

Seok Kim PhD

Assistant Professor	Department of Mechanical Science & Engineering	University of Illinois at Urbana-Champaign	
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Academic Training

Postgraduate **University of Illinois at Urbana-Champaign, IL, USA**
Mar 2009 – Aug 2011 Postdoctoral Research Associate, Mentor: *John A. Rogers*

Ph.D. (2009) **Carnegie Mellon University, Pittsburgh, PA, USA**
Aug 2005 – Jan 2009 Mechanical Engineering, Thesis Advisor: *Metin Sitti*

M.S. (2005) **University of California at Los Angeles, CA, USA**
Sep 2003 – Dec 2004 Mechanical and Aerospace Engineering

B.S. (2000) **Pohang University of Science and Technology (POSTECH), Pohang, S. Korea**
Mar 1994 – Feb 2000 Mechanical Engineering

Professional Experience

Nov 2011 – Present **Department of Mechanical Science and Engineering**
 University of Illinois at Urbana-Champaign, IL, USA
 Assistant Professor

Aug 2005 – Jan 2009 **NanoRobotics Laboratory, Carnegie Mellon University, Pittsburgh, PA, USA**
 Research Assistant

Sep 2003 – Dec 2004 **MicroManufacturing Laboratory, University of California at Los Angeles, CA, USA**
 Graduate Student Researcher

Awards and Honors

July 2015 KSEA (Korean-American Scientists and Engineers Association) YIG (Young Investigator Grant) Award

June 2015 ASME Chao and Trigger Young Manufacturing Engineer Award

Apr 2015 Engineering Council Award for Excellence in Advising, UIUC

Feb 2014 National Science Foundation CAREER (Faculty Early Career Development) Award

Sep 2003 CNSI (California NanoSystems Institute) fellowship, UCLA

Professional Journal and Academic Society Review

2012-present Associate Editor
 Journal of Micro-Bio Robotics, Springer

2016 Symposium Organizer
 2016 MRS Spring (Materials Research Society)
 Phoenix, Arizona

2012-present Topic Organizer / Session Chair
 ASME International Mechanical Engineering Congress and Exposition (IMECE)
 Houston, Texas / San Diego, California / Montreal, Canada / Houston, Texas / Phoenix,
 Arizona / Tampa, Florida

2016-present Program Committee Member
 International Conference on Manipulation, Automation and Robotics at Small Scales
 (MARSS)
 Paris, France / Montreal, Canada

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Professional Society Membership

Member of the American Society of Mechanical Engineers (ASME)
Member of the Institute of Electrical and Electronics Engineers (IEEE)
Member of the Materials Research Society (MRS)
Member of the Korean-American Scientists and Engineers Association (KSEA)

