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Professional Preparation

Indian Institute of Technology, Kharagpur, India; Naval Arch/Ocean Engr. B. Tech. (Hon),
1982

University of Tokyo, Tokyo, Japan; Naval Arch., Ocean Engr.; M. Eng. 1988

University of Notre Dame, Notre Dame, IN; Mechanical Engineering. Ph.D., 1993

Appointments

Research Professor, Environmental Health and Engineering, Johns Hopkins University (JHU):
August 2018-Present

Consultant, Applied Physics Laboratory (APL), Johns Hopkins University: July 2019-Present

Consultant, Murtech, Inc.: February 2019 - Present

Director, Marine Systems Integration, Murtech, Inc.: Jan. 2018-February 2019

Richard and Elizabeth Henes Chair Professor in Wave Energy, Mechanical Engineering-
Engineering Mechanics, Michigan Technological University (MTU): Dec. 2016-Dec. 2018
(tenured)

Pearson Endowed Chair and Professor in Mechanical Engineering (ME), South Dakota School
of Mines and Technology (SDSMT): Jan. 2012-Dec. 2016 (tenured)

Pearson Endowed Professor in Energy and Manufacturing, ME, SDSMT, August 2010-Dec.
2011 (tenured)

Professor, Department of Mechanical Engineering, SDSMT, July 2008 –July 2010 (tenured
2009)

Associate Professor of Mechanical Engineering, SDSMT, 2003 – June 2008

Associate Professor of Mechanical and Manuf. Engineering, St. Cloud State Univ., MN,
2002-2003

Chair and Associate Professor of Mechanical Engineering, Indiana Tech., IN 1999- 2002

NSF/JSPS Research Fellow: University of Tokyo, 2001

NSF/STA Research Fellow, Japan Marine Science and Tech. Center (JAMSTEC), 1997-1999

Assistant Professor of Mechanical Engineering, Christian Brothers University, 1993-1996

Current Research Interests

Mathematical modeling; wave energy, hydrodynamic control, ecological resilience and
control, wave dynamics, quantum theory, variational optimization and control, Fisher
information applications.

Example Application Problems addressed by Current Projects

- Persistent sensing in deep oceans
- Autonomous deployment of floating energy converters for rapid black-start and restoration of remote coastal and island power grids.
- Emergence in ecological and other systems.
- Strategic force application for progressive lifting of coastal land masses.
- Sufficiently powering ocean sensors and autonomous vehicles with dependable deep-water energy sources.

- Multi-degree of freedom actuation for impedance matching conversion from irregular waves.

Honors and Recognition

Press Releases on research: *New approach optimizes use of future wave electricity generators during disaster*, AIP, over 7 news outlets, Eurekalert, Science Daily, Homeland Security News Wire, UN Prevention web, etc. Top 5% of all articles scored by Altmetric;

On camera appearance: <https://foxbaltimore.com/news/local/hopkins-professor-working-on-using-wave-energy-to-restore-power-after-emergency>

Johns Hopkins Engineering Magazine Fall/Winter 2019: Impact article;

Johns Hopkins Magazine, Winter 2019: feature article.

Featured Article: *J. Renewable and Sustainable Energy (AIP)*, v. 11, n. 3, 2019.

Fellow, American Society of Mechanical Engineers (ASME)

Session Chair: Numerous conferences including *European Wave and Tidal Energy Conferences*, *OMAE Conferences*, *IFAC 2014*, *SPIE Smart Structures and Materials*, etc.

Co-Guest Editor: *J. Ocean Engineering and Marine Energy*: Springer; special issue on wave energy conversion (with Antonio Falcao and John V. Ringwood) 2015

Associate Editor: *J. Ocean Engineering and Marine Energy*, Springer, since April 2014

Book Review Editor: *J. Ocean Engineering and Marine Energy*, Springer, since April 2014

ASME (OMAE) *Conference*; Special Appreciation Award: 2006, 2013

Associate Editor, Editorial Board: *Ocean Engineering* (Elsevier), January 2006-December 2015

Reviewer: NSF, ARPA-E, external reviewer: faculty promotion/tenure dossiers

Member, US Technical Advisory Board, ANSI/IET TC 114 Marine Hydrokinetic Energy

Japanese Government Distinguished Foreign Scientist: 1995

Invited talks: Sandia National Labs (2014); IFAC 2014 (Wave energy); MTU 2016;

