# Huizhou Yang

## Personal Information

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## Education background

**Ph.D. in Mechanical Engineering** **University of Denver**, Denver, CO Jan. 2016 – Nov. 2021

**M.S. in Mechanical Engineering** **University of Denver**, Denver, CO Sep. 2013 – Jun. 2015

## Work Experience

### Postdoctoral Researcher

*Center for Orthopaedic Biomechanics, University of Denver* Dec. 2021 – Present

### Research Assistant

*Center for Orthopaedic Biomechanics, University of Denver* Sept. 2016 – Nov. 2021

## Research Experience

### Finite element application in orthopaedic research

*Center for Orthopaedic Biomechanics, University of Denver*

Faculty advisor: Dr. Paul Rullkoetter Jan. 2016 – Present

- Develop and validate computational models of test devices, implants, specimens, and biological tissues
- Simulate post-operative lower limb activities to evaluate implants effects on joint mechanics and function
- Support design teams and surgeons by testing prototypes, surgical plans, and technique concepts

### Cervical spine modeling for implant evaluation

*Center for Orthopaedic Biomechanics, University of Denver*

Faculty advisor: Dr. Paul Rullkoetter Dec. 2023 – Present

- Collaborated with HIGHRIDGE MEDICAL to evaluate novel cervical implant concepts
- Develop and validate full cervical spine finite element models to assess biomechanical performance
- Analyze implant effects on range of motion, disc stress, and facet contact mechanics
- Provide simulation-based insight that informed product design improvement

### Hip capsule-muscle contributions to joint stability

*Center for Orthopaedic Biomechanics, University of Denver*

Faculty advisor: Dr. Paul Rullkoetter, Dr. Chadd Clary Dec. 2023 – Dec. 2024

- Developed and calibrated standardized computational models integrating capsule and local musculature to assess passive joint stability after THA
- Identified key stabilizing structures through simulation of functional activities
- Investigated anterior/posterior dislocation mechanisms and the influence of femoral stem alignment

### Implant stability after hip arthroplasty

*Center for Orthopaedic Biomechanics, University of Denver*

Faculty advisor: Dr. Paul Rullkoetter, Dr. Chadd Clary Dec. 2022 – Dec. 2023

- Developed integrated experimental-computational frameworks for evaluating hip implant stability
- Compare bone strain and implant stability across novel THA designs
- Provide recommendations for improving cementless fixation strategies

### Implant stability after knee arthroplasty

*Center for Orthopaedic Biomechanics, University of Denver*

Faculty advisor: Dr. Paul Rullkoetter Dec. 2018 – Dec.2022

- Developed experimental-computational frameworks to evaluate TKA/UKA implant stability
- Created comprehensive TKA/UKA models including bone, implants, cartilage, and soft tissue
- