A. GALIP ULSOY CURRICULUM VITAE

15 December 2023

SHORT BIOGRAPHY

(Wikipedia Page for A. Galip Ulsoy)

Galip Ulsoy is the C.D. Mote, Jr. Distinguished University Professor Emeritus of Mechanical Engineering (ME) and the William Clay Ford Professor Emeritus of Manufacturing at the University of Michigan (UM), Ann Arbor. He received the Ph.D. in ME from University of California at Berkeley (1979), the M.S. degree in ME from Cornell University (1975), and the B.S. degree in Engineering from Swarthmore College (1973). He served as Chair of the ME Department, founding Director of the Ground Robotics Reliability Center, founding Deputy Director of the Engineering Research Center for Reconfigurable Manufacturing Systems, founding Editor of the American Society of Mechanical Engineers (ASME*) Dynamic Systems and Control Magazine*, Technical Editor of the *ASME J. Dynamic Systems, Measurement and Control*, President of the American Automatic Control Council (AACC), the USA national member organization of the International Federation of Automatic Control (IFAC), and Director of the Civil and Mechanical Systems Division at the National Science Foundation.

Galip Ulsoy made basic research contributions to the mechanics of axially moving elastic systems (e.g., translating bands, rotating shafts), to control system design (e.g., adaptive control, state derivative feedback, co-design of an artifact and its controller, time delay systems) as well as contributions to manufacturing systems (e.g., reconfigurable manufacturing, robotics, sawing, turning, milling, drilling, stamping), automotive systems (e.g., accessory drive belts, active suspensions, vehicle lateral control), and other engineering systems (e.g., disk drives, mineral processing). He is co-author of four books, over 375 articles, is a co-inventor on three USA and one European patent, and has been a principal investigator for research projects funded at over $90 million.

Galip Ulsoy has advised 47 doctoral students, and four of his former students have started successful companies. His published work is highly cited, and his research has had significant impact in industry. Commercial automotive accessory drive belts and active safety systems worldwide utilize methods and technologies he has developed. Reconfigurable manufacturing systems have been widely adopted in industry based on his work. Design of bandsaw blades, design and control of drills, and control of machine tools have been influenced by his research. Automotive suspensions, stamping presses, disk drives, and ground robots have also been improved based on his research findings.

Galip Ulsoy received the 1979 Wood Award from the Forest Products Research Society, a Society of Manufacturing Engineers (SME) 1986 Outstanding Young Manufacturing Engineer Award, the 1993 O. Hugo Schuck Best Paper Award and 2020 Richard E. Bellman Control Heritage Award from AACC, the 1995 South West Mechanics Lectureship, the 1997 Service Excellence Award and the 2011 Stephen S. Attwood Award from the College of Engineering at UM, the 2003 and 2016 Rudolf Kalman Best Paper Awards from the *ASME Journal of Dynamic Systems, Measurement and Control,* the 2002 Michael J. Rabins Leadership Award and the 2004 Henry M. Paynter Outstanding Investigator Award from the Dynamic Systems and Control Division of ASME, the 2008 Albert M. Sargent Progress Award from SME, the 2008 Rufus T. Oldenburger Medal, the 2013 Charles Russ Richards Award from ASME, and the 2014 Hideo Hanafusa Outstanding Investigator Award in Flexible Automation.

Galip Ulsoy is a member of the USA National Academy of Engineering, and received a 2012 Presidential Special Award (equivalent to the Medal of Science) from the Turkish Scientific and Technological Research Council (TÜBİTAK). A distinguished interdisciplinarian, he is a Fellow of ASME, SME, IFAC and the Institute of Electrical and Electronics Engineers (IEEE).

PERSONAL

Born Aug. 17, 1950 in Turkey; Naturalized citizen of the USA (1983); Married in 1975 to Susan K. Glowski with one daughter, Jessie E. Ulsoy (born 1976).

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Degrees Earned

- Ph.D., Mech. Engineering, University of California at Berkeley, 1979
  - Thesis: Vibration and Stability of Bandsaw Blades, Advisor: C.D. Mote, Jr.
- M.S., Mech. Engineering, Cornell University, 1975
  - Thesis: Optimal Pseudo-Derivative Feedback Control, Advisor: R.M. Phelan
- B.S., Engineering, Swarthmore College, 1973

Positions at Univ. of Michigan

- C.D. Mote, Jr. Distinguished University Professor Emeritus of Mech. Engineering and William Clay Ford Professor Emeritus of Manufacturing and Professor Emeritus of Mech. Engineering (2016 -).
- C.D. Mote, Jr. Distinguished University Professor of Mechanical Engineering (2009-2016), William Clay Ford Professor of Manufacturing (1996-2016), Professor (1992-2016), Associate Professor (1986-92), Assistant Professor (1980-86), Dept. of Mechanical Engineering.
- Founding Director (2007-2009), Deputy Director (2009-2010), Interim Director (2010-2011), Ground Robotics Reliability Center. Academic research/education center in autonomous ground vehicles, funded at over $10,000,000 by the US Army and member companies.
- Founding Deputy Director, National Science Foundation (NSF) Engineering Research Center for Reconfigurable Machining Systems, 1996-2002, and 2006-2010. The largest academic manufacturing research center in the USA, funded at over $40,000,000 by the National Science Foundation during 1996-2007 and by member companies.
- Chair, Dept. of Mechanical Engineering, 1998-2001. One of the largest and highest ranked mechanical engineering departments in the USA, with an annual budget of over $30,000,000, over 50 faculty and 60 staff, awarding approximately 250 BS, 150 MS and 40 PhD degrees per year.
- Founding Director, Program in Manufacturing, College of Engineering, 1993-94, 1996-98. Initiated in 1994, this program has grown to become one of the largest graduate programs in the College, and has led to the establishment of many other professional master's degree programs.
- Director (1992-94), Founding Associate Director (1990-92), NSF Industry-University Cooperative Research Center for Dimensional Measurement and Control in Manufacturing. Funded primarily by industry, with some support from NSF, at approximately $750,000 per year.
- Associate Chair and Director of Laboratories, Dept. of Mech. Engineering, 1992-93.
- Chair, Mech. Engineering Graduate Program, H.H. Rackham Graduate School, 1987-89.
- Director, Consortium on Sensing and Control for Metal Cutting, 1984-86.

Positions at Other Institutions

- Director, Division of Civil and Mechanical Systems, National Science Foundation, Arlington, Virginia, 2003-2005. The division annual budget was approximately $85,000,000, with 12 Program

Officers, and 6 administrative staff. Testified before the USA Senate Committee on Commerce, Science, and Transportation and briefed the USA House Committee on Science and Technology.
- Visiting Researcher, Research Labs, Ford, Dearborn, Michigan, 1995 and summers 1990-92. Co-inventor on two Ford patents, and co-author of several publications with Ford researchers.
- Visiting Associate Professor, Mech. Engin., Boğaziçi University, Istanbul, Turkey, 1986-87.
- Invited Lecturer, Shanghai Jiatong University, Nanjing Institute of Technology, and Xian Northwestern Polytechnical University, People's Republic of China, Aug. 1985.
- Postdoctoral Fellow, Material Science & Mineral Engin., Univ. of California, Berkeley, 1979-80.
- Teaching Assoc./Research Assistant, Mech. Engin., Univ. of California, Berkeley, 1975-79.
- Teaching/Research Assistant, Mech. & Aerospace Engin., Cornell University, 1973-74.

Professional Accomplishments

Teaching: Galip Ulsoy was founding Director of the Program in Manufacturing at Univ. of Michigan. He established the M. Eng. and D. Eng. in Manufacturing degrees and initiated their awarding by distance learning to General Motors sites around the world. Galip Ulsoy has co-developed and taught six new courses (i.e., adaptive control, digital control, microcomputer applications in manufacturing, vehicle control, manufacturing technologies and strategies, and reconfigurable manufacturing) at the Univ. of Michigan, and has co-authored the textbooks *Microcomputer Applications in Manufacturing* (Wiley, 1989) and *Automotive Control Systems* (Cambridge, 2012). He has taught short courses on vehicle control systems, and reconfigurable manufacturing systems. Galip Ulsoy has taught over 5,000 students, received course evaluations averaging over 4/5 for his classroom teaching and advised, or co-advised, 47 doctoral students. His former students hold positions in various academic institutions around the world, as well as leadership positions in industry, and four have established successful companies. Galip Ulsoy organized NSF sponsored workshops on "The 5xME: Transforming Mechanical Engineering Education in the USA," and edited the workshop reports.

Research: Galip Ulsoy's research interests are in the dynamics and control of mechanical systems, especially manufacturing and automotive systems. He has conducted fundamental research on the dynamic analysis and control of rotating and translating elastic systems as well as on the design of control systems. His work in the dynamics of bandsaw blades and drills is extensively cited, as is his work on the dynamics of accessory drive belts and road-departure prevention systems. He is regarded as one of the pioneers in the application of methods from advanced control theory to manufacturing systems. Galip Ulsoy is one of the originators of the reconfigurable manufacturing systems concept, which has had global impact. His publications are widely cited and his research has been recognized through a variety of awards, e.g. FPRS Wood Award, SME Outstanding Young Manufacturing Engineer, Southwest Mechanics Lectureship, AACC O. Hugo Schuck Best Paper Award, 2003 and 2016 Rudolf Kalman Best Paper Awards for *J. Dynamic Systems, Measurement and Control*, 2004 Henry M. Paynter Outstanding Investigator Award from the ASME Dynamic Systems and Control Division, election to the National Academy of Engineering in 2006, 2008 SME Albert M. Sargent Progress Award, the 2008 Rufus T. Oldenburger Medal and the 2013 Charles Russ Richards Memorial Award from ASME, the 2014 Hideo Hanafusa Outstanding Investigator Award in Flexible Automation, the 2012 Special Award (equivalent to the Medal of Science) from the Turkish Scientific and Technological Research Council, and the 2020 Richard E. Bellman Control Heritage Award from AACC. He has co-authored over 375 technical publications, research monographs on *Time Delay Systems* (World Scientific, 2010) and *Process Control for Sheet Metal Stamping* (Springer, 2014), is co-inventor on 3 USA patents, and consults with industry and government worldwide.

Service: Galip Ulsoy has served as the Director of the Civil and Mechanical Systems Division of the National Science Foundation, as the Editor of the *ASME J. of Dynamic Systems, Measurement and Control*, the founding Editor of the *ASME Dynamic Systems and Control Magazine*, and served on the editorial boards of several international journals. Galip Ulsoy has served as President of the American Automatic Control Council; the national member organization which represents the USA in the International

Federation of Automatic Control (IFAC). He has served as the General Chair of the 2000 American Control Conf., the 2008 Dynamic Systems and Control Conf., and the 2015 IFAC Workshop on Time Delay Systems. He also served as Chair of the Dynamic Systems and Control Division of ASME. At the Univ. of Michigan, he served as the Chair, Associate Chair, and Graduate Program Chair for the Mech. Engineering Dept., as an elected member of the College of Engineering Executive Committee, as the founding Director of the Program in Manufacturing, the founding Deputy Director of the Engineering Research Center for Reconfigurable Machining Systems and the founding Director of the Ground Robotics Research Center. He has also served as the Associate Director and Director of the Industry-University Cooperative Research Center. He is a member of the National Academy of Engineering and a Fellow of ASME, IEEE, IFAC and SME and a Member of ASEE. He has received Service Excellence Awards from the Dept. of Mech. Engineering and the College of Engineering at the Univ. of Michigan, and the ASME Dynamic Systems and Control Division 2002 Michael J. Rabins Leadership Award.

Honors and Awards

- Distinguished University Professorship, held by Kon-Well Wang, was named after A. Galip Ulsoy, University of Michigan, Ann Arbor, 2023.
- Collegiate Chair Professorship, held by Judy Jin, was named after A. Galip Ulsoy, College of Engineering, University of Michigan, Ann Arbor, 2023.
- Richard E. Bellman Control Heritage Award is given for distinguished career contributions to the theory or application of automatic control. It is the highest recognition of professional achievement for USA control systems engineers and scientists. The citation reads: *For seminal research contributions with industrial impact in the dynamics and control of mechanical systems, especially manufacturing systems and automotive systems*, American Automatic Control Council*,* 2020.
- Edward Law Emeritus Outstanding Service Award, College of Engin., Univ. of Michigan, 2018-2019
- Distinguished Lecture, Department of Industrial Engineering, Peking Univ., Nov. 13, 2018.
- Inaugural Lecture, Centennial Distinguished Lectureship Series, Dept. of Mechanical and Aerospace Engin., Missouri Univ. of Science and Technology, Rolla, April 11, 2017.
- Rudolf Kalman Best Paper Award for *ASME J. Dynamic Systems, Measurement and Control,* 2016.
- Named C.D. Mote Jr. Distinguished University Professor Emeritus and William Clay Ford Professor Emeritus of Manufacturing and Professor Emeritus of Mechanical Engineering by the Board of Regents, University of Michigan effective July 1, 2016.
- Texas A&M University at Qatar Distinguished Lecture Series, Doha, Qatar, March 2016.
- Keynote Paper, *Reconfigurable Manufacturing Systems: The Role of Dynamics and Control*, Automation 2015 Conference, Taipei, Taiwan, Nov. 13-15, 2015.
- Hideo Hanafusa Outstanding Investigator Award in Flexible Automation, International Symposium on Flexible Automation, Awaji Island, Japan, 2014.
- Election to Fellow, Institute of Electrical and Electronics Engineers (IEEE), 2013.
- Nyquist Lecturer, ASME Dynamic Systems and Control Conference, Palo Alto, CA, 2013.
- Charles Russ Richards Memorial Award from ASME and Pi Tau Sigma, 2013.
- Special Award from TÜBİTAK (Turkish Scientific and Technological Research Council) is equivalent to the Medal of Science and is presented by the President of Turkey to a Turkish national who works abroad. The citation reads: *"For his exemplary research on dynamic systems and automatic control, including dynamic analysis and control of axially rotating and translating elastic systems and application of advanced control theory to manufacturing and automotive systems."* 2012.
- Stephen S. Attwood Award, College of Engineering, University of Michigan, 2012.
- Election to Fellow, International Federation of Automatic Control (IFAC), 2010.
- Distinguished University Professorship Lecture, Univ. of Michigan, March 2010.
- Rufus T. Oldenburger Lecturer, Purdue University, Oct. 2009.
- Distinguished University Professorship, Univ. of Michigan, Ann Arbor, 2009.
- The 2008 Oldenburger Lecture, ASME DSCC, Ann Arbor, Oct. 2008.