Maynooth University, Ireland; Wave Energy Workshops 2014, 2016; ASHRAE Meeting 2014, SDSMT Women in Sci. and Eng., 2014, METS 2017 Sandia Workshop; Great Lakes Research Center, MTU 2017; Johns Hopkins Wolman Environmental Health and Engineering Seminar, Jan. 2019; Johns Hopkins Center for Environmental and Applied Fluid Mechanics Seminar, March 2019; Johns Hopkins Applied Physics Laboratory, April 2019

Current Collaborators

Johns Hopkins Applied Physics Laboratory, Johns Hopkins Bloomberg School of Public Health, Johns Hopkins Civil Engineering Department, Johns Hopkins Environmental Health and Engineering Department; Sandia National Laboratories; Naval Information Warfare Center Pacific and Atlantic, Office of Naval Research, Monterey Bay Aquarium Research Institute; University of Hawaii at Manoa, etc.

Patent Disclosures at JHU

1. Persistent Sensing of Underwater Objects with Impedance-matched Energy Converter Arrays: JHU Ref. C16015
2. Rapid Power Restoration after Extreme Events - with Mobile, Unmoored, Site-independent-high-performance Wave Energy Devices: JHU Ref. C16016
3. A Deep-sea Sea-floor Energy Source Powered by Second-order Surface Wave

Funded Research

Current Grants/Contracts:

1. PI: Deep-ocean microseism energy harvesting; **Office of Naval Research**; proposal pending, February 2020.
2. PI: Persistent sensing with impedance-matched energy converters: **Office of Naval Research**: (\$305,000): funded, February 2020.
3. PI: Digital displacement hydraulic power take-off for wave-by-wave impedance matching: **Sandia National Laboratories, Department of Energy**: funded, February 2020.
4. PI: Underwater infrasonic detection: **Naval Information Warfare Center-Pacific**: (\$47,800): funded February 2020.
5. PI: Integrating efficient and dependable wave power generation into ocean-sensing buoys: a pilot study; **National Science Foundation**: (\$300,000): Nov. 2019 start; new project at JHU with JHU Applied Physics Laboratory and Monterey Bay Aquarium Research Institute (MBARI).
6. PI: Using X-band radar to provide near-optimal control of a wave energy device in numerical simulations: [**Naval Facilities and Engineering Command Engineering and Expeditionary Warfare Center (NAVFAC EXWC)**]: Contract ongoing since January 2017 (\$440,000): work transferred as of June 2019
7. PI: 10-fold improvement in wave energy converter performance for dynamic microgrids: **Defense Advanced Research Projects Agency (DARPA)**: contract completed (deliverables met) (\$250,000); follow-on in discussion
8. PI: Integrating new object detection capability into a coastal energy conversion system **Office of Naval Research (ONR)**]: grant ongoing since January 2016 (\$876,000): January 2016
9. PI: Wave-by-wave control for near-optimal conversion on small (1-1.3 m radius) buoys for ocean sensing [**National Science Foundation (NSF)**]: grant ongoing since July 2016 (\$327,000): transferred to JHU as of July 2018
10. PI: Deterministic wave prediction; Contract through **Sandia National Laboratories, Water Power Technologies Group**, advisor and collaborator on wave energy converter control (**Department of Energy (DOE)**; multi-year): Current; my role in overall project: geometry, hydrodynamics, control design, wave prediction (\$95,000 for 2019): Funded.
11. PI: Underwater infrasonic detection: seismic propagation: Contract through **Naval Information Warfare Center (NIWC)-Pacific**; consultant support through JHU Applied Physics Laboratory (\$20,000): February 2020, funded.

Prior Grants/Contracts:

1. PI: "Subreflector Actuation for Reconfigurable Antennas", **Army Research Laboratory (ARL)**: Concluded, December 2013 (\$86,000)
2. PI: "Shielding on Sounding Rockets and Launch Vehicles", **Air Force Research Laboratory (AFRL)**, Kirtland AFB, NM: Concluded September 2012 (\$300,000)
3. PI: "Shielding Rocket Payloads in Transient Acoustic Loads", **Air Force Research Laboratory (AFRL)**, Kirtland AFB, NM: Concluded September 2012 (\$256,000)
4. PI: "Noise Shielding On Launch Vehicles", **AFRL**, Kirtland AFB, NM: Concluded Sept.

