

Yihui Zhang

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EDUCATION

Ph.D. in Engineering Mechanics, Tsinghua University, China	6/2011
M.S. in Engineering Mechanics, Tsinghua University, China	6/2008
B.S. in Engineering Mechanics, Nanjing University of Aeronautics & Astronautics, China	6/2006

PROFESSIONAL EXPERIENCE

Research Assistant Professor in Civil & Environmental Engineering, Northwestern University, USA	6/2014–
Postdoctoral Fellow in Civil & Environmental Engineering, Northwestern University, USA (Advisor: Prof. Yonggang Huang)	10/2011–5/2014
Research Assistant in Engineering Mechanics, Tsinghua University, China	7/2006–9/2011

PROFESSIONAL SERVICES AND ACTIVITIES

Reviewer for <i>ASME-Journal of Applied Mechanics</i> ; <i>Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences</i> ; <i>Structural Engineering and Mechanics</i> , <i>An International Journal</i>	10/2011–Present
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SELECTED AWARDS & HONORS

Selected to give an invited talk at the Workshop on Origami Engineering	2014
Excellent doctor thesis award, Tsinghua University	2011
Academic awards to excellent doctoral graduate students, Ministry of education of China (40 recipients among all doctor graduates (>8000) in Tsinghua University)	2010
Golden Medal award for outstanding presentation in 242 th Tsinghua Forum (on Mechanics) for doctoral candidates, 13-14 May, Beijing	2010
“Xu Shunshou” and “Du Qinhua” Scholarship, First Prize, Tsinghua University	2009 & 2010

Excellent master thesis award, Tsinghua University	2008
“611” special-grade scholarship, Nanjing University of Aeronautics and Astronautics	2005
5 th “Peiyuan Zhou” National Mechanics Contest for College Students, Second Prize, China (3 recipients for first prize and 7 recipients for second prize in China)	2004

REFEREED JOURNAL PUBLICATIONS, BOOK & BOOK CHAPTER

1. S Xu†, **YH Zhang**†, L Jia†, KE Mathewson†, KI Jang, JH Kim, HR Fu, X Huang, P Chava, RH Wang, S Bhole, LZ Wang, YJ Na, Y Guan, M Flavin, ZS Han, YG Huang, JA Rogers. Soft Microfluidic Assemblies of Sensors, Circuits and Radios for the Skin. *Science.*, 344 (6179), 70-74 (2014) (†: **Authors contributed equally**)
 --- This work is highlighted as an item and feature image in the News of the Week on the Science website. It appears in >300 print, web and radio, such as the media: *Bio News Texas, CBS News, CBS Local, China.com (China), China Daily (China), e! Science News, ElectronicsWeekly.com, Engineering and Technology Magazine, EurekAlert! by AAAS, Fast Company, Gizmag.com, HealthCanal.com, Live Science, MedGadget.com, Medical Daily, Medical News Today, MIT Technology Review, Mobi Health News, Mother Nature News Bureau, Network, Nanowerk, New Electronics, Northwestern University, People.com.cn (China), Photonics.com, Phys.org, Popular Science, Printed Electronic World, Product Design & Development, PolymerSolutions.com, Scicasts, Science Codex, Science Daily, Science News Line, Science Now, Sciencenet.cn (China), sinc – La ciencia es noticia (Spain), Smithsonian, Tech Times, The Engineer, The Times of India (India), Thinkdigit.com, Today’s Medical Developments, University of Illinois, Xinhuanet.com (China), Yahoo News ...*
2. **YH Zhang**†, SD Wang†, XT Li, JA Fan, S Xu, YM Song, KJ Choi, SN Nazaar, BW Lu, L Yin, WH Yeo, KC Hwang, JA Rogers, YG Huang. Experimental and Theoretical Studies of Serpentine Microstructures Bonded To Prestrained Elastomers for Stretchable Electronics. *Advanced Functional Materials*, **24**, 2028-2037 (2014)
3. HY Cheng, **YH Zhang***, KC Hwang, JA Rogers, YG Huang*. Buckling of a stiff thin film on a pre-strained bi-layer substrate. *International Journal of Solids and Structures*, In Press, (2014) (*: **Corresponding author**)
4. CJ Yu†, **YH Zhang**†, DK Cheng, XT Li, Huang YG, Rogers JA. All-Elastomeric, Strain-Responsive Thermochromic Color Indicators. *Small*, **7**, 1266-1271 (2014) (†: **Authors contributed equally**)
5. JA Fan, WH Yeo, YW Su, Y Hattori, W Lee, SY Jung, **YH Zhang**, ZJ Liu, HY Cheng, L Falgout, M Bajema, T Coleman, D Gregoire, R Larson, YG Huang, JA Rogers. Fractal Design Concepts for Stretchable Electronics. *Nature Communications*, **5**, 3266 (2014)
6. JW Jeong, MK Kim, HY Cheng, X Huang, WH Yeo, YH Liu, JB Lim, **YH Zhang**, YG Huang, JA Rogers. Capacitive Epidermal Electronics for Electrically Safe, Long - Term Electrophysiological Measurements. *Advanced Healthcare Materials*, **3**, 642-648 (2014) (**Front cover feature article**)
7. Y Hattori, L Falgout, W Lee, SY Jung, E Poon, JW Lee, I Na, A Geisler, D Sadhwani, **YH Zhang**, YW Su, XQ Wang, Z Liu, J Xia, HY Cheng, RC Webb, AP Bonifas, P Won, JW Jeong,

