6-9, 2011 (invited by Prof. Tadeusz Uhl)
- *Advanced Structural Health Monitoring for Power Generation and Propulsion Systems*, Invited Presentation, Materials and Manufacturing Directorate, Air Force Research Laboratory, Wright-Patterson Air Force Base, Ohio, November 24, 2009 (invited by Mr. Charles F. Buynak)
- *New Approach in Detection of Cracks in Rotors using AMBs*, Invited Seminary Lecture, Institute of Mechatronics, Technical University of Munich, Garching, Germany, November 2, 2009 (invited by Professor Heinz Ulbrich)
- IUTAM Symposium on Emerging Trends in Rotor Dynamics, Invited Speaker, IIT Delhi, India, March 23-26, 2009 (invited by Professor K. Gupta)
- Invited Speaker, NASA Aviation Safety Technical Conference, Denver, CO, USA, 21-23 October 2008
- *Rationale for Mu-Synthesis Control of Flexible Rotor - Magnetic Bearing Systems*, Keynote Speaker, 4th International Conference Mechatronic Systems and Materials (MSM 2008), 14-17 July, 2008, Bialystok, Poland
- *Introduction to Rotor Cracks – Modeling, Simulation and Diagnosis*, Keynote Speaker, 2007 Westinghouse Reactor Coolant Pump and Motor Workshop (RCPM 2007), Westinghouse Electric Company, December 10-14, 2007, Las Vegas, NV (invited by Mr. Mark Stickel)
- *Rotor Crack Detection Using Active Magnetic Bearings*, Keynote Speaker, 3rd International Conference Mechatronic Systems and Materials (MSM 2007), 27-29 September, 2007, Kaunas, Lithuania (invited by Professor R. Bansevicius)
- *Recent Advances in Rotordynamics Research*, Invited Presentation, GE Aircraft Engines, Cincinnati, June 25, 2007 (invited by Mr. Tod Steen)
- *Advances in Structural Health Monitoring of Rotordynamical Systems*, Invited Lecture Series, Department of Engineering Physics, Tsinghua University, Beijing, China, April 16, 2007 (invited by Professor X. Dai)
- *Advances in Structural Health Monitoring of Rotordynamical Systems*, Invited Lecture Series, Department of Power Engineering, Harbin Institute of Technology, Harbin, China, April 18, 2007 (invited by Professor D. Xu)

- *The Eminent Professor Lecture Series*, Invited Professor, Gas Turbine Rotor Bearing Dynamics and Bearing Sealing,” “Gas Turbine Engineering Department, Siemens-Westinghouse Power Corporation, Orlando, Florida, January 12, 2006 (invited by Gerry McQuiggan)
- Invited Guest Speaker, Structural Health Monitoring, 47th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, Newport, Rhode Island, May 1-4, 2006 (invited by Professors Gelman and Chattopadhyay)
- *Modeling and Performance Evaluation of Machining Spindle with Active Magnetic Bearings*, Invited Guest Speaker, The 8th International Conference on Motion and Vibration Control, MOVIC 2006, KAIST, Daejeon, Korea, August 27-30, 2006 (invited by Professor C.W. Lee)
- *Dynamic Response and Performance Evaluation of High Speed Machining Spindle with Active Magnetic Bearings*, Invited Guest Speaker, ISMST-8, International Symposium on Magnetic Suspension Technology, Dresden, Germany, September 26-28, 2005 (invited by Dr. A. Kirchner and Prof. H.J. Schneider-Muntau)
- *Recent Progress in the Modeling and Detection of Damaged Rotating Structures*, Guest Lecture, Department of Mechanical Engineering, The University of Technology of Compiègne, France, July 29-31, 2003 (invited by Professor Menad Sidahmed)
- *Recent Advances in Modeling of Cavitation Effects on the Dynamics of Fluid-Film Journal Bearings*, Invited Speaker, Institute of Fluid-Flow Machinery of the Polish Academy of Sciences in Gdansk, Poland, August 2, 2003 (invited by Professor R. Rzadkowski)
- *Modeling and Detection of Rotor Cracks*, Invited NFFP Lecture Series, Ohio Aerospace Institute, June 18, 2003 (invited by Professor Joseph Prah)
- *Some Advances in Diagnostics of Rotating Machinery Malfunctions*, Keynote Speaker, Annual Meeting of the Japan Society of Mechanical Engineers, Tokyo, Japan, September 25-26, 2002 (invited by Professor Takuzo Iwatsubo)
- *Smart Magnetic Bearings - Design and Analysis*, Invited Lecture on “Mechatronics Laboratory, Technical University of Turin, Turin, Italy, October 9, 2001 (invited by Professor G. Genta)
- *Investigation of Temperature and Speed Limitations of Fluid-Film (Journal) Bearings for Advanced Gas Turbine Aircraft Engines*, Insights in Research and Technology Symposium, The Research and Technology Directorate, NASA Lewis Research Center, August 6, 1998 (invited by Mr. Erwin Zaretsky)
- *Recent Advances in Analysis of Dynamically Loaded Journal Bearings*, AlliedSignal Automotive, Elyria, Ohio, May 5, 1998 (invited by Dr. V. Dunaevsky and H. Burchardt)
- *Theoretical and Experimental Study of Cavitation Phenomena in Dynamically Loaded Journal Bearings*, August 14, 1997, Surface Science and Tribology Branch, NASA Lewis Research Center, Cleveland, Ohio (invited by Mr. Dave Brew)