- 2012 (\$293,000)
5. PI: “Advanced Smart Structures”, **AFRL**, Kirtland AFB, NM: Concluded August 2009 (\$325,000)
 6. PI: “Self-Repair of Space Structures”, **AFRL**, Kirtland AFB, NM: Concluded. Sept. 2012 (\$150,000)
 7. PI: “Intelligent Passive Damping of Membrane Structures”, **AFRL**, Kirtland AFB, NM: Concluded September 2012 (\$200,000)
 8. Co-PI: “Model Driven Feedforward Control of Laser Powder Deposition”, **Army Research Laboratory**: Concluded December 2013; my role: analytical modeling, control design (\$525,000)
 9. Co-PI: “Friction stir welded space structures for Passive Structural Damping”, **Air Force Research Lab (AFRL)**, Concluded 2008; my role: analytical modeling and experimental testing (\$550,000)
 10. Co-PI: “Instrumentation for Advanced Material Characterization”, **National Science Foundation (NSF)**, Major Research Instrumentation Grant: Concluded July 2006; 1/3 of the project: one instrument acquisition, set up, calibration, personnel training (\$400,000)
 11. PI: “Advanced High Performance Micromachines”, **NSF/EPSCoR + State of SD** Grant: Concluded July 2006 (\$60,000)
 12. PI: College of Engineering Research Grant, St. Cloud State University, Spring 2003 (\$6,000)
 13. PI: National Science Foundation Japan Program/ Japan Society for Promotion of Science: Principal Investigator, 2001 (\$40,000)
 14. PI: Consulting Grant from Japan Marine Science and Technology Center, 2000 (\$5,000)
 15. PI: **National Science Foundation International Program** grant: May 1997 (\$10,000)
 16. PI: Japan Science and Technology Agency **NSF/STA Program Fellowship**, May 1997 April 1999 (2-years; full support + research, travel support)
 17. PI: **Japanese Government Research Award for Distinguished Foreign Specialists**, 1996 (1 month + travel)
 18. Co-PI: **Ball Foundation** Initiation Grant or Applied Research Center; Joint Project Director, 2000: my role: configuration design, development of new applications in wave energy (\$26,000)
 19. Co-PI: **National Science Foundation ILI** Program; Integrated Manufacturing Laboratory; Co-Project Director, 1995; my role: overall configuration design, robotics and integrated manufacturing: hardware design, acquisition, testing (\$100,000)
 20. PI: **Society of Manufacturing Engineers** Education Foundation Grant; Project Director, 1995 (\$25,000)
 21. PI: College of Engineering Research Grant, Christian Brothers University, Summer, 1994 (\$5,000)

Publications

A. Books:

1. Korde, U. A. and J. V. Ringwood, *Hydrodynamic Control of Wave Energy Devices*, Cambridge University Press, September 2016; ISBN 9781139942072
- A. Korde, U. A., *Engineering Mathematics for Marine Applications*, Cambridge University Press, in preparation

