Curriculum Vitae of KOH Soo Jin Adrian

Name: KOH Soo Jin Adrian
Title: Assistant Professor

Office Mailing Address: Department of Mechanical Engineering, Faculty of Engineering, 9 Engineering Drive 1, National University of Singapore, Singapore 117575

Email: adrian_koh@nus.edu.sg
Contact No: +65-6516 8023

Current Position: Assistant professor, Department of Mechanical Engineering, National University of Singapore.

Percentage of time spent in Singapore every year for the current position: About 90%, 10% spent on conference travels and attending to invitations to speak.

Employment History

- 2012 – present Assistant Professor, Department of Mechanical Engineering, NUS
- 2007 – 2012 Scientist, Institute of High Performance Computing, A*STAR
- 2008 – 2010 Postdoctoral Researcher, Harvard School of Engineering and Applied Sciences, Harvard University, Massachusetts, USA
- 2002 – 2003 Design Engineer, Buro Engineers, Singapore

Academic Qualifications

- PhD, Integrative Sciences & Engineering, NUS, 2008
- Masters of Engineering, Civil Engineering, NUS, 2003
- Bachelor of Engineering (Hons., 1st Class) with Minor in Business Administration, NUS, 2000

Research Interests

- Mechanics of Soft Active Materials
  Analysis, optimization, design, characterization and prototype development of soft active materials.

- Soft Robotics
  Development of artificial muscle modules for integrative soft robotics applications.

- Motion-based Energy Harvesting
  Development of stretchable generator pumps for low frequency, high power output motion-based energy harvesting.

- Autonomous Sensing
  Stretchable sensors for real-time rail track health monitoring.

- Applied Mechanics
  For design of innovative solar panel designs and deployment, and devising standards for safety harnesses for use in work sites.

Selected List of Publications

1. A. T. Mathew, C. Liu, T. Y. N. Ng and S. J. A. Koh, “A high energy dielectric-elastomer-amplified piezoelectric (DEAmP) to harvest low frequency motions”. Sens. Act. A 294 (2019): 61–72.
2. Y. F. Goh, S. Akbari, V. T. K. Vo and S. J. A. Koh, “Electrically-Induced Actuation of Acrylic-Based Dielectric Elastomers in Excess of 500% Strain”. Soft Robotics 6 (2018): 675–684.
3. S. J. A. Koh, C. Keplinger, R. Kaltseis, C. C. Foo, R. Baumgartner, S. Bauer and Z. Suo, “High-performance electromechanical transduction using laterally-constrained dielectric elastomers part I: Actuation processes”. J. Mech. Phys. Sol. 105 (2017): 81–94.
4. A. T. Mathew and S. J. A. Koh, “Operational limits of a non-homogeneous dielectric elastomer transducer”, Int. J. Smart Nano Mat. DOI: 10.1080/19475411.2017.1421276 (2017).
5. V. T. K. Vo, A. T. Mathew and S. J. A. Koh, “Stackable configurations of artificial muscle modules that is continuously-tunable by voltage”. SPIE EAPAD 2017 10163 (2017): art. no. 101632K.
6. Y. S. Teh and S. J. A. Koh, “Giant continuously-tunable actuation of a dielectric elastomer ring actuator”. Ex. Mech. Lett. 9 (2016): 195–203
7. H. Shea, S. J. A. Koh, I. Graz and J. Shintake, “Dielectric Elastomers as EAPs: How to start experimenting with them?” Book Chapter in Electromechanically Active Polymers, Polymers and Polymeric Composites: A Reference Series, Springer International (2016), Chapter 34, pp 767–788.
8. Y. Wong, J. Goh and S. J. A. Koh, “Prototype demonstration of a stretchable energy harvester” in Proceedings of 1st International Symposium of Engineering Science, Singapore, May 19–20, 2015.
9. Q. J. Lim, P. Wang, S. J. A. Koh, E. H. Khoo and K. Bertoldi, “Wave propagation in fractal-inspired self-similar beam lattices”. Appl. Phys. Lett. 107 (2015): 221911.
10. R. Kaltseis, C. Keplinger, S. J. A. Koh, R. Baumgartner, Y. F. Goh, W. H. Ng, A. Kogler, A. Trols, C. C. Foo, Z. Suo and S. Bauer, “Natural rubber for sustainable high-power electrical energy generation”. RSC Adv. 4 (2014): 27905–27913.
11. C. C. Foo, S. J. A. Koh, C. Keplinger, R. Kaltseis, S. Bauer and Z. Suo, “Performance of Dielectric Elastomer Generators”. J. Appl. Phys. 111 (2012): art. no. 094107.
12. C. C. Foo, S. Cai, S. J. A. Koh, S. Bauer and Z. Suo, “Model of Dissipative Dielectric Elastomers”. J. Appl. Phys. 111 (2012): art. no. 034102.
13. X. Zhao, S. J. A. Koh and Z. Suo, “Nonequilibrium Thermodynamics of Dielectric Elastomers”. Int. J. Appl. Mech. 3 (2011): 203–217.

14. S. J. A. Koh, C. Keplinger, T. Li, S. Bauer and Z. Suo, “Dielectric Elastomer Generators: How much energy can be converted?”. IEEE/ASME Trans. Mech. 16 (2011): 33–41.
15. S. J. A. Koh, X. Zhao and Z. Suo, “Maximal energy that can be converted by a dielectric elastomer generator”. Appl. Phys. Lett. 94 (2009): 262902.

Patents held

1. “Dielectric-elastomer-amplified piezoelectrics to harvest low frequency motions”, A. T. Mathew, C. Liu, T. Y. N. Ng and S. J. A. Koh, Singapore Patent Office, Application No.: 10201902560R. Filed on 21 March 2019.
2. “Dielectric elastomer transducer based exoskeleton type knee motion harvester”, S. K. Sahu, K. Patra and S. J. A. Koh, Indian Patent Office, Application No.: E-18(iii)/304/2018/KOL. Filed on 28 March 2018.

Awards & Honours

- Best Demonstration Award (3rd Place) at the SPIE EAPAD 2018 in EAP-in-action, for “Dielectric elastomer energy harvester autonomously primed by piezo- and tribo-electricity”, held at Denver, CO, USA.
- Best Paper Award, Silver Award at the International Conference for Electronics, Information and Communication (IEEE/ASME), 2015.
- Promising International Researcher Award by the European Scientific Network for Artificial Muscles (ESNAM), 2013.
- Philip Yeo Prize for Best Student Researcher, A*STAR, 2007.
- Best Paper Award, Institute of High Performance Computing, A*STAR, 2006.
- A*STAR Graduate Scholarship, A*STAR, 2003–2007.

Bio

Dr. KOH Soo Jin Adrian received his PhD from the National University of Singapore (NUS) in 2008. He was a post-doctoral fellow at Harvard University, School of Engineering and Applied Sciences from 2008 to 2010. During the same period, he holds a concurrent appointment of Scientist at the Institute of High Performance Computing (Singapore). He is currently an Assistant Professor at NUS, a post that he has held since 2012. His research interests are soft active materials, utilized in specific fields of soft robotics, energy harvesting and autonomous sensing. The key material component in soft active materials is elastomeric rubber, in which natural rubber is an excellent candidate. Dr. Koh was awarded the “Promising International Researcher Award in Electroactive Transducers” by the European Union in 2013, in Switzerland. He is a keynote and invited speaker for numerous materials conferences, workshops and seminars.