Huizhou (Jack) Yang

Personal Information

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Education

Ph.D. in Mechanical Engineering University of Denver | Denver, CO, USA 2016 – 2021

M.S. in Mechanical Engineering University of Denver | Denver, CO, USA 2013 – 2015

Awards and Honors

Harris Award Finalist, Orthopaedic Research Society, 2025.

Experience

Postdoctoral Research Fellow 2021 – Present

Center for Orthopaedic Biomechanics, University of Denver

- Lead independent research projects on hip and knee arthroplasty stability, implant fixation, and joint biomechanics
- Develop and validate finite element models for orthopedic implant evaluation across multiple joint systems
- Collaborate with industry partners including Highridge Medical and DePuy Synthes on implant design optimization and clinical evaluation
- Investigate bone-implant interface mechanics, micromotion analysis, and primary fixation strategies for cementless implants
- Assess capsule-muscle contributions to hip joint stability and dislocation risk after total hip arthroplasty
- Evaluate effects of surgical alignment, implant positioning, and design parameters on implant performance
- Conduct experimental-computational validation studies integrating cadaveric testing with finite element predictions
- Support surgical planning, prototype testing, and design iteration through biomechanical simulation

Graduate Research Assistant 2016 – 2021

Center for Orthopaedic Biomechanics, University of Denver

- Conducted computational biomechanics research on cementless total knee arthroplasty
- Developed and validated finite element models to predict tibial strains and tray-bone interface micromotions
- Investigated effects of surgical alignment, implant design, and patient anatomy on TKA fixation stability

Professional Service

Abstract Reviewer, Orthopaedic Research Society, 2025.

Publications

Yang H, Colone K, Haas B, Myers CA, Rullkoetter PJ, Clary CW. (2025). Hip Stability After Total Hip Arthroplasty: Quantifying Capsule and Passive Muscle Contributions. *Journal of Orthopaedic Research*. 43(10):1826-1839. (Harris Award Finalist)

Yang H, Marras D, Clary CW, Zumbrunn T, List R, Ferguson SJ, Rullkoetter PJ. (2025). Impact of Surgical Alignment, Bone Properties, Anterior–Posterior Translation, and Implant Design Factors on Fixation in Cementless Unicompartmental Knee Arthroplasty. *Journal of Biomechanical Engineering*. 147(1):011007.

Yang H, Bayoglu R, Clary CW, Rullkoetter PJ. (2023). Impact of patient, surgical, and implant design factors on predicted tray-bone interface micromotions in cementless total knee arthroplasty. *Journal of Orthopaedic Research*. 41(1):115-129.

Yang H, Behnam Y, Clary CW, Rullkoetter PJ. (2022). Drivers of initial stability in cementless TKA: Isolating effects of tibiofemoral conformity and fixation features. *Journal of the Mechanical Behavior of Biomedical Materials*. 136:105507.

Yang H, Bayoglu R, Clary CW, Rullkoetter PJ. (2021). Impact of surgical alignment, tray material, PCL condition, and patient anatomy on tibial strains after TKA. *Medical Engineering & Physics*. 88:69–77.

Yang H, Bayoglu R, SharifiRavani M, Behnam Y, Navacchia A, Clary CW, Rullkoetter PJ. (2020). Validation and sensitivity of model-predicted proximal tibial displacement and tray micromotion in cementless total knee arthroplasty under physiological conditions. *Journal of the Mechanical Behavior of Biomedical Materials*. 109:103793.

Zhao J, Chen Z, **Yang H**, Yi Y. (2016). Finite element analysis of thermal buckling in automotive clutch plates. *Journal of Thermal Stresses*. 39(1):77-89.

Conference Presentations

Yang H, Fugit W, Rullkoetter PJ, Clary CW. Impact of design factors on implant stability in cementless hip revision arthroplasty: Experimental-computational studies evaluating different implant designs. *34th International Society for Technology in Arthroplasty*, New York, September 2023.

Yang H, Marras D, Clary CW, Rullkoetter PJ. Impact of implant alignment, bone material, and implant design factors on the primary fixation stability in cementless unicompartmental knee replacement. *Orthopaedic Research Society*, Dallas, February 2023.

Yang H, Behnam Y, Clary CW, Rullkoetter PJ. Drivers of initial stability in cementless TKA: Isolating effects of tibiofemoral articulation and fixation features from current implants. *33rd International Society for Technology in Arthroplasty*, Maui, September 2022.

Han X, **Yang H**, Navacchia A, Clary CW, Rullkoetter PJ. Evaluating the initial stability in cementless patellar implant during a single-leg lunge. *33rd International Society for Technology in Arthroplasty*, Maui, September 2022.

Yang H, Bayoglu R, Clary CW, Rullkoetter PJ. Impact of alignment variation and activity on tray-bone interface micromotion in cementless TKA. *Orthopaedic Research Society*, Phoenix, February 2020.

Yang H, Bayoglu R, SharifiRavani M, Behnam Y, Navacchia A, Clary CW, Rullkoetter PJ. Validation of model-predicted proximal tibial displacement and tray micromotion in cementless TKA. *32nd International Society for Technology in Arthroplasty*, Toronto, October 2019.

Yang H, Bayoglu R, Clary CW, Rullkoetter PJ. Impact of surgical alignment, tray material, PCL condition, and patient anatomy on proximal tibial strains after cemented TKA. *32nd International Society for Technology in Arthroplasty*, Toronto, October 2019.

Han X, **Yang H**, Clary CW, Rullkoetter PJ. Validation of model-predicted cementless patella displacements during lunge. *32nd International Society for Technology in Arthroplasty*, Toronto, October 2019.

Peer Review Experience

Served as peer reviewer for multiple scientific journals including Journal of Orthopaedic Research, Journal of Biomechanics, The Knee, BMC Musculoskeletal Disorders, and others (2019-Present)

Technical Skills

Computational modeling: ABAQUS, HyperMesh, ScanIP

CAD/Design: SolidWorks

Programming: Python, MATLAB

Expertise: Finite element modeling, Biomechanical Analysis, Statistical Analysis, Medical Image Segmentation