- Rufus T. Oldenburger Medal recognizes significant contributions and outstanding achievements in the field of automatic control. The citation reads: " *For fundamental and wide-ranging contributions to the analysis and control of dynamic systems with a broad spectrum of applications, from automotive systems to manufacturing systems,"* ASME, 2008.
- Robert M. Caddell Memorial Faculty/Student Achievement Award to A. Galip Ulsoy, Yongseob Lim and Ravi Venugopal, Dept. of Mech. Engin., Univ. of Michigan, 2008.
- Plenary Presentation, "Recommendations from the 5xME Workshop on Transforming Mech. Engin. Education," ASME Mech. Engineering Education Conf., Galveston, TX, April 2008.
- Albert M. Sargent Progress Award, Society of Manufacturing Engineers, 2008.
- Graduate Colloquium Speaker, Dept. of Mech. Engin., Purdue University, Nov. 2006.
- Outstanding Achievement Award, Dept. Mech. Engin., Univ. of Michigan, 2005-2006.
- National Academy of Engineering, USA, 2006 *"For research on the dynamics and control of axially moving elastic materials and their implementation in automotive and manufacturing systems."*
- Sectional Keynote Paper, *Strategic Issues in Sensors & Smart Structures*, 3rd European Conf. on Structural Control, 2006.
- Keynote Paper, *A 21st Century Engineering Education for Leading Concurrent Discovery and Innovation*, President's Roundtable, CIRP General Assembly, Antalya, Turkey, Aug. 2005.
- H. M. Paynter Outstanding Investigator Award, ASME Dynamic Systems & Control Division, 2004.
- Rudolf Kalman Best Paper Award for *ASME J. Dynamic Systems, Measurement and Control,* 2003.
- M. J. Rabins Leadership Award, ASME Dynamic Systems & Control Division, 2002.
- Distinguished Lecturer, Computer Integrated Studies Research Center, Un. British Columbia, Vancouver, Canada, Feb. 2002.
- Distinguished Lecturer, Materials & Manufacturing Ontario, National Research Council, Canada, 2001, and Keynote Paper, Workshop on Reconfigurable Manufacturing: Beyond Flexible, McMaster University, Canada, Oct. 2001.
- Ford Innovation Award for patent "Vehicle Steering System and Method for Controlling Vehicle Direction Through Differential Braking of Left and Right Road Wheels," 2000.
- Plenary Paper, *Reconfigurable Machine Tools and Systems*, International Machine Tool Engineers Conf., Tokyo, Japan, Oct. 2000.
- Distinguished Lecture Series, Dept. Mech. Engin., Penn State University, Feb. 2000.
- Feddersen Distinguished Lecturer, Dept. of Mech. Engin., Purdue University, Feb. 2000.
- Technology and Innovation Award, 1999, *Industry Week*, Agile Line Boring Project, Member of Joint Univ. of Michigan and Lamb Technicon Research Team.
- Ford Innovation Award for patent "Method and Apparatus for Vehicle Yaw Rate Estimation," 1999.
- Keynote Paper, *Reconfigurable Manufacturing Systems*, CIRP General Assembly, Switzerland,1999.
- Service Excellence Award, College of Engineering, Univ. of Michigan, 1997.
- William Clay Ford Professorship, College of Engineering, Univ. of Michigan, 1996.
- Election to Fellow, Society of Manufacturing Engineers (SME), 1996.
- Research Excellence Award, Dept. of Mech. Engin., Univ. of Michigan, 1996.
- Distinguished Lecturer Series in Manufacturing, University of California, Davis, Nov. 1995.
- Lecturer, Southwest Mechanics Lecture Series, 1995.
- Best Presentation in Session Awards at American Control Conferences: 2014 (w/ S. Yi), 2012 (w/ S. Duan & J. Ni), 2008 (w/ S. Yi & P.W. Nelson), 2002 (w/ H. Mahmoud, P.T. Kabamba & G. Brusher & w/ L.K. Chen), 2000 (w/ F.M. Asl), 1999 (w/ LK. Chen & w/ C.W. Hsu), 1997 (w/ T. Pilutti, & w/ G. Brusher & P.T. Kabamba), 1995 (w/ T. Pilutti), 1994 (w/ G. Brusher & P. T. Kabamba), and 1993 (w/ R. J. Furness & C. L. Wu).
- O. Hugo Schuck Best Paper Award, American Automatic Control Council, for the paper "Supervisory Control of Drilling," by R. Furness, A. G. Ulsoy, and C. L. Wu, 1993.

- Biography included in *Who's Who in America*, *Who's Who in Science and Engineering, Who's Who Among America's Teachers, Who's Who in the Midwest*, *Who's Who in Finance and Industry*, *Who's Who in Turkey*, and *Directory of Turkish-American Scientists.*
- Election to Fellow, American Society of Mechanical Engineers (ASME), 1993.
- Service Excellence Award, Dept. Mech. Engin., Univ. of Michigan, 1993.
- Letter of Commendation for Excellence in Classroom Teaching (i.e., among top 10% in student course evaluations) from Dean of the College of Engineering, 1992 and 1994.
- Outstanding Young Manufacturing Engineer, Society of Manufacturing Engineers, 1986.
- Research Incentive Award, Exxon Foundation Faculty Assistance Program, 1984-85.
- TRW Faculty Assistanceship Grant, 1983-85.
- Mining and Mineral Resources Institute Post Doctoral Fellowship, 1979-80.
- Wood Award (1st place), Forest Products Research Society, 1979.
- Stanley M. Tasheira Fellowship, University of California at Berkeley, 1975-76.
- Elected Member, Nu Chapter of Sigma Tau, Engineering Honor Society.
- John Russel Hayes Poetry Prize (1st place), Swarthmore College, 1971.
- Swarthmore College Scholarship, 1969-73.
- Charles S. MacNeal Award, Robert Academy, Istanbul, 1969.

TEACHING

Contributions to Teaching

Galip Ulsoy has made major contributions to curriculum development, including the initiation and development of the College of Engineering's professional Master of Engineering and Doctor of Engineering degree templates and the founding of the interdisciplinary Program in Manufacturing (PIM) at the Univ. of Michigan. He also initiated and implemented the first distance learning M. Eng. degree offering (through PIM) with General Motors. Galip Ulsoy has contributed to and led the efforts over the past twenty years in making the Mech. Engin. Dept. at Michigan one of the best in the world in manufacturing automation and in the control of mechanical systems. He has developed new courses in microcomputer applications in manufacturing, design of automatic control systems, adaptive control systems, vehicle control systems, manufacturing technologies and strategies, special topics (e.g., sensors and signal processing) and contributed to the development of other courses (e.g., agile, reconfigurable manufacturing).

Galip Ulsoy co-authored, with W.R. DeVries, the textbook *Microcomputer Applications in Manufacturing* (Wiley, 1989), with S. Yi and P.W. Nelson the research monograph *Time Delay Systems: Analysis and Control Using the Lambert W Function* (World Scientific, 2010), with H. Peng and M. Çakmakcı the textbook *Automotive Control Systems* (Cambridge, 2012), and with Y. Lim and R. Venugopal the research monograph *Process Control for Sheet Metal Stamping* (Springer, 2014). He has taught over 5,000 students, received student course evaluations of over 4 out of 5, and advised, or co-advised, 47 doctoral students. His former doctoral students hold positions in various academic institutions around the world, as well as leadership positions in industry, and four have established successful companies. He has also developed excellent laboratory facilities for undergraduate and graduate student education and research in manufacturing and controls. This included the funding, design and implementation of the showcase Integrated Manufacturing Systems Laboratory. Galip Ulsoy organized the NSF workshops on "The 5xME: Transforming Mechanical Engineering Education in the USA," and edited the workshop reports (see http://www-personal.umich.edu/~ulsoy/5XME.htm).

New Courses Introduced at UM

- ME 465 - Microcomputer Applications in Manufacturing (Senior Level). Simulation, data acquisition, data analysis, and control in real-time using interrupts. Manufacturing case studies for forming, machining, stepping motor control, and dc servo motor control. Lecture and lab. (w/ W.R. DeVries).

- ME 561 - Design of Automatic Control Systems (Graduate Level). Topics of state vector feedback, state estimation, modal control, optimal control, parameter estimation, and adaptive control are introduced for both continuous and discrete time systems. Design application is emphasized through a course project and case studies. Lecture only.
- ME 568 - Vehicle Control Systems (Graduate Level). Vehicle control systems, lateral & longitudinal motion control, suspensions, braking, traction. Review of vehicle dynamics, role and modeling of the driver, and advanced vehicle control systems for intelligent vehicle-highway systems. Lecture only.
- ME 599 - Special Topics Courses (Graduate level). Computer Control of Mechanical Systems (Boğaziçi University). Lecture only. Sensors and Signal Processing (w/ S. Braun at Univ. of Michigan). Lecture only. Mechanical Vibrations (Boğaziçi University). Lecture only.
- MFG 501, 502, 503 - Manufacturing Seminar/Project (Graduate Level). A joint manufacturing seminar between engineering and business schools for both Master of Engineering in Manufacturing and Master of Business Administration degree students. Speakers on a variety of manufacturing topics from industry, engineering faculty and business faculty. Summer manufacturing internships and team building. Renamed Manufacturing Technologies & Strategies.
- ME 661 - Adaptive Control Systems (Graduate Level). Control of systems with undetermined or slowly time varying parameters. Self-tuning and model reference adaptive control for continuous and discrete time systems. Simulation studies based on engineering applications. Lecture only.

Other Courses Taught at U of M

- ME 240 - Introduction to Dynamics (Sophomore Level). Introduction to Newtonian Mechanics. Dynamics of particles, systems of particles, and rigid bodies. Applications include central force motion and vibration problems. Lect. only.
- ME 360 - Introduction to System Dynamics (Junior Level). Dynamic modeling and analysis of lumped-parameter mechanical systems utilizing experimental, analytical, and numerical methods. Lect. & lab.
- ME 461 - Automatic Control (Senior Level). Linear feedback control theory with emphasis on mechanical syst. Methods for control system representation, analysis, stability, design. Lect. & lab.
- ME 560 - Modeling Dynamic Systems (Graduate Level). A unified approach to the dynamic modeling of linear systems using bondgraphs, and to their simulation and analysis. Lect. only.
- ME587 - Reconfigurable, Agile Manufacturing (Graduate Level). A graduate level introduction to reconfigurable manufacturing for engineering and business students. Lect. only.
- ME 790 - Seminar in Mechanical Systems and Control (Graduate Level). A seminar course for Ph.D. candidates conducting research in the dynamic modeling and control of mechanical systems. Student discussions/presentations on topics of current research interest.

Short Courses

- Reconfigurable Manufacturing Systems (Co-Taught at Univ. of Michigan). Various aspects of reconfigurable manufacturing systems (RMS). Co-taught the module on the RMS science-base.
- Vehicle Control Systems (Taught at the G.M. Technical Center). Vehicle control systems, including lateral and longitudinal motion control, suspensions, braking and traction control, etc.

Ph.D. Thesis Committees Chaired

(47) Keval Ramani, "Feedforward Tracking Control of Nonminimum Phase Systems using Filtered Basis Functions – with Application to a 3D Printer," Dec. 2019 (Co-chair: C. Okwudire) (Assistant Professor, Indian institute of Technology, Kanpur, India).

(46) Jin Ge, "Connected Cruise Control Design in Mixed Traffic Flow Consisting of Human-Driven and Automated Vehicles," May 2017. (Co-chair: G. Orosz) (Research Engineer, Toyota Research Institute, Los Altos, CA).

(45) Surat Kwanmuang, "Filtering and Tracking for a Pedestrian Dead-Reckoning System," May 2015. (Co-chair: E. Olson). (Lecturer and Assistant Dean, Dept. Mechanical Engineering, Chulalongkorn University, Bangkok, Thailand).

(44) Amir Sadrpour, "Acceptance Testing and Energy-Based Mission Reliability in Unmanned Ground Vehicles (UGVs)," Dec. 2013. (Co-chair: J. Jin). (Lead Data Scientist, Boeing, Seattle, WA).
(43) William R. Brown, "Maneuver Based Design of Passive Assist Devices for Active Joints," May 2013. (Product Engineer, Ford Motor Company, Dearborn, MI).
(42) Rachael Bis, "Safe Operation of Autonomous Vehicles with Uncertain Sensors and Actuators around Moving Obstacles," Dec. 2011. (Co-chair: H. Peng). (Missile System Analyst, Johns Hopkins University Applied Physics Laboratory, Laurel, MD).
(41) Shifang Li, "Distributed Supervisory Controller Design in Plug-In Hybrid Electric Vehicles for Battery Swapping Modularity," May 2011. (Co-chair: I. Kolmanovsky). (Research Engineer, General Motors, Warren, MI).
(40) Shiming Duan, "Stability of Uncertain Piecewise Affine Time-Delay Systems with Application to All Wheel Drive Clutch Control," May 2011 (Co-chair: J. Ni). (Research Engineer, General Motors, Warren, MI).
(39) Kyungjun Song," Modeling, Simulation and Design of Plasmonic Nanoarchitectures for Ultrafast Circuit Systems," Aug. 2010. (Co-chair: P. Mazumder) (Researcher, Korea Institute of Machinery and Materials, Seoul, Korea).
(38) Yongseob Lim, "Multi-Input Multi-Output Adaptive Process Control in Stamping Using Punch Force," May 2010. (Assoc. Prof., DGIST, Korea).
(37) Diane L. Peters, "Coupling and Controllability in Optimal Design and Control," Dec. 2009. (Co-chair: P.Y. Papalambros). (Assoc. Prof., Kettering University, Flint, MI).
(36) Sun Yi, "Time Delay Systems: Analysis and Control Using the Matrix Lambert W Function," Dec. 2009. (Co-chair: P.W. Nelson, Math.). (Prof., North Carolina A&T State Univ., Greensboro, NC).
(35) Melih Çakmakcı, "Mechatronic Design for Component Swapping Modularity using Bi-Directional Communication in Networked Control Systems," May 2009. (Technical Leader, Ford Otosan, Ankara, Turkey).
(34) Jaspreet S. Dhupia, "Effect of Joint Nonlinearities on the Dynamic Performance of Machine Tools," Dec. 2006. (Co-chair: R. Katz) (Senior Lecturer, Univ. of Auckland, New Zealand).
(33) Sulaiman F. Alyaqout, "A Multi-System Optimization Approach to Coupling in Robust Design and Control," May 2006. (Co-chair: P.Y. Papalambros) (Asst. Prof., Kuwait Univ., Safat, Kuwait).
(32) Haitham Mahmoud, "Setting and Management of Subsystem Design Targets in the Parallel Design of Complex Engineered Systems," Dec. 2004 (Co-chair: P.T. Kabamba, Aerospace Engineering). (Head of Countries Business Development at Qatar National Bank Group).
(31) Hosam K. Fathy, "Combined Plant and Controller Optimization: Theory, Strategies and Applications," May 2003 (Co-chair: P.Y. Papalambros). (Prof, Univ Maryland, College Park, MD).
(30) Farshid Maghami Asl, "Capacity Management in Reconfigurable Manufacturing Systems," Dec. 2002. (Managing Director, Goldman Sachs & Co., New York, NY).
(29) Liang-Kuang Chen, "Driver and Controller Interactions in Vehicle Active Safety Systems," Aug. 2002. (Assoc. Prof., Dept. of Mech. Engin., National Taiwan Univ. of Science and Technology).
(28) Cheng-Wei Hsu, "Analysis, Design and Experiments for Punch Force Control in Sheet Metal Forming," May 2000. (Research Engineer, Ford Motor Company, Dearborn, MI).
(27) Tomas Larsson, "Controller Design for Linear Systems Subject to Actuator Saturation," Aug. 1999. (Vice President, Data Science, C2G, Glenelg, Maryland).
(26) Chen-Jung Li, "Tool Tip Displacement Measurement, Process Modeling and Chatter Avoidance in Agile Precision Line Boring," May 1999 (Co-chair: W.J. Endres). (Assoc. Prof., National Kaohsiung First Univ. of Science and Technology, Taiwan)
(25) Robert G. Landers, "Supervisory Machining Control: A Design Approach Plus Chatter Analysis and Force Control Components," April 1997. (Adv. Mfg. Collegiate Prof., Dept. of Aerospace and Mech. Engin., Notre Dame Univ., South Bend, IN).
(24) Thomas Pilutti, "Lateral Vehicle Co-Pilot to Avoid Unintended Roadway Departure," Feb. 1997. (Staff Research Engineer, Scientific Research Labs, Ford, Dearborn, MI).