EXTERNAL FUNDING (recent shown only)

1. “Development of a Powered Pediatric Orthosis for Adaptive and Optimal Rehabilitation during Task-Oriented Training,” R01, National Institutes of Health, PI, \$2,279,429, 2023 (submitted).
2. “Entrepreneurial Manufacturer Digitization Support (EMDiS) Center of Excellence,” U.S. EDA Build to Scale (B2S) Program, PI, \$1,216,788 (including 50% cost share), 9/2020 – 9/2023.
3. “Laser Beam Stabilization Studies Towards Free-Space Quantum/Laser Communication Applications,” NASA GRC, PI, \$51,000, 3/2020 - 3/2021.
4. “NDE Techniques for Advanced Aerospace Materials and Structures,” NASA GRC, PI, \$346,190, 3/2020 - 3/2021.
5. “CSU and KSU Technology Validation and Start-up Fund,” Ohio Development Services Agency, PI, \$150,000, 6/ 2019 – 7/2021.
6. “CWRU/CSU IoT Collaborative,” The Cleveland Foundation via CWRU, PI, \$1,870,014, 1/2019 – 12/2021.
7. “CSU and KSU Technology Validation and Start-up Fund,” Ohio Development Services Agency, PI, \$400,000, 5/ 2017 – 9/2019.
8. “Statewide Commercialization and Workforce Development Center,” Ohio Department of Higher Education (via Wright State Applied Research Corporation), \$1,100,000, PI, 2/2016 – 2/2018.
9. “CWRU-CSU The Cleveland IoT: Creating Our Future Together,” Cleveland Foundation, PI, \$128,000.00, 1/2017 – 12/ 2017.
10. “Nondestructive Research and Development, and Facilities Maintenance in Support of the Aerojet Additive Manufacturing Space Act Agreement,” NASA, Contract NNC13TA85T, PI, \$626,381, 10/2015 – 3/2018.

11. "Numerical and Experimental Study of Dynamically-Loaded Journal Bearings", Lubrizol Corporation, PI, \$205,000, 2014-2029.
12. "Development of Experimental and Testing Infrastructure for Powered Pediatric Lower Limb Orthosis," State of Ohio's Third Frontier Program, PI, \$178,460, 2015 (12 months).
13. "Powered Lower Limb Orthosis for Pediatrics," Parker Hannifin Corp., PI, \$150,000, PI, 10/2013 – 10/2018.
14. "Efficient High Temperature Lab-Scale Thermal Energy Storage (TES) Prototype," NASA via Ohio Aerospace Institute to support the Argonne National Lab, PI, \$51,071, 2/2014 – 9/2014.
15. "Nondestructive Research and Development, and Facilities Maintenance," NASA Contract NNC13BA10B, Task NNC13TA90T-1, PI, \$163,234, 10/2013 – 9/2014.
16. "Integration of NDE and Finite Element and Image Visualization for Environmental Barrier Coating Durability Life Modeling," NASA, PI, \$110,970, 10/2013 – 9/2014.
17. "Propulsion Health Monitoring System Development and Instrumentation," NASA, \$109,203, PI, Contract NNC13BA10B, Oct. 1, 10/2013 – 9/2014.
18. "Graduate Fellowship Research Program," Parker Hannifin Foundation, PI, \$400,000, PI, 11/2012 – 11/2015.
19. "Robust Model-Based Fault Diagnosis for Propulsion System Components with Uncertainties," Ohio Aerospace Institute, PI, \$30,000, 12/2010 – 5/2012.