B. Journal Papers:

1. Korde, UA, Coe, RG, Bacelli, G, 'Deterministic incident wave prediction in intermediate water depth', submitted, February 2010
2. Korde, UA, 'Enhancing the resilience of energy systems: optimal deployment of wave energy devices following coastal storms', *Journal of Renewable and Sustainable Energy (AIP)*, v. 11, n. 3, 2019
3. Korde, UA, 'Wave energy conversion under wave-by-wave impedance matching with amplitude and phase-match limits', *Applied Ocean Research*, v. 90, September 2019, 101858.
4. Korde UA, Lyu JY, Robinett RD, Wilson DG, Bacelli G, Abdelkhalik O, 'Constrained near-optimal wave-by-wave control of a wave energy device in three oscillation modes', *Applied Ocean Research*, v. 69, November 2017, pp. 126-137
5. Korde UA, Song JJ, Robinett RD, Abdelkhalik O, 'Hydrodynamic design and near-optimal wave-by-wave control of a small wave energy device for ocean measurement applications', *Marine Technology Society Journal*, November/December 2017
6. Korde UA, Robinett RD, Wilson DG, 'Wave-by-wave control in irregular waves for a wave energy converter with approximate parameters' *J. Ocean Engineering and Marine Energy*, DOI 10.1007/s40722-016-0068-0, March 2016; pp. 501-519
7. Abdelkhalik O, Robinett RD, Zhou S, Bacelli G, Coe R, Bull DL, Wilson DG, Korde UA, 'On the optimal control design of wave energy converters with wave prediction', *J. Ocean Engineering and Marine Energy*, 2016, DOI: 10.1007/s40722-016-0048-4
8. Korde UA, 'Near-optimal control of wave energy converters in irregular waves with propagation-model driven wave prediction', *Applied Ocean Research*, v. 53, 2015, pp. 31-45, DOI: j.apor.2015.07.007
9. Korde UA, 'Energy storage requirements for approximate near-optimal control of two axisymmetric wave energy devices', *IFAC Annual Reviews in Control*, Oct. 2015, DOI: j.arcontrol.2015.08.004
10. Korde UA, Ertekin RC, 'Wave energy conversion by controlled floating and submerged cylinder buoys', *J. Ocean Engineering and Marine Energy*, March 2015, DOI: 10.1007/s40722-015-0021-7
11. Korde U.A., 'On using up-wave surface elevation for efficient wave energy conversion in irregular waves', *Applied Ocean Research*, v. 46, June 2014, pp. 79-93
12. Korde U.A., Ertekin, R.C. 'On wave energy focusing and conversion in open water', *Renewable Energy - an international journal*, v. 62. February 2014, pp. 84-99
13. Engberg T, Korde U.A, 'Modeling of the acoustic response of payload bays within launch vehicle fairings', *AIAA J. Spacecraft and Rockets*, v. 50, n. 2, 2013, pp. 423-432
14. Fehrman, B.C., Korde U.A., 'Time reversed focusing for targeted delivery of energy to accelerate epoxy crack healing', *J. Intelligent Material Systems and Structures*, v. 24, n. 15, 2013, pp. 1865-1887
15. Korde, U.A., 'On a submerged device with active control for efficient wave energy conversion', *GREEN: Int. J. Sustainable Energy Conversion and Storage*, June 2012; invited
16. Holenstein B, Fehrman BC, Wickersham MA, Korde UA, Genet R, 'Low cost active secondary mirrors', *Amateur Astronomy*, n. 70, March, 2011.
17. Korde, UA, 'Large-displacement electrostatic actuation of membrane reflectors through mechanical control of electrode-membrane gap', *J. Intelligent Material Systems and Structures*, v. 21, January 2010, pp. 61-82
18. Korde, U.A., 'Large-displacement control of variable area electrostatic actuation for membrane reflectors', *J. Intelligent Material Systems and Structures*, v. 20, n. 6, 2009, pp. 697-721
19. Korde, U.A., Wickersham M.A., Carr S.G., 'Effect of a negative capacitance circuit on the out-of-plane stiffness and dissipation of piezoelectric membranes', *J. Smart Materials and*

Structures, 17 (2008) 035017 (13pp); doi: 10.1088/0964-1726/17/3/035017

20. Korde U.A., 'Studies on area controlled electrostatic actuation of small membrane reflectors', *J. Intelligent Material Systems and Structures*, v. 19, n. 11, 2008, pp. 1339-1359
21. Jenkins, C.H., and Korde, U.A., 'Experimental membrane vibrations: an historical perspective and recent results', *J. Sound and Vibration*, v. 295 (3-5), pp. 602-613, August 2006
22. Korde, U.A., 'Study of a jet-propulsion method for an underwater vehicle', *Ocean Engineering*, v. 31, pp. 1205-1218, 2004
23. Korde, U.A., 'Systems of reactively controlled oscillating bodies in wave energy conversion', *Applied Ocean Research*, v. 25, n. 2, pp. 79-91, 2003
24. Lin, F., Schoen M. and Korde, U.A. 'Phase control of floating bodies from an onboard reference', *Applied Ocean Research*, v. 23, n. 5, pp. 251-262, 2001
25. Korde, U.A., 'Latching control of wave energy devices from an active reference', *Ocean Engineering*, v. 29, n. 11, pp. 1343-1355, 2001
26. Korde, U.A. 'Use of oscillation constraints in providing a reaction on deep-water floating wave energy devices', *Int. J. Offshore and Polar Eng.*, v. 11, n. 2, pp. 155-160, 2001
27. Korde, U.A. 'Hydrodynamics of a tail-tube buoy', *Ocean Engineering*, v. 27, pp. 1473-1484, 2000
28. Korde, U.A., 'On providing a reaction for efficient wave energy absorption by floating devices', *Applied Ocean Research*, v. 21, n. 6, pp. 587-599, 1999
29. Korde, U.A., Karlsson, P., and Flinkberg, E., 'Use of an on-board motion compensated block to enhance wave-energy conversion by floating devices', *J. JAMSTECR*, v. 38, Oct. 1998
30. Korde, U.A., 'On efficient primary energy conversion in irregular waves', *Ocean Engineering*, v. 26, pp. 625-651, 1999
31. Korde, U.A., 'Active heave compensation on drill-ships in irregular waves', *Ocean Engineering*, v. 25, no. 7, pp. 541-561, 1998
32. Korde, U.A., 'Performance of a wave-energy device in shallow-water, nonlinear waves: Part I', *Applied Ocean Research*, v. 19, no. 1, pp. 1-12, 1997
33. Korde, U.A., 'Performance of a wave-energy device in shallow-water, nonlinear waves: Part II', *Applied Ocean Research*, v. 19, no. 1, pp. 13-20, 1997
34. Gonzalez-Galvan E, Skaar SB, Korde UA, Chen W, 'Application of a precision enhancing technique to 3-D camera-space manipulation', *Int. J. Robotics Research*, v. 16, n. 2, 1998, pp. 240-257
35. Chen, W.Z., Korde, U.A., Skaar, S.B., 'Position control experiments using vision', *Int. J. Robotics Research*, v. 13, no 4, pp. 199-208, 1994
36. Korde, U.A., 'On the control of wave energy devices in multi-frequency waves', *Applied Ocean Research*, v. 13, no. 3, pp. 132-141, 1991
37. Korde, U.A., 'Development of a reactive control apparatus for a 2-dimensional oscillating water column wave energy device', *Ocean Engineering*, v. 18, no. 5, pp. 465-483, 1991
38. Korde, U.A., 'A power take-off mechanism for maximizing the performance of an oscillating water column wave energy device', *Applied Ocean Research*, v. 13, no. 2, pp. 75-81, 1991
39. Korde, U.A., 'Study of a wave energy device for possible application in communication and spacecraft propulsion', *Ocean Engineering*, v. 17, no. 6, pp. 587-599, 1990