(23) Foued Ben Amara, "Adaptive Sinusoidal Disturbances Rejection in Linear Systems with Application to Noise Cancellation," Dec. 1996. (Co-chair P.T. Kabamba). (Senior Engineer, eBrisk Video, Vancouver, Canada).
(22) Chiu Feng Lin, "Lane Sensing and Path Prediction for Preventing Vehicle Road Departure Accidents," June 1995 (Advisor, Ministry of Economic Affairs, Taiwan).
(21) Diana M. Rincon, "Coupled Force and Vibration Modeling of Drills with Complex Cross Sectional Geometries," Dec. 1993 (Asst. Prof., College of Ed., Florida Int. Univ., Miami, FL).
(20) Gerald A. Brusher, "Coupling Between the Modeling and Controller-Design Problems" Aug. 1993. (Co-chair: P.T. Kabamba). (Technical Evangelist, MathWorks, Novi, MI).
(19) Zbigniew Pasek, "An Adaptive Assembly System for Automotive Applications," Aug. 1993. (Co-chair: S. M. Wu). (Prof., Industrial and Manuf. Engin., Univ. of Windsor, Windsor, Canada).
(18) Steven Jones, "Quantification and Reduction of Dynamically Induced Errors in Coordinate Measuring Machines," Completed June 1993. (Technical Consultant, Steelcase, Grand Rapids, MI).
(17) Sung-Gwang Chen, "Machining Error Source Diagnostics Using a Turning Process Simulator," June 1993. (Co-chair: Y. Koren). (Co-Founder/President/CEO, A2 Automation (http://a2vn.vn/Default), Taipei, Taiwan).
(16) Abdulghaffar Azhari Al-Jawi, "Vibration Localization in Dual-Span Axially Moving Elastic Systems," Dec. 1992. (Co-chair: C. Pierre). (Assoc. Prof. and Vice Dean, Dept. of Mech. Engin., King Abdulaziz Univ., Jeddah, Saudi Arabia).
(15) Randall Beikmann, "Static and Dynamic Behavior of Serpentine Belt Drive Systems: Theory and Experiment," Dec. 1992 (Co-chair: N.C. Perkins). (Senior Research Engineer, Noise and Vibration Laboratory, General Motors Proving Grounds, Milford, MI).
(14) Su-hyun Choi, "Vibration Localization in Rotating Shafts," Aug. 1992. (Co-chair: C. Pierre). (Executive VP, Daewoo Shipbuilding & Marine Engineering Co., Seoul, Korea).
(13) Heuigi Son, "Dynamics of Prestressed Translating or Rotating Anisotropic Plates Subject to Transverse Loads and Heat Sources," June 1992 (Co-chair: N. Kikuchi). (Manager, Goldstar Corp., Seoul, Korea).
(12) Richard Furness, "Supervisory Control of the Drilling Process," June 1992. (Manager, Global Manufacturing Engineering Methods, Ford, Dearborn, MI).
(11) Fon-Lin Hu, "Force and Motion Control of a Constrained Flexible Manipulator," Dec. 1991 (President, Belltek Corporation Ltd. (http://www.belltk.com), Taichung, Taiwan).
(10) Jong-Jin Park, "Adaptive Observer and Computer Vision for On-Line Flank Wear Estimation." June 1990. (Founder and President, Tae Wha Industrial Co. Ltd., Seoul, Korea).
(9) Kyung Chul Shin, "Observation and Control of Force and Motion in Constrained Dynamical Systems." Aug. 1988. (Co-chair: P.T. Kabamba). (President, Yujin Robotics Co (https://yujinrobot.com), Seoul, Korea).
(8) Ahmet Yiğit, "Dynamics of Flexible Mechanisms with Impact." June 1988. (Co-chair: R.A. Scott). (Professor, Yıldırım Beyazıt Univ., Ankara, Turkey).
(7) Ozan Tekinalp, "Dynamic Modeling of Drill Bit Vibrations." June 1988. (Professor, Dept. of Aeronautical Engineering, Middle East Technical University, Ankara, Turkey).
(6) Ye-Chen Pan, "Dynamic Simulation of Flexible Robots with Prismatic Joints." Jan. 1988. (Co-chair: R.A. Scott). (Technical Integration Engineer, General Motors, Troy, MI).
(5) Reuven Katz, "Dynamics of a Rotating Shaft Subject to Moving Loads, and Its Possible Application in Machining." June 1987. (Co-chair: R.A. Scott). (Prof., Mech. Engin., Technion, Israel).
(4) Aslaug Haraldsdottir, "Performance Improvement by Derivative Feedback in Linear Systems." June 1987. (Co-chair: P.T. Kabamba). (Principal Engineer, Boeing, Seattle, WA).
(3) Kourosh Danai, "An Adaptive Observer for On-Line Tool Wear Estimation in Turning." June 1986. (Professor, Dept. of Mech. Engineering, Univ. of Massachusetts, Amherst, MA).
(2) Nabil G. Chalhoub, "Control of a Leadscrew Driven Flexible Robot Arm." June 1986. (Professor, Dept. of Mech. Engin., Wayne State University, Detroit, MI).

(1) Leal K. Lauderbaugh, "Implementation of Model Reference Adaptive Force Control in Milling." June 1986. (Assoc. Prof., Dept. Mech. Engin., Univ. Colorado, Colorado Springs, CO).

M.S. Thesis and M. Eng. Practicum Advised

(15) Kevin Weld, "Modeling and Simulation of a Constant Flux Dynamic Magnetostrictive Sensor," M.S. Thesis, May 2016.
(14) Hongtao Wang, "Vision Based Robotic Arm Picker," M. Eng. Project, Robotics and Autonomous Vehicles, Dec. 2011.
(13) William Westrick, "Incorporation of Pedestrian Detection into the VOS Algorithm," M.S. Thesis, Dec. 2011 (Co-chair: H. Peng).
(12) Shifang Li, "Modeling/Simulation of Series Hybrid Vehicle," M.S. Thesis, Dec. 2008. Research Engineer, General Motors, Warren, MI.
(11) Jason Ord, "A Model and Controller for a High-Performance Printer Actuator," M. Eng. Practicum Project with HP, Aug. 2006.
(10) Sung I. Kim, "Robust Machining Force Control with Process Compensation," Dec. 2000 (Co-chair: R. Landers).
(9) Jorge Sandoval, "Supervisory Control of a Reconfigurable Machine Tool," Aug. 1999 (Co-chair: R. Landers).
(8) Byunghoon Chung, "Sensitivity Reduction with State Plus State Derivative Feedback in Active Suspensions," May 1999.
(7) Melih Çakmakcı, "Modular Design of DC Servo Motors," May 1999. Assistant Professor, Bilkent University, Ankara, Turkey.
(6) Elaine Chang "Acceleration Feedback in Machine Tool Servo Control," Dec. 1997.
(5) Ryan Strathearn, "Active Suspension Design and Evaluation Using a Quarter Car Test Rig," Dec. 1996 (Co-chair H. Peng). Mechanical Engineer, Opti-Forms Inc., Temecula, CA
(4) Douglas Walker, "Input-Output Criterion for Linear Model Order Determination," May 1996 (Co-chair: J.L. Stein).
(3) Adrian Adamson, "Closed-Loop Dimensional Control in Sheet Metal Forming via the Blank Restraining Force," Dec. 1995. Senior Systems Engineer, Deep Space Systems, Holland, CT.
(2) Eric Mockenstrum, "Nonlinear Vibrations in Serpentine Drive Systems," Aug. 1993 (Co-chair: N. C. Perkins). Associate Professor, Penn State University, University Park, PA.
(1) Mehmet Pakdemirli, "Transverse Vibration of an Axially Accelerating String." M. S. Thesis, Boğazici University, Istanbul, Turkey. July 1987 (Co-chair: A. Ceranoğlu). President, Celal Bayar University, Manisa, Turkey.

Post-Doctoral Researchers and Visiting Scholars Supervised and Hosted

(33) Ahmet Kırlı, "A Steer-By-Wire Safety Strategy for Total Actuator Failure, Co-advised by C. Okwudire, " 9/15/2016-9/1/2017.
(32) Masato Ishii, "Energy-Efficient Robot Maneuver Optimization," 8/4/14-9/26/14.
(31) Azad Ghaffari, "Plug-and-Play Controller Design and Experimental Validation," 6/1/14-9/15/16.
(30) Süleyman Murat Bağdatlı, "Design of Passive Vibration Absorbers via Control Design Methods," Co-advised by C. Okwudire, 6/1/13-8/31/13.
(29) Shiming Duan, "Modular Controller Design and Time Delay Systems," 8/20/11-11/12/11.
(28) Wang Yuefei, "Experimental Evaluation of Swapping Modularity in Controller Design," Co-advised by I. Kolmanovsky, 2/10/11-3/10/12.
(27) Diane Peters, "Design and Control of Mechanical Systems," Co-advised by P.Y. Papalambros, 1/1/10-7/1/10.
(26) Brandon Moore, "Thermal Management for UGVs," Co-advised with D.M. Tilbury, 9/1/09-8/31/10.
(25) Jaspreet S. Dhupia, "Parametric Excitation in Time Delayed Systems," 1/1/07-6/31/08.
(24) Bartosz S. Powalka, "Nonlinear Dynamic Characterization of Machine Tool Joints," 4/05-12/06.
(23) H.S. Cho, Visiting Professor, "Sensing and Control of Manufacturing Systems," 10/03-9/04.
(22) C.W. Lee, Visiting Professor, "Dynamics, Vibrations, and Control," 1/03-12/03.

(21) R. Rajamani, "Automotive Control Systems," 10/02-12/02.
(20) K. Yaguchi, Visiting Scholar, "Vibration Isolation," 9/99-8/00.
(19) Ahmet Yigit, Visiting Scholar, "Machine Tool Vibrations," 8/99-7/00.
(18) Elzbieta Jarzebowska, Visiting Scholar, "Dynamics of Reconfigurable Mfg. Systems," 2/98-1/99.
(17) Byeong Hee Kim, Visiting Scholar, "Reconfigurable Machining Systems," 1/98-12/98.
(16) Yun-Jae Won, Visiting Scholar, "Reconfigurable Machining Systems," 7/97-6/98.
(15) Robert Landers, Assistant Research Scientist, "Supervisory Control of Machine Tools," 5/97-7/00.
(14) Moses Mehrabi, Assistant Research Scientist, "Reconfigurable Machining Systems,"1/97-8/02.
(13) Foued Ben Amara, Post Doctoral Researcher, "Adaptive Disturbance Rejection," 1/97-12/97.
(12) Mehmet Pakdemirli, Visiting Scholar, "Perturbation Analysis of Axially Moving Elastic Systems," 2/96-7/97.
(11) David LeBlanc, Post Doctoral Researcher, "Crewman's Associate for Path Control," 7/94-4/97.
(10) Yansong Shan, Assistant Research Scientist, "A Hierarchical Controller for Real-Time Quality Assurance in Machining," 1/94-12/94.
(9) Zbigniew Pasek, Assistant Research Scientist and Operations Manager, "Flexible Line Boring, Hierarchical Control of Machine Tools, and Reconfigurable Machining Systems" 8/93-8/05.
(8) Kunsoo Huh, Post Doctoral Researcher, "Lateral Control of Vehicles," 9/92-2/93.
(7) Sheng-Jiaw Hwang, Post Doctoral Researcher, "Automotive Serpentine Belt Drive Dynamics," 10/91-8/92.
(6) Jongjin Park, Post Doctoral Researcher, "Process Control in Turning," 5/90-12/90.
(5) Ahmet Yiğit, Post Doctoral Researcher and Lecturer, "Control of Rigid-Flexible Multibody Systems," 5/88-12/88.
(4) Kourosh Danai, Post Doctoral Researcher, "Force Measurements in Turning," 5/86-12/86.
(3) Chong-Won Lee, Visiting Scholar, "Dynamics of Rotating Shafts," 8/84-7/85.
(2) Jiang-Guang Lun, Visiting Scholar, "Computer Controlled Systems," 1/83-5/83.
(1) Yi-Ping Chen, Visiting Scholar, "Automation of Manufacturing Processes," 1/81-5/82.

Student Projects Directed

- Chaired/Co-chaired 47 Ph.D. and 15 MS/MEng thesis committees.
- Supervised 33 postdoctoral researchers and visiting scholars.
- Served on over 60 Ph.D. and 10 M.S. thesis committees as a member.
- Supervised over 50 independent research projects at the M.S. level.
- Supervised over 50 independent research projects at the B.S. level.
- Mentor and course advisor to about 10 graduate students per year.
- Mentor and course advisor to about 15 undergraduate students per year.
- Advised Mech. Engin. graduate students, as Graduate Program Chair (1987-89)
- Advisor (1990-92) to Whirlpool Fellows (four per year) pursuing M.S. degrees.
- Faculty mentor in Pi Tau Sigma mentoring program.
- Advised Program in Manufacturing applicants/students as Director (1993-94, and 1996-98).

Awards to Students Supervised by A.G. Ulsoy

- R. Landers, Advanced Manufacturing Collegiate Professorship, Notre Dame University, 2021
- D.L. Peters, Outstanding Faculty Advisor Award, Kettering University, 2017.
- D.L. Peters, elected Fellow of SWE, 2016.
- K. Weld, William Mirsky Memorial Fellowship, Mechanical Engin. Dept., Univ. of Michigan, 2016.
- S. Yi, Best Presentation in Session Award at the American Control Conf., 2014.
- H. K. Fathy, NSF CAREER Award, 2014.
- R. Landers, Elected Fellow of ASME, 2014.
- D.L. Peters, ASEE Educational Research and Methods Apprentice Faculty Grant, 2013.
- A. Sadrpour, Richard F. and Eleanor A. Towner Prize for Distinguished Academic Achievement, College of Engin., Univ. of Michigan, 2013.

