

# Serife Tol

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EDUCATION	<b>Georgia Institute of Technology</b> , Atlanta, GA, USA Ph.D. in Mechanical Engineering Dissertation: Structure-Borne Elastic Wave Energy Harvesting Enhanced by Metamaterial Concepts Advisors: Prof. Alper Erturk and Prof. F. Levent Degertekin  <b>Middle East Technical University</b> , Ankara, Turkey M.S. in Mechanical Engineering Thesis: Dynamic Modeling of Structural Joints Advisor: Prof. H. Nevzat Ozguven  <b>Middle East Technical University</b> , Ankara, Turkey B.S. in Mechanical Engineering	August 2012 - August 2017  September 2009 - May 2012  September 2004 - June 2009
PROFESSIONAL EXPERIENCE	<b>Assistant Professor, Mechanical Engineering</b> University of Michigan, Ann Arbor, MI, USA  <b>Visiting Scholar, Civil and Materials Engineering</b> University of Illinois at Chicago, Chicago, IL, USA  <b>Research Assistant, Mechanical Engineering</b> Georgia Institute of Technology, Atlanta, GA, USA  <b>Test and Analysis Engineer</b> ASELSAN - Defense Systems Technologies Sector, Ankara, Turkey	September 2018 - Present  September 2017 - July 2018  August 2012 - May 2017  January 2009 - July 2012
RESEARCH INTERESTS	Dynamical systems, smart materials, metamaterials, phononic crystals, electromechanical systems, energy harvesting, mechanical vibrations, wave propagation, nondestructive testing	
JOURNAL PUBLICATIONS	J7: Tol, S., Degertekin, F. L., and Erturk, A., 3D-Printed Lens for Next-Generation Structure-Borne Wave Focusing and Harvesting, <i>Additive Manufacturing</i> , 29, 100780, 2019.  J6: Tol, S., Degertekin, F. L., and Erturk, A., Structurally-Embedded Reflectors and Mirrors for Elastic Wave Focusing and Harvesting, <i>Journal of Applied Physics</i> , 122, 164503, 2017.  J5: Tol, S., Degertekin, F. L., and Erturk, A., Phononic Crystal Luneburg Lens for Omnidirectional Elastic Wave Focusing and Energy Harvesting, <i>Applied Physics Letters</i> , 111, 013503, 2017.  J4: Tol, S., Xia, Y., Ruzzene, M., and Erturk, A., Self-Bending Elastic Waves and Obstacle Circumventing in Wireless Power Transfer, <i>Applied Physics Letters</i> , 110, 163505, 2017.  J3: Tol, S., Degertekin, F. L., and Erturk, A., Gradient-Index Phononic Crystal Lens-based Enhancement of Elastic Wave Energy Harvesting, <i>Applied Physics Letters</i> , 109, 063902, 2016. <b>(2017 ASME Energy Harvesting Best Paper Award)</b> .  J2: Tol, S., Degertekin, F. L., and Erturk, A., Piezoelectric Power Extraction from Bending Waves: Electroelastic Modeling, Experimental Validation, and Performance Enhancement, <i>Wave Motion</i> , 60, pp. 20-34, 2016.	

