Stanford

# Ellen Kuhl

Catherine Holman Johnson Director of Stanford Bio-X, Walter B Reinhold Professor in the School of Engineering, Professor of Mechanical Engineering and, by courtesy, of Bioengineering

NIH Biosketch available Online  Curriculum Vitae available Online

### CONTACT INFORMATION


- **Administrative Contact**

  Jill Sakata Melosh - Executive Assistant

  **Email** jsakata@stanford.edu


## Bio

### BIO

Ellen is the Catherine Holman Johnson Director of Stanford Bio-X and the Walter B. Reinhold Professor in the School of Engineering. She is a Professor of Mechanical Engineering and, by courtesy, Bioengineering. Her area of expertise is Living Matter Physics, the design of theoretical and computational models to simulate and predict the behavior of living systems. Ellen has published more than 200 peer-reviewed journal articles and edited two books; she is an active reviewer for more than 30 journals at the interface of engineering and medicine and an editorial board member of seven international journals in her field. Ellen is a founding member of the Living Heart Project, a translational research initiative to revolutionize cardiovascular science through realistic simulation with 400 participants from research, industry, and medicine from 24 countries. Ellen was the Robert Bosch Chair of Mechanical Engineering from 2019-2024. She is the current Chair of the US National Committee on Biomechanics and a Member-Elect of the World Council of Biomechanics. She is a Fellow of the American Society of Mechanical Engineers and of the American Institute for Mechanical and Biological Engineering. She received the National Science Foundation Career Award in 2010, was selected as Midwest Mechanics Seminar Speaker in 2014, and received the Humboldt Research Award in 2016, the ASME Ted Belytschko Applied Mechanics Award in 2021, and the ERC Advanced Grant in 2024. Ellen is a three-time All American triathlete, a multiple Berlin, Boston, Chicago, and New York marathon runner, and a three-time Kona Ironman World Championship participant.

### ACADEMIC APPOINTMENTS

- Professor, Mechanical Engineering
- Professor (By courtesy), Bioengineering
- Member, Bio-X
- Member, Cardiovascular Institute
- Member, Wu Tsai Human Performance Alliance
- Member, Institute for Computational and Mathematical Engineering (ICME)
- Member, Wu Tsai Neurosciences Institute

### ADMINISTRATIVE APPOINTMENTS

- Director, Stanford Bio-X, (2024- present)
- Chair, Stanford Mechanical Engineering, (2019-2024)

- Chair, US National Committee on Biomechanics, (2018- present)
- Member, Stanford Bio-X Leadership Council, (2022- present)
- Member, Wu Tsai Human Performance Alliance Executive Committee, (2021- present)
- Member-Elect, World Council of Biomechanics, (2018- present)
- Chair, Stanford Mechanical Engineering Graduate Admission Committee, (2018-2019)
- Member, Stanford Mechanical Engineering Faculty Search Committee, (2018-2019)
- Chair, Stanford Mechanical Engineering Graduate Curriculum Committee, (2017-2018)
- Member, Stanford Long-Range Planning Steering Group Research, (2017-2018)
- Member, Stanford Neurosciences Institute Faculty Search Committee, (2017-2018)
- Member-at-Large, US Association for Computational Mechanics, (2016-2020)
- Vice Chair, US National Committee on Biomechanics, (2016-2018)
- Member, NIH IMAG Interagency Modeling Analysis Group Steering Committee, (2016-2018)
- Member, Stanford Mechanical Engineering Appointment & Promotion Committee, (2016-2018)
- Member, Stanford Leading the Biomedical Revolution, (2016-2017)
- Chair, US Association for Computational Mechanics Biological Systems, (2015-2019)
- Fellow, Stanford University, (2015-2017)
- Chair, Stanford Mechanical Engineering Faculty Search Committee, (2015-2016)
- Member, Stanford Mechanical Engineering, Advisory Committee AdCom, (2014-2024)
- Member, NIH Modeling and Analysis of Biological Systems MABS Study Section, (2014-2018)
- Secretary, US National Committee on Biomechanics, (2014-2016)
- Member, Stanford Faculty Voice & Influence Program, (2013-2014)
- Chair, Stanford Mechanical Engineering Graduate Admission Committee, (2012-2014)
- Member, Stanford Bioengineering Faculty Search Committee, (2010-2011)
- Member, Stanford Mechanical Engineering Faculty Search Committee, (2009-2010)
- Member, Stanford Mechanical Engineering Graduate Admission Committee, (2008-2012)
- Member, Stanford Mechanical Engineering Faculty Search Committee, (2008-2009)
- Member, Stanford Mechanical Engineering ABET Committee, (2008-2009)