C. Technical Monthly:

1. Korde, U.A., ‘Active control applications in wave energy conversion’, *Sea Technology*, v. 43, n. 7, July 2002 (invited article)

D. Peer-Reviewed Conferences:

1. Korde UA, Coe RG, Bacelli G, ‘Deterministic wave elevation prediction for real-time impedance Matching control of wave energy devices in intermediate waters, *Marine Energy Technology Systems, METS- Water Power Week*, Washington, DC, 2019
2. Korde UA, Robinett RD, Wilson DG, Bacelli G, Abdelkhalik O, ‘Deterministic wave prediction and near-optimal wave by wave control of a wave energy converter’, *Proc. European Wave and Tidal Energy Conference*, Cork, Ireland, August 2017
3. Korde UA, Robinett RD, Wilson DG, ‘Hydrodynamic Modeling and Control of Buoy Oscillations for Efficient Use of Wave Power in Ocean Sensing’, *ONR/MTS Buoy Workshop*, Woods Hole, April 2016
4. Bacelli G, Coe R, Wilson DG, Abdelkhalik O, Korde UA, Robinett RD, Bull DL, ‘A comparison of WEC control strategies for a linear WEC model’, *Int. Marine Renewable Energy/Marine Energy Technology Conference*, Washington DC, April 2016
6. Korde UA, Robinett RD, Wilson DG, ‘Wave-by-wave adaptive control for maximum power absorption by a wave energy converter in irregular waves’, *Proc. MTS/IEEE Oceans 2015 Conference*, Washington, DC, October, 2015
7. Korde UA, ‘Approximate near-optimal control of two 2-body axisymmetric devices in irregular waves’, *Proc. European Wave and Tidal Energy Conference (EWTEC)*, Nantes, France, September, 2015
8. Korde UA, ‘Energy storage requirements for near-optimal smooth real-time hydrodynamic control in irregular waves’, *19th Congress Int. Federation of Automatic Control World Congress (IFAC 2014)*, Aug. 2014, [invited paper](#), Cape Town, SA
9. Korde UA, Ertekin RC, ‘Near-optimal time domain control of small buoys in irregular waves’, 5. *Proc. ASME ; 33rd Int. Conf. OMAE*, San Francisco, CA, OMAE 2014-24570
10. Korde UA, Ertekin RC, ‘Control strategies for small buoys equipped for wave energy generation’, *ONR/MTS Buoy Workshop*, San Diego, CA, March 2014
11. Korde UA, ‘Up-wave surface elevation for smooth hydrodynamic control of wave energy conversion in irregular waves’, *Oceans 2013*, San Diego, CA, Sept. 2013
12. Korde UA, Ertekin RC, ‘An open water submerged device for wave energy focusing and conversion’, *European Wave and Tidal Energy Conversion (EWTEC)*, Aalborg, Denmark; Sept. 2013
13. Korde UA, Ertekin RC, ‘Active-controlled submerged wave energy device’, *Proc. 4th International Conference on Ocean Energy*, Dublin, Ireland, October 2012
14. Fehrman BC, Cushman AJ, Korde UA, ‘Iterative time reversal in dispersive and non- dispersive media’, *Proc. 53rd AIAA SDM Conference*, Honolulu, HI, 2012
15. Musil EJ, Reddy AE, Korde UA, Widerner C, ‘Friction stir processing of aluminum for enhanced damping: modeling and testing’, *Proc. 53rd AIAA/ASME/ASCE Structural Dynamics*, Honolulu, HI, 2012
16. Cushman AJ, Fehrman BC, Korde UA, ‘Accelerating the rate of epoxy crack healing’, *Proc. SPIE Smart Structures/Materials 2012*, San Diego, CA, March 2012
17. Comrie J and Korde UA, ‘Vibroacoustic studies on sounding rocket bulkheads’, *Proc. 19th SPIE Smart Structures and Materials Conference*, San Diego, CA, March 2012
18. Fehrman BC, Cushman A, Korde UA, ‘Using focused acoustic excitation to accelerate crack healing’, *52nd AIAA SDM/Adaptive Structures Conference*, full paper presented at the conference; April 2011