KI Jang, YM Song, B Nardone, M Nodzenski, YG Huang, DP West, AS Paller, M Alam, WH Yeo, JA Rogers. Multifunctional Skin-like Electronics for Quantitative, Clinical Monitoring of Cutaneous Wound Healing. *Advanced Healthcare Materials*, In Press (2014)

8. **YH Zhang**, JY Li, DN Fang. Fracture analysis of ferroelectric single crystals: domain switching near crack tip and electric field induced crack propagation. *Journal of the Mechanics and Physics of Solids*, **61**, 114-130 (2013).
9. S Xu†, **YH Zhang**†, J Cho, J Lee, X Huang, L Jia, JA Fan, YW Su, J Su, HG Zhang, HY Cheng, BW Lu, CJ Yu, C Chuang, Ti Kim, T Song, K Shigeta, S Kang, C Dagdeviren, I Petrov, PV Braun, YG Huang, U Paik, JA Rogers. Stretchable Batteries with Self-Similar Serpentine Interconnects and Integrated Wireless Recharging Systems. *Nature Communications*, **4**, 1543 (2013). (†: Authors contributed equally)

--- This work is featured by *Nano Energy* (Vol 2, 2013, 325-326), and appears in >300 print, web and radio, such as the media: *ASME News*, *BBC News*, *CBS News*, *China Daily (China)*, *Chinese Academy of Sciences (China)*, *Chicago Tribune*, *Daily Mail (UK)*, *Electronics Weekly*, *French Tribune (France)*, *Indian Express (India)*, *IOP blog*, *Le Monde (France)*, *Live Science*, *Materials Today*, *Materials Views*, *MIT Technology Review*, *MSNBC*, *Nano Werk*, *NBC News*, *New Zealand Herald (New Zealand)*, *Northwestern University*, *Popular Science*, *R&D Magazine*, *Science Daily*, *The Times of India (India)*, *United Press International*, *Veicoli Elettrici News (Italia)*, *Yahoo News*...

10. **YH Zhang**†, HR Fu†, YW Su, S Xu, HY Cheng, JA Fan, KC Hwang, Rogers JA, Huang YG. Mechanics of ultra-stretchable self-similar serpentine interconnects. *Acta Materialia*, **61**, 7816-7827 (2013).
11. **YH Zhang**†, S Xu†, HR Fu, J Lee, J Su, KC Hwang, JA Rogers, YG Huang. Buckling in serpentine microstructures and applications in ultra-stretchable electronics with high areal coverage. *Soft Matter*, **9**, 8062-8070 (2013).
12. **YH Zhang**, KC Hwang, YG Huang. Mechanics of Stretchable Electronics. *Key Engineering Materials*, **535-536**: 25-31 (2013)
13. RC Webb, AP Bonifas, A Behnaz, **YH Zhang**, KJ Yu, HY Cheng, MX Shi, ZG Bian, ZJ Liu, YS Kim, W Yeo, JS Park, JZ Song, YH Li, YG Huang, AM Gorbach, JA Rogers. Ultrathin conformal devices for precise and continuous thermal characterization of human skin. *Nature Materials*, **12**, 938-944 (2013).