## HONORS AND AWARDS

- ERC Advanced Grant, European Research Council (2024)
- ASME Ted Belytschko Applied Mechanics Award, American Society of Mechanical Engineers (2021)
- ASME Fellow, American Society of Mechanical Engineers (2017)
- Humboldt Research Award, Alexander von Humboldt Stiftung (2016)
- AIMBE Fellow, American Institute for Medical and Biological Engineering (2014)
- NSF CAREER Award, National Science Foundation (2010-2014)
- Hellman Faculty Scholar, Hellman Faculty Scholar (2009)
- Habilitation Research Fellowship, German National Science Foundation (DFG) (2001-2004)
- Graduate Research Fellowship, German National Science Foundation (DFG) (1996-1999)

### BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Editorial Advisory Board, Computer Methods in Applied Mechanics and Engineering (2022 - present)
- Editorial Advisory Board, Computational Mechanics (2022 - present)
- Editorial Board Member, Brain Multiphysics (2019 - present)
- Associate Editor, Annals of Biomedical Engineering (2015 - present)
- Associate Editor, Journal of the Mechanics and Physics of Solids (2015 - present)
- Editorial Board Member, Biomechanics and Modeling in Mechanobiology (2015 - present)
- Editorial Adviser, Journal of the Mechanics and Physics of Solids (2013 - 2015)
- Editorial Board Member, Journal of Computational Surgery (2012 - present)
- Associate Editor, ASME Applied Mechanics Reviews (2012 - 2016)
- Editorial Board Member, Acta Mechanica Sinica (2011 - present)
- Editorial Board Member, Comp Methods Biomechanics and Biomed Engineering (2011 - present)
- Editorial Board Member, Int J Numerical Methods in Biomedical Engineering (2011 - present)

### PROFESSIONAL EDUCATION

- habil., TU Kaiserslautern (2004)
- Ph.D., University of Stuttgart (2000)
- M.S., Leibniz University of Hanover (1995)
- B.S., Leibniz University of Hanover (1993)

### LINKS

- Lab Website: https://livingmatter.stanford.edu/
- Google Scholar: https://scholar.google.com/citations?user=jjQDKYYAAAAJ&hl=en

## Research & Scholarship

### CURRENT RESEARCH AND SCHOLARLY INTERESTS

Ellen is the Catherine Holman Johnson Director of Stanford Bio-X and the Walter B. Reinhold Professor in the School of Engineering. She is a professor of mechanical engineering and, by courtesy, bioengineering. Ellen's lab integrates physics-based modeling with machine learning and create interactive simulation tools to understand, explore, and predict the dynamics of living systems. Her area of expertise is living matter physics, the design of theoretical and computational models to simulate and predict the behavior of living systems. She has pioneered constitutive neural networks for automated model discovery of soft matter systems including the brain, the heart, arteries, skin, and, most recently, plant-based and animal meat.

## Teaching

### COURSES

**2026-27**

- Automated Model Discovery: ME 233 (Win)

**2025-26**

- Automated Model Discovery: ME 233 (Win)

**2024-25**

- Automated Model Discovery: ME 233 (Win)

**2023-24**

- Automated Model Discovery: ME 233 (Win)

### STANFORD ADVISEES

**Doctoral Dissertation Reader (AC)**

Ethan Darwin, Sehui Jeong, Janelle Kaneda, Lazaros Papamanolis, Kristen Steudel, Jessica Towns