19. Engberg T, Kizer J, Korde UA, 'Acoustic modeling of rocket payload bays within launch fairings', *Proc. 52nd AIAA SDM/Adaptive Structures Conference*, April 2011
20. Comrie J, Korde UA, 'Laboratory testing of sounding rocket vibroacoustic response', *Proc. 51st AIAA SDM/Adaptive Structures Conference*; April 2011
21. Comrie J, Korde UA, 'Laboratory testing of sounding rocket vibroacoustic response', *Proc. 51st AIAA SDM/Adaptive Structures Conference*; April 2011
22. Cushman AJ, Fehrman BC, Korde UA, 'Experiments on the focusing and use of acoustic energy to enhance the rate of polymer healing', *Proc. SPIE Smart Structures/Materials 2011*, March 2011
23. Kizer J, Fontaine MR, Korde UA., 'Sound pressure damping with piezoelectric membranes with negative capacitance circuits', *Proc. SPIE Smart Materials/Structures Conference*; March 2011.
24. Wickersham MA, Fehrman BC, Robinson LK, Downs AW, Korde UA, 'Electrostatically actuated membrane mirrors with mechanical control of electrode gap', *2010 Mirror Technology Days Conf.*, presented.
25. Robinson LK, Wickersham MA, Korde UA, Fehrman BC, 'Experiments on a twelve mode membrane mirror with boundary located electrostatic actuators', *51st SDM/18th AIAA/ASME/ASCE Adaptive Structures Conf.*, April 2010
26. Fehrman B, Petersen EA, Barnes KA, Korde UA, 'Using focused acoustic excitation to accelerate crack healing', *51st SDM/18th AIAA/ASME/ASCE Adaptive Structures Conf.*, April 2010
27. Engberg T, Kizer J, Korde UA, 'Acoustic shielding of rocket payloads within launch fairings', *51st SDM/18th AIAA/ASME/ASCE Adaptive Structures Conf.*, April 2010
28. Fontaine MR, Wickersham MA, Korde UA., 'Study of a tuned vibration absorber using piezoelectric patches with active shunt circuits', *17th SPIE Smart Structures and Materials Conf.*, March 2010
29. Petersen EA, Fehrman B, Barnes, KA, Korde UA, 'Experiments on focusing and use of acoustic energy to enhance the rate of polymer healing', *17th SPIE Smart Structures and Materials Conf.*, March 2010
30. Barnes KA, Korde UA, Jenkins CH, Winter RM, 'On the use of acoustic excitation to accelerate self-healing in polymers', *2nd Int. Conf. on Self-Healing Materials*, Chicago, June 2009
31. Sarrazin JC, Jenkins CH, Korde UA, Rutherford SA, 'Ultrasonic self healing', *2nd Int. Conf. on Self-Healing Materials*, Chicago, June 2009.
32. Robinson LK, Wickersham MA, Korde UA, 'Membrane mirrors with boundary located actuators', *50th SDM/17th AIAA/ASME/ASCE Adaptive Structures Conf.*, April 2009.
33. Wickersham MA, Fehrman BC, Robinson LK, Downs AW, Korde UA, 'Electrostatic actuation with discrete area actuation for steering and focusing with membrane mirrors', *16th SPIE Smart Structures and Materials Conf.*, April 2009.
34. Fontaine MR, Wickersham MA, Korde UA., 'Altering the natural frequencies of simply- supported piezoelectric membranes using negative capacitance circuits', *16th SPIE Smart Structures and Materials Conf.*, March 2009.
35. Fontaine MR, Wickersham MA, Korde UA., 'Modifying the natural response of piezoelectric membranes with negative capacitance circuits', *50th SDM/16th AIAA/ASME/ASCE Adaptive Structures Conf.*, April 2009.
36. Zelfer TJ, Korde UA, 'Application of expanded light weight polarized polypropylene in