- S. Duan, Best Presentation in Session Award at the American Control Conf., 2012.
- N.G. Chalhoub, Elected Fellow of ASME, 2012.
- D.L. Peters, Grad. Student Distinguished Achiev. Award, College of Engin, Univ. of Michigan, 2010.
- R. Katz, Outstanding Research Scientist Award, College of Engin, Univ. of Michigan, 2010.
- R. Bis, Best Presentation Award (1st place), Dynamic Systems and Control Area, Graduate Student Symposium, College of Engin, Univ. of Michigan, 2009.
- D.L. Peters, Best Presentation Award (2nd place), Dynamic Systems and Control Area, Graduate Student Symposium, College of Engin, Univ. of Michigan, 2009.
- F. Ben Amara, 2009 Koh Young Paper Award, *International Journal of Optomechatronics*.
- S. Yi, Nominated by the Mech. Engin. Department for the Distinguished Dissertation Award, H.H. Rackham Graduate School, Univ. of Michigan, 2009.
- R. Bis, Student Best Paper Award Finalist, ASME Dynamic Systems and Control Conf., 2009
- A. Haraldsdottir, SWE Achievement Award, 2009
- A.S. Yiğit, Elected Fellow of ASME, 2009.
- D.L. Peters, Marian Sarah Parker Graduate Prize, Univ. of Michigan, 2009.
- D.L. Peters, Distinguished Leadership Award - Graduate, College of Engin, Univ. of Michigan, 2009.
- H. Fathy, Outstanding Research Scientist Award, College of Engin, Univ. of Michigan, 2009.
- R. Bis, Finalist, Student Best Paper Award, *ASME Dynamic Systems and Control Conf.*, 2009.
- R. Bis, Best Presentation Award (2nd place), Dynamic Systems and Control Area, Graduate Student Symposium, College of Engin, Univ. of Michigan, 2008.
- S. Yi, Best Presentation in Session Award at the American Control Conf., 2008.
- Y.S. Lim, Robert M. Caddell Memorial Faculty/Student Achievement Award to A. Galip Ulsoy, Yongseob Lim and Ravi Venugopal, Dept. of Mech. Engin., Univ. of Michigan, 2008.
- S. Yi, Best Presentation Award (1st place), Dynamic Systems and Control Area, Graduate Student Symposium, College of Engin, Univ. of Michigan, 2006.
- R. Bis, National Science Foundation Graduate Research Fellow, 2005-2009.
- R.G. Landers, M. Eugene Merchant Outstanding Young Manufacturing Engineer Award, Society of Manufacturing Engineers, 2004.
- H.K. Fathy, Student Best Paper Award, ASME Dynamic Systems and Control Division, International Mech. Engin. Congress and Exposition, 2003, Washington, D.C.
- H. Mahmoud, 2002 Distinguished Leadership Award, College of Engineering, Univ. of Michigan.
- L.K. Chen, 2003 Rudolf Kalman Best Paper Award, *ASME J. Dynamic Syst., Meas. Control*, for "Identification of Driver Steering Model, and Model Uncertainty, from Driving Simulator Data."
- K. Danai, Elected Fellow of ASME, 2003.
- H.K. Fathy, Best Presentation Award (1st place), Dynamic Systems and Control Area, Graduate Student Symposium, Mech. Engin. Department, Univ. of Michigan, 2002.
- F.M. Asl, Best Presentation Award (2nd place), Dynamic Systems and Control Area, Graduate Student Symposium, Mech. Engin. Department, Univ. of Michigan, 2002.
- H. Mahmoud, Best Presentation in Session Award at the American Control Conf., 2002.
- Z. Pasek, Outstanding Research Scientist Award, College of Engineering, Univ. of Michigan, 2001.
- H. Fathy, Best Presentation Award, Design and Manufacturing Area, Graduate Student Symposium, Mech. Engin. Department, Univ. of Michigan, 2000.
- F.M. Asl, Best Presentation in Session Award at the American Control Conf., 2000.
- L.K. Chen, Best Presentation in Session Award at the American Control Conf., 1999 and 2002
- C.W. Hsu, Best Presentation in Session Award at the American Control Conf., 1999
- T. Larsson, Harold and Vivian Shapiro Award, Rackham Graduate School, Un. Michigan, 1998.
- B. Chen, Student Best Paper Award Finalist, Dynamic Systems and Control Division, ASME International Mech. Engin. Congress and Exposition, Nov. 1998.

- S. Jones, Philip R. Marsilius Outstanding Young Manufacturing Engineer Award, Society of Manufacturing Engineers, 1997.
- T. Pilutti, Best Presentation in Session Award at American Control Conf., 1997 and 1995.
- G. Brusher, Best Presentation in Session Award at American Control Conf., 1997 and 1994.
- R. Furness, Philip R. Marsilius Outstanding Young Manufacturing Engineer Award, Society of Manufacturing Engineers, 1996.
- A. Adamson, Caddell Memorial Award, Mech. Engin, Univ. of Mich., Ann Arbor, 1995.
- R. Furness, O. Hugo Schuck Best Paper Award, American Automatic Control Council, for the paper "Supervisory Control of Drilling," Co-authors: A. G. Ulsoy, and C. L. Wu, 1994.
- R. Furness, Best Presentation in Session Award at the American Control Conf., 1993.
- A. Yiğit, McIvor Award, Applied Mechanics Program, Univ. of Michigan, Ann Arbor, 1987.

RESEARCH

Contributions to Research

Galip Ulsoy has over four decades of research experience in the dynamic modeling, analysis, and control of mechanical systems as a principal investigator or co-investigator on projects totaling over $90 million. Fundamental areas of research emphasis are in control systems design and dynamics and control of axially translating or rotating elastic systems. Applications in manufacturing systems (robotics, turning, milling, drilling, sawing, stamping), and automotive systems (accessory belt drives, active suspensions, vehicle lateral control, autonomous vehicles) are of particular interest. Galip Ulsoy's award-winning research activities span the full range from basic to applied engineering research and employ analytical, experimental, and numerical methods. He has published two textbooks, two research monographs, over 375 technical articles and received numerous national and international awards for his research accomplishments, including election in 2006 to the USA National Academy of Engineering, the 2008 Rufus T. Oldenburger Medal from ASME, the 2008 Albert M. Sargent Progress Award from SME, the Presidential Special Award (equivalent to the Medal of Science) in 2012 from the Turkish Scientific and Technological Research Council, the 2013 Charles Russ Richards Memorial Award from ASME and Pi Tau Sigma, the 2014 Hideo Hanafusa Outstanding Investigator Award in Flexible Automation from the International Symposium on Flexible Automation, and the 2020 Richard E. Bellman Control Heritage Award from AACC. A distinguished interdisciplinarian, he is a Fellow of ASME, IEEE, IFAC and SME.

Galip Ulsoy is among the pioneers in applying advanced concepts from control and estimation theory to the monitoring and control of manufacturing processes. Major contributions include a model reference adaptive force controller for milling; adaptive tool wear estimation methods using force measurements and computer vision; supervisory controllers for improved hole quality in high production rate drilling while preventing drill breakage. He has also made important contributions to dynamic modeling of drill and bandsaw vibrations and forces; vibration reduction in coordinate measuring machines and flexible manipulators; open-architecture controllers; and control of stamping processes. He is a co-inventor on the patent on reconfigurable manufacturing systems and a key contributor to the development of this internationally acclaimed new manufacturing paradigm.

Galip Ulsoy's research contributions in automotive systems include pioneering research on the dynamics of automotive accessory drive systems (e.g., serpentine belt systems which drive multiple accessories); active suspension modeling and design; active safety systems for preventing unintended road departure accidents and other "co-pilot" technologies to assist the driver. He is a co-inventor on patents for vehicle yaw rate estimation and emergency vehicle steering via differential braking. Other application areas of interest include autonomous vehicles and robots (e.g., reliability, robust design and pedestrian avoidance), composite computer disk drive vibrations including thermal effects, dynamics and control of mineral processing operations (e.g., grinding, flotation and high gradient magnetic separation), and others (e.g., active noise control).

Elastic components, which rotate about, or translate along, a fixed axis include rotating shafts, drill bits, power transmission belts and chains, and bandsaw blades. The vibration and stability of such components are affected by the transport (i.e., rotation or translation) speed. Galip Ulsoy's fundamental research contributions in this field include the effects of membrane stresses, modal analysis methods for rotating shafts, coupling between spans in multi-span systems, effects of moving loads and variations in transport speed, parametrically excited vibrations, and vibration localization in both rotating shafts and axially translating beams. Galip Ulsoy has also made fundamental contributions to control systems design. The use of state derivatives in a feedback control system has been shown to improve sensitivity to parameter variations and to disturbance loads; the coupling between the problems of artifact and controller design has been quantified, and methods for simultaneously designing an artifact and its controller has been presented. A new method, based upon the matrix Lambert *W* function, has been developed for analysis and control of systems of linear delay differential equations. Also developed are adaptive methods for rejection of unknown periodic disturbances, design methods to achieve swapping modularity in control systems, and design methods for systems with control input saturation.

Grants and Contracts

(57) "UGV System Reliability Modeling and Improvement," *Automotive Research Center, U.S. Army TACOM*, 1/1/12 – 12/31/13, $96,000. Co-PI's: Judy Jin and A.G. Ulsoy.

(56) "Ground Robotics Reliability Center," *U.S. Army TACOM*, 7/1/09 – 8/31/11, $5,000,000. Center Director: D.M. Tilbury, Co-PI's: J. Borenstein, J. Laird, H. Peng and A.G. Ulsoy.

(55) "Implementing the "5xME" Workshop Recommendations for Transforming Mech. Engin. Education and Research," *National Science Foundation*, 1/1/09 – 12/31/10, $50,000. Project Director: A.G. Ulsoy, Co-PI: K.W. Wang.

(54) "Ground Robotics Research Center," *U.S. Army TACOM*, 7/1/07 – 6/31/09, $5,000,000. Center Director: A.G. Ulsoy. Co-PI's: J. Borenstein, J. Laird, H. Peng and D. Tilbury.

(53) "Design For Swapping Modularity Case Study: A Hybrid-Electric Vehicle," *Ford*, 9/1/07 – 8/31/09, $88,000. Project Director: A.G. Ulsoy.

(52) "Optimal Co-Design of Controlled Systems and their Controllers," *National Science Foundation*, 1/1/07 – 12/31/09, $210,000. Project Director: A.G. Ulsoy, Co-PI: P.Y. Papalambros.

(51) "Development of an Intelligent Computer Aided Stamping System," *Michigan Economic Development Corp. 21st Century Fund*, 1/1/07 - 12/31/09, $670,000. Project Director: A.G. Ulsoy.

(50) "The 5xME Workshop and Report: Transforming Mech. Engin. Education and Research," *National Science Foundation*, 9/1/06 – 8/31/08, $50,000. Project Director: A.G. Ulsoy.

(49) "Analysis of Time Delayed Systems via Lambert Functions," *National Science Foundation*, 8/1/06-7/31/09, $260,000. Project Director: A.G. Ulsoy, Co-PI: P.W. Nelson (Mathematics).

(48) "Student Summer Support Grant," *H.H. Rackham Graduate School*, 6/1/06 – 8/1/06, $4,000., Project Director; A.G. Ulsoy, Co-PI: P.W. Nelson.

(47) "Future Combat Systems (FCS): Phase II Production Planning Study for the Manned Ground Vehicle (MGV), " *US Army*, 6/05-5/06, $603,000, Project Director: S. Jack Hu, Co-PIs: J. Cristiano, J. Shi, A. Shih, S. Skerlos, and A.G. Ulsoy.

(46) "Engineering Research Center for Reconfigurable Manufacturing Systems," *National Science Foundation and 25 Industrial Firms*, 8/04-7/07. Second three-year renewal of original center grant. $16,000,000. Project Director: Y. Koren, Deputy Director: A.G. Ulsoy.

(45) "Design and Manufacturing for Responsiveness of Military and Commercial Ground Vehicles." *U.S. Army TACOM*, 6/02-4/03, $150,000, Project Director: A. Galip Ulsoy, Co-PI: S. Jack Hu.

(44) "System Norms for NVH Design Target Cascading," *Ford Motor Company*, 3/01-12/02, $97,000. Project Director: P.T. Kabamba, Co-PI: A.G. Ulsoy.

(43) "Combined Design of Plant and Controller for Automotive Controls," *Ford Motor Company*, 1/01-12/01, $30,000. Project Director: A.G. Ulsoy, Co-PI: P.Y. Papalambros.

(42) "Engineering Research Center for Reconfigurable Manufacturing Systems," *National Science Foundation and 25 Industrial Firms*, 8/01-7/04. Three-year renewal of original center grant. $18,000,000. Project Director: Y. Koren, Deputy Director: A.G. Ulsoy.

(41) "Vehicle Control Interactions Between Drivers and Active Safety Systems," *U.M. Intelligent Transportation Systems Research Center of Excellence Industrial Advisory Board*, 10/96-9/99, $222,000. Project Director: A.G. Ulsoy.

(40) "Engineering Research Center for Reconfigurable Machining Systems," *National Science Foundation and 25 Industrial Firms*, 8/96-7/01. $15,000,000. Project Director: Y. Koren, Deputy Director: A.G. Ulsoy.

(39) "Agile Precision Line Boring," *Lamb Technicon and the NIST Advanced Technology Program*, 10/95-12/99, $997,000. Project Director: Y. Koren, Co-PI: A.G. Ulsoy.

(38) "Establishment of an Integrated Machining Systems Laboratory," *National Science Foundation*, 3/15/95-3/31/98, $950,000, Project Director: A.G. Ulsoy.

(37) "Active Suspension Research," *Ford*, 1995-96, $40,000. Proj Director: A.G. Ulsoy, Co-PI: H. Peng.

(36) "Adaptive Repetitive Control of Nonlinear Discrete-Time Systems," *National Science Foundation,* 11/94-10/97, $171,123. Project Director: A.G. Ulsoy, Co-PI: P.T. Kabamba.

(35) "Automotive Research Center," U.S. Army TACOM, 9/94-8/97, $7,500,000. Project Director: P.Y. Papalambros, One of 15 Co-PI's: A.G. Ulsoy.

(34) "Stamping Process Modeling, Monitoring, Diagnostics, and Control," *Ford Motor Company,* 4/94-4/97, $150,000. Project Director: A. G. Ulsoy.

(33) "ITS Research Center of Excellence," *U.S. Department of Transportation - Federal Highway Administration,* 9/93-9/95, $1,000,000. Project Director: C. White, One of 23 Co-PI's: A.G. Ulsoy.

(32) "Adaptive Driver and Vehicle Models," *U.M. Intelligent Transportation Systems Ind. Advisory Board*, 1/94-12/96, $64,961. Project Director: A.G. Ulsoy, Co-PIs: H. Peng and C. MacAdam.

(31) "Establishment of a Graduate Research Traineeship Program in Machine Tool Technology," *National Science Foundation*, 10/93-9/98, $690,745. Project Director: A. G. Ulsoy, Co-PIs: E. Kannatey-Asibu, Y. Koren, J. Ni, and J.L. Stein.

(30) "The Coalition for New Manufacturing Education," *National Science Foundation,* 10/93-9/96, $15,000,000. Coalition members are Focus:Hope, University of Detroit Mercy, Central State University, Lawrence Technological University, Lehigh University, Univ. of Michigan, and Wayne State University. Coalition Director: L. Hanafin (University of Detroit), Co-PI's from Univ. of Michigan: M. Parsons, W, Hancock, and A. G. Ulsoy.

(29) "Hierarchical Controller for Real-Time Quality Control in Machining," *National Science Foundation*, 12/93-11/96, $548,645. Project Director:A.G. Ulsoy, Co-PIs: Y. Koren and K.G. Shin.

(28) "A University-Industry-Government Consortium Addressing Basic Automotive Research Issues," *US Army, TACOM,* 8/93-10/93, $53,796. Project Director: A.G. Ulsoy, Co-PI: J. MacBain.

(27) "Crewman's Associate for Path Control: An Automated Driving Function," *US Army, TACOM,* 10/93-9/95, $661,381. Project Director: R.D. Ervin, Co-PIs: C.C. MacAdam and A.G. Ulsoy.