**Postdoctoral Faculty Sponsor**

Aeneas Koosis, Vahidullah Tac

**Orals Evaluator**

Faisal As'ad

**Doctoral Dissertation Advisor (AC)**

Jeremy McCulloch

**Doctoral Dissertation Co-Advisor (AC)**

Divya Rajasekharan, Devin Seyler

## Publications

### PUBLICATIONS

- **Artificial intelligence for food innovation.** *Nature food*
  Datta, B., Buehler, M. J., Chow, Y., Gligorić, K., Jurafsky, D., Kaplan, D. L., Ledesma-Amaro, R., Del Missier, G., Neidhardt, L., Pichara, K., Sanchez-Lengeling, B., Schlangen, M., St Pierre, et al
  2026
- **Generative artificial intelligence creates delicious, sustainable, and nutritious burgers.** *NPJ science of food*
  Tac, V., Gardner, C. D., Kuhl, E.
  2026; 10 (1)
- **AI for food: accelerating and democratizing discovery and innovation.** *NPJ science of food*
  Kuhl, E.
  2025; 9 (1): 82
- **Democratizing biomedical simulation through automated model discovery and a universal material subroutine** *COMPUTATIONAL MECHANICS*
  Peirlinck, M., Linka, K., Hurtado, J. A., Holzapfel, G. A., Kuhl, E.
  2024
- **On automated model discovery and a universal material subroutine for hyperelastic materials** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*
  Peirlinck, M., Linka, K., Hurtado, J. A., Kuhl, E.
  2024; 418
- **Bayesian Physics-Based Modeling of Tau Propagation in Alzheimer's Disease.** *Frontiers in physiology*
  Schafer, A., Peirlinck, M., Linka, K., Kuhl, E., Alzheimer's Disease Neuroimaging Initiative (ADNI)
  2021; 12: 702975
- **Unsupervised material fingerprinting: Ultra-fast hyperelastic model discovery from full-field experimental measurements** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*
  Flaschel, M., Moreno-Mateos, M., Wiesheier, S., Steinmann, P., Kuhl, E.
  2026; 461
- **Non-smooth optimization meets automated material model discovery** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Flaschel, M., Hastie, T., Kuhl, E.

2026; 563

- **The meatball matchup: Plant vs. animal proteins on campus** *FOOD RESEARCH INTERNATIONAL*
  St Pierre, S. R., Koosis, A. O., Zhang, N., Kuhl, E.
  2026; 240
- **The meatball matchup: Plant vs. animal proteins on campus.** *Food research international (Ottawa, Ont.)*
  St Pierre, S. R., Koosis, A. O., Zhang, N., Kuhl, E.
  2026; 240: 119631
- **Generalized invariants meet constitutive neural networks: A novel framework for hyperelastic materials** *JOURNAL OF THE MECHANICS AND PHYSICS OF SOLIDS*
  Martonova, D., Goriely, A., Kuhl, E.
  2026; 206
- **Biophysical modeling of anatomically realistic prenatal cortical folding development.** *Nature communications*
  Hou, J., Wu, Z., Jiang, K., Wu, T., Zhang, L., Zhu, D., Gao, W., Razavi, M. J., Liu, T., Kuhl, E., Li, G., Wang, X.
  2026
- **A whole-brain model of amyloid beta accumulation and cerebral hypoperfusion in Alzheimer's disease#** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*
  Corti, M., Ahern, A., Goriely, A., Kuhl, E., Antonietti, P. F.
  2026; 461
- **The mechanics and physics of tofu: Understanding hydrated soft solids through feature networks** *JOURNAL OF THE MECHANICS AND PHYSICS OF SOLIDS*
  Boes, B., Simon, J., Holthusen, H., Kuhl, E.
  2026; 213
- **Generative AI for material design: A mechanics perspective from burgers to matter** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*
  Tac, V., Kuhl, E.
  2026; 461
- **Adaptive Material Fingerprinting for the fast discovery of polyconvex feature combinations in isotropic and anisotropic hyperelasticity** *INTERNATIONAL JOURNAL OF ENGINEERING SCIENCE*
  Flaschel, M., Holthusen, H., Martonova, D., Kuhl, E.
  2026; 227
- **Open-Source Benchmarking of Plant-Based and Animal Meats.** *Foods (Basel, Switzerland)*
  van den Bedem, S. D., Kuhl, E., Cotto, C.
  2026; 15 (12)
- **Texture Independently Drives Liking in AI-Generated Alternative Protein Burgers.** *Foods (Basel, Switzerland)*
  Tac, V., Koosis, A. O., Kuhl, E.
  2026; 15 (11)
- **A convex route to thermoelasticity: Learning internal energy and dissipation** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*
  Holthusen, H., Steinmann, P., Kuhl, E.
  2026; 459
- **Shape-Space Graphs: Fast and Collision-Free Path Planning for Soft Robots** *IEEE ROBOTICS AND AUTOMATION LETTERS*
  Veil, C., Flaschel, M., Kuhl, E.
  2026; 11 (5): 5582-5589
- **A note on constitutive artificial neural networks for finite strain plasticity#** *MECHANICS RESEARCH COMMUNICATIONS*
  van der Velden, T., Boes, B., Brepols, T., Kuhl, E., Holthusen, H.
  2026; 155
- **Mechanical, rheological, and sensory characterization of lion's mane mushroom steak.** *Current research in food science*

