

Huizhou Yang

Personal Information

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Education background

01/2016-11/2021	University of Denver (DU), Denver Doctor of Philosophy in Mechanical Engineering	GPA: 3.88
09/2013-06/2015	University of Denver (DU), Denver Master of Science in Mechanical Engineering	GPA: 3.75

Work Experience

Research Assistant

Center for Orthopaedic Biomechanics, University of Denver

Sept. 2016 – Nov. 2021

Postdoctoral Researcher

Center for Orthopaedic Biomechanics, University of Denver

Dec. 2021 - Present

Research Experience

Application of finite element analysis in orthopaedics

Center for Orthopaedic Biomechanics, University of Denver

Faculty advisor: Paul Rullkoetter

Jan. 2016 – Present

- Develop and validate computational models for experiment devices, implants, specimens, and human tissues
- Simulate post-operative lower limb activities and study the influence of implants on joint related parameters
- Test implant designs and prototypes under physiological conditions and give suggestions for improvement
- Answer surgeons' concerns by testing potential surgical plans and technique concepts

Hip capsule-muscle contributions to hip joint stability

Center for Orthopaedic Biomechanics, University of Denver

Faculty advisor: Paul Rullkoetter, Chadd Clary

Dec. 2023 – Present

- Develop and calibrate standardized computational models that incorporate both the hip capsule and local muscles to identify the primary contributors to hip passive stability following THA
- Investigate the anterior and posterior dislocation mechanism and the impact of stem alignment

Implant stability after knee arthroplasty

Center for Orthopaedic Biomechanics, University of Denver

Faculty advisor: Paul Rullkoetter

Dec. 2018 – Dec.2022

- Develop experimental-computational frameworks for evaluating TKA/UKA implant stability
- Develop UKA models that include bones, implants, cartilages, and soft-tissues for evaluating implant designs
- Investigate the impact of TKA factors on bone remodeling and cementless implant-bone micromotion
- Compare the implant stability between novel cementless TKA/UKA designs

Implant stability after hip arthroplasty

Center for Orthopaedic Biomechanics, University of Denver

Faculty advisor: Paul Rullkoetter, Chadd Clary

Dec. 2022 – Dec. 2023

- Develop experimental-computational frameworks for evaluating hip implant stability
- Compare the implant stability and bone strain energy density between novel designs

Thermal Elastic Instabilities in Automotive System

Department of Mechanical Engineering, University of Denver

Faculty Advisor: Yunbo Yi

Aug. 2014 – Aug. 2015

- Researched in Thermal problems in automotive systems
- Applied simulation software to research TI problems

Research Publications

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*. J. Mech. Behav. Biomed. Mater. 109:103793.

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*. Med. Eng. Phys. 88:69–77.

Yang H, Bayoglu R, Clary CW, Rullkoetter PJ. 2022. *Impact of patient, surgical, and implant design factors on predicted tray-bone interface micromotions in cementless total knee arthroplasty*. J. Orthop. Res. 1-15.

Yang H, Behnam Y, Clary CW, Rullkoetter PJ. 2022. *Drivers of initial stability in cementless TKA: Isolating effects of tibiofemoral conformity and fixation features*. J. Mech. Behav. Biomed. Mater. 136:105507

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*. J. Biomech. Eng. 147(1):011007.

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

Conference Presentations

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.

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, 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, 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*. 33rd International Society for Technology in Arthroplasty, Orthopaedic Research Society, Dallas, February 2023.

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

Peer review experience (13 journals and 39 reviews)

Journal of Biomechanics (2); Applied science (6); International Journal of Environmental Research and Public Health (7); Biology (1); Electronics (1); Healthcare (4); Symmetry (1); BMC Musculoskeletal Disorders (9); Engineering Analysis with Boundary Elements (1); Medicina (2); Journal of Clinical Medicine (3); Tomography (1); Osteology (1).

Skills and Abilities

ABAQUS, Hypermesh, ScanIP, Python, Matlab, Solidwork, Inkspace, OriginPro, finite element modeling, finite element analysis, statistical analysis