- J1: Tol, S. and Ozguven, H. N., Dynamic Characterization of Bolted Joints Using FRF Decoupling and Optimization, *Mechanical Systems and Signal Processing*, 54-55, pp. 124-138, 2015.
- CONFERENCE C12: Tol, S., Okudan, G., and Ozevin, D., Amplifying Propagating Elastic Waves in Pipe-Like Structures by Metamaterial Lens for the Enhanced Guided Wave Ultrasonics, *9th Conference on Structural Health Monitoring of Intelligent Infrastructure*, St Louis, MO, 4-9 August 2019.
- C11: Tol, S., Okudan, G., and Ozevin, D., Wave focusing in pipe-like structures via gradient-index metamaterial lens toward damage detection and localization, *Proceedings of the 26th SPIE Annual International Symposium on Smart Structures and Materials & Nondestructive Evaluation and Health Monitoring*, Denver, CO, 3-7 March 2019.
- C10: Tol, S., Degertekin, F. L., and Erturk, A., Low-Frequency Elastic Wave Focusing and Harvesting via Locally Resonant Metamaterials, *Proceedings of the 10th ASME Conference on Smart Materials, Adaptive Structures and Intelligent Systems*, Snowbird, UT, 18-20 September 2017.
- C9: Tol, S., Degertekin, F. L., and Erturk, A., Luneburg Lens for Omnidirectional Structure-Borne Wave Focusing and Energy Harvesting, *Proceedings of the 24th SPIE Annual International Symposium on Smart Structures and Materials & Nondestructive Evaluation and Health Monitoring*, Portland, OR, 25-29 March 2017.
- C8: Tol, S., Degertekin, F. L., and Erturk, A., 3D-Printed Lens for Structure-Borne Wave Focusing and Energy Harvesting, *Proceedings of the 24th SPIE Annual International Symposium on Smart Structures and Materials & Nondestructive Evaluation and Health Monitoring*, Portland, OR, 25-29 March 2017.
- C7: Tol, S., Vora, F. T., Degertekin, F. L., and Erturk, A., Embedded Elastic Wave Mirrors for Enhanced Energy Harvesting, *Proceedings of the IEEE Sensors Conference*, Orlando, FL, 30 October - 2 November 2016.
- C6: Tol, S., Degertekin, F. L., and Erturk, A., Elastic Wave Focusing Concepts for Dramatically Enhanced Piezoelectric Energy Harvesting, *Proceedings of the 27th International Conference on Adaptive Structures and Technologies Conference*, Lake George, NY, 3-5 October 2016.
- C5: Tol, S., Degertekin, F. L., and Erturk, A., Dramatic Enhancement of Elastic Wave Energy Harvesting Using a Gradient-Index Phononic Crystal Lens, *Proceedings of the 9th ASME Conference on Smart Materials, Adaptive Structures and Intelligent Systems*, Stowe, VT, 28-30 September 2016.  
(**Best Student Paper Award**).
- C4: Tol, S., Degertekin, F. L., and Erturk, A., Modeling and Enhancement of Piezoelectric Power Extraction from One-Dimensional Bending Waves, *Proceedings of the 21st SPIE Annual International Symposium on Smart Structures and Materials & Nondestructive Evaluation and Health Monitoring*, San Diego, CA, 9-13 March 2014.
- C3: Tol, S., Degertekin, F. L., and Erturk, A., Harvesting of Bending Waves in One-Dimensional Infinite Beams Using Resistive-Reactive Circuits, *Proceedings of the 6th ASME Conference on Smart Materials, Adaptive Structures and Intelligent Systems*, Snowbird, UT, 16-18 September 2013.
- C2: Tol, S. and Ozguven, H. N., Experimental Verification and Improvement of Dynamic Characterization Method for Structural Joints, *Topics in Modal Analysis I, Volume 7, Proceedings of the 31st International Modal Analysis Conference (IMAC)*, Anaheim, CA, 2013.
- C1: Tol, S. and Ozguven, H. N., Dynamic Characterization of Structural Joints Using FRF Decoupling, *Topics in Modal Analysis I, Volume 5, Proceedings of the 30th International Modal Analysis Conference (IMAC)*, Jacksonville, FL, 2012.

CONFERENCE PRESENTATIONS P4: Tol, S., Gradient metamaterials and metasurfaces for elastic wave guiding and focusing, *ASME 2019 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference (IDETC/CIE 2019)*, Anaheim, CA, 18-21 August 2019.

P3: Tol, S., Elastic Metasurfaces for Focusing Flexural Lamb Waves toward Enhanced Energy Harvesting, *Phononics 2019*, Tucson, AZ, 3-7 June 2019.

P2: Tol, S., Degertekin, F. L., and Erturk, A., Metamaterial concepts for elastic wave focusing, *16th Pan-American Congress of Applied Mechanics*, Ann Arbor, MI, 20-24 May 2019.

P1: Tol, S., Kabir, M., and Ozevin, D., Wave Energy Focusing with Gradient-index Metamaterial Layer for Damage Detection and Localization in Pipe-like Structures, *18th U.S. National Congress for Theoretical and Applied Mechanics*, Chicago, IL, 5-9 June 2018.