St Pierre, S. R., Boyle, L., Vervenne, T., Darwin, E. C., Goodson, M. A., Palomares, M., Zhang, N., Kuhl, E.
2026; 12: 101403

- **Material Fingerprinting: A shortcut to material model discovery without solving optimization problems** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*
  Flaschel, M., Martonova, D., Veil, C., Kuhl, E.
  2026; 450
- **A complement to neural networks for anisotropic inelasticity at finite strains** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*
  Holthusen, H., Kuhl, E.
  2026; 450
- **Reanimating the past: From historical collections of the placenta and uterus to modern imaging, machine learning, and multiscale modeling.** *Placenta*
  Rolf, M., Jayatissa, S., Reshef, J., Posch, S., Kuhl, E., James, J. L., Clark, A. R., Allerkamp, H. H.
  2026
- **State-of-the-art and tomorrow's challenges and opportunities in constitutive modeling of soft biological tissues with a focus on arterial, cardiac and brain biomechanics.** *Acta biomaterialia*
  Avril, S., Goriely, A., Holzapfel, G. A., Kuhl, E., Nordsletten, D., Ogden, R. W.
  2026
- **Biophysical modeling of anatomically realistic prenatal cortical folding development.** *Research square*
  Wang, X., Hou, J., Wu, Z., Jiang, K., Wu, T., Zhang, L., Zhu, D., Gao, W., Razavi, M., Liu, T., Kuhl, E., Li, G.
  2026
- **A generalized dual potential for inelastic Constitutive Artificial Neural Networks: A JAX implementation at finite strains** *JOURNAL OF THE MECHANICS AND PHYSICS OF SOLIDS*
  Holthusen, H., Linka, K., Kuhl, E., Brepols, T.
  2026; 206
- **Material Fingerprinting for rapid discovery of hyperelastic models: First experimental validation** *JOURNAL OF THE MECHANICS AND PHYSICS OF SOLIDS*
  Martonova, D., Kuhl, E., Flaschel, M.
  2026; 208
- **Stretching the Limits: From Planar-Biaxial Stress-Stretch to Arterial Pressure-Diameter.** *Journal of biomechanical engineering*
  Vervenne, T., Vermeeren, N., Demeersseman, N., Fehervary, H., Peirlinck, M., Kuhl, E., Famaey, N.
  2025: 1-33
- **A universal material model subroutine for soft matter systems.** *Engineering with computers*
  Peirlinck, M., Hurtado, J. A., Rausch, M. K., Tepole, A. B., Kuhl, E.
  2025; 41 (2): 905-927
- **Discovering dispersion: How robust is automated model discovery for human myocardial tissue?** *Biomechanics and modeling in mechanobiology*
  Martonová, D., Leyendecker, S., Holzapfel, G. A., Kuhl, E.
  2025
- **Democratizing biomedical simulation through automated model discovery and a universal material subroutine.** *Computational mechanics*
  Peirlinck, M., Linka, K., Hurtado, J. A., Holzapfel, G. A., Kuhl, E.
  2025; 75 (6): 1703-1723
- **Mechanical Characterization of Brain Tissue: Experimental Techniques, Human Testing Considerations, and Perspectives.** *Acta biomaterialia*
  Hou, J., Jiang, K., Ramanathan, A., Kumar, A. S., Zhang, W., Zhao, L., Wu, T., Pidaparti, R., Zhu, D., Li, G., Song, K., Liu, T., Razavi, et al
  2025
- **Discovering uncertainty: Gaussian constitutive neural networks with correlated weights** *COMPUTATIONAL MECHANICS*
  McCulloch, J. A., Kuhl, E.