- noise shielding’, *50th SDM/16th AIAA/ASME/ASCE Adaptive Structures Conf.*, April 2009.
37. Zelfer TJ, Korde UA, ‘Lightweight polarized polypropylene foam for noise shielding’, *16th SPIE Smart Structures and Materials Conf.*, March 2009.
 38. Wickersham MA, Downs A, Korde UA, Hofacker ME, Kingsbury NA, ‘Membrane Reflectors with Variable Area Electrostatic Actuation for Laser Beam Guidance’, *Proc. 49th SDM/16th AIAA/ASME/ASCE Adaptive Structures Conf.*, Schaumburg, IL, April 2008
 39. Wickersham MA, Downs A, Korde UA, Hofacker ME, Kingsbury NA, ‘Recent Studies on Electrostatic Variable Area Actuation of Membrane Reflectors for Beam Guidance’, *Proc. 15th SPIE Smart Structures and Materials Conf.*, San Diego, CA, March 2008
 40. Petersen EA, Barnes KA, Korde UA, ‘Studies on Wave Propagation on Thin Lightweight Structures’, *Proc. 15th SPIE Smart Structures and Materials Conf.*, San Diego, CA, March 2008
 41. Barnes KA, Petersen EA, Korde UA, ‘Wave Propagation on Thin Lightweight Structures’, *6. Proc. 16th AIAA/ASME/ASCE Adaptive Structures Conf.*, Schaumburg, IL, April 2008
 42. Wickersham MA, Zelfer TJ, Korde UA, Petersen EA, ‘Recent Studies on Electronic Tuning of Out of Plane Stiffness and Dissipation of Piezoelectric Polymer Membranes’, *Proc. 15th SPIE Smart Structures and Materials Conf.*, San Diego, CA, March 2008
 43. Wickersham MA, Zelfer TJ, Korde UA, Petersen EA, ‘Electronic Control of Stiffness and Dissipation of Piezoelectric Polymer Membranes’, *Proc. 16th AIAA/ASME/ASCE Adaptive Structures Conf.*, Schaumburg, IL, April, 2008
 44. Korde UA, ‘Studies on a submerged flexible sheet type wave energy device with distributed point-wise secondary power conversion’, *Proc. 26th ASME Offshore Mechanics and Arctic Engineering (OMAE) Symp.*, June 2007
 45. Korde UA, Wickersham MA, Farke JJ, Hofacker ME, ‘Electrostatically actuated small circular membrane mirrors for laser beam guidance’, *Proc. 48th AIAA SDM/15th Adaptive Structures Conf.*, Honolulu, HI, April 2007
 46. Korde UA, Wickersham MA, Farke JJ, Hofacker ME, ‘Studies on small circular mirrors with electrostatic actuation and closed loop control’, *Proc. 14th SPIE Smart Structures/Materials Conf.*, San Diego, CA, March 2007
 47. Korde UA, Petersen EA, Daugaard D, ‘In-plane vibration response of piezoelectrically actuated membranes’, *Proc. 48th AIAA SDM/15th Adaptive Structures Conf.*, Honolulu, April, 2007
 48. Korde UA, Petersen EA, Daugaard D, ‘In-plane vibration of membrane strips and sheets with piezoelectric actuation and sensing’, *Proc. 14th SPIE Smart Structures and Materials Conf.*, San Diego, March 2007
 49. Korde UA, Wickersham, MA, Zelfer, TJ, Jenkins CH, Kjerengtroen L, ‘On semi-active enhancement of the dissipation provided by piezoelectric films’, *Proc. 14th SPIE Smart Structures and Materials Conf.*, San Diego, March 2007
 50. Korde U.A., Wickersham, M.A., Carr, S.G., Jenkins, C.H., ‘Active control of material damping in a piezoelectric membrane’, *Proc. 46th AIAA SDM/14th Adaptive Structures Conference*, Newport, RI, May 2006
 51. Korde, U.A., Jenkins, C.H., Petersen, E.A., ‘Acoustic energy propagation across cracks in a thin membrane structure’, *Proc. 46th AIAA SDM/14th Adaptive Structures Conference*, Newport, RI, May 2006
 52. Korde, U.A., Jenkins, C.H., ‘Studies on small rectangular membranes with actuation along