(26) "Flexible Line Boring," *Chrysler, Ford, and General Motors, NSF IUCRC Project*, 5/93-4/94, $130,000. Project Director: A. G. Ulsoy, Co-PIs: Y. Koren and J. Ni.

(25) "Industrial Partnership Development in Advanced Machining," *Ford Manufacturing Grant Advisory Committee*, 1/93-12/93, $30,000. Project Director: A.G. Ulsoy.

(24) "Characterization and Modeling of On-Board Lane Sensing Systems" *Great Lakes Center for Truck and Transportation Research*, 1/93-8/93, $18,800. Project Director: A.G. Ulsoy.

(23) "Assessment of Technology Needs of the Machine Tool Industry," *Rand Corporation Critical Technologies Institute,* 11/92-8/93, $50,000. Project Director: A. G. Ulsoy.

(22) "Baseline Requirements for Lane Sensing to Avoid Run-Off-Road Accidents," *U.M. Intelligent Vehicle-Highway Systems Ind. Advisory Board*, 1/92-12/93, $162,097. Project Director: A.G. Ulsoy, Co-PIs: R.D. Ervin and C. MacAdam.

(21) "Automotive Serpentine Belt Vibrations," *Ford*, 1991-93, $100,000. Co-PIs: N.C. Perkins, A.G. Ulsoy.

(20) "Coupled Drill Force and Vibration Modeling Including Breakthrough," *General Motors Technical Center*, 1/91-8/92, $63,975. Project Director: A.G. Ulsoy.
(19) "Machining Error Diagnostics in Face Milling of AOD and AODI Transmission Parts," Ford Motor Company, 6/90-8/90, $9,968. Co-PIs: A.G. Ulsoy and Y. Koren.
(18) "Industry/University Cooperative Research Center for Dimensional Measurement and Control in Manufacturing," *National Science Foundation and Companies*, since 6/90, $700,000. approximate annual budget. Center Director: J. Ni (1994-), A. G. Ulsoy (1992-1994) and S.M. Wu (1990-1992).
(17) "Representation of Complex Drill Geometry in Drill Vibration Models," *General Motors Research Laboratories*, 1/90-12/90, $43,105. Project Director: A.G. Ulsoy.
(16) "Modeling, Analysis and Control of a Metal Cutting System," *Univ. of Michigan Center for Research in Integrated Manufacturing*, 9/89-12/89, $8,606. Co-PIs: A.G. Ulsoy and Y. Koren.
(15) "Computational Tools and a Design Project in Teaching of Introductory Dynamics," *Univ. of Michigan Undergraduate Initiatives Fund*, 1/89-12/89, $11,757. Project Director: A.G. Ulsoy.
(14) "Modeling Methodologies for Machining," *Ford*, 8/87-12/91, $205,000. Co-PIs: J.L. Stein, A.G. Ulsoy.
(13) "Process Modeling for Wear and Breakage Detection in Metal Cutting", *National Science Foundation*, 9/86-8/88, $193,337. Co-PIs: A.G. Ulsoy and Y. Koren.
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(T32) *Representation of Complex Drill Geometry in Drill Vibration Models*, D. Rincon and A.G. Ulsoy, Final Report to the General Motors Corporation, Technical Report UM-MEAM-90-06, Dept. of Mech. Engin., Univ. of Michigan, Ann Arbor, MI, Sept. 1990.

(T31) *Model-Based Tool Wear Estimation in Metal Cutting*, A.G. Ulsoy and Y. Koren, Final Report to the National Science Foundation, Technical Report UM-MEAM-89-12, Dept. of Mech. Engin., Univ. of Michigan, Ann Arbor, MI, Oct. 1989.

(T30) *Stability Robustness and LQG/LTR Design of Active Suspensions*, A.G. Ulsoy and D. Hrovat, Technical Report, Scientific Research Labs, Ford Motor Company, Dearborn, MI, Aug. 1989.

(T29) *Computer Programs Developed to Solve the Equations of Motion for Drill Dynamics*, O. Tekinalp, and A.G. Ulsoy, Technical Report UM-MEAM-88-02, Dept. of Mech. Engin., Univ. of Michigan, Ann Arbor, MI, May 1988.

(T28) *A Simulation Program for the Dynamics of a Radially Rotating Beam with Impact*, A. Yigit, A.G. Ulsoy, and R.A. Scott, Technical Report UM-MEAM-88-01, Dept. of Mech. Engin., Univ. of Michigan, Ann Arbor, MI, May 1988.

(T27) *Adaptive and Sensor Based Control of Machine Tools*, J. L. Stein and A.G. Ulsoy, Final Report to the General Motors Corp., Dept. of Mech. Engin., Univ. of Michigan, Ann Arbor, MI, June 1986.

(T26) *Application Software for a Model Based Approach to Tool Wear Estimation,* K. Danai, A.G. Ulsoy, Report UM-MEAM-86-36, Dept. of Mech. Engin., Univ. of Michigan, Ann Arbor, MI, May 1986.

(T25) "Control of a Flexible Robot Arm," A.G. Ulsoy and N.G. Chalhoub, in D. Atkins *et al*, *Coordinated Research in Robotics and Integrated Manufacturing*, Final Report to Air Force Office of Scientific Research, Univ. of Michigan, Ann Arbor, MI, Aug. 1985.

(T24) *Variable Gain Adaptive Process Control Systems for Milling,* A.G. Ulsoy and L. K. Lauderbaugh, Final Report to NSF, Dept. of Mech. Engin., Univ. of Michigan, Ann Arbor, MI, May 1985.

(T23) *Tool Breakage Detection in Turning Using a Multi-Sensor Strategy,* A.G. Ulsoy and E. Han, Report to Cons. on Diag. Sensing and Control for Metal Cutting, Ann Arbor, MI, Nov. 1984.

(T22) *Dynamic Modeling and Control of the Milling Process*, A.G. Ulsoy, L. K. Lauderbaugh, Report UM-MEAM-84-31, Dept. of Mech. Engin., Univ. of Michigan, Ann Arbor, MI, Nov. 1984.

(T21) *A Comparison of Automatic Control Schemes for Control of the Speed of a DC Motor Using a Digital Microcomputer*, D. R. Lymburner and A. G. Ulsoy, Technical Report No. UM-MEAM-84-26, Dept. of Mech. Engin., Univ. of Michigan, Ann Arbor, MI, June 1984.

(T20) *RELTIM: A Library of Routines For Use in Real Time Machine Control Applications,* F. Rasmussen, L. K. Lauderbaugh and A. G. Ulsoy, Technical Report No. UM-MEAM-84-24, Dept. of Mech. Engin., Univ. of Michigan, Ann Arbor, MI, May 1984.

(T19) *Programming Optimal Suggestions in the Design Concept Phase: Application to the Boothroyd Assembly Charts*, M. Jakiela, P. Papalambros and A. G. Ulsoy, Tech. Report No. UM-MEAM-84-23, Dept. of Mech. Engin., Univ. of Michigan, Ann Arbor, MI, May 1984.

(T18) *SIMULA:Digital Control System Simulation Package*, L. K. Lauderbaugh and A.G. Ulsoy, Report UM-MEAM-84-22, Dept. of Mech. Engin., Univ. of Michigan, Ann Arbor, MI, Apr. 1984.

(T17) *Experimental Evaluation of Transverse Drill Bit Vibrations*, O. Tekinalp and A.G. Ulsoy, Tech. Rep. No. UM-MEAM-84-21, Dept. of Mech. Engin., Univ. of Mich., Ann Arbor, MI, Feb. 1984.

(T16) *Variable-Gain Adaptive Control Systems for Machine Tools*, A.G. Ulsoy, Y. Koren and L.K. Lauderbaugh, Progress Report to National Science Foundation, Tech. Report No. UM-MEAM-83-18, Dept. Mech. Engin., Univ. of Michigan, Ann Arbor, MI, Feb. 1984.

(T15) *Current Research in Product Design for Automated Assembly*, M. Jakiela, *et al*, Progress Report to IBM Corporation, Technical Report No. UM-MEAM-83-16, Dept. of Mech. Engin., Univ. of Michigan, Ann Arbor, MI, Sept. 1983.

(T14) *Dynamic Simulation of Flexible Robot Arm Controller,* N.G. Chalhoub and A.G. Ulsoy, Technical Report No. TR-RSD-13-83, Center for Robotics and Integrated Manufacturing, Univ. of Michigan, Ann Arbor, MI, Sept. 1983.

(T13) *A Computational Package for Design and Process Evaluation in Band Sawing - A User's Manual*, J. E. Borchelt, A.G. Ulsoy and P. Papalambros, Technical Report No. UM-MEAM-83-14, Dept. of Mech. Engin., Univ. of Michigan, Ann Arbor, MI, June 1983.

(T12) *Development of an Efficient Computational Procedure for Evaluating Band Saw Blade Stresses,* J. E. Borchelt, A.G. Ulsoy and P. Papalambros, Technical Report No. UM-MEAM-83-13, Dept. of Mech. Engin., Univ. of Michigan, Ann Arbor, MI, June 1983.

(T11) *Variable-Gain Adaptive Control Systems for Machine Tools*, A.G. Ulsoy and Y. Koren, Progress Report to the NSF, Dept. of Mech. Engin., Univ. of Michigan, Ann Arbor, MI, Oct. 1982.

(T10) *Research Directions in Robotics*, D. Atkins, *et al*. Technical Report No. RSD-TR-16-82, Center for Robotics and Integrated Manufacturing, Univ. of Michigan, Ann Arbor, MI, Oct. 1982.

(T9) *Simple Adaptive Control of a Robot Arm*, D. Goldberg, A. G. Ulsoy and Y. Koren, Center for Robotics and Integrated Manufacturing, Univ. of Michigan, Ann Arbor, MI, Sept. 1981.

(T8) *Computer-Aided Design of Automotive Accessory Drive Systems*, A. G. Ulsoy and J. E. Whitesell, Final Report to Ford, Dept. of Mech. Engin., Univ. of Michigan, Ann Arbor, MI, Sept. 1981.

(T7) "Analysis of Band Saw Vibration and Stability," A.G. Ulsoy, in Mote, C. D., Jr. (editor), *Optimizing Circular Saw Design and Operation*, Technical Report No. 35.01.130, UC Forest Products Lab., Richmond, CA, Nov. 1979.

(T6) *Vibration and Stability of Band Saw Blades: A Theoretical and Experimental Study*, A.G. Ulsoy, Technical Report No. 35.01.130, UC Forest Products Lab., Richmond, CA, Oct. 1979.

(T5) *Two Computer Codes for Band Saw Vibration and Stability Analysis,* A.G. Ulsoy, Technical Report No. 35.01.130, UC Forest Products Lab., Richmond, CA, Oct. 1979.

(T4) "Analysis of Band Saw Vibration," A.G. Ulsoy, in Mote, C. D., Jr. (editor), *Optimizing Circular Saw Design and Operation*, Technical Report No. 35.01.130, Progress Report No. 9, Section E, University of California Forest Products Laboratory, Richmond, CA, Nov. 1978.

(T3) "Band Saw Vibration and Stability Research," A.G. Ulsoy, in Mote, C. D., Jr. (editor), *Control of Vibration in Thin Circular Saws*, Interim Progress Report No. APR77-11557, Section C, Dept. of Mech. Engin., University of California, Berkeley, CA, May 1978.

(T2) "Band Saw Vibration Research", A.G. Ulsoy, in Mote, D. C., Jr. (editor), *Optimizing Circular Saw Design and Operation*, Technical Report No. 35.01.130, Progress Report No. 8, Section E, University of California, Berkeley, CA, May 1978.

(T1) *Full Utilization of a Rail Right of Way*: *A Case Study of Philadelphia's Media-Westchester Line*, A.G. Ulsoy, (editor, contributor), Urban Transportation Series Report No. 3, Dept. of Engineering, Swarthmore College, Swarthmore, PA, Feb. 1973.

TECHNOLOGY TRANSFER

Contributions to Technology Transfer

Galip Ulsoy has worked closely with industry and is a co-inventor on three USA and one European patent. The Agile Line Boring project, with Lamb Technicon, led to an *Industry Week* magazine award and a new machine tool for line boring. Galip Ulsoy's work on vehicle active safety and road-departure accident prevention, has led to several prototype systems being built at Ford and to two Ford Innovation Awards. Furthermore, both Ford and GM currently use methods and software developed in Galip Ulsoy's research to design their engine accessory drive belts. Four of Galip Ulsoy's former students have founded successful startup companies, while several have taken positions in industry and contribute to transfer of technology to the companies they work for (e.g., the award-winning research on process control in drilling was implemented at Ford).

Galip Ulsoy also spent a sabbatical year, and two summers, working at Ford Research Labs and interacted extensively with various companies through the Engineering Research Center for Reconfigurable Manufacturing Systems and its technology transfer activities. Galip Ulsoy has been Director of the U.S. Army funded Ground Robotics Reliability Center, Director (and Associate Director) of the NSF industry-University Cooperative Research Center and the Consortium for Diagnostics in Machining. Galip Ulsoy also served on the executive board of the NIST Advanced Technology Project (ATP) "2mm Project," one of the most successful Univ. of Michigan efforts ever in terms of technology transfer, and a project often highlighted by NIST as a successful ATP project. He served as a member of the Corporate Board for the US Army TACOM Ground Vehicle Industrial Enterprise, and as a member of the Board of Directors for Intellicass, a stamping press automation company utilizing results from his research on stamping process control. He also consults for industry and government organizations.

Patents Issued

(3) "Reconfigurable Manufacturing System Having A Production Capacity, Method for Designing Same, and Method for Changing Its Production Capacity," Y. Koren and A.G. Ulsoy, U.S. Patent 6,349,237 issued Feb. 19, 2002. Assigned to Univ. of Michigan.

(2) "Vehicle steering system and method for controlling vehicle direction through differential braking of left and right road wheels," T. Pilutti, D. Hrovat and A.G. Ulsoy, U.S. Patent 6,021,367 issued Feb. 1, 2000. Assigned to Ford Motor Company.

(1) "Method and Apparatus for Vehicle Yaw rate Estimation," N. Sivashankar, A.G. Ulsoy, and D. Hrovat. U.S. Patent 5,878,357 issued March 2, 1999. European Patent EP0826576 issued Dec. 16, 2009. Assigned to Ford Motor Company.

