

Armita Hamidi, Ph.D.

Assistant Professor, Mechanical Engineering
 David L. Hirschfeld Department of Engineering
 Angelo State University
 Member, Texas Tech University System
 San Angelo, TX 76909-1056
 Phone: (325) 486-5518
 Email: armita.hamidi@angelo.edu



SUMMARY

Ph.D. in mechanical engineering, proficient in bio-robotic systems, manufacturing and design innovations, smart materials, thermal sciences, fluid flow analysis, and solar technologies. Highly skilled at engineering design, finite element analysis and material characterization with a specialization in robotics. Extensive practical hands-on with Wind Lidar, rheometer, actuators, 3D printer, laser cutter, tensile test machine, AFM, SEM, and optical microscopy. Key skills:

- Design and development of bio-robotic systems and underwater robots
- Additive manufacturing technologies
- Material characterization
- Design and development of novel actuation systems
- Design, development, and optimization of energy systems

EDUCATION

University of Texas at Dallas (UTD), Richardson, Texas, USA. January 2015-December 2019
 Ph.D., Mechanical Engineering
 Thesis title: *Additive Manufacturing of Heterogeneous Composites for Bio-mimetic Robots*

Eastern Mediterranean University (EMU), Famagusta, Cyprus. September 2010-August 2012
 M.S., Mechanical Engineering (Magna cum Laude)
 Thesis title: *Energetic and Exergetic Analyses of a Direct Steam Generation Solar Thermal Power Plant in Cyprus*

Shahid Beheshti University (Abbaspour College of Technology), Tehran, Iran. September 2003-May 2008
 B.S., Applied & Scientific Field of Mechanical Engineering Power plant
 Thesis title: *Exergy Analysis of a Steam Power Plant*

RESEARCH EXPERIENCE

Graduate Research Assistant, University of Texas at Dallas. June 2015-December 2019

Bio-robotic systems design and development for applications in all sorts of environments

- Designed and developed bioinspired jellyfish robots by implementing twisted coiled polymer muscles (TCPs), shape memory alloys (SMAs) and pneumatic actuators with the capability of swimming underwater
- Designed and developed a bioinspired multidirectional modular joint using TCP muscles, obtaining complex modes of bending

- Designed and developed a bioinspired soft flapping system (inspired by manta rays) using artificial muscles

Additive Manufacturing (AM)

- Assembled a custom-made multi-material 3D printer set up for manufacturing bioinspired robotic structures
- 3D printed very soft elastomer with extensive stretchability
- 3D printed sacrificial carbohydrate glass/elastomer structures for robotic applications
- Developed 3D printing of polymers reinforced with continuous metal fibers (continuous fiber 3D printing)

Energy harvesting from Human Motion

- Developed and optimized a wearable energy harvester device for generating energy from human motion (walking and dancing)
- Characterized and analyzed sound waves with NI DAQ hardware and LabVIEW software for generating motion

Rapid-prototyping micro-fluidic channels

- Expanded the fabrication capabilities of a laser cutter machine for prototyping microfluidic devices
- Studied effects of the fabrication parameters such as laser power, speed, and pulse duration on the quality (geometry and tolerances) of micro-channels

XPIA Project (eXperimental Planetary boundary layer Instrument Assessment)

- Designed and performed field experiments with wind lidar for measuring atmospheric boundary conditions
- Performed data profiling (collecting and analyzing data) for lidars and sonic radars measurements to validate novel measurement approaches
- Analyzed measurement accuracy by comparing wind data collected with triple Doppler lidars technique and sonic anemometer measurements at Boulder Atmospheric Observatory in Boulder, Colorado

Graduate Research Assistant, Eastern Mediterranean University. February 2011-December 2014

Solar Power Systems Feasibility, Efficiency, and Lifecycle Study

- Designed, analyzed and presented models for solar thermal systems (solar plant and solar desalination system)
- Studied and determined the effect of critical parameters such as solar radiation and ambient temperature on the efficiency of solar systems

Exergy and Exergoeconomic Analysis and Optimization of Power Plants

- Derived energy and exergy efficiency of a functioning steam power plant in Iran
- Performed life cycle analysis, simulation, and optimization of solar thermal systems, cogeneration systems, and multi-generation energy systems
- Proposed a model of multi-objective optimization of energy systems

TEACHING EXPERIENCE

Teaching Assistant, University of Texas at Dallas January 2015- May 2018

- Courses: Computer Aided Design, Computer Aided Design Laboratory

Mentor, George A. Jeffrey Nonexplorers Program for High-Schoolers May 2018-August 2018
 Alan G. MacDiarmid Nanotechnology Institute, University of Texas at Dallas May 2017-August 2017

- Taught the research-based skills in a program for pre-collegiate students
- Supervised high school students to perform lab experiments

Ment, Young Women in Science & Engineering Investigators (YWISEI) Program, University of Texas at Dallas September 2015-May 2017

- Mentored 10 junior high school students to complete science, technology or engineering projects in a program sponsored by the Engineering and Computer Science School at UT Dallas, Texas Instruments Foundation, and Hirsch Family Foundation
- Led two teams of high school students with selected proposals titles as: “Specialized Cartesian Robot Paste Printer” and “Drone as a Locator”
- Attended special training session at Texas Instrument Foundation

Teaching Assistant, Eastern Mediterranean University February 2011-December 2014

- Courses: Thermodynamics I & II, Fluid Mechanics, Solar Engineering, Building, and Environmental Systems in Architecture, Material Science, Principles of CAE

PUBLICATIONS

Almubarak Y., Punnoose M., Maly N., **Hamidi A.**, Tadesse Y. "KryptoJelly: A Jellyfish robot with confined, adjustable pre-stress, and easily replaceable shape memory alloy NiTi actuators. " *Smart Materials and Structures*, 2020.

