Jiawei Yang

Assistant Professor, Department of Mechanical and Material Engineering, Worcester Polytechnic Institute
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EDUCATION

Ph.D., Engineering Sciences, Harvard University, USA. Advisor: Zhigang Suo 2019
M.S., Engineering Sciences, Harvard University, USA. 2016
D.Eng., Engineering Mechanics, Tongji University, China. 2015
B.E., Engineering Mechanics, Tongji University, China. 2009

ACADEMIC POSITIONS

Assistant Professor 01/2024 – Present
Department of Mechanical and Material Engineering, Worcester Polytechnic Institute

Research Fellow 07/2019 – 12/2023
Massachusetts Institute of Technology, Boston Children's Hospital
Lab of Daniel Anderson and Robert Langer

RESEARCH INTERESTS

- Soft Materials: hydrogels, elastomers, composites, biomaterials
- Solid Mechanics: large deformation, fracture, fatigue, instability, multi-field coupling
- Biotechnology: bioadhesives, biointerfacing materials, medical devices

PUBLICATIONS (# Equal contribution)

27. Yang, J., 2022. A polymer brush theory for quantitative prediction of maximum height change between dry and wet states, preprint, https://arxiv.org/abs/2208.06892

26. Yang, X., Steck, J., **Yang, J.**, Wang, Y. and Suo, Z., 2021. Degradable plastics are vulnerable to cracks. Engineering, 7(5), pp.624-629.

25. Chu, C.K., Joseph, A.J., Limjoco, M.D., **Yang, J.**, Bose, S., Thapa, L.S., Langer, R., and Anderson, D.G., 2020. Chemical Tuning of Fibers Drawn from Extensible Hyaluronic Acid Networks. Journal of the American Chemical Society, 142(46), pp.19715-19721.

24. Yang, J., Illeperuma, W. and Suo, Z., 2020. Inelasticity increases the critical strain for the onset of creases on hydrogels. Extreme Mechanics Letters, p.100966.

23. Yang, J., Steck, J. and Suo, Z., 2020. Gelation kinetics of alginate chains through covalent bonds. Extreme Mechanics Letters, p.100898.

22. Yang, J., Steck, J., Bai, R., and Suo, Z., 2020. Topological adhesion II. Stretchable adhesion. Extreme Mechanics Letters, p100891.

21. Steck, J., Kim, J., **Yang, J.**, Hassan, S. and Suo, Z., 2020. Topological adhesion. I. Rapid and strong topohesives. Extreme Mechanics Letters, p.100803.

20. Mu, R., **Yang, J.**, Wang, Y., Wang, Z., Chen, P., Sheng, H. and Suo, Z., 2020. Polymer-filled macroporous hydrogel for low friction. Extreme Mechanics Letters, p.100742.

19. Yang, J., Bai, R., Li, J., Yang, C., Yao, X., Liu, Q., Vlassak, J.J., Mooney, D.J. and Suo, Z., 2019. Design molecular topology for wet-dry adhesion. ACS Applied Materials & Interfaces, 11(27), pp.24802-24811.

18. Yang, J., Bai, R., Chen, B. and Suo, Z., 2019. Hydrogel Adhesion: A Supramolecular Synergy of Chemistry, Topology, and Mechanics. Advanced Functional Materials, p.1901693.

17. Yang, J., Jin, L., Hutchinson, J.W. and Suo, Z., 2019. Plasticity retards the formation of creases. Journal of the Mechanics and Physics of Solids, 123, pp.305-314.

16. Yang, X.#, **Yang, J.#**, Chen, L. and Suo, Z., 2019. Hydrolytic crack in a rubbery network. Extreme Mechanics Letters, p.100531.

15. Wang, Y., Jia, K., Xiang, C., **Yang, J.**, Yao, X. and Suo, Z., 2019. Instant, tough, noncovalent adhesion. ACS Applied Materials & Interfaces, 11(43), pp.40749-40757

14. Chen, B., **Yang, J.**, Bai, R. and Suo, Z., 2019. Molecular Staples for Tough and Stretchable Adhesion in Integrated Soft Materials. Advanced Healthcare Materials, p.1900810.

13. Steck, J., **Yang, J.** and Suo, Z., 2019. Covalent Topological Adhesion. ACS Macro Letters, 8, pp.754-758.

12. Bai, R., **Yang, J.**, Morelle, X.P. and Suo, Z., 2019. Flaw-Insensitive Hydrogels under Static and Cyclic Loads. Macromolecular Rapid Communications, 40(8), p.1800883.

11. Bai, R., Chen, B., **Yang, J.** and Suo, Z., 2019. Tearing a hydrogel of complex rheology. Journal of the Mechanics and Physics of Solids, 125, pp.749-761.

10. Bai, R., **Yang, J.** and Suo, Z., 2019. Fatigue of hydrogels. European Journal of Mechanics-A/Solids, 74, pp.337-370.