AWARDS & HONORS

- ASME Best Paper Award in Energy Harvesting, 2017.
- Best Student Paper Award in the Energy Harvesting Symposium, In: *9th ASME Conference on Smart Materials, Adaptive Structures and Intelligent Systems (SMASIS)*, 2016.
- IEN (Institute for Electronics and Nanotechnology) Seed Grant Award for Bistable snap-through MEMS systems for ultra-broadband nonlinear energy harvesting from elastoacoustic waves, 2014.
- M.S. Fellowship of the Scientific and Technological Research Council of Turkey, 2009 - 2011.
- Kemal Kurdas Academic Achievement Scholarship (Granted to the top rank scholar in the college of engineering), 2008 - 2009.
- High Honor Roll (7 times) and Honor Roll (1 time) in Dean's List, 2005 - 2009.
- DAAD (German Academic Exchange Service) Scholarship, July - August 2008.
- Istanbul METU Alumni Association Scholarship, 2004 - 2008.

TEACHING EXPERIENCE

**Assistant Professor** September 2018 - Present  
ME 240 Introduction to Dynamics and Vibrations  
University of Michigan, Ann Arbor, MI

ME 541 Mechanical Vibrations  
University of Michigan, Ann Arbor, MI

**Lead Teaching Assistant** August 2014 - July 2015  
ME 3057 Experimental Methodology  
Georgia Institute of Technology, Atlanta, GA

**Teaching Assistant** January 2013 - July 2015 & August 2016 - May 2017  
ME 3057 Experimental Methodology  
Georgia Institute of Technology, Atlanta, GA

PROFESSIONAL ACTIVITIES

**Reviewer Service**  
Smart Materials and Structures  
Journal of Vibration and Acoustics  
Journal of Intelligent Material Systems and Structures  
Applied Physics Letters

Journal of Applied Physics  
Mechanical Systems and Signal Processing  
Mechatronics  
ASME International Design Engineering Technical Conferences & Computers and Information in Engineering Conference (IDETC/CIE)  
ASME Conference on Smart Materials, Adaptive Structures and Intelligent Systems (SMASIS)

**Conference Program Committee**

SPIE Smart Structures/NDE 2019  
IDETC-VIB 2019

**Technical Committee**

Adaptive Structures and Material Systems (ASMS)  
Technical Committee on Vibration and Sound (TCVS)

**Memberships**

American Society of Mechanical Engineers (ASME)  
The International Society for Optical Engineering (SPIE)  
Society of Women Engineers (SWE)

SERVICE

- Member of the Seminar Committee, Mechanical Engineering, University of Michigan, September 2018 - present.
- Webmaster of the Woodruff School Graduate Women's Group, May 2016 - May 2017.
- Secretary of the Acoustical Society of America Georgia Tech Student Chapter, 2013 - 2014.
- K-12 Outreach:
  - Inspire-ME module for the WISE Girls in Science and Engineering (GISE) Camp at the University of Michigan, Ann Arbor, MI, June 2019.
  - Karina S. Scott, a GIFT (Georgia Intern Fellowship for Teachers) Fellow, Georgia Institute of Technology, Atlanta, GA, June - July 2016.
  - Technology, Engineering and Computation (TEC) Camp, Georgia Institute of Technology, Atlanta, GA, June 2014.
  - Kids Interested in Technology, Engineering and Science (KITES) Fair at Scott Elementary School, Atlanta, GA, April 2014.
- Competition Judge:
  - ASME IDETC-VIB Best Student Paper Competition, International Design Engineering Technical Conferences & Computers and Information in Engineering Conference, 2019.
  - ASME Noise Control and Acoustics Division Best Student Paper Competition, International Mechanical Engineering Congress & Exposition (IMECE), 2018.
  - The 2nd Annual Air Products ME Undergraduate Research Symposium, Georgia Institute of Technology, Atlanta, GA, April 2014.
  - Georgia High School InVenture Challenge, Georgia Institute of Technology, Atlanta, GA, March 2014.
- Invited Panels/Forums:
  - NextProf Pathfinder Workshop, University of Michigan, Ann Arbor, MI, September 2019.
  - Panelist at Female Faculty-Student Fall Mixer, University of Michigan, Ann Arbor, MI, November 2018.
  - Group Forum: Successful Academic and Professional Strategies for Female Engineers, University of Michigan, Ann Arbor, MI, October 2018.
  - Graduate Student Panel held by the Office of International Education, Georgia Institute of Technology, Atlanta, GA, August 2014.