Stanford

Joy Ku

Research Technical Manager, Wu Tsai Human Performance Alliance

Bio

CURRENT ROLE AT STANFORD

Joy Ku is focused on biocomputation and the advancement of their use through teaching, science communications, community building, and the promotion of research resource sharing efforts, particularly as related to reproducibility and open-source science.

She is currently Deputy Director of the Wu Tsai Human Performance Alliance at Stanford (https://humanperformance.stanford.edu) and also leads the education and outreach efforts for the overall Wu Tsai Human Performance Alliance, which consists of institutions across the country, including Boston Children's Hospital, Salk, UC San Diego, the University of Kansas, and the University of Oregon. The Alliance's mission is to discover biological principles to optimize human performance and catalyze innovations in human health.

Dr. Ku is also the Director of Promotions and Didactic Interactions for the NIH-funded Restore Center (https://restore.stanford.edu), as well as the Director of Education and Communications for the Mobilize Center (https://mobilize.stanford.edu), an NIH Biomedical Technology Resource Center. Both Centers provide tools, infrastructure, and training to support the research community. The Mobilize Center's emphasis is on biomechanical modeling and machine learning algorithms to provide new insights into human movement from data sources, such as wearables, video, and medical images. The Restore Center's mission is to advance rehabilitation research using mobile sensor and video technology for real-world assessments of movement and factors affecting movement.

She also manages SimTK (https://simtk.org), a software, model, and data-sharing platform for the biocomputation research community.

Publications

PUBLICATIONS

- **Leveraging Mobile Technology for Public Health Promotion: A Multidisciplinary Perspective.** *Annual review of public health*
  Hicks, J. L., Boswell, M. A., Althoff, T., Crum, A. J., Ku, J. P., Landay, J. A., Moya, P. M., Murnane, E. L., Snyder, M. P., King, A. C., Delp, S. L.
  2022
- **Mobile Health: making the leap to research and clinics** *NPJ DIGITAL MEDICINE*
  Ku, J. P., Sim, I.
  2021; 4 (1): 83
- **Credible practice of modeling and simulation in healthcare: ten rules from a multidisciplinary perspective** *JOURNAL OF TRANSLATIONAL MEDICINE*
  Erdemir, A., Mulugeta, L., Ku, J. P., Drach, A., Horner, M., Morrison, T. M., Peng, G. Y., Vadigepalli, R., Lytton, W. W., Myers, J. G.
  2020; 18 (1): 369
- **Reference data on in vitro anatomy and indentation response of tissue layers of musculoskeletal extremities** *SCIENTIFIC DATA*
  Schimmoeller, T., Neumann, E. E., Owings, T. M., Nagle, T. F., Colbrunn, R. W., Landis, B., Jelovsek, J., Hing, T., Ku, J. P., Erdemir, A.

2020; 7 (1): 20

- **Reference data on thickness and mechanics of tissue layers and anthropometry of musculoskeletal extremities** *SCIENTIFIC DATA*
  Neumann, E. E., Owings, T. M., Schimmoeller, T., Nagle, T. F., Colbrunn, R. W., Landis, B., Jelovsek, J., Wong, M., Ku, J. P., Erdemir, A.
  2018; 5: 180193

- **OpenSim: Simulating musculoskeletal dynamics and neuromuscular control to study human and animal movement.** *PLoS computational biology*
  Seth, A., Hicks, J. L., Uchida, T. K., Habib, A., Dembia, C. L., Dunne, J. J., Ong, C. F., DeMers, M. S., Rajagopal, A., Millard, M., Hamner, S. R., Arnold, E. M., Yong, et al
  2018; 14 (7): e1006223

- **Credibility, Replicability, and Reproducibility in Simulation for Biomedicine and Clinical Applications in Neuroscience** *FRONTIERS IN NEUROINFORMATICS*
  Mulugeta, L., Drach, A., Erdemir, A., Hunt, C. A., Horner, M., Ku, J. P., Myers, J. G., Vadigepalli, R., Lytton, W. W.
  2018; 12: 18

- **Perspectives on Sharing Models and Related Resources in Computational Biomechanics Research** *JOURNAL OF BIOMECHANICAL ENGINEERING-TRANSACTIONS OF THE ASME*
  Erdemir, A., Hunter, P. J., Holzapfel, G. A., Loew, L. M., Middleton, J., Jacobs, C. R., Nithiarasu, P., Lohner, R., Wei, G., Winkelstein, B. A., Barocas, V. H., Guilak, F., Ku, et al
  2018; 140 (2)

- **The mobilize center: an NIH big data to knowledge center to advance human movement research and improve mobility.** *Journal of the American Medical Informatics Association*
  Ku, J. P., Hicks, J. L., Hastie, T., Leskovec, J., Ré, C., Delp, S. L.
  2015; 22 (6): 1120-1125

- **OpenMM 4: A Reusable, Extensible, Hardware Independent Library for High Performance Molecular Simulation** *JOURNAL OF CHEMICAL THEORY AND COMPUTATION*
  Eastman, P., Friedrichs, M. S., Chodera, J. D., Radmer, R. J., Bruns, C. M., Ku, J. P., Beauchamp, K. A., Lane, T. J., Wang, L., Shukla, D., Tye, T., Houston, M., Stich, et al
  2013; 9 (1): 461-469

- **Simbios: an NIH national center for physics-based simulation of biological structures** *JOURNAL OF THE AMERICAN MEDICAL INFORMATICS ASSOCIATION*
  Delp, S. L., Ku, J. P., Pande, V. S., Sherman, M. A., Altman, R. B.
  2012; 19 (2): 186-189

- **Comparison of CFD and MRI flow and velocities in an in vitro large artery bypass graft model** *ANNALS OF BIOMEDICAL ENGINEERING*
  Ku, J. P., Elkins, C. J., Taylor, C. A.
  2005; 33 (3): 257-269

- **In vivo validation of a one-dimensional finite-element method for predicting blood flow in cardiovascular bypass grafts** *IEEE TRANSACTIONS ON BIOMEDICAL ENGINEERING*
  Steele, B. N., Wan, J., Ku, J. P., Hughes, T. J., Taylor, C. A.
  2003; 50 (6): 649-656

- **Internet-based system for simulation-based medical planning for cardiovascular disease** *IEEE TRANSACTIONS ON INFORMATION TECHNOLOGY IN BIOMEDICINE*
  Steele, B. N., Draney, M. T., Ku, J. P., Taylor, C. A.
  2003; 7 (2): 123-129

- **In vivo validation of numerical prediction of blood flow in arterial bypass grafts** *ANNALS OF BIOMEDICAL ENGINEERING*
  Ku, J. P., Draney, M. T., Arko, F. R., Lee, W. A., Chan, F. P., Pelc, N. J., Zarins, C. K., Taylor, C. A.
  2002; 30 (6): 743-752

- **In vivo validation of a one-dimensional finite element method for simulation-based medical planning for cardiovascular bypass surgery** *23rd Annual International Conference of the IEEE-Engineering-in-Medicine-and-Biology-Society*
  Steele, B. N., Taylor, C. A., Wan, J., Ku, J. P., Hughes, T. J.
  IEEE.2001: 120–123

- **Predictive medicine: computational techniques in therapeutic decision-making.** *Computer aided surgery*
  Taylor, C. A., Draney, M. T., Ku, J. P., Parker, D., Steele, B. N., Wang, K., Zarins, C. K.
  1999; 4 (5): 231-247