Professional Activity

Sep 2004 – Dec 2004 President of Korean Graduate Student Association, UCLA

Publications

Journal Articles

53. R. Potekin, S. Kim, D.M. McFarland, L.A. Bergman, H. Cho, and A.F. Vakakis, "A micromechanical mass sensing method based on amplitude tracking within an ultrawide broadband resonance," *Nonlinear Dynamics*, in press.
52. Z. Yang, J. Park, and S. Kim, "Magnetically Responsive Elastomer-Silicon Hybrid Surfaces for Fluid and Light Manipulation," *Small*, 14, 1702839 (2018).
51. Z. Yang, R. Potekin, A. Vakakis, and S. Kim, "A Spring-Mass System with Elastomeric Beams and Stretchable Interconnects," *Journal of Micromechanics and Microengineering*, 28, 014003 (2018).
50. J. Eisenhaure and S. Kim, "High-Strain Shape Memory Polymers as Practical Dry Adhesives," *International Journal of Adhesion and Adhesives*, 81, 74-78 (2018).
49. Y. Kim, J. Kim, B.-K. Kim, H.-J. Kim, S. Kim, E. Kim, J.-H. Hwang, and S.-H. Park, "Application of Flash Lamp Annealing on Nitrogen-Doped Amorphous Indium-Gallium-Zinc Oxide Thin Film Transistors," *ECS Journal of Solid State Science and Technology*, 6, 778-785 (2017).
48. J. Park, Z. Yang, and S. Kim, "Black Silicon/Elastomer Composite Surface with Switchable Wettability and Adhesion between Lotus and Rose Petal Effects by Mechanical Strain," *ACS Applied Materials & Interfaces*, 9, 33333-33340 (2017).
47. J. Park and S. Kim, "Droplet Manipulation on A Structured Shape Memory Polymer Surface," *Lab on a Chip*, 17, 1793-1801 (2017)
46. J. Eisenhaure and S. Kim, "A Review of the State of Dry Adhesives: Biomimetic Structures and the Alternative Designs They Inspire," *MDPI Micromachines*, 8, 125-1-125-38 (2017)
45. Y. Kim, S. Park, S. Kim, B.-K. Kim, Y. Choi, J.-H. Hwang, H.J. Kim, "Flash lamp annealing of indium tin oxide thin-films deposited on polyimide backplanes," *Thin Solid Films*, 628, 88-95 (2017)
44. Z. Yang and S. Kim, "Positioning Errors in Transfer Printing-Based Microassembly," *Journal of Micro-Bio Robotics*, 12, 53-64 (2017)
43. H. Keum, Y. Jiang, J. Park, J. C. Flanagan, M. Shim, and S. Kim, "Solvent-Free Patterning of Colloidal Quantum Dot Films Utilizing Shape Memory Polymers," *MDPI Micromachines*, 8, 18 (2017)
42. J. Eisenhaure and S. Kim, "Laser-Driven Shape Memory Effect for Transfer Printing Combining Parallelism with Individual Object Control," *Advanced Materials Technologies*, 1, 1600098 (2016)
41. J. Seo, J. Eisenhaure, and S. Kim, "Micro-wedge array surface of a shape memory polymer as a reversible dry adhesive," *Extreme Mechanics Letters*, 9, 207 (2016)
40. H. Keum, Z. Yang, K. Han, D.E. Handler, T.N. Nguyen, J. Schutt-Aine, G. Bahl, and S. Kim, "Microassembly of Heterogeneous Materials using Transfer Printing and Thermal Processing," *Nature Scientific Reports*, 6, 29925 (2016)

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39. S. Kim, "Lego-Like Mioassembly Using Reversible Dry Adhesion," *IEEE Potentials*, 35, 4, 14 (2016)
38. S. Lee, B. Kang, H. Keum, N. Ahmed, J.A. Rogers, P.M. Ferreira, S. Kim*, and B Min*, "Heterogeneously Assembled Metamaterials and Metadevices via 3D Modular Transfer Printing," *Nature Scientific Reports*, 6, 27621 (2016), *co-corresponding authors
37. A. Bhaswara, H. Keum, F. Mathieu, B. Legrand, S. Kim, L. Nicu, and T. Leichle, "A Simple Fabrication Process based on Micro-Masonry for the Realization of Nanoplate Resonators with Integrated Actuation and Detection Schemes," *Frontiers in Mechanical Engineering, section Micro- and Nanoelectromechanical Systems*, 01 March (2016)
36. Z. Yang, Q. Chen, A.E. Elbanna, and S. Kim, "Transfer printing enabled soft composite films for tunable surface topography," *Extreme Mechanics Letters*, 7, 145 (2016)
35. B. Jeong, C. Pettit, S. Dharmasena, H. Keum, J. Lee, J. Kim, S. Kim, D.M. McFarland, L.A. Bergman, A.F. Vakakis, and H. Cho, "Utilizing Intentional Internal Resonance to Achieve Multi-Harmonic Atomic Force Microscopy," *Nanotechnology*, 27, 199501 (2016)
34. J. Eisenhaure, S.I. Rhee, A.M. Al-okaily, A. Carlson, P.M. Ferreira, and S. Kim, "The Use of Shape Memory Polymers for MEMS Assembly," *IEEE/ASME Journal of Microelectromechanical Systems*, 25, 69 (2016)
33. Z. Yang, B. Jeong, A. Vakakis, and S. Kim, "A Tip-Tilt-Piston Micromirror with An Elastomeric Universal Joint Fabricated via Micro-Masonry," *IEEE/ASME Journal of Microelectromechanical Systems Letters*, 24, 262 (2015)
32. Y. Xue, Y. Zhang, X. Feng, S. Kim, J.A. Rogers, and Y. Huang, "A theoretical model of reversible adhesion in shape memory surface relief structures and its application in transfer printing," *Journal of the Mechanics and Physics of Solids*, 77, 27 (2015)
31. H. Ning*, N.A. Krueger*, X. Sheng, H. Keum, C. Zhang, K.D. Choquette, X. Li, S. Kim, J.A. Rogers, and P.V. Braun, "Transfer printing of tunable porous silicon microcavities with embedded emitters," *ACS Photonics*, 1, 1144 (2014)
30. B. Jeong, H. Cho, H. Keum, S. Kim, D.M. McFarland, L.A. Bergman, W.P. King, and A.F. Vakakis, "Complex Nonlinear Dynamics in the Limit of Weak Coupling of a System of Microcantilevers Connected by a Geometrically Nonlinear Tunable Nanomembrane," *Nanotechnology*, 25, 465501 (2014)
29. A. Bhaswara, H. Keum, S. Rhee, B. Legrand, F. Mathieu, S. Kim, L. Nicu, and T. Leichle, "Fabrication of Nanoplate Resonating Structures via Micro-Masonry," *Journal of Micromechanics and Microengineering*, 24, 115012 (2014)
28. J. Eisenhaure, S.I. Rhee, A.M. Al-okaily, A. Carlson, P.M. Ferreira, and S. Kim, "The Use of Shape Memory Polymers for Microassembly by Transfer Printing," *IEEE/ASME Journal of Microelectromechanical Systems Letters*, 23, 1012 (2014)
27. J. Eisenhaure and S. Kim, "An Internally Heated Shape Memory Polymer Dry Adhesive," *Polymers*, 6, 2274 (2014)
26. H. Keum and S. Kim, "Micro-Masonry for 3D Additive Micromanufacturing," *Journal of Visualized Experiments*, 90, e51974 (2014)
25. Y. Zhang, H. Keum, K. Park, R. Bashir, and S. Kim, "Micro-Masonry of MEMS Sensors and Actuators," *IEEE/ASME Journal of Microelectromechanical Systems*, 23, 308 (2014)
24. J. Eisenhaure, T. Xie, S. Varghese, and S. Kim, "Microstructured Shape Memory Polymer Surfaces with Reversible Dry Adhesion," *ACS Applied Materials and Interfaces*, 5, 7714 (2013)
23. H. Keum*, H.-J. Chung*, and S. Kim, "Electrical Contact at The Interface between Silicon and Transfer-Printed Gold Films by Eutectic Joining," *ACS Applied Materials and Interfaces*, 5, 6061 (2013) *equally contributing authors