PROFESSIONAL SERVICE

Contributions to Service

Galip Ulsoy has contributed extensively to professional service at all levels. At the national/international level he served as Past President, President, Vice-President and member of the Board of Directors of the American Automatic Control Council; the national member organization representing the USA in the International Federation of Automatic Control (IFAC). He has served as an Editor of an American Society of Mechanical Engineers (ASME) Transactions journal, is the founding Editor of the *ASME Dynamic Systems and Control Magazine*, and is on the editorial board of several international journals. He was the General Chair of the first ASME Dynamic Systems and Control Conference in 2008, General Chair of the 12th IFAC Workshop on Time Delay Systems in 2015, and General Chair of the 2000 American Control Conference. He also served as the Chair of the Dynamic Systems and Control Division of the ASME. He served as the Director of the Division of Civil and Mechanical Systems at the National Science Foundation during 2003-2005. As NSF Division Director, he testified before a subcommittee of the US Senate Committee on Commerce, Science, and Transportation and briefed the US House Committee on Science and Technology. At the University of Michigan he served as the founding Deputy Director of the Engineering Research Center for Reconfigurable Machining Systems, the Chair, Associate Chair and Graduate Program Chair of the Mech. Engin. (ME) Department, founding Director of the Program in Manufacturing and of the Industry-University Cooperative Research Center, and founding Director of the Ground Robotics Research Center. As Chair, he led the ME Department to a number two ranking in the April 2003 *US News & World Report* ranking of graduate programs. He served as an elected member of the College of Engineering Executive Committee and has received Service Excellence Awards from the College of Engineering and the ME Department as well as an ASME Dynamic Systems and Control Division Leadership Award. Galip Ulsoy has also served as a consultant to both industry and governmental organizations worldwide and was elected to membership in the National Academy of Engineering (NAE) in 2006. He served on the NAE National Materials and Manufacturing Board, and the NAE Standing Committee on Defense Materials, Manufacturing and Infrastructure. He has served on the NAE Awards Selection Committee, and the National Research Council's Panel on Manufacturing Engineering.

Major Committee Assignments at Univ. of Michigan

Univ. of Michigan (UM)

- Co-chair (2021-2022), SACUA Administrative Evaluation Committee.
- Member (2013-2016), Conflict of Interest/Conflict of Commitment Policy Review Group.
- Chair (2014-2015), Vice-Chair (2013-2014), Member (2012-2013), Committee on the Economic Status of the Faculty.
- Panel Member, Seminar on Preparing Future Faculty, Rackham and CRLT. May 2010.
- Workshop Leader, Advanced Manufacturing Workshop, University Research Corridor Conf., The Role of Engaged Universities in Economic Transformation, Oct. 2007.
- Member, SACUA Faculty Grievance Procedures Task Force, 2006. This led to new Faculty Grievance Procedures being established at University of Michigan.
- Member, Hearing Committee for Regents Bylaws 5.09 Faculty Dismissal Proceedings, 2006-8.
- Member, Internal Review Committee for the Tauber Manufacturing Institute, 2000.
- Member, Executive Committee, Tauber Manufacturing Institute, 1996-98.

- Member, Director Search Committee, MI Joint Manufacturing Initiative Between College of Engineering and Business School, 1992-93.
- Member, Rackham School of Graduate Studies, ITS Certificate Program Committee, 1990-94.
- Member, College of Engineering/Business School, Ford Manufacturing Education Initiative, Program Advisory Committee, 1989-93.
- Member, Engineering College Dean Search Committee, 1989.
- Member, College of Engineering/Business School, Ford Mfg. Education Initiative, 1988.
- Member, Rackham School of Graduate Studies, Dissertation Grant Selection Committee, 1986.
- Member, Rackham School of Graduate Studies, Predoctoral Fellowship Committee, 1985.

UM College of Engineering

- Promotion and/or Tenure Review Committee for J.L. Stein (Chair, 1987), R.S. Rao (Member, 1989), R.B. Brown (Member, 1990), D. Wehe (Member, 1991), M. Walker (Member, 1991), W. Ribbens (Member, 1992), W. Birmingham (Member, 1993), E. Kannatey-Asibu (Member, 1993), J. Ni (Member, 1996), J. Liker (Member, 1997), A. Stefanopoulou (Chair, 2002 and 2005), S. Skerlos (Chair, 2011), I. Kolmanovsky (Member, 2012), B. Epureanu (Chair, 2012).
- Reappointment Review Committee for C. Pierre (Member, 1987), H. Peng (Chair, 1996), D. Brei (Chair, 1997) and K. Barton (Chair, 2013).
- Coordinator, Emeriti Faculty and National Academy of Engineering activities, 2020-.
- Member, Pierre T. Kabamba Fellow Selection Committee, 2017-.
- Mentor, Summer Engineering Experience Camp, Society of Women Engineers, July 2018.
- Advisor, Search Committee for Mechanical Engineering Department Chair, 2017-2018.
- Chair, Robotics Institute Director Search Committee, 2014-15.
- Member, Faculty Advisory Board, Center for Res. on Learning and Teaching in Engin., 2012-14.
- Member, Research Advisory Committee, 2010-13.
- Member, College Bicentennial Advisory Committee, 2012-2013.
- Chair, Interdisciplinary Faculty Search Comm. in Autonomous Vehicles & Robotics, 2007-2008.
- Member (2007-2008 and 2009-2010), Budget Task Force
- Elected Member, College of Engineering Executive Committee, 2006-2010.
- Member, Committee on PIM-TMI Relations, 2001
- Member, Chairs Advisory Committee/College Council, 1993-2001.
- Member, Technology Transfer and Commercialization Committee, 1998.
- Member, Graduate Professional Programs Committee, 1998.
- Member, Advisory Board, NSF Sponsored Combined Research-Curriculum Development in Lasers for Manufacturing, 1996-98.
- Member, World Wide Web Committee, 1996-97.
- Chair, Michigan Institute for Manufacturing Technology Task Force, 1994.
- Member, Strategic Resource Planning Group, 1993-94.
- Member, Fraunhofer-USA Initiative Team, 1993-94.
- Co-Director, Advanced Vehicle Control Research Cluster, Intelligent Vehicle-Highway Systems Research Program, 1992.
- Member, Manufacturing Strategy Planning Group, 1991-92.
- Member, Faculty Goals Review Committee, 1991-92.
- Member (Chair for 1991), Control, Systems and Optimization Coordinating Committee, 1990-92.
- Member, Search Committee for a Senior Faculty Member in Automotive Simulation, 1990.
- Member, Design and Manufacturing Colloquium Organizing Committee, 1990.
- Member, Search and Screening Committee for the Anderson Chair in Manufacturing, 1985-86.
- Member, Center for Research in Integrated Manufacturing (CRIM) Mgmt. Comm., 1984-85.
- Member, Robot Systems, Management Committee, 1984-86.

- Representative, Faculty Candidate Interviews, 1984-.
- Member, Committee on an Interdisciplinary Program in Manufacturing, 1983-84.
- Member, Manufacturing Committee, 1980.

UM Department of Mech. Engin.

- Examiner, Ph.D. Qual. Exams in "Dynamics and Vibrations" and "Systems and Control" 1981-2016.
- Member, Department 150th Anniversary Celebration Planning Committee, 2016-18.
- Member, GGB Renovation Public Space Committee, 2013.
- Member, Faculty Search Committee, 2007-08.
- Chair, Planning Committee, 1998-2001.
- Chair, Advisory Committee, 1998-2001.
- Elected Member, Advisory Committee, 1996-98 and 1989-92.
- Coordinator, Dynamics, Systems and Controls Instructional Area, 1998.
- Member, Facilities Planning Task Force, 1996.
- Member, Planning Committee, 1992-93.
- Member, Honors and Awards Committee, 1990-92.
- Chair, Laboratories and Safety Committee, 1992.
- Chair, Faculty Search Committee for Manufacturing Processes/Materials Processing, 1990-91.
- Member, Search Committee for Faculty in Mechanical Sciences, 1990-92 and 1984-86.
- Chair, Ad Hoc Committee on Instruction, 1989-90.
- Member, Graduate Admissions and Financial Aid Committee, 1988-89.
- Organizer, "Current Research in Mechanical Systems" Seminar Series, 1988-89 and 1982-86.
- Member (Chair, 1987-1989), Graduate Program Committee, 1982-90.
- Member, Publicity Committee, 1981-82.

Administrative Duties at UM

- Coordinator, National Academy of Engineering and Emeriti Faculty Events, College of Engineering, 2020-2023.
- Founding Director (2007-09), Deputy Director (2009-11), and Interim Director (2010-11), Ground Robotics Reliability Center.
- Chair, Department of Mech. Engineering, 1998-2001.
- Founding Deputy Director, Engineering Research Center for Reconfigurable Machining Systems, College of Engineering, 1996-2002, and 2006-10.
- Founding Director, Program in Manufacturing, College of Engineering, 1993-98.
- Director (1992-94), and Founding Assoc. Director (1990-92), National Science Foundation Industry-University Coop. Research Center for Dimensional Measurement and Control in Manufacturing.
- Associate Chair, Dept. of Mech. Engineering and Applied Mechanics, 1992-93.
- Director of Laboratories, Dept. of Mech. Engineering and Applied Mechanics, 1992.
- Chair, Mech. Engineering Graduate Program, H.H. Rackham Graduate School, 1987-89.
- Director, Consortium on Diagnostic Sensing and Control for Metal Cutting, 1984-86.

Service to Government, Professional or Community Organizations

- Editorial Activities:
    - Member, Advisory Board, *Mech. Syst. & Signal Processing*, 2020-.
    - Founding Editor, *ASME Dynamic Systems and Control Magazine*, 2011-14.
    - Editor, *ASME J. of Dyn. Syst., Meas. & Control*, 1999-2004.
    - Member, Editorial Board, *Mech. Syst. & Signal Processing*, 1987-2008.
    - Member, Editorial Board, *International Journal of Manufacturing Research*, 2006-16.
    - Member, Editorial Board, *Inter. J. of Control, Automation and Systems*, 2003-2008.
    - Member, Editorial Board, *Intern. J. of Vehicle Autonomous Systems*, 2000-16.

  - Member, Editorial Board, *Trans. on Control, Autom. & Syst. Engin*., Korea, 2000-2010.
  - Member, Editorial Board, *Karaelmas Science and Engineering Journal*, 2011-16.
  - Member, Editorial Board, *Mechanical Systems Design Handbook*, Wiley, 1998-2001.
  - Member, Editorial Board, *I. Mech. E. J. of Engineering Manufacture*, 1999-2001.
  - Member, Editorial Board, *GSU Engin. & Techn. Journal* (Istanbul), 1996.
  - Technical Editor, *IEEE/ASME Trans. on Mechatronics*, 1995-98.
  - Member, Management Committee, *IEEE/ASME Trans. on Mechatronics*, 2006-16.
  - Associate Editor, *ASME J. of Dyn. Syst., Meas. & Control*, 1987-93.
  - Guest Editor, *Mech. Syst. & Signal Processing*, Special issue, July 1988.
- Proposal reviewer for various funding agencies (e.g., NSF, NSERC, ERC, CONICYT)
- Reviewer for a variety of journal and book publishers in the areas of control, manufacturing, design, vibrations, dynamics, automotive engineering, etc.
- External evaluator for various programs:
  - Mechanical Engineering, University of Texas, Dallas, 2019
  - School of Automation, Beijing Institute of Technology, Beijing, China, 2018
  - Mechanical Engineering, University of British Columbia, Vancouver, Canada, 2016, 2022
  - Co-chair, Committee of Visitors, Engineering Education and Centers Division, National Science Foundation, Arlington, 2016
  - Member, Canvassing Committee for Division Director, Engineering Education and Centers Division, National Science Foundation, 2018 and 2021.
  - Mechanical and Aerospace Engineering, University of California, San Diego, 2014
  - Mechanical Engin. Dept., University of California, Berkeley, 2012
  - Dept. Mechanical, Materials, and Aerospace Engin., Univ. of Central Florida, 2012.
  - Mech. Engin. Dept., Carnegie Mellon University, 2009.
  - Mech. Engin. Dept., Ohio State University, 2007.
  - Board of Directors, Ground Systems Industrial Enterprise, US Army TACOM, 2002-05
  - Singapore Institute of Manufacturing Technology, 2002-2004
  - Mechanical and Nuclear Engineering Department, Penn State University, 2003-2005.
  - Mechanical and Industrial Engineering Department, University of Toronto, 1999.
  - The Strategic Foundation, Stockholm, Sweden, 1997.
  - Swedish National Board for Industrial and Technical Development, 1996.
  - Manufacturing Research Center, Georgia Institute of Technology, 1995-1998.
  - Technical Review Board, USAF Next Generation Controller Project, 1990.
- External referee for promotion and tenure reviews at various U.S. and international institutions.
- External evaluator for Ph.D. dissertations:
  - Royal Institute of Technology, Stockholm, Sweden, 1996.
  - University of British Columbia, Vancouver, Canada, 1994, 2004 and 2015.
  - University of Windsor, Windsor, Canada, 2006.
- Organizer or Invited Participant at Various International Workshops:
  - IFAC Workshop on Time Delay Systems, General Chair (Ann Arbor, 2015)
  - NAE Lifelong Learning Imperative Workshops (Washington, DC, 2009 and 2011)
  - NSF Workshop on Implementing 5xME Recommendations (Orlando, FL, 2009)
  - NSF Workshop on The 5xME (Arlington, VA, 2007-2008)
  - NSF Workshop on Redefining Mech. Engin. (Clearwater, FL, 2002)
  - Focused NIST ATP in Automotive Manufacturing (Ann Arbor, MI, 1994)
  - NSF Workshop on Research for National Competitiveness (Ann Arbor, MI, 1991).
  - NSF West Germany - USA Workshop on Manufacturing (Dearborn, MI, 1982).
  - Co-Chair, Advisory Board, IFAC Modeling Estimation & Control Conf (Austin, TX, 2021)
- American Society of Mechanical Engineers (ASME) Activities:
  - Co-Chair, Advisory Board, Modeling, Estimation and Control Conference, 2020-2021.

  - Member, ASME Dynamic Systems and Control Division Honors Committee, 2015-2017.
  - Organizer/Chair, Transforming Engineering Education: A Panel Discussion, 2011 DSCC.
  - Member, ASME Vision 2030 Committee on Engineering Education, 2009-2010.
  - Founding General Chair, Dynamic Systems and Control Conf., 2008.
  - Technical Editor, *J. Dyn. Sys Meas Control*, 1999-2003
  - Plenary Session Organizer, ASME/MEDH Education Conf., 2002
  - Chair, Dyn. Syst. & Control Division, Executive Committee, 1997.
  - Member, Advisory Committee, Turkey Section of ASME International, 1996-.
  - Member, Dyn. Syst. & Control Division, Executive Committee, 1994-98.
  - Dyn. Syst. & Control Division, Honors Committee, 1991-97.
  - Member, Committee to promote participation in ACC, 1988-89.
  - Member, Technical Panel on Manufacturing Systems, 1986-89.
  - Symposium Co-Organizer at WAM, Miami, 1985.
  - Session Chair at numerous Conferences since 1983.
- National Academy of Engineering (NAE) Activities:
  - Moderator, Panel on Vehicle Safety and Regulatory Issues in a Global Environment, Automotive Engineering in a Global Competitive Environment, A Regional Meeting of the NAE, Ann Arbor, April 17, 2006.
  - Reviewer, NAE Report: Benchmarking Research Competitiveness of US in Mech. Engin.
  - Member (2008), Chair (2009), and Past Chair (2010), NAE Awards Committee.
  - Member (2008-2010), Board on Manufacturing and Engineering Design (BMED), NAE
  - Member (2011-2012), National Materials and Manufacturing Board (NMMB), NAE
  - Member (2010-2015), Standing Comm. on Defense Materials, Manufacturing and Infrastructure (DMMI), NAE
  - Member (2010), Panel on NIST Manufacturing Engineering Laboratory, and Team Leader (2014), Panel on NIST Engineering Laboratories, National Research Council Board on Laboratory Assessments, NAE
  - Member, Organizing Committee, Symposium on Engineering to Improve the Operations of Manufacturing Enterprises, and NAE Regional Meeting, May 2010.
  - Chair, NRC Liaison Committee for NAE Section 10 (ME), 2015-2018
  - Correspondent (2014 -), Committee on Human Rights, National Academies
  - Panelist, NRC Committee on Future Center Based Multidisciplinary Engineering Research, National Academies, Dec. 2015.
  - Member, National Academies Panel on Engineering Sciences at the Army Research Office, August 2020.
  - Member, National Academies Study of the Department of Defense's Engagement with its Manufacturing Innovation Institutes, 2020-2021.
  - Review Coordinator for National Academies Report *Options for a National Plan for Smart Manufacturing,* National Materials and Manufacturing Board (NMMB) and Board on Science Technology and Economic Policy (STEP), June-September 2023.
- General Chair (Chicago, 2000), Best Paper Award Selection Committee Member (Philadelphia, 1997), Program Chair (Seattle, 1995), Publications Chair (Boston, 1991), Program Committee Member (1989-90) Session Chair and Reviewer for American Control Conferences since 1983.
- Member, IFAC Nichols Medal Selection Committee, 2018-2020.
- Member, Board of Directors of American Automatic Control Council, representing the American Society of Mechanical Engineers, Alternate Director (2002-2003) and Director (2004-2005).
- Member of Organizing/Program Committees for Various National/International Conferences.
- Member, Executive Committee of the Board of Directors, 2 mm Program, Inc., National Institute of Standards and Technology, Advanced Technology Program, 1992-95.