--- This work is featured by *Nature Materials* (Vol 12, 2013, 871-872), "Flexible electronics: Sophisticated skin", and appears in many media, such as: *DailyMe*, *Discovery News*, *e! Science News*, *Live Science*, *I4u.com*, *Medgadget*, *Scinexx (Germany)*, *Phys.org*, *Qmex*, *Royal Society of Chemistry (RSC, Chemistry World)*, *The Verge*, *TG Daily*, ...

14. HY Cheng, **YH Zhang**, X Huang, JA Rogers, YG Huang. Analysis of a concentric coplanar capacitor for epidermal hydration sensing. *Sensors & Actuators: A. Physical*, **203**, 149-153 (2013).
15. L Persano, C Dagdeviren, YW Su, **YH Zhang**, S Girardo, D Pisignano, YG Huang, JA Rogers. High Performance, Flexible Piezoelectric Devices Based on Aligned Arrays of Nanofibers of Poly[(vinylidene fluoride-co-trifluoroethylene)]. *Nature Communications*, **4**, 1633 (2013).
16. DN Fang, FX Li, B Liu, **YH Zhang**, JW Hong, XH Guo. Advances in developing electromechanically coupled computational methods for piezoelectrics/ferroelectrics at multiscale. *Applied Mechanics Review*, **65**, 060802 (2013)

17. JZ Song, CF Lu, X Xie, YH Li, **YH Zhang**, KL Grosse, S Dunham, YG Huang, WP King, JA Rogers. Thermal-mechanical modeling of scanning Joule expansion microscopy imaging of single-walled carbon nanotube devices. *Journal of Applied Mechanics*, **80**, 040907 (2013).
18. X Huang, HY Cheng, KL Chen, YL Zhang, **YH Zhang**, YH Liu, CQ Zhu, SC Ouyang, Gw Kong, CJ Yu, YG Huang, JA Rogers. Epidermal Impedance Sensing Sheets for Precision Hydration Assessment and Spatial Mapping. *IEEE Transactions on Biomedical Engineering*, **60**, 2848-2857 (2013)
19. **YH Zhang**, R Xu, B Liu, DN Fang. An electromechanical atomic-scale finite element method for simulating evolutions of ferroelectric nanodomains. *Journal of the Mechanics and Physics of Solids*, **60**, 1383-1399 (2012).
20. **YH Zhang**, YH Li, RH Kim, H Tao, Ti Kim, FG Omenetto, JA Roger, Y Huang. Three-Dimensional Thermal Analysis of Wirelessly Powered Light Emitting Systems. *Proceedings of the Royal Society A: Mathematical, Physical & Engineering Sciences*, **468**, 4088-4097 (2012)
21. H Zhou, JW Hong, **YH Zhang**, YM Pei, DN Fang. External uniform electric field removing the flexoelectric effect in epitaxial ferroelectric thin film. *EPL (Europhysics Letters)*, **99**, 47003 (2012)
22. H Zhou, JW Hong, **YH Zhang**, YM Pei, DN Fang. Flexoelectricity induced increase of critical thickness in epitaxial ferroelectric thin films. *Physica B*, **407**, 3377-3381 (2012)
23. RH Kim, T Hu, TI Kim, **YH Zhang**, S Kim, B Panilaitis, M Yang, DH Kim, YH Jung, BH Kim, YH Li, YG Huang, FG Omenetto, JA Rogers. Materials and Designs for Wirelessly Powered Implantable Light Emitting Systems. *Small*, **8**, 2812-2818 (2012) (**Inside cover feature article**)
24. X Xie, KL Grosse, JZ Song, CF Lu, S Dunham, F Du, AE Islam, YH Li, **YH Zhang**, E Pop, YG Huang, WP King, JA Rogers. Quantitative Thermal Imaging of Single Walled Carbon Nanotube Devices by Scanning Joule Expansion. *ACS Nano*, **11**, 10267-10275 (2012).
25. DH Kim, NS Lu, R Ghaffari, SD Wang, SP Lee, H Keum, RD Angelo, L Klinker, YW Su, CF Lu, YS Kim, A Ameen, YH Li, **YH Zhang**, B Graff, YY Hsu, ZJ Liu, J Ruskin, FG Omenetto, YG Huang, M Mansour, MJ Slepian, JA Rogers. Electronic Sensor and Actuator Webs for Large-Area Complex Geometry Cardiac Mapping and Therapy. *Proceedings of the National Academy of Sciences USA*, **109**, 19910-19915 (2012).
--- Featured by *Materials Today* (Vol 16, 2013, 156-157), and appears in many media, e.g., *e! Science News*, *EurekAlert!* by AAAS, *Fizziks Info*, *Science Codex*, *Science Newslite*, *Medical News Today*, *Medical Replies*, *Medical Xpress*, *OPE Journal*, *Plastic Electronics*.
26. LM Chen, MJ Chen, YM Pei, **YH Zhang**, DN Fang. Optimal Design of Sandwich Beams with Lightweight Cores in Three-Point Bending. *International Journal of Applied Mechanics*, **4**, 125003 (2012).
27. **YH Zhang**, B Liu, DN Fang. Stress-induced phase transition and deformation behavior of BaTiO₃ nanowires. *Journal of Applied Physics*, **110**, 054109 (2011)
28. **YH Zhang**, YL Sang, B Liu, DN Fang. Critical thickness and the size-dependent Curie temperature of BaTiO₃ nanofilms. *Journal of Computational and Theoretical Nanoscience*, **8**, 867-872 (2011)