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22. J.-W. Jeong, B. Park, H. Keum, S. Kim, J. A. Rogers, and O. Solgaard, "Two-Axis MEMS Scanner with Transfer-Printed High-Reflectivity, Broadband Monolithic Silicon Photonic Crystal Mirrors," *Optics Express*, 21, 13800 (2013)
21. H. Keum, M. Seong, S. Sinha, and S. Kim, "Electrostatically Driven Collapsible Au Thin Films Assembled Using Transfer Printing for Thermal Switching," *Applied Physics Letters*, 100, 211904 (2012)
20. H. Keum, A. Carlson, H. Ning, A. Mihi, J. Eisenhaure, P.V. Braun, J.A. Rogers, S. Kim, "Silicon Micro-Masonry Using Elastomeric Stamps for Three-Dimensional Microfabrication," *Journal of Micromechanics and Microengineering*, 20, 055018 (2012)
19. H. Cheng, M. Li, J. Wu, A. Carlson, S. Kim, Y. Huang, Z. Kang, K.-C. Hwang, and J.A. Rogers, "A Viscoelastic Model for the Rate Effect in Transfer Printing," *Journal of Applied Mechanics -Transactions of the ASME*, 80, 041019 (2012)
18. Y. Su, Z. Liu, S. Kim, J. Wu, Y. Huang, and J.A. Rogers, "Mechanics of stretchable electronics with high fill factors," *International Journal of Solids & Structures*, 49, 3416 (2012)
17. S. Kim*, A. Carlson*, H. Cheng, S. Lee, J.-K. Park, Y. Huang, J.A. Rogers, "Enhanced Adhesion With Pedestal-Shaped Elastomeric Stamps for Transfer Printing," *Applied Physics Letters*, 100, 171909 (2012) *equally contributing authors
16. S.Y. Yang, A. Carlson, H. Cheng, Q. Yu, N. Ahmed, J. Wu, S. Kim, M. Sitti, P.M. Ferreira, Y. Huang, and J.A. Rogers, "Elastomer surfaces with directionally dependent adhesion strength and their use in transfer printing with continuous roll-to-roll applications," *Advanced Materials*, 24, 2117 (2012)
15. H. Yang, D. Zhao, J.-H. Seo, S. Chuwongin, S. Kim, J.A. Rogers, Z. Ma, and W. Zhou, "Broadband Membrane Reflectors on Glass," *IEEE Photonics Technology Letters*, 24, 476 (2012)
14. S. Kim, Y. Su, A. Mihi, S. Lee, Z. Liu, T.K. Bhandakkar, J. Wu, J.B. Geddes III, H.T. Johnson, Y. Zhang, J.-K. Park, P.V. Braun, Y. Huang, and J.A. Rogers, "Imbricate Scales as a Design Construct for Microsystems Technologies," *Small*, 8, 901 (2012) **Cover Picture**
13. Y. Meguc, S. Yang, S. Kim, J.A. Rogers, and M. Sitti, "Gecko Inspired Controllable Adhesive Structures Applied to Micromanipulation," *Advanced Functional Materials*, 22, 1245 (2012) **Frontispiece**
12. J. Wu, S. Kim, A. Carlson, C.F. Lu, K.-C. Hwang, Y. Huang, and J.A. Rogers, "Contact Radius of Stamps in Reversible Adhesion," *Theoretical and Applied Mechanics Letters*, 1, 011001 (2011)
11. D. Oh*, S. Kim*, S. Sinha, J.A. Rogers, and D. Cahill, "Interfacial thermal conductance of transfer-printed metal films," *Advanced Materials*, 23, 5028 (2011) **Frontispiece** * equally contributing authors
10. J. Wu, S. Kim, W. Chen, A. Carlson, K.-C. Hwang, Y. Huang, and J.A. Rogers, "Mechanics of Reversible Adhesion," *Soft Matter*, 7, 8657 (2011)
9. H. Kim, E. Brueckner, J. Song, Y. Li, S. Kim, C. Lu, J. Sulkin, K. Choquette, Y. Huang, R.G. Nuzzo, and J.A. Rogers, "Unusual strategies for using indium gallium nitride grown on silicon (111) for solid-state lighting," *Proceedings of the National Academy of Sciences of USA*, 108, 10072 (2011) **Cover Picture**
8. S. Kim, J. Wu, A. Carlson, S.H. Jin, A. Kovalsky, P. Glass, Z. Liu, N. Ahmed, S.L. Elgan, W. Chen, P.M. Ferreira, M. Sitti, Y. Huang, and J.A. Rogers, "Microstructured elastomeric surfaces with reversible adhesion and an example of their use in deterministic assembly by transfer printing," *Proceedings of the National Academy of Sciences of USA*, 107, 17095 (2010)
7. S. Kim, M. Sitti, T. Xie, and X. Xiao, "Reversible dry micro-fibrillar adhesives with thermally controllable adhesion," *Soft Matter*, 5, 3689 (2009)
6. S. Kim, E. Cheung, and M. Sitti, "Wet self-cleaning of biologically inspired elastomer mushroom shaped microfibrillar adhesives," *Langmuir*, 25, 7196 (2009)