2025; 76 (6): 1527-1539

- **Probing mycelium mechanics and taste: The moist and fibrous signature of fungi steak.** *Acta biomaterialia*
  Vervenne, T., St Pierre, S. R., Famaey, N., Kuhl, E.
  2025
- **Ultra-fast physics-based modeling of the elephant trunk** *JOURNAL OF THE MECHANICS AND PHYSICS OF SOLIDS*
  Kaczmarski, B., Moulton, D. E., Goriely, Z., Goriely, A., Kuhl, E.
  2025; 200
- **Convex neural networks learn generalized standard material models** *JOURNAL OF THE MECHANICS AND PHYSICS OF SOLIDS*
  Flaschel, M., Steinmann, P., De Lorenzis, L., Kuhl, E.
  2025; 200
- **Medical digital twins: enabling precision medicine and medical artificial intelligence.** *The Lancet. Digital health*
  Sadée, C., Testa, S., Barba, T., Hartmann, K., Schuessler, M., Thieme, A., Church, G. M., Okoye, I., Hernandez-Boussard, T., Hood, L., Shmulevich, I., Kuhl, E., Gevaert, et al
  2025: 100864
- **Mechanical Characterization of Brain Tissue: Experimental Techniques, Human Testing Considerations, and Perspectives.** *ArXiv*
  Hou, J., Jiang, K., Ramanathan, A., Kumar, A. S., Zhang, W., Zhao, L., Wu, T., Pidaparti, R., Zhu, D., Li, G., Song, K., Liu, T., Razavi, et al
  2025
- **Texture profile analysis and rheology of plant-based and animal meat.** *Food research international (Ottawa, Ont.)*
  Dunne, R. A., Darwin, E. C., Perez Medina, V. A., Levenston, M. E., St Pierre, S. R., Kuhl, E.
  2025; 205: 115876
- **Constitutive neural networks for main pulmonary arteries: discovering the undiscovered.** *Biomechanics and modeling in mechanobiology*
  Vervenne, T., Peirlinck, M., Famaey, N., Kuhl, E.
  2025
- **Characterizing variability in passive myocardial stiffness in healthy human left ventricles using personalized MRI and finite element modeling.** *Scientific reports*
  Kolawole, F. O., Wang, V. Y., Freytag, B., Loecher, M., Cork, T. E., Nash, M. P., Kuhl, E., Ennis, D. B.
  2025; 15 (1): 5556
- **Automated model discovery for tensional homeostasis: Constitutive machine learning in growth and remodeling.** *Computers in biology and medicine*
  Holthusen, H., Brepols, T., Linka, K., Kuhl, E.
  2025; 186: 109691
- **Discovering uncertainty: Bayesian constitutive artificial neural networks** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*
  Linka, K., Holzapfel, G. A., Kuhl, E.
  2025; 433
- **Atrial Constitutive Neural Networks**
  Peirlinck, M., Linka, K., Kuhl, E.
  edited by Chabiniok, R., Zou, Q., Hussain, T., Nguyen, H. H., Zaha, V. G., Gusseva, M.
  SPRINGER INTERNATIONAL PUBLISHING AG.2025: 249-259
- **Biaxial testing and sensory texture evaluation of plant-based and animal deli meat.** *Current research in food science*
  St Pierre, S. R., Sibley, L. S., Tran, S., Tran, V., Darwin, E. C., Kuhl, E.
  2025; 10: 101080
- **The mechanical and sensory signature of plant-based and animal meat.** *NPJ science of food*
  St Pierre, S. R., Darwin, E. C., Adil, D., Aviles, M. C., Date, A., Dunne, R. A., Lall, Y., Parra Vallecillo, M., Perez Medina, V. A., Linka, K., Levenston, M. E., Kuhl, E.
  2024; 8 (1): 94
- **Mimicking Mechanics: A Comparison of Meat and Meat Analogs.** *Foods (Basel, Switzerland)*