29. DN Fang, **YH Zhang**, GZ Mao. A COD fracture model of ferroelectric ceramics with applications in electric field induced fatigue crack growth. *International Journal of Fracture*, **167**, 211-220 (2011)
30. XD Cui, **YH Zhang**, H Zhao, TJ Lu, DN Fang. Stress concentration in two-dimensional lattices with imperfections. *Acta Mechanica*, **216**, 105-122 (2011)
31. **YH Zhang**, JY Li, DN Fang. Oxygen-vacancy-induced memory effect and large recoverable strain in barium titanate single crystal. *Physical Review B*, **82**, 064103 (2010)
32. **YH Zhang**, JW Hong, B Liu, DN Fang. Strain effect on ferroelectric behavior of BaTiO₃ nanowires: A molecular dynamics study. *Nanotechnology*, **21**, 015701 (2010)
33. **YH Zhang**, JW Hong, B Liu, DN Fang. A surface-layer model of ferroelectric nanowire. *Journal of Applied Physics*, **108**, 124109 (2010)
34. **YH Zhang**, JY Li, DN Fang. Size dependent domain configuration and electric field driven evolution in ultrathin ferroelectric films: a phase field investigation. *Journal of Applied Physics*, **107**, 034107 (2010)
35. DN Fang, **YH Zhang**, GZ Mao. Electric field induced fatigue crack growth in ferroelectric ceramics. *Theoretical and Applied Fracture Mechanics*, **54**, 98-104 (2010)
36. **YH Zhang**, JW Hong, B Liu, DN Fang. Molecular dynamics investigations on size-dependent ferroelectric behavior of BaTiO₃ nanowires. *Nanotechnology*, **20**, 405703 (2009)
37. **YH Zhang**, ZY Xue, LM Chen, DN Fang. Deformation and Collapse Mechanisms of Lattice Cylindrical Shells under Axial Loading. *International Journal of Mechanical Sciences*, **51**, 213-221 (2009)
38. Y Jiang, **Y Zhang**, B Liu, D Fang. Study on crack propagation in ferroelectric single crystal under electric loading. *Acta Materialia*, **57**, 1630-1638 (2009)
39. **YH Zhang**, XM Qiu, DN Fang. Mechanical properties of two novel planar lattice structures. *International Journal of Solids and Structures*, **45**, 3751-3768 (2008)
40. **YH Zhang**, HL Fan, DN Fang. Constitutive Relations and Failure Criterion of Planar Lattice Composites. *Composites Science and Technology*, **68**, 3299-3304 (2008)
41. **YH Zhang**, ZY Xue, XM Qiu, DN Fang. Plastic yield and collapse mechanism of planar lattice structures. *Journal of Mechanics of Materials and Structures*, **3**, 1257-1277 (2008)
42. **YH Zhang**, Y Gu, XM Qiu, HC Guo, H Zhao, DN Fang. Vibration and buckling of lattice sandwich structures. *International Journal of Nonlinear Sciences and Numerical Simulation*, **9**, 41-46 (2008)
43. B Wang, **YH Zhang**, DN Fang. Effects of high order deformations on the strength of planar lattice materials. *Acta Mechanica Sinica*, **24**, 533-540 (2008)
44. XW Wang, LF Gan, **YH Zhang**. Differential quadrature analysis of the buckling of thin rectangular plates with cosine-distributed compressive loads on two opposite sides. *Advances in Engineering Software*, **39**, 497-504 (2008)