- Member, Steering Committee, Greenfield Coalition for New Manufacturing Education (Focus: Hope, University of Detroit Mercy, Wayne State University, Lawrence Institute of Technology, Central State University, Univ. of Michigan, Lehigh University), 1993-94.
- Member, Industrial and Professional Advisory Council, Mech. Engin. Division, College of Engineering, Penn State University, 2003.
- Member, Korea Advanced Institute of Science and Technology (KAIST) Int. Advisory Committee, South Korea, 2000.
- Member, Scientific Advisory Board, Singapore Institute of Manufacturing Technology (SIMT), 2003.
- Member, Scientific Advisory Board, Woxencentrum Manuf. Research Program, Sweden, 2000-03.
- Member, Corporate Board of Directors, Ground Systems Industrial Enterprise, US Army TACOM, 2002-05.
- Member, Board of Directors, Intellicass, Montreal, Canada, 2006-14.
- Member, Scientific Advisory Board, NSF ERC for Compact and Efficient Fluid Power, Univ. of Minnesota, 2006-09.
- Volunteer, Speaker and Education Committee Member, Voters Not Politicians Independent Citizens Redistricting Commission Ballot Initiative, Michigan, 2018-20, Promote the Vote Initiative, Michigan 2022.
- Precinct Organizer, Washtenaw County Democratic Party, Michigan, 2020.
- Election Inspector, November 3 Election 2020, August 2 Election 2022, City of Dexter, Michigan.
- Member, Selection Panel, Kuwait Prize in Applied Sciences – Engineering Sciences, 2020.
- Member, Advisory Committee, Modeling, Estimation and Control Conference (MEEC), 2020-22.

Consulting

- External Review of the Dept. of Mechanical Engin., Univ. of British Columbia, Vancouver.
- Crash protective systems for naval helicopters, Paradigm Research and Engin., Ann Arbor, MI.
- Member, Selection Panel, 2020 Kuwait Prize: Applied Sciences – Engineering Sciences, Kuwait.
- Expert Panel, Canada Foundation for Innovation, Toronto, Canada
- External Review of the Dept. of Mechanical Engin., Univ. of Texas, Dallas, TX.
- Engineering Research Center Planning Grant for Comprehensive Energy Storage Solutions for Electrified Transportation (CESSET), Univ. of Michigan, Ann Arbor, MI.
- External Review of the School of Automation at Beijing Institute of Technology, Beijing, China
- Automotive Control Systems, Baker & McKenzie, San Francisco, CA.
- External review of Department of Mechanical Engin.. Univ. of British Columbia, Vancouver.
- Automotive Control Systems, Sughrue Mion, Washington, DC.
- Automotive Control Systems, Goodwin Procter, Boston.
- Modeling/Optimization of Magnetostrictive Sensor, Paradigm Research and Engin., Ann Arbor, MI.
- External review of the Dept. Mechanical and Aerospace Engin., Univ. of California, San Diego, CA.
- External review of the Dept. Mechanical Engin., Univ. of California, Berkeley, CA.
- External review of the Dept. Mechanical, Materials and Aerospace Engin. at Univ. of Central Florida, Orlando, FL.
- External review of the Dept. Mechanical Engin. at Carnegie Mellon Univ., Pittsburg, PA.
- Research Proposal Reviewer and Faculty Search Committee Member, KAUST and UC Berkeley Academic Excellence Alliance.
- External review of the Dept. Mechanical Engin. at Ohio State Univ., Columbus, OH
- Expert, Directorate for Engineering, National Science Foundation, Arlington, VA.
- Academic Advisor to the LG Production Research Center, Seoul, South Korea.
- Reconfigurable Manufacturing - Implications for Materials Handling, Jervis B. Webb Company, Farmington Hills, MI.
- External Review of the Dept. Mechanical and Industrial Engin., Univ. of Toronto, Toronto, Canada.

- Evaluation of Proposed Manufacturing Research and Education Program - PROPER, The Strategic Foundation, Stockholm, Sweden.
- Evaluation of Manufacturing Research Program - TIME, Swedish National Board for Industrial and Technical Development (NUTEK), Stockholm, Sweden.
- University-Industry Relations, Transfer of Knowledge Through Expatriate Nationals (TOKTEN), United Nations, Ankara, Turkey.
- Predictive Process Control, National Center for Manufacturing Sciences (NCMS), Ann Arbor, MI.
- Vehicle Control Systems, General Motors Technical Center, Warren, MI.
- Lateral Control of Vehicles, Scientific Research Laboratories, Ford Motor Co., Dearborn, MI.
- Sources of Flatness Errors in Milling, Transmission Plant, Ford Motor Co., Livonia, MI.
- Stability Robustness of Controllers for Active Suspensions, Ford Research Lab., Dearborn, MI.
- Design of a Window Raising Mechanism, Johnson Controls, Madison Heights, MI.
- Adaptive Controller Design for a Semi-Active Suspension, Ford Motor Co., Dearborn, MI.
- Vibration of Accessory Belt Drives, Cummins Engine Co., Columbus, Indiana.
- Circular Saw Vibration and Stability Analysis, California Cedar Products Co., Stockton, CA.

OTHER

Collaborative Activities

Galip Ulsoy has had extensive collaborations with researchers at the Univ. of Michigan and at other institutions. For example, his co-authors on various publications include not only his advisors, graduate students and research associates, but also Yoram Koren, Panos Papalambros, Jeff Stein, Huei Peng, Noel Perkins, Christophe Pierre, Dick Scott, Dawn Tilbury, Gabor Orosz, Chinedum Okwudire, Jun Ni and Noboru Kikuchi from the Department; Pierre Kabamba, Dennis Bernstein, Judy Jin, Ilya Kolmanovsky, Kang Shin and Harris McClamroch from the College; Bob Ervin, Rita Gitik, Dave LeBlanc, Patrick Nelson and Peter Heytler from the University; Charles Wu, Davor Hrovat, Shiva Sivashankar, Rick Meckstrof and Mahmoud Demeri from Ford, Ravi Venugopal from OPAL-RT and Intellicass, Mehmet Uras from Paradigm Research and Engineering, and Paul Wright and Masayoshi Tomizuka from UC Berkeley; and A. Ceranoğlu, U. Heisel, F. Jovane, A. Kırlı, C.W. Lee, E. Lenz, T. Moriwaki, M. Pakdemirli, B. Powalka, G. Pritchow, O. Türkay, H. VanBrussel, and A. Yiğit from academic institutions in Europe, the Middle East and Asia. Also, he has collaborated with researchers through the interdisciplinary Engineering Research Center for Reconfigurable Machining Systems and the Ground Robotics Reliability Center. He has also collaborated with other faculty in teaching (e.g., Microcomputer Applications, Vehicle Control Systems, Sensors and Signal Processing) including development of two courses (i.e., Manufacturing Technologies and Strategies; Agile, Reconfigurable Manufacturing) jointly with faculty in the UM Business School.

Invited Presentations

(P115) "Interviews with Internationally Renowned Turkish Expatriate Scientists on their Immigration Stories," Turkish Engineers and Architects Association, Germany, October 13, 2022. https://www.youtube.com/watch?v=Kwl9S1KJ-Bg

(P114) "Acceptance Speech for the 2020 Richard E. Bellman Control Heritage Award," American Control Conference, Atlanta, GA, June 7, 2022. https://a2c2.org/richard-e-bellman-control-heritage-award#recipients

(P113) "DOD Engagement with Its Manufacturing Innovation Institutes Phase 2 Study: Final Report," NASEM Briefing to DOD, 9/9, 11/5, 12/8, 2021.

(P112) "Engineers Change the World: Selected Research Contributions," Urbana High School, STEAM/Engineering Club, April 22, 2021.

(P111) "Engineers Create Our World: Selected Research Contributions," Transform: An Engineering Symposium hosted by Michigan Neuroprosthetics, October 28, 2020.

(P110) "Time-Delayed Control of Single-Input Single-Output Systems for Improved Stability Margins," College of Engineering Control Seminar, University of Michigan, Ann Arbor, Feb. 14, 2020.
(P109) "Reconfigurable Systems for Manufacturing and Automotive Applications," Ruixin Academy of Classic Learning, Beijing Institute of Technology, Nov. 14, 2018.
(P108) "Reconfigurable Systems for Manufacturing and Automotive Applications," Distinguished Lecture, Department of Industrial Engineering, Peking University, Nov. 13, 2018.
(P107) Independent Citizens Redistricting Commission Ballot Initiative, Voters Not Politicians, various Southeast Michigan locations, 2018-2019.
(P106) "Dynamics and Control of Manufacturing and Automotive Systems: Reconfiguration, Co-Design and Swapping Modularity," Department of Mechanical Engineering, Texas A&M University, College Station, TX, June 12, 2017.
(P105) "Co-Design of a Smart Artifact and Its Controller," Department of Mechanical and Aerospace Engineering, Missouri University of Science and Technology, Rolla, MO, April 12, 2016.
(P104) "Designing Reconfigurable Systems for Manufacturing and Automotive Applications," Inaugural Lecture, Centennial Distinguished Lectureship Series, Department of Mechanical and Aerospace Engineering, Missouri University of Science and Technology, Rolla, April 11, 2016.
(P103) Lectures on Automotive Control Systems, Beijing Institute of Technology, China, March 2017.
(P102) "Designing Reconfigurable Manufacturing and Automotive Systems," GM Sigma Xi Annual Dinner, Troy, Michigan, Oct. 21, 2016.
(P101) "Reconfigurable Manufacturing Systems: The Role of Dynamics and Control," Distinguished Lecture Series, Texas A&M University at Qatar, Doha, Qatar, March 28, 2016.
(P100) "Reconfigurable Manufacturing Systems: The Role of Dynamics and Control," Keynote Paper, Automation 2015 Conference, Taipei, Taiwan, Nov. 13-15, 2015, and also at National Cheng Chi University (NCCU), Advanced Institute of Manufacturing with Hi-Tech Innovation (AimHi), and National Taiwan University of Science and Technology (NTUST).
(P99) "Reconfigurable Systems: The Role of Dynamics and Control," Department of Mechanical Engineering, Notre Dame University, South Bend, IN, Oct. 27, 2015,
(P98) "Reconfigurable Systems: The Role of Dynamics and Control," Department of Mechanical Engineering, Columbia University, New York, NY, Oct. 9, 2015,
(P97) "Reconfigurable Manufacturing Systems: Principles and Examples," Defense Materials Manuf. Infrastructure Workshop, National Academy of Engineering, Washington, DC, Sept. 2015.
(P96) "Reconfigurable Systems: The Role of Dynamics and Control," Department of Mechanical Engineering, Ohio State University, Columbus, OH, Oct. 31, 2014,
(P95) "Challenges in Modeling and Control of Manufacturing Systems – A Panel Discussion," Panelist, Frontier Session, ASME Dynamic Systems and Control Conf., San Antonio, Texas, Oct. 2014.
(P94) "Reconfigurable Systems: The Role of Dynamics and Control," Nyquist Lecture, ASME Dynamic Systems and Control Conference, Stanford, CA, Oct. 22, 2013.
(P93) "You Might Be A Successful Graduate Student If …," College of Engineering Graduate Student Welcome, University of Michigan, Ann Arbor, Aug. 2013.
(P92) "Controller Design for Swapping Modularity: Battery Swapping Modularity for PHEVs," College of Engineering Control Seminar, University of Michigan, Ann Arbor, Feb. 2013.
(P91) "Introducing and Shaping the New DSC Magazine," Panelist and Special Session Organizer, ASME Dynamic Systems and Control Conference, Ft. Lauderdale, FL, Oct. 2012.
(P90) "Cyber-Enabled Manufacturing Systems," Panelist, ASME International Symposium on Flexible Automation, St. Louis, MO, June 2012.
(P89) "Transforming Engineering Education: A Panel Discussion," ASME Dynamic Systems and Control Conference, Arlington, VA, Oct. 2011.
(P88) "Implementing the Recommendations of the 5xME Workshop for Transforming Mechanical Engineering Education," Mechanical Engineering, Georgia Institute of Technology, Nov. 2010.
(P87) "Intelligent Machines and Smart Products," Ubiquiti Meeting, Ann Arbor, MI, May 2010.

