

EDUCATION

The George Washington University, Washington, DC

Ph.D., Mechanical Engineering, School of Engineering and Applied Science

Aug 2016

Advisor: Prof. Santiago Solares

University of Maryland, College Park, MD

Ph.D., Mechanical Engineering, A. James Clark School of Engineering (two years completed, transferred to The George Washington University with advisor)

Aug 2012 – Aug 2014

M.S., Mechanical Engineering, A. James Clark School of Engineering

May 2012

B.S. Mechanical Engineering, A. James Clark School of Engineering

Dec 2010

PROFESSIONAL APPOINTMENTS

- **Assistant Professor**, Widener University June 2018- Present
 - **Visiting Scholar**, The George Washington University, DC Sept 2016– Present
 - **Director of Nanometrology Core Facility**, University of Maryland Aug 2017– June 2018
 - **Teaching Faculty**, University of Maryland Sep 2016 –June 2018
 - **Adjunct Professor**, George Mason University Jan 2017– June 2017
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RESEARCH EXPERIENCE

Micro- and Nano-manufacturing by Multifrequency SPM

Sept 2016– Present

- Transformation of SPM techniques to expand its capabilities to surface modification
- Modification of surface drag coefficient by AFM tip

Development of Nano-metrology technique for Subsurface Imaging by AFM

Aug 2012–Present

- Development of new techniques in multifrequency AFM to study soft matter
- In-situ measurements on polymers for varying environmental conditions

Effect of Temperature and Humidity on Additive Manufacturing Filament

Sept 2017–Present

- Studying the effect of relative humidity on quality of 3D printed parts
- Designing and developing automated environmental controlled 3D printer

Development of an Automated Assembly Line for Visually Indicating Fasteners

Jan 2011 – May 2012

- Refinement of manufacturing process for visual tension indicating fasteners
- Design and fabrication of an automated assembly line of visual tension indicating fasteners

Development of Automated Subsystem Measuring Density of Synthetic Filaments

Jan 2010 – Dec 2010

- Development of a novel concept for measuring density of synthetic filaments and bristles
- Design of a full-scale automated subsystem for the assembly line of paint brushes

ACADEMIC INSTRUCTION

Teaching Faculty, University of Maryland, College Park, MD

Sept 2016 – Present

- ENME272: Introduction to Computer Aided Design
- ENME361: Vibration, Control, and Optimization I
- ENME371: Product Development Design
- ENME400: Machine Design
- ENME472: Integrated Product and Process Development

Course Instructor, University of Maryland, College Park, MD Jan 2012 – May 2012

- ENME371: Product Engineering and Manufacturing (Spring 2012)

Teaching Assistant, University of Maryland, College Park, MD Sep 2010 – May 2013

- ENME332: Thermodynamics (Fall 2010)
- ENME371: Product Engineering and Manufacturing (Spring & Fall 2011)
- ENME361: Vibrations (Spring 2013)

Laboratory Manager, University of Maryland, College Park, MD Jan 2010 – May 2012

- Automation and Design Laboratory
- Mechanical Engineering Machine Shop
- Product Innovation & Realization Laboratory Suite (PIRLS)

COMPUTER SKILLS

- Igor Pro
- Programming: MATLAB, C++
- Proficiency in CAD software: CreO, SolidWorks, AutoDesk Inventor, NX
- FEA: Pro/Mechanica, SolidWorks, ANSYS
- MasterCAM, Catalyst, G&M Generator

PERSONNEL MANAGEMENT, MENTORING and ADVISING

- Graduate Student advising (University of Maryland, College Park): Sep 2016 – Jan 2018
Miead Nikfarjam (Graduate Student): Optimization of imaging parameters for AFM
David Kriesberg (Graduate Student): Design and development of environmental controlled 3D Printer
- Direct Reports (University of Maryland, College Park): June 2014 – Aug 2014
Ramya Durvasula (High School Intern): Application of viscoelastic models in AFM simulation and experimental property measurements using amplitude modulation modes.
- Trainees Directly Supervised (University of Maryland, College Park): Jan 2014 – Aug 2014
Dr. Haijuan Ding (Visiting Professor): Instruction on different AFM imaging modes, including contact mode, amplitude modulation, bimodal imaging, both in air and liquid measurements
Tao Chao, Fudong Han (PhD Candidates): Instruction on electrochemical cell studies in the context of AFM imaging
Alfredo Diaz, Enrique Lopez, Sarice Barkley (New Laboratory Mates, PhD Students): Instruction on different imaging techniques, force spectroscopy and multifrequency imaging, both in air and liquid environments