St Pierre, S. R., Kuhl, E.
2024; 13 (21)

- **Machine learning reveals correlations between brain age and mechanics.** *Acta biomaterialia*
  Hoppstädter, M., Linka, K., Kuhl, E., Schmicke, M., Böl, M.
  2024
- **Personalizing the shoulder rhythm in a computational upper body model improves kinematic tracking in high range-of-motion arm movements.** *Journal of biomechanics*
  Maier, J. N., Bianco, N. A., Ong, C. F., Muccini, J., Kuhl, E., Delp, S. L.
  2024; 176: 112365
- **Automated model discovery for textile structures: The unique mechanical signature of warp knitted fabrics.** *Acta biomaterialia*
  McCulloch, J. A., Kuhl, E.
  2024
- **A universal material model subroutine for soft matter systems** *ENGINEERING WITH COMPUTERS*
  Peirlinck, M., Hurtado, J. A., Rausch, M. K., Tepole, A., Kuhl, E.
  2024
- **Automated Data-Driven Discovery of Material Models Based on Symbolic Regression: A Case Study on the Human Brain Cortex.** *Acta biomaterialia*
  Hou, J., Chen, X., Wu, T., Kuhl, E., Wang, X.
  2024
- **Data-driven continuum damage mechanics with built-in physics** *EXTREME MECHANICS LETTERS*
  Tac, V., Kuhl, E., Tepole, A.
  2024; 71
- **Data-driven continuum damage mechanics with built-in physics.** *Extreme Mechanics Letters*
  Tac, V., Kuhl, E., Tepole, A. B.
  2024; 71
- **Theory and implementation of inelastic Constitutive Artificial Neural Networks** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*
  Holthusen, H., Lamm, L., Brepols, T., Reese, S., Kuhl, E.
  2024; 428
- **Automated model discovery for human cardiac tissue: Discovering the best model and parameters** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*
  Martonova, D., Peirlinck, M., Linka, K., Holzapfel, G. A., Leyendecker, S., Kuhl, E.
  2024; 428
- **Best-in-class modeling: A novel strategy to discover constitutive models for soft matter systems** *EXTREME MECHANICS LETTERS*
  Linka, K., Kuhl, E.
  2024; 70
- **Minimal activation with maximal reach: Reachability clouds of bio-inspired slender** *EXTREME MECHANICS LETTERS*
  Kaczmarski, B., Moulton, D. E., Goriely, A., Kuhl, E.
  2024; 71
- **I too I 2: A new class of hyperelastic isotropic incompressible models based solely on the second invariant** *JOURNAL OF THE MECHANICS AND PHYSICS OF SOLIDS*
  Kuhl, E., Goriely, A.
  2024; 188
- **Panel stacking is a threat to consensus statement validity.** *Journal of clinical epidemiology*
  Kepp, K. P., Aavitsland, P., Ballin, M., Balloux, F., Baral, S., Bardosh, K., Bauchner, H., Bendavid, E., Bhopal, R., Blumstein, D. T., Boffetta, P., Bourgeois, F., Brufsky, et al
  2024: 111428

