Curriculum Vitae

Notarization. I have read the following and certify that this *curriculum vitae* is a current and accurate statement of my professional record.

Signature  Date 02/02/2021

I. Personal Information

I.A. Contact Information

Jungjin Park, Ph.D.
Department of Aerospace Engineering.
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https://aero.umd.edu/clark/faculty/60/Jungjin-Park

I.B. Academic Appointments at UMD

I.B.1. **Assistant research scientist** May, 2013 - Present
Aerospace Engineering, University of Maryland.

1. Amorphous glass cellular structure Supervisor: Prof. Norman Wereley
   - Developed a cellular structure using micro hollow glass spheres for energy absorption and under-water buoyancy applications.
   - Utilized electron microscopy, mechanical testing, and finite element method (FEM) to characterize microstructure and mechanical properties of the cellular structure to understand sintering kinetics and energy absorbing capacity.
   - Developed a cellular structure with tunable energy absorbing property to limit impact stress. (patent in preparation)
   - Developed dry power printing system
   - Involved in development of glass/metal sphere former system.
   - Designed and implemented a novel co-axial nozzle to produce hollow spheres. (1st author, patent in preparation)
   - Conducted an additive manufacturing of glass foam.
   - Developed magnetorheological elastomer for additive manufacturing application.

2. Magnetostrictive materials Supervisor : Prof. Alison Flatau
   - Utilized nanowire array to develop a pressure sensor.
   - Developed a torque sensor utilizing electrodeposited thin film of magnetostrictive materials.
   - Studied on the efficacy of the stress/field annealing to introduce built-in uniaxial anisotropy to the magnetostrictive materials for an energy harvesting application.

- Performed Zinc electrodeposition on flow sensors in aqueous conditions (sea water) to prevent corrosion.
- Participated in a joint project with NAVY in developing a magnetic sensor to detect sediment in ballast.
- Fabricated magnetostrictive Fe-Al sheet material for energy harvesting application.

3. Smart garment developments Supervisor : Prof. Alison Flatau

- Developed passive body size measurements methods.
- Developed a method using 3D reconstruction to build a body to measure body sizes.
- Successfully performed 3D reconstruction of various types of samples in different shapes.
- Developed an algorithm that can measure body size with a prototype of inelastic strip on a legging. We successfully build a wearable prototype that can measure accurate body sizes with a smart phone camera using the algorithm to translate the optical images into the sizes of body parts that are used for making a pants.
- Field tested of the body measurement algorithm was performed with volunteers successfully.

I.B.2. **Post-doctoral fellow** May, 2009 – May, 2013
Aerospace Engineering, University of Maryland.

Magnetostrictive materials Supervisor : Prof. Alison Flatau
- Investigated magnetic nanostructured materials utilizing micromagnetic simulation and FEM to simulate stress induced magnetization change.
- Performed electron microscopies and magnetic force microscopy for fundamental nanoscale characterizations.

I.B.3. **Graduate research assistant** Sept 1999 – April 2006
Material Science and Engineering, University of Maryland.

BioMEMS Research
- Conducted packaging system development and in-situ, programmable biomolecule assembly in microfluidic environment.
- Studied in-situ electrodeposition of chitosan biopolymer and biomolecule (DNA, protein, and enzyme) assembly on the chitosan platform in the microfluidics.

Semiconductor Research
- Research intern (IRST, Italy).
- Studied processing and characterization nanoporous low-K dielectrics. - Investigated the polymerization kinetics of nanoporous low-K and porogen via mass spectrometer.

Liquid crystal material
- Grazing Incidence X-Ray (GIXS) analysis of liquid crystal thin films and buried interfaces (Brookhaven national laboratory, NY).

I.C. Other Employment

I.C.1. **Guest researcher** July 2006 – May 2009
National Institute of Standards and Technology.
100 Bureau Drive, Gaithersburg, MD 20899.

Nanoparticles Research
- Conducted physical characterization (optical properties, hydrodynamic radius, and concentration) of luminescent nanocrystals (quantum dots) for biomolecular detection and imaging.
- Studied fate of nanoparticles in biological system
- Established new methods of elucidating and controlling kinetics of electrostatic interaction between dispersed nanoparticles and various surfaces that comprise the biological/synthetic environment.
- Studied extracellular matrix collagen, self-assembled monolayers and blood proteins.
- Developed a microfluidic system with surface plasmon resonance (SPR) for in-situ monitoring nanoparticle-biomolecule interaction.