9. Yang, J. 2019. Hydrogel Adhesion. Doctoral dissertation, Harvard University, Graduate School of Arts & Sciences.

8. Yang, J., Bai, R., and Suo, Z., 2018. Topological Adhesion of Wet Materials. Advanced Materials, p.1800671.

7. Ouchi, T.#, **Yang, J.#**, Suo, Z. and Hayward, R.C., 2018. Effects of Stiff Film Pattern Geometry on Surface Buckling Instabilities of Elastic Bilayers. ACS Applied Materials & Interfaces, 10(27), pp.23406-23413.

6. Bai, R., **Yang, J.**, Morelle, X.P., Yang, C. and Suo, Z., 2018. Fatigue Fracture of Self-Recovery Hydrogels. ACS Macro Letters, 7(3), pp.312-317.

5. Auguste, A., **Yang, J.**, Jin, L., Chen, D., Suo, Z. and Hayward, R.C., 2018. Formation of high aspect ratio wrinkles and ridges on elastic bilayers with small thickness contrast. Soft Matter, *14, 8545-8551*.

4. Li, J., Celiz, A.D.#, **Yang, J.#**, Yang, Q., Wamala, I., Whyte, W., Seo, B.R., Vasilyev, N.V., Vlassak, J.J., Suo, Z. and Mooney, D.J., 2017. Tough adhesives for diverse wet surfaces. Science, 357(6349), pp.378-381.

3. Huang, J.#, **Yang, J.#**, Jin, L., Clarke, D.R. and Suo, Z., 2016. Pattern Formation in Plastic Liquid Films on Elastomers by Ratcheting. Soft Matter, 12(16), pp.3820-3827.

2. Yang, J. and Nie, G., 2014. Analysis of Sinusoidal Interfacial Wrinkling of an Anisotropic Film Sandwiched Between Two Compliant Layers. Journal of Applied Mechanics, 81(9), p.091013.

1. Yu, A., **Yang, J.**, Nie, G. and Yang, X., 2011. An improved model for naturally curved and twisted composite beams with closed thin-walled sections. Composite Structures, 93(9), pp.2322-2329.

PATENTS

3. Yang, J., Ruobing, B., and Suo, Z., Harvard College, 2021. *Topological adhesion of materials*. U.S. Patent Application 17/048,803.

2. Kun Jia, Zhigang Suo, Yecheng Wang, Chunping Xiang, **Jiawei Yang,** and Xi Yao, *Instant and tough adhesion*. U.S. Patent, 62/848, 088, filed May 15, 2019.

1. Crystal Chu, Alby J. Joseph, Matthew D. Limjoco, Lavanya S. Thapa, **Jiawei Yang**, Robert Langer, and Daniel Griffith Anderson, *Extensible, dynamic hyaluronic acid networks produce mechanically tunable bioinspired fibers*, Application No.: 62914344, filed October 11, 2019.

HONORS AND AWARDS

Reviewer of Outstanding Contribution, Extreme Mechanics Letters, Elsevier	2018
Robert L. Wallace Prize Fellowship, Harvard University	2015
Excellence in Teaching, Derek Bok Center for Teaching & Learning, Harvard University	2015
China Scholarship Council Fellowship, Beijing, China	2011
Tongji University Graduate Fellowship, Tongji University, Shanghai, China	2009
Autodesk Certified AutoCAD Engineer, Shanghai, China	2007

PRESENTATIONS

"A thermodynamic model of polymer brushes in solvents I: Quantitative prediction of thickness", Society of Engineering Sciences, Minneapolis, Minnesota 10/2023

"Biointerfaces by design: from wet adhesion to implantation", Worcester Polytechnic Institute, Worcester, MA

04/2023
"Design molecular topologies for wet tough adhesion", the Dow Chemical Company, Midland, MI 10/2022
"Molecular topology design of wet adhesion for merging human-machine interface", Texas A&M University, College Station, TX 04/2022
"Wet adhesion technology for merging human-machine interface", University of Cincinnati, virtual. 02/2022
"Wet adhesion technology for merging human-machine interface", Pennsylvania State University, State College, PA 12/2021
"Wet, tough adhesion for merging human-machine interface", Syracuse University, Syracuse, NY 11/2021
"Wet, Tough adhesion for merging human-machine interface", Case Western Reserve University, virtual 09/2021
"Can crease form in metals", Engineering and Applied Science Forum (EASF) 03/2021
"Molecular stitching of wet materials", New England Workshop on the Mechanics of Materials and Structures, Brown University, Providence, RI 09/2018
"Topological adhesion of wet materials", 18th National Congress for Theoretical and Applied Mechanics (USNC-TAM), Chicago, IL 06/2018
Gordon Research Conference on Adhesion, South Hadley, MA 07/2017

TEACHING AND MENTORING EXPERIENCE

ES2502 Stress Analysis, Worcester Polytechnic Institute Spring 2024
ES180 *Engineering Thermodynamics*, Teaching Fellow, Harvard University Fall 2015

PROFESSIONAL ACTIVITIES

Reviewer: *Journal of the Mechanics and Physics of Solids; ACS Macro Letters; Macromolecules; Journal of Materials Chemistry B; RSC Advances*; *Cellulose*; *Extreme Mechanics Letters; NPG Asia Materials*; *Acta Biomaterialia; Applied Physics Letters*.