- the boundary’, *Proc. 46th AIAA SDM/14th Adaptive Structures Conference*, Newport, RI, May 2006
53. Korde, U.A., Wickersham M.A., Carr, S.G., Jenkins, C.H., ‘Active control of stiffness and damping of piezoelectric films’, *Proc. 13th SPIE Smart Structures and Materials Conf.*, San Diego, March 2006
 54. Korde, U.A., Jenkins, C.H., Petersen, E.A., ‘Energy transfer across cracks in a thin membrane strip’, *Proc. 13th SPIE Smart Structures and Materials Conf.*, San Diego, March 2006
 55. Korde, U.A., Jenkins, C.H., ‘Adaptive rectangular membranes actuated near boundaries’, *Proc. 13th SPIE Smart Structures and Materials Conf.*, San Diego, March 2006
 56. Korde, U.A., Langerman, M.A., Sears, J.W., ‘Development of a smart substrate for a laser powder deposition process’, *Proc. 13th SPIE Smart Structures and Materials Conf.*, San Diego, March 2006
 57. Korde, U.A., Langerman, M.A., Hainy, M.E., Zelfer, T.J., Sears, J.W., ‘Active control of heat induced deformation in a laser deposition process’, *Proc. 24th Int. Cong. Appl. Lasers and Electro- Optics (ICALEO)*, Laser Institute of America, Oct. 2005
 58. Koester, J.J., Langerman M.A., Sears J.W., Korde U.A., ‘Laser calorimeter for absorptivity measurement’, *Proc. 24th Int. Cong. Appl. Lasers and Electro- Optics (ICALEO)*, Laser Institute of America, Oct. 2005
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E. Research Monograph:

Korde, U.A., *Optimal Control of Floating Wave Energy Devices*, Research Monograph, Marine Technology Department, JAMSTEC, January 1999

Society Memberships

American Society of Mechanical Engineers (ASME): Fellow
Marine Technology Society (MTS): Member
American Geophysical Union (AGU): Member

Current Teaching

EN 570.422: Resilience of Ecological Systems: Spring 2020.

Other Teaching

A. Graduate Students

1. (15 graduate students + 1 research scientist): Mr. Comrie, Jeffrey; Mr. Engberg, Tyler M.; Mr. Fehrman, Brian C.; Ms. Flinkberg, Elisabet; Mr. Fontaine, Michael A.; Dr. Hossain, Awlad, N.; Mr. Husain, Sal; Mr. Karlsson, Peter; Mr. Koester, Jacob; Mr. Narayana, Jagadeesh; Mr. Nelson, Kevin; Ms. Reddy, Abiuda; Ms. Swartzmiller, Samantha; Song, J.J.; Mr. Turlapaty, Subhan; Mr. Wickersham, Miles A.

B. Current Course Development and Teaching Interests

Complex systems resilience; Energy systems for resilience; Complex systems modeling in public health

Engineering for Professionals Program, JHU: Complex systems resilience (1 semester; graduate course)

C. Course Development and Teaching Experience includes

(a) Undergraduate:

Systems Dynamics, Dynamics, Dynamics of Mechanisms, Theory of Machines, Kinematics, Machine Control and Robotics, Mechanical Vibrations, Robotics; Statics, Intro. to Engineering Design, Engineering Graphics, Computer Aided Design, Design for Manufacturability, Computer Integrated Manufacturing; Sustainable Energy Systems Design and Product Development, Sustainable Energy, Sustainable Energy for Vehicles, Resilience of Ecological Systems.

(b) Graduate:

Resilience of Complex Systems. Wave Energy Converter Dynamics, Hydrodynamics, Wave Phenomena, Advanced Mechanical Systems Control, Engineering Mathematics, Advanced Dynamics, Advanced Vibrations, Smart Structures, Advanced Renewable Energy Systems Design.