(P86) "Reconfigurable Manufacturing: Principles and Applications," College of Engin. Seminar, Univ. of Oklahoma, April 2010.
(P85) "Intelligent Machines and Smart Products," Distinguished University Professorship Lecture, University of Michigan, Ann Arbor, March 2010.
(P84) "Implementing the Recommendations of the 5xME Workshop," Panelist, ASME Vision 2030 Plenary, International Mechanical Engineering Education Conference, Long Beach, March 2010.
(P83) "MIMO Control of Stamping," Dept. of Mech. Engin. Seminar, Purdue Univ., Oct. 2009.
(P82) "Control of Time Delay Systems via the Lambert W Function," Oldenburger Lecture, Purdue Univ., Oct. 2009.
(P81) "Control of Time Delay Systems via the Lambert W Function," Department of Mech. Engin. Seminar, University of Houston, Sept. 2009.
(P80) "Ground Robotics Reliability Center," Plenary Speaker at the NDIA Ground Vehicle Systems Engineering and Technology Symposium, Troy, MI, Aug. 2009.
(P79) "Critical Unmet Research Needs in Unmanned Ground Vehicles and Robotics," Plenary Speaker at AUVSI Automotive-Robotics Workshop, Oakland Univ., Rochester, MI, July 2009.
(P78) "Control of Time Delay Systems via the Lambert W Function," Mech. Engin. Department Seminar, Worchester Polytechnic Institute, Worchester, MA Dec. 2008.
(P77) "Control of Time Delay Systems via the Lambert W Function," Oldenburger Medal Lecture, 1st ASME Dynamic Systems and Control Conf., Ann Arbor, MI, Oct. 2008.
(P76) "Recommendations from the 5XME Workshop on Transforming Mech. Engin. Education," Invited Plenary, ASME Mech. Engin. Education Conf., Galveston TX, April 2008.
(P75) "Analysis and Control of Time Delay Systems via the Lambert W Function," Control Seminar Series, University of California at San Diego, Feb. 2008.
(P74) "Mechatronic Design," Dept. of Mech. Engin., Purdue University, Nov. 2006.
(P73) "Analysis of Delay Differential Equations via the Matrix Lambert W Function," Dept. of Mech. Engin., Purdue University, Nov. 2006.
(P72) "Some Current Research Topics in Design of Mechatronic Systems," IMS Centre, University of Windsor, Windsor, Canada, Aug. 2006.
(P71) "Dynamics and Control of Driver-Vehicle Systems using Driving Simulators," Toyota Central R& D Laboratories, Nagoya, Japan, July 2006.
(P70) "A 21st Century Engineering Education for Leading Concurrent Discovery and Innovation," Invited Keynote Paper, CIRP President's Roundtable, CIRP Gen. Assembly, Antalya, Turkey, Aug. 2005.
(P69) "Challenges and Opportunities in the Engineering of Intelligent Systems," 4th International Workshop on Structural Control, Columbia University, NY, June 2004.
(P68) "Civil and Mechanical Systems at NSF, and Combined Optimal Design and Control," Texas A&M University, College Station, TX, April 2004.
(P67) "Civil and Mechanical Systems Division of NSF," Univ. Maryland Baltimore, MD, Oct. 2003.
(P66) "21st Century Manufacturing," W.R. DeVries and A.G. Ulsoy, CIRP General Assembly, STC-M, Montreal, CA, Aug. 2003.
(P65) "Perspectives on RMS," Speaker, Panelist and Moderator, 2nd CIRP Conf. on Reconfigurable Manufacturing, Ann Arbor, MI, Aug. 2003.
(P64) "Manufacturing Responsiveness in US Army Depots and Their Commercial Counterparts," US Army Ground Systems Industrial Enterprise Board Meeting, Rock Island Arsenal, IL, June 2003.
(P63) "Writing a Winning NSF CAREER Proposal," Speaker and Panelist at Plenary Session, American Control Conf., Denver, CO, June 2003.
(P62) "Forum on Advanced Control and Sensors" Speaker and Panelist at Plenary Session, American Control Conf., Denver, CO, June 2003
(P61) "Network for Earthquake Engineering Simulation (NEES) Research," NEES Consortium Meeting, Park City, UT, May 2003.
(P60) "Civil and Mechanical Systems Division of NSF," Univ. of California, Berkeley, CA, April 2003.
(P59) "Fuel Cell Control Research at the NSF," Univ. of California, Irvine, CA, April 2003.

(P58) "Reconfigurable Manufacturing Systems," Univ, of Florida, Gainsville, FL, April 2002.
(P57) "Report from the Workshop on Redefining Mech. Engin.," ASME/MEDH Education Conf., Clearwater, FL, April 2002.
(P56) "Keeping Cars on the Road," Univ. of Minn., Dept. Mech. Engin., Minneapolis, MN, Feb. 2002.
(P55) "Reconfigurable Manufacturing Systems," Computer Integrated Studies Research Center, University of British Columbia, Vancouver, Feb., 2002.
(P54) "Reconfigurable Manf. Systems," Dept. of Mech. Engin., Univ. of Missouri, Rolla, MO, Nov. 2001.
(P53) "Reconfigurable Manufacturing Systems," Keynote, Manufacuring and Materials of Ontario Workshop on Reconfigurable Manufacturing, McMaster Univ., Canada, Oct. 2001.
(P52) Reconfigurable Manufacturing Systems (RMS) and Research Topics in RMS," Manufacturing and Materials of Ontario, Distinguished Lecture Series, National Research Council, Canada, London, Hamilton, Waterloo and Windsor, Ontario, Mar. – June 2001.
(P51) "Some Topics in Control Research for Reconfigurable Manufacturing Systems," A.G. Ulsoy, Dept. Mech. Engin., Michigan State University, E. Lansing, MI, Jan. 2001.
(P50) "Reconfigurable Machine Tools and Reconfigurable Systems," Y. Koren and A.G. Ulsoy, 9th International Machine Tool Engineers' Conf., Tokyo, Japan, Oct. 2000.
(P49) "Reconfigurable Manufacturing Systems," LG Production Research, Seoul, Korea, Aug. 2000.
(P48) "Engineering Research Center for Reconfigurable Machining Systems" Frontiers in Engineering Conf., College of Engineering, Univ. of Michigan, MI, May 2000.
(P47) "Welcoming Remarks," Automotive Laser Applications Workshop, Dearborn, MI, March 2000.
(P46) "Control Issues in Reconfigurable Manufacturing," Mech. Engin. Department, Penn State University, PA, Feb. 2000, Distinguished Lecture Series.
(P45) "Control Issues in Reconfigurable Manufacturing," Mech. Engin. Department, Purdue University, IN, Feb. 2000, Feddersen Distinguished Lecture.
(P44) "Reconfigurable Manufacturing Systems," Jervis B. Webb Co., Farmington Hills, MI, Sept. 1999.
(P43) "Reconfigurable Mfg. Sys. and Controllers," Carnegie-Mellon Univ., Pittsburgh, PA, Jan. 1999.
(P42) "Controllers for Reconfigurable Manufacturing," Oakland Univ., Auburn Hills, MI, Oct. 1998.
(P41) "Research in Reconfigurable Machine Tool Controllers," Georgia Tech, Atlanta, Apr. 1998.
(P40) "Reconfigurable Controllers for Machining Systems," Univ. of Connecticut, Hartford, Mar. 1998.
(P39) "Active Safety Systems for Preventing Vehicle Road Departure Accidents," Univ. of Michigan ITS Speakers Series, Jan. 1998.
(P38) "Panel on New Directions in Manufacturing," ASME IMECE, Dallas, TX, Nov. 1997.
(P37) "Panel on Advances in Manufacturing Education," ASME IMECE, Dallas, TX, Nov. 1997.
(P36) "Reconfigurable Machining Systems and Their Control," Univ. of Illinois, Urbana, IL, Apr. 1997.
(P35) "Panel on Real-Time Open Architecture Sys. for Mfg.," ASME IMECE, Atlanta, GA, Nov. 1996.
(P34) "Open Architecture Controllers for Machine Tools," Univ. of Michigan, Manufacturing Systems Seminar, Dearborn, MI, May 1996.
(P33) "NSF IUCRC for Dimensional Measurement and Control in Manufacturing, and Vibration Reduction in CMM's," Distinguished Lecturer Series - Mfg., Univ. Calif., Davis, CA, Nov. 1995.
(P32) "Dynamics and Control of Rotating Shafts, With Application to Drilling," South West Mechanics Lecture presented at Univ. Oklahoma (Norman, OK), Southern Methodist Univ. (Dallas, TX), South West Research Institute (San Antonio, TX), and Univ Houston (Houston, TX), Sept. 1995.
(P31) "Manufacturing Research and Education in the USA," Scania Corp., Sweden, May 1995.
(P30) "Control of a Drilling Process," Royal Institute of Technology, Stockholm, Sweden, May 1995.
(P29) "Dynamics and Control Research with Automotive Applications," Ford Research Laboratory Seminar, Ford Motor Company, Dearborn, MI, Apr. 1995.
(P28) "Control of Machining Processes," NSF Workshop on Nonlinear Dynamics and Manufacturing, University of California, San Diego, CA, Mar. 1995.
(P27) "Control of Machining: A Drilling Application" Univ. of California, Berkeley, CA, Feb. 1995.
(P26) "Flexible Line Boring," Warsaw University of Technology, Warsaw, Poland, May 1994.

(P25) "Education and Research in Manufacturing at the Univ. of Michigan," Warsaw Univ. of Technology, Warsaw, Poland, May 1994.
(P24) "Predictive Process Control," National Center for Manufacturing Sciences, Annual Meeting and Conf., Anaheim, CA, May 1994.
(P23) "Panel on Industry-University-Government Cooperative Research," ASME Winter Annual Meeting, New Orleans, Louisiana, Dec. 1993.
(P22) "Research in Dynamics and Control of Manufacturing Systems," Istanbul Technical Univ., Istanbul, Turkey, Aug. 1993.
(P21) "An Nonlinear Adaptive Observer for On-Line Tool Wear Estimation in Turning," Dept. of Mech. Engin., Wayne State Univ., Detroit, MI, Nov. 1991.
(P20) "Self-Tuning Adaptive Control and Supervisory Control," Next Generation Controller Technology Review Board, St. Petersburg, FL, Nov. 1990.
(P19) "Axially Moving Material Systems: Application to Automotive Belt Vibrations," General Motors Advanced Engineering Staff, Technical Center, Warren, MI, May 1990.
(P18) "Modeling and Finite Element Analysis of Drill Bit Vibrations," General Motors Research Laboratories, Technical Center, Warren, MI, Oct. 1989.
(P17) "Experimental Results in Modeling, Analysis, and Control of Flexible Multi-Body Systems," NASA/UCLA 5th Annual SCOLE Workshop, Lake Arrowhead, CA, Oct. 1988.
(P16) "Experimental Validation of Flexible Robot Arm Modeling and Control," NASA Workshop on Computational Aspects in the Control of Flexible Systems, Williamsburg, VA, July 1988.
(P15) "Simulation of Experimental Structures With Impact: Experimental Validation," NASA Workshop: Computational Aspects in Control of Flexible Systems, Williamsburg, VA, July 1988.
(P14) "Control of a Flexible Robot Arm," Dept. of Aerospace Engineering, Istanbul Technical Univ., Istanbul, Turkey, Dec. 1986.
(P13) "An Adaptive Observer for Tool Wear Sensing in Turning", Department of Mech. Engin., Boğaziçi University, Istanbul, Turkey, Dec. 1986.
(P12) "Implementation of a Model Reference Adaptive Force Controller in Milling", Sibley School of Mechanical and Aerospace Engineering, Cornell University, Ithaca, NY, Dec. 1985.
(P11) "Lectures on Dynamics and Control of Manufacturing Systems," Northwestern Polytechnical Univ., Xian, China, Aug., 1985.
(P10) "Dynamics & Control of Manufac. Systems," Nanjing Inst. of Tech., Nanjing, China, Aug. 1985.
(P9) "Dynamics & Control of Manufacturing Systems," Jiao Tong Univ., Shanghai, China, July 1985.
(P8) "Applications of Adaptive Control Theory to Metal Cutting," Department of Mech. Engin., Ohio State University, Columbus, OH, May 1985.
(P7) "Applications of Adaptive Control Theory to Metal Cutting," Corporate Research and Development, General Electric Company, Schenectady, NY, Feb. 1985.
(P6) "Adaptive Control Systems for Machine Tools," General Motors, Warren, MI, Feb. 1984.
(P5) "Research in Control of Manufacturing Processes," Industrial Tech. Inst., Ann Arbor, Jan. 1984.
(P4) "Adaptive Control of Machine Tools," General Motors Institute, Flint, MI, May 1982.
(P3) "Variable-Gain Adaptive Control Systems for Machine Tools," NSF Workshop on Manufacturing Systems and Productivity, Dearborn, MI, Mar. 1982.
(P2) "On-Line Saw Stability Control Using Electro-magnets," Workshop on Design and Operation of Circular and Band Saws, Richmond, CA, Sept. 1981.
(P1) "Analysis of the Dynamic Behavior of Band Saws," 33rd Annual Meeting of the Forest Products Research Society, San Francisco, CA, July 1979.

Articles that Quote or Mention A.G. Ulsoy

- Çocuklarınıza Örnek Olarak Gösterebileceğiniz Türklerde Bugün: Mühendis Galip Ulsoy, Görkem Kızıldağ, *Onedio*, April 30, 2023 https://onedio.com/haber/cocuklariniza-ornek-olarak-gosterebileceginiz-turklerde-bugun-muhendis-galip-ulusoy-1143538

- *ASME J. Manufacturing Science and Engineering*, "A Review of Manufacturing Process Control," by R. Landers, K. Barton, S. Devasia, T. Kurfess, P. Pagilla and M. Tomizuka, Nov. 2020, Vol. 142, No. 11, 110814. https://doi.org/10.1115/1.4048111
- **www.3ders.org**, " University of Michigan professor doubles 3D printing speeds using vibration-mitigating algorithm," Oct 20, 2017.
- *Texas A&M University at Qatar Newsletter*, "Texas A&M at Qatar's Third 2015-2016 Distinguished Lecture Series Explores RMS," March 31, 2016.
- *IEEE Control Systems Magazine*, "25 Years Ago: Applications of Adaptive Control to Machine Tool Process Control by A. Galip Ulsoy and Yoram Koren," Vol. 34, No. 3, 2014, pp. 15-16.
- *IEEE Control Systems Magazine*, "People in Control: Interview with A. Galip Ulsoy," Vol. 34, No. 3, 2014, pp. 30-32.
- *Accelerate Magazine*, U.S. Army TARDEC, March 2014, pp 16-19, "Energy Intelligence"
- Anatolia News Agency (AA), "Beyaz Saray'ın mühendis danışmanına TÜBİTAK Özel Ödülü," article in Turkish press about Ulsoy receiving Presidential Special Award from TÜBİTAK (Turkish Scientific and Technological Research Council).
- *Daily News*, Hürriyet's English Language Daily in Turkey, "Turkish Prof. Honored by Science Body," Aug. 24, 2012.
- *Dünya,* Ulsoy receives TÜBITAK special award, Aug. 24, 2012.
- Anatolia News Agency (AA), "Beyaz Saray'a Danışman Oldu," article in Turkish press about Ulsoy's election to the National Academy of Engineering, Dec. 2010.
- WWJ Radio, "Robotics Conf. Heralds Expansion of Industry in Michigan" *Great Lakes IT Report*, Aug. 7, 2008.
- Saini, Ekjyot, "Researchers vie for state grants," *Michigan Daily*, April 11, 2006.
- Brown, Alan S., "Redefining the ME," *Mech. Engin.*, Sept. 2004,
- Mullen, R., "A Consensus Has Emerged On Car Of The Future," *New Technology Week*, April 21, 2003, pp 1 and 8.
- DeGaspari, J., "All in the Family," *Mech. Engin.*, Feb. 2002, pp 56-58.
- Mellor, C., "Quick Change Artists," *Ontario Technologist*, Jan./Feb. 2002, pp 12-15.
- Anon, "Breakaway (A Special Report): 20th Century Legacy – Henry Ford: Transportation for All," *Wall Street Journal*, Nov. 29, 1999.
- Fuhrmann, H., "The 50: People who Most Influenced Business This Century; Ford Offered the Masses Freedom of Movement," *Los Angeles Times*, Oct. 25, 1999

Professional Societies

- Member, USA National Academy of Engineering (NAE).
- Fellow, International Federation of Automatic Control (IFAC)
- Fellow, American Society of Mechanical Engineers (ASME)
- Fellow, Society of Manufacturing Engineers (SME)
- Fellow, Institute of Electrical and Electronics Engineers (IEEE)
- Member, American Society of Engineering Education (ASEE).
- Member, Pi Tau Sigma – Mechanical Engineering Honor Society