Hamidi, A., Almubarak Y., Warren J., Rupawat Y.M. (in press) “Poly-Saora Robotic Jellyfish: Swimming underwater by Twisted and Coiled Polymer Actuators”. *Smart Materials and Structures*, 2020.

Hamidi, A., and Tadesse, Y. "3D printing of very soft elastomer and sacrificial carbohydrate glass/elastomer structures for robotic applications." *Materials & Design* (2019): 108324.

Hamidi, A., Almubarak Y., Tadesse, Y., “Multidirectional 3D-Printed Functionally Graded Modular Joint Actuated by TCPFL Muscles for Soft Robots”. *Bio-des. Manuf.* (2019): 1-13.

Hamidi, A., and Tadesse, Y. "Single step 3D printing of bioinspired structures via metal reinforced thermoplastic and highly stretchable elastomer." *Composite Structures* 210 (2019): 250-261.

Lundquist, J.K., Wilczak, J. M., Ashton R., Bianco, L., Brewer, W.A., Choukulkar, A., Clifton, A., Debnath, M., Delgado, R., Friedrich, K., Gunter, S., **Hamidi, A.** et al. "Assessing state-of-the-art capabilities for probing the atmospheric boundary layer: the XPIA field campaign." *Bulletin of the American Meteorological Society* 98, no. 2 (2017): 289-314.

Hamidi, A., Parham, K., Atikol, U., Shahbaz, A.H., “A parametric performance analysis of single and multi-effect distillation systems integrated with open-cycle absorption heat transformers”. *Desalination* 371 (2015): 37-45.

Ameri, M., Ahmadi, P., **Hamidi, A.** “Energy, exergy and exergoeconomic analysis of a steam power plant: A case study”. *International Journal of Energy Research* 33, no. 5 (2009): 499-512.

CONFERENCE PRESENTATIONS

Wu, Lianjun, Farzad Karami, **Armita Hamidi**, and Yonas Tadesse. "Biorobotic systems design and development using TCP muscles." In *Electroactive Polymer Actuators and Devices (EAPAD) XX*, vol. 10594, p. 1059417. International Society for Optics and Photonics, 2018.

Armita Hamidi, Yonas Tadesse, “Additive Manufacturing of Multifunctional Structures for Robots”, Poster presentation at TEXAS SYSTEMS DAY, University of Texas at Dallas, April 6, 2018. <https://engineering.utdallas.edu/engage/events/2018-texas-systems-day/>

Armita Hamidi, Shrenik Jain, and Yonas Tadesse. "3D printing PLA and silicone elastomer structures with sugar solution support material." SPIE Smart Structures and Materials+ Nondestructive Evaluation and Health Monitoring. International Society for Optics and Photonics, 2017.

Rashid, Evan, **Armita Hamidi**, and Yonas Tadesse. "Optimization of voltage output of energy harvesters with continuous mechanical rotation extracted from human motion (Conference Presentation)." Active and Passive Smart Structures and Integrated Systems 2017.

Armita Hamidi, and Yonas Tadesse. "Energy harvesting from dancing: for broadening in participation in STEM fields." SPIE Smart Structures and Materials+ Nondestructive Evaluation and Health Monitoring. International Society for Optics and Photonics, 2016.

Armita Hamidi, and Yonas Tadesse. “Hybrid Energy Harvesting from Motion”. Poster presented at 2nd Semi-Annual Industrial Advisory Board Meeting of the National Science Foundation’s (NSF) Industry/University Cooperative Research Centers (IUCRC) iPerform Center for Assistive Technologies (AT), University of Texas at Dallas, October 2015. <http://cs.utdallas.edu/ipperformcenter/>

Armita Hamidi, and Ugur Atikol, “Energy and Exergy Analyses of a Direct Steam Generation Solar Thermal Power Plant in Cyprus”. Presented at 6TH International Exergy, Energy and Environment Symposium (IEEEES-6) 2013, Turkey.

EDITORIAL ACTIVITIES

Reviewer, Journal of Applied Energy
 Reviewer, Smart Materials and Structures
 Reviewer, Bioinspiration & Biomimetics
 Reviewer, Bio-design & Manufacturing
 Reviewer, IEEE/ASME transactions on Mechatronics
 Reviewer, Engineering Research Express

AWARDS AND HONORS

Graduate Program Scholarship from Eastern Mediterranean University

NON- ACADEMIC EXPERIENCE

Technical Engineer, Fan Generator Industrial Group , Tehran, Iran	February 2009-February 2010
Sales Engineer, Boresh Abzar Iran Company , Tehran, Iran	October 2008-February 2009
Technical Trainee, Montazer Ghaem , Tehran, Iran	July 2005-September 2005

TECHNICAL SKILLS

Programming Language: FORTRAN, PYTHON

Technical Software: ABAQUS CAE, MATLAB/Simulink, ANSYS, Engineering Equation Solver (EES), TRNSYS, VENSIM, TECPLOT, LABVIEW, ImageJ, AutoCAD, Solid Works, PTC Creo