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5. M.P. Murphy, S. Kim, and M. Sitti, "Enhanced adhesion by gecko-inspired hierarchical fibrillar adhesives," ***ACS Applied Materials & Interfaces***, 1, 849 (2009) **Cover Picture**
4. R. Long, C.-Y. Hui, S. Kim, and M. Sitti, "Modeling the soft backing layer thickness effect on adhesion of elastic microfiber arrays," ***Journal of Applied Physics***, 104, 044301 (2008)
3. S. Kim, B. Aksak, and M. Sitti, "Enhanced friction of elastomer microfiber adhesives with spatulate tips," ***Applied Physics Letters***, 91, 221913 (2007)
2. S. Kim, M. Sitti, C.-Y. Hui, R. Long, and A. Jagota, "Effect of backing layer thickness on adhesion of single-level elastomer fiber arrays," ***Applied Physics Letters***, 91, 161905 (2007)
1. S. Kim and M. Sitti, "Biologically inspired polymer microfibers with spatulate tips as repeatable fibrillar adhesives," ***Applied Physics Letters***, 89, 261911 (2006), Selected among 15 core papers of research front on GECKO ADHESIVE SETAE from the field of material science for mapping from the list of Fast Moving Fronts for January 2008 by Thomson Scientific, <http://www.esi-topics.com/fmf/maps/january2008-map2.html>