- **Minimal Design of the Elephant Trunk as an Active Filament.** *Physical review letters*
  Kaczmarski, B., Leanza, S., Zhao, R., Kuhl, E., Moulton, D. E., Goriely, A.
  2024; 132 (24): 248402
- **Sex-specific cardiovascular risk factors in the UK Biobank.** *Frontiers in physiology*
  St Pierre, S. R., Kaczmarski, B., Peirlinck, M., Kuhl, E.
  2024; 15: 1339866
- **On sparse regression, L<sub>p</sub>-regularization, and automated model discovery** *INTERNATIONAL JOURNAL FOR NUMERICAL METHODS IN ENGINEERING*
  McCulloch, J. A., St Pierre, S. R., Linka, K., Kuhl, E.
  2024
- **Elephant Trunk Inspired Multimodal Deformations and Movements of Soft Robotic Arms** *ADVANCED FUNCTIONAL MATERIALS*
  Leanza, S., Lu-Yang, J., Kaczmarski, B., Wu, S., Kuhl, E., Zhao, R.
  2024
- **Benchmarking physics-informed frameworks for data-driven hyperelasticity.** *Computational mechanics*
  Taç, V., Linka, K., Sahli-Costabal, F., Kuhl, E., Tepole, A. B.
  2024; 73 (1): 49-65
- **Data-driven hyperelasticity, Part II: A canonical framework for anisotropic soft biological tissues** *JOURNAL OF THE MECHANICS AND PHYSICS OF SOLIDS*
  Tikenogullari, O., Acan, A., Kuhl, E., Dal, H.
  2023; 181
- **Discovering a reaction-diffusion model for Alzheimer's disease by combining PINNs with symbolic regression** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*
  Zhang, Z., Zou, Z., Kuhl, E., Karniadakis, G.
  2024; 419
- **Discovering the mechanics of artificial and real meat** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*
  St Pierre, S. R., Rajasekharan, D., Darwin, E. C., Linka, K., Levenston, M. E., Kuhl, E.
  2023; 415
- **Automated model discovery for muscle using constitutive recurrent neural networks.** *Journal of the mechanical behavior of biomedical materials*
  Wang, L. M., Linka, K., Kuhl, E.
  2023; 145: 106021
- **Effects of cardiac growth on electrical dyssynchrony in the single ventricle patient.** *Computer methods in biomechanics and biomedical engineering*
  Tikenoğulları, O. Z., Peirlinck, M., Chubb, H., Dubin, A. M., Kuhl, E., Marsden, A. L.
  2023: 1-17
- **Benchmarking physics-informed frameworks for data-driven hyperelasticity** *COMPUTATIONAL MECHANICS*
  Tac, V., Linka, K., Sahli-Costabal, F., Kuhl, E., Tepole, A.
  2023
- **Automated model discovery for skin: Discovering the best model, data, and experiment** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*
  Linka, K., Tepole, A., Holzapfel, G. A., Kuhl, E.
  2023; 410
- **Validating MRI-Derived Myocardial Stiffness Estimates Using In Vitro Synthetic Heart Models.** *Annals of biomedical engineering*
  Kolawole, F. O., Peirlinck, M., Cork, T. E., Levenston, M., Kuhl, E., Ennis, D. B.
  2023
- **Bayesian design optimization of biomimetic soft actuators** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*
  Kaczmarski, B., Moulton, D. E., Goriely, A., Kuhl, E.

2023; 408

- **A Simulation Tool for Physics-Informed Control of Biomimetic Soft Robotic Arms** *IEEE ROBOTICS AND AUTOMATION LETTERS*
  Kaczmarski, B., Goriely, A., Kuhl, E., Moulton, D. E.
  2023; 8 (2): 936-943
- **Automated model discovery for human brain using Constitutive Artificial Neural Networks.** *Acta biomaterialia*
  Linka, K., Pierre, S. R., Kuhl, E.
  2023
- **A new family of Constitutive Artificial Neural Networks towards automated model discovery** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*
  Linka, K., Kuhl, E.
  2023; 403
- **Image-based axon model highlights heterogeneity in initiation of damage.** *Biophysical journal*
  Wang, L. M., Goodman, M. B., Kuhl, E.
  2022
- **Bayesian Physics Informed Neural Networks for real-world nonlinear dynamical systems** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*
  Linka, K., Schafer, A., Meng, X., Zou, Z., Karniadakis, G., Kuhl, E.
  2022; 402
- **How viscous is the beating heart?: Insights from a computational study.** *Computational mechanics*
  Tikenoğulları, O. Z., Costabal, F. S., Yao, J., Marsden, A., Kuhl, E.
  2022; 70 (3): 565-579
- **Correlating the microstructural architecture and macrostructural behaviour of the brain.** *Acta biomaterialia*
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