I.D. **Educational Background**

Ph.D, in Materials Science and Engineering
University of Maryland, College Park, MD, February 2007
Thesis "Development of bioMEMS device and package for a spatially programmable biomolecule assembly" Advisor: Prof. Gary W. Rubloff

B. Eng, Metallurgical Engineering and Materials Science
Hongik University, Seoul, South Korea, February 1998

I.E. **Professional Certifications, Licenses, and Memberships**

Materials Research Society (MRS), AVS science and technology Society, Materials Research Society (MRS), Materials Research Society of Korea (MRSK), American Chemical Society (ACS), IEEE Magnetics

II. **Research, Scholarly, Creative and/or Professional Activities**

II.A. **Book Chapters**

Magnetostrictive Fe-Ga Nanowires for actuation and sensing applications
AB Flatau, BJH Stadler, J Park, KSM Reddy, PR Downey, C Mudivarthi, Magnetic Nano- and Microwires, 737-776, 2020

II.B. **Published Journal Articles**

1. Bilayer glass foam with tunable energy absorbing property by localizing voids density, Jungjin Park, John M. Howard, Avi Edery, Matthew DeMay, and Norman Wereley. Advanced engineering Materials, Submitted 2021
2. Process parameter effects on cellular structured materials using hollow glass Spheres, J Park, JM Howard, A Edery, M DeMay, N Wereley, Materials and Manufacturing Processes 34 (9), 1026-1034, 2019
3. Electrodeposited Fe–Ga Alloy Films for Directly Coupled Noncontact Torque Sensing, M Hein, J Park, JA Cozzo, A Flatau, BJH Stadler, IEEE Sensors Journal 19 (16), 6655-6661, 2019
4. Magnetostrictive whisker sensor application of carbon fiber-alfenol composites

SM Na, JJ Park, NJ Jones, N Wereley, AB Flatau, Smart Materials and Structures 27 (10), 105010, 2018

5. Magnetic and structural anisotropic properties of magnetostrictive Fe-Ga flake particles and their epoxy-bonded composites, SM Na, JJ Park, S Lee, SY Jeong, AB Flatau Materials Letters 213, 326-330, 2018
6. Field-anneal-induced magnetic anisotropy in highly textured Fe-Al magnetostrictive strips, JJ Park, SM Na, AB Flatau, AIP Advances 7 (5), 056431, 2017
7. Magnetostrictive Fe–Ga/Cu nanowires array With GMR sensor for sensing applied pressure, JJ Park, KSM Reddy, B Stadler, A Flatau, IEEE Sensors Journal 17 (7), 2015-2020, 2017
8. Stress-anneal-induced magnetic anisotropy in highly textured Fe-Ga and Fe-Al magnetostrictive strips for bending-mode vibrational energy harvesters, JJ Park, SM Na, G Raghunath, AB Flatau, AIP Advances 6 (5), 056221, 2016
9. Electrochemical synthesis of magnetostrictive Fe–Ga/Cu multilayered nanowire arrays with tailored magnetic response, SM Reddy, JJ Park, SM Na, MM Maqableh, AB Flatau, BJH Stadler, Advanced Functional Materials 21 (24), 4677-4683, 2011
10. Characterization of the magnetic properties of multilayer magnetostrictive iron-gallium nanowires, JJ Park, M Reddy, C Mudivarthi, PR Downey, BJH Stadler, AB Flatau, Journal of Applied Physics 107 (9), 09A954, 2010
11. Characterization of non-equilibrium nanoparticle adsorption on a model biological substrate, JJ Park, MC Weiger, SH De Paoli Lacerda, D Pristinski, ML Becker, Langmuir 26 (7), 4822-4830, 2010
12. Quantification of the binding affinity of a specific hydroxyapatite binding peptide, MC Weiger, JJ Park, MD Roy, CM Stafford, A Karim, ML Becker, Biomaterials 31 (11), 2955-2963, 2010
13. Interaction of gold nanoparticles with common human blood proteins, SHDP Lacerda, JJ Park, C Meuse, D Pristinski, ML Becker, A Karim, ACS nano 4 (1), 365-379, 2010
14. SPR imaging study of DNA wrapped single wall carbon nanotube (ssDNA-SWCNT) adsorption on a model biological (collagen) substrate, JJ Park, JA Fagan, JY Huh, KB Migler, A Karim, D Raghavan, Soft Matter 6 (21), 5581-5588, 2010
15. Characterization of a specific hydroxyapatite-binding peptide using SPR imaging, MC Weiger, JJ Park, MD Roy, A Karim, ML Becker, Abstracts of Papers of the American Chemical Society 238, 2009
16. Langmuir adsorption study of the interaction of CdSe/ZnS quantum dots with model substrates: influence of substrate surface chemistry and pH, JJ Park, SHDP Lacerda, SK Stanley, BM Vogel, S Kim, JF Douglas, Langmuir 25 (1), 443-450, 2009
17. A fast-response microfluidic gas concentrating device for environmental sensing, S Li, JC Day, JJ Park, CP Cadou, R Ghodssi, Sensors and Actuators A: Physical 136 (1), 69-79, 2007
18. Electrochemical study of chitosan films deposited from solution at reducing Potentials, RA Zangmeister, JJ Park, GW Rubloff, MJ Tarlov, Electrochimica acta 51 (25), 5324-5333, 2006
19. Electrochemical Study of Chitosan Films Deposited on Gold Electrodes, RA Zangmeister, JJ Park, GW Rubloff, MJ Tarlov, Langmuir 51 (25), 5324-5333, 2006
20. Chitosan-mediated in situ biomolecule assembly in completely packaged microfluidic devices, JJ Park, X Luo, H Yi, TM Valentine, GF Payne, WE Bentley, R Ghodssi,