Book:

1. DN Fang, **YH Zhang**, XD Cui, Mechanics and Multifunctional Design of Lightweight Lattice Materials, Science Press, Beijing, 2009

Book Chapter:

1. Y Huang, **YH Zhang**, KC Hwang, “Mechanics design and analyses of stretchable electronics”, in *Shell Structure, Theory and Applications*, Vol. 3 (edited by Wojciech Pietraszkiewicz & Jaroslaw Gorski), CRC Press, Taylor & Francis Group, London, 2014, pp. 27-32.

INVITED TALKS & CONFERENCES

1. **YH Zhang**, YG Huang, S Xu, JA Rogers. Fractal-inspired interconnect designs for stretchable/foldable batteries and soft device systems. *Workshop on Origami Engineering*, April 14-16, 2014, University of Illinois at Urbana-Champaign. (**Invited talk**)
2. **YH Zhang**. Fractal-inspired interconnect designs for stretchable batteries and soft device systems. *Invited lecture at Peking University*, April 25, 2014, Beijing, China. (**Invited talk**)
3. **YH Zhang**, KC Hwang, YG Huang. Mechanics of Stretchable Electronics. *11th Asia-Pacific Conference on Engineering Plasticity and its Application*, Dec 5-7, 2012, Singapore.
4. DN Fang, **YH Zhang**, Y Gu. Domain patterns of nanoscale ferroelectrics by multi-scale computational methods. *48th Annual Technical Meeting of Society of Engineering Sciences*, Oct 12-14, 2011, Evanston, USA.
5. **YH Zhang**, JW Hong, B Liu, DN Fang. Size effect and strain Effect on ferroelectric behaviors of BaTiO₃ Nanowires: A Molecular Dynamics Study. *International Conference on Mechanical Properties of Materials*, May 24-28, 2010, Hangzhou, China. (**Oral presentation**)
6. DN Fang, **YH Zhang**. Size effects of low-dimensional ferroelectric materials by multi-scale computational methods. *IUTAM Symposium on Surface Effects in the Mechanics of Nanomaterials and Heterostructures*, Aug 8-12, 2010, Beijing, China (**Invited talk, in representative of my doctoral supervisor Prof. Daining Fang**)
7. JW Hong, **YH Zhang**, DN Fang. Unusual polarization pattern in BaTiO₃ nanowires with circular cross-section: first-principles study. *12th International meeting on ferroelectricity & 18th IEEE international symposium on the applications of ferroelectrics*, Aug 23-27, 2009 Xi'an, China
8. **YH Zhang**, DN Fang. Effects of high order deformations on elastic modulus and collapse of planar lattice materials. *International Conference on Heterogeneous Material Mechanics (ICHMM)*, June 03-08, 2008, Huangshan, China
9. **YH Zhang**, XM Qiu, DN Fang. Analyses on static mechanical properties of planar lattice materials. *The Chinese Congress of Theoretical and Applied Mechanics*, Aug 20-22, 2007, Beijing, China (**Oral presentation**)
10. **YH Zhang**, XM Qiu, DN Fang. Mechanical properties of 2-D lattice materials. *7th International Conference on Fracture and Strength of Solids (FEOFS 2007)*, Aug 27-29, 2007, Urumqi, China
11. DN Fang, XD Cui, **YH Zhang**. Mechanical properties and design of lattice composites and structures. *IUTAM Symposium on Mechanical Properties of Cellular Materials*, Sep 17-21, 2007, Cachan Paris, France