PUBLICATIONS & PRESENTATIONS

- **Invited Talks:**
“Multifrequency Atomic Force Microscopy”, 2017, IEEE Nano, Pittsburg, PA.

▪ **Journal Publications:**

Nikfarjam, M.; Lopez-Guerra, E.A.; Solares, S.D.; **Eslami, B.**; *Imaging of Viscoelastic Soft Matter with Low Indentation Using Higher Eigenmodes in Single-Eigenmode Amplitude-Modulation Atomic Force Microscopy*, Beilstein J. Nanotech. 2018, 9, 1116-1122.

Nikfarjam, M.; Lopez-Guerra, E.A.; Solares, S.D.; **Eslami, B.**; “Higher eigenmode tricks in multifrequency atomic force microscopy,” *Imaging & Microscopy* 2017, issue 3, 38-39.

Eslami, B.; Solares, S.D.; “Imaging of surface nanobubbles by atomic force microscopy in liquids: influence of the drive frequency on the characterization of ultra-soft matter,” *Microscopy Research and Technique* 2017, 80, 41-49.

Eslami, B.; Lopez-Guerra, E.A., Raftari, M., Solares, S.D.; “Evolution of nano-rheological properties of Nafion® thin films during pH modification by strong base treatment: A static and dynamic force spectroscopy study,” *J. Appl. Phys.* 2016, 119, 165301.

Eslami, B.; Solares, S.D.; “Experimental approach for selecting the excitation frequency for maximum compositional contrast in viscous environments for piezo-drive bimodal atomic force microscopy,” *J. Appl. Phys.* 2016, 119, 084901.

Eslami, B.; Lopez-Guerra, E.A.; Diaz, A.J.; Solares, S.D.; “Optimization of the excitation frequency for high probe sensitivity in single eigenmode and bimodal tapping-mode AFM,” *Nanotechnology* 2015, 26, 165703.

Diaz, A.J; **Eslami, B.**; López-Guerra, E.A.; Solares, S.D.; “Selection of higher eigenmode amplitude based on dissipated power and virial contrast in bimodal atomic force microscopy,” *J. Appl. Phys.* **2014**, in press.

Eslami, B.; Ebeling, D.; Solares, S.D.; “Trade-offs in sensitivity and sampling depth in bimodal atomic force microscopy and comparison to the trimodal case,” *Beilstein J. Nanotech.* **2014**, 5, 1144-1151.

Ebeling, D.; **Eslami, B.**; Solares, S.D.; “Visualizing the subsurface of soft matter: simultaneous topographical imaging, depth modulation, and compositional mapping with triple frequency atomic force microscopy,” *ACS Nano* **2013**, 7, 10387-10396.

▪ **Conference Publications:**

Eslami, B.; Ganya, R.; Bunai, C.; Thamire, C.; “Smart fasteners and their application in flanged joints”, ASME 2011 International Mechanical Engineering Congress and Exposition, Paper No. IMECE2011-64214, Volume 3: Design and Manufacturing, 707-714.

▪ **Conference Presentations:**

“Visualizing the subsurface of soft matter using trimodal AFM”, International Conference of Nanoscience and Technology July 2014, Symposium: Novel SPM Techniques, Vail, Colorado.

“Smart fasteners and the applications in flanged joints”, Graduate Research Interaction Day 2011, University of Maryland College Park. (1st Prize Winner)

“Automated Assembly Line Design for Manufacturing Smart Fasteners”, International Mechanical Engineering Congress and Exposition 2010.