Lab on a Chip 6 (10), 1315-1321, 2006

21. Thin-film transformations and volatile products in the formation of nanoporous low-polymethylsilsesquioxane-based dielectric, P Lazzeri, L Vanzetti, M Anderle, M Bersani, JJ Park, Z Lin, RM Briber, Journal of Vacuum Science & Technology B: Microelectronics and Nanometer 2005
22. ToF-SIMS studies of nanoporous PMSSQ materials: kinetics and reactions in the processing of low-K dielectrics for ULSI applications, P Lazzeri, GW Rubloff, L Vanzetti, RM Briber, M Anderle, M Bersani, .Surface and Interface Analysis. 2004

II.C. Published Conference Proceedings

1. Xiaolong Luo, Jung Jin Park, Hyunmin Yi, Angela T. Lewandowski, William E. Bentley, Gregory F. Payne, Reza Ghodssi, Gary W. Rubloff. "Chitosan-mediated Enzyme Assembly toward Rebuilding a Metabolic Pathway in the Microfluidic Environment" Materials Research Society (MRS) San Francisco, CA, April 2007
2. In situ biomolecule assembly and activity within completely packaged microfluidic Devices, JJ Park, X Luo, H Yi, R Ghodssi, GW Rubloff, 2006 IEEE/NLM Life Science Systems and Applications Workshop, 1-2, 2006
3. Chitosan as a functional interface between biology and microsystems, ST Koev, MA Powers, JJ Park, H Yi, L Wu, WE Bentley, GF Payne, Bio Micro and Nanosystems Conference, 82-82, 2006
4. J. J. Park, T.M. Valentine, R. Ghodssi, and G. W. Rubloff, "Integrated Chip and Package Design for Surface-Controlled Bioreaction Processes with Robust, Reusable Fluidic Sealing;, Proceedings of MicroTAS 2005, 9th International Conference on Miniaturized Systems in Chemistry and Life Sciences, October 9-13, 2005.Boston MA, 2005
5. Material Characterization and the Formation of Nanoporous PMSSQ Low-K Dielectrics, P Lazzeri, L Vanzetti, E Iacob, M Bersani, M Anderle, JJ Park, Z Lin, AIP Conference Proceedings 683 (1), 551-555, 2003
6. Voltage-programmable biofunctionality in MEMS environments using electrodeposition of a reactive polysaccharide, LQ Wu, H Yi, S Li, DA Small, JJ Park, GW Rubloff, R Ghodssi, WE Bentley, Transducers'03. 12th International Conference on Solid-State Sensors. 2003
7. P. Lazzeri, L. Vanzetti, E. Iacob, M. Bersani, M. Anderle, J. J. Park, Z. Lin, R. M. Briber, G. W. Rubloff, and R. D. Miller. " Material Characterization and the Formation of Nanoporous PMSSQ Low-K Dielectrics" Proc. 2003 International Conference on Characterization and Metrology for ULSI Technology, Austin, TX, March 24-28, 551-555, 2003

II.D. Conferences, Workshops, and Talks

1. Magnetic Particle Reinforced Elastomer Composites for Additive Manufacturing, Jungjin Park, Andrew Becknel, Alison Flatau, Norman Wereley, INTERMAG21, April 26-30 2021, virtual.
2. Active Galfenol Bending Sensor for Monitoring Bending Load Impedances. E.J. Barranco , J. Park , J. Yoo and A.B. Flatau, 14th Joint MMM-Intermag Conference, January 14-18, 2019, Washington, DC
3. Field-Anneal-Induced Magnetic Anisotropy in Highly Textured Fe-Al Magnetostrictive Strips. J. Park, S. Na and A.B. Flatau, 161st Annual Conference on Magnetism and Magnetic Materials, October 31 – November 4, 2016, New Orleans, LA

4. Stress-anneal-induced magnetic anisotropy in highly textured Fe-Ga and Fe-Al magnetostrictive strips for bending-mode vibrational energy harvesters. J. Park , S. Na , G. Raghunath and A.B. Flatau,13th Joint MMM-Intermag Conference, January 11-15, 2016, San Diego, CA
5. Determining magnetostrictive constants from magnetostriction in oriented Galfenol. G. Raghunath , J. Park and A.B. Flatau, 13th Joint MMM-Intermag Conference, January 11-15, 2016, San Diego, CA
6. Measurement of magnetostriction in an individual multilayered Fe-Ga/Cu nanowire using atomic force microscopy. J. Park , E.C. Estrine , B.J. Stadler and A.B. Flatau, 58th Conference on Magnetism and Magnetic Materials, November 4-8, 2013, Denver, CO
7. Epitaxial Fe1-xGax / GaAs Structures via Electrochemistry for Spintronics and MEMS Applications K. Reddy, J. Park, S. Na, M. Maqableh, A. Flatau, and B. Stadler, 12th Joint MMM-Intermag Conference, January 14-18, 2013, Chicago, IL
8. Hysteresis measurement of individual multilayered FeGa/Cu nanowires using magnetic force microscopy. J. Park , M. Reddy, B.J. Stadler and A.B. Flatau,12th Joint MMM-Intermag Conference, January 14-18, 2013, Chicago, IL
9. Structural and Magnetic Characterization of Electrodeposited Magnetostrictive Fe1-xGax/Cu Multilayered Nanowires. K. Reddy, J. Park , S. Na , M. Maqableh, A. Flatau and B. Stadler, 56th Conference on Magnetism and Magnetic Materials, October 30 - November 3, 2011, Scottsdale, AZ
10. Epitaxial Fe1-xGax / GaAs Structures via Electrochemistry for Spintronics and MEMS Applications. K. Reddy, J. Park, S. Na, M. Maqableh, A. Flatau and B. Stadler, 256th Conference on Magnetism and Magnetic Materials, October 30 - November 3, 2011, Scottsdale, AZ
11. Characterization of the Magnetic Properties of Multilayer Magnetostrictive Iron-Gallium Nanowires, 11th Joint MMM-Intermag Conference, Washington D.C, January 18 - 22 (2010)
12. “Comparative adsorption of CdSe/ZnS quantum dot nanoparticles on collagen versus model SAM surfaces”, MRS Symposium, Boston, MA, November 30 - December 4 (2009)
13. “Interactions of DNA wrapped Single Wall Carbon Nanotube (SWCNT) with Collagen as Model Biological Substrate: An SPR Study”, MRS Symposium, Boston, MA, November 30 - December 4 (2009)
14. “Interaction of Quantum Dots with Collagen Immobilized Surfaces” ACS meeting, Washington D.C, August 16-20 (2009)
15. “Characterization of a specific hydroxyapatite-binding peptide using SPR imaging” ACS meeting, Washington D.C, August 16-20 (2009)
16. “Interaction of Quantum Dots with Collagen Immobilized Surfaces in Microfluidic Device”, MRS Symposium, Boston, MA, December 1-5 (2008)
17. “Langmuir Adsorption Study of CdSe/ZnS Quantum Dots on Model Substrate”, American Academy of Nanomedicine, Potomac, MD, September 4-7 (2008)
18. “Langmuir Adsorption Study of CdSe/ZnS Quantum Dots on Synthetic Template: Substrate Surface Chemistry and pH”, Particles 2008, Orlando, FL, May 10-13, (2008)
19. “Chitosan-mediated Enzyme Assembly toward Rebuilding a Metabolic Pathway in the Microfluidic Environment” MRS Symposium, San Francisco, CA, April 10-13, (2007)

20. "In situ Biomolecule Assembly and Activity within Completely Packaged Microfluidic Devices" IEEE/NLM Life Science Systems and Applications Workshop, Bethesda, MD, July 13-14 (2006)
21. "Biomolecule Assembly and Functionality in Completely Packaged Microfluidic Devices" AVS 53rd International Symposium, San Francisco, CA, November 12-17, (2006)
22. "Development of A Fast-Response Microfluidic Gas Concentrating Device" EUROSENSORS XIX, Barcelona, Spain, September 11-14, (2005)
23. "BioMEMS Chip and Package Design for Surface-Controlled Bioreaction Processes", AVS 52nd International Symposium, Boston, MA, October 30-November 4, (2005)
24. "Integrated Chip and Package Design for Surface-Controlled Bioreaction Processes with Robust, Reusable Fluidic Sealing", The 9th International Conference on Miniaturized Chemical and Biochemical Analysis Systems (MicroTAS), Boston, Massachusetts, October 9-13, (2005)
25. "Combinatorial Studies of Biopolymer Deposition and Surface Functionalization for Biomolecular Reactions in BioMEMS Environments" IVC-16/ICSS-12/NANO-8/AIV-17, Venezia, Italy, June, 29, (2004)
26. "Processing and Characterization of PMSSQ Based Materials for Nanoporous Low-K Dielectrics" P. Lazzeri, J.J. Park, et al. AVS 50th International Symposium, Baltimore MD, November 3-8. (2003)

II.E. Sponsored Research and Programs – Administered by the Office of Research Administration (ORA)

II.E.1. Grants

II.E.2. Contracts

II.F. Patents

1. Fabrication and integration of polymeric bioMEMS, JJ Park, R Ghodssi, GW Rubloff, MJ Kastantin, S Li, LQ Wu, H Yi, US Patent 7,375,404, 2008
2. Co- curing process for stress tunable glass foam. Jungjin Park, Norman Wereley, John M. Howard, Avi Edery, Matthew DeMay, 2020 submitted.
3. Single-piece coaxial nozzle for producing hollow shells, Jungjin Park, Norman Wereley, John M. Howard, Avi Edery, Matthew DeMay, 2021 in preparation
4. Development of dry printing system, Jungjin Park, Norman Wereley, John M. Howard, Avi Edery, Matthew DeMay, 2021 in preparation

II.G. Research Fellowships, Prizes and Awards

II.H. Advising: Research

II.H.1. **Undergraduate**

1. Maria Pascale 2014 – 2015
   Study on magnetostrictive properties of Fe-Ga nanowires.
   3rd place for best presentations and papers at 14th AIAA YPSE Conference.

2. Joey Cozzo 2014 – 2015
   Magnetostrictive Galfenol (Fe-Ga) as a Non-Contact Stress Sensor.
   Honorable Mention for best presentations and papers at 14th AIAA YPSE Conference

3. Shannon Donaldson 2019 - 2020
   ENME-499 Polymer matrix composites reinforced with hollow amorphous glass

4. Elizabeth Barranco 2018 - 2019
   Fe-Al and Fe-Ga magnetostrictive material development for flow sensing application.

II.H.2. **Doctoral**

1. Colleen Murray 2020-Present
   Research on hollow microsphere system

II.I. **Professional and Extension Education**

Involved in micromagnetic simulation tool 'Object Oriented MicroMagnetic Framework (OOMMF)' development in NanoHUB (Computational nanotechnology research site)

III. **Service and Outreach**

III.A. **Editorships, Editorial Boards, and Reviewing Activities**

III.A.1. Reviewing Activities for Journals and Presses

III.A.2. Reviewing Activities for Conferences

III.B. **Committees, Professional & Campus Service**

1. Maryland Day– demonstrating various material science related equipment and laboratories in the University of Maryland's largest community outreach event.
2. Managing laboratories with the knowledge about chemicals storage, safety procedures, trainings, and chemical waste disposal.

III.C. **Organizing Committee**

Session chair, INTERMAG 2021 April 26 – 30 2021.

III.D. **External Service and Consulting**

1. Dentsplysirona: magnetic material grain orientation analysis (2020)
2. Technical Data Analysis, Inc.: corrosion sensor (2017)
3. Integrity Research Institute.: MS-PZT combination in a non-permeable metal device (2019)

III.E. **Community Engagements, Local, State, National, International**

1. Career day volunteer – Brown station elementary school
2. Montgomery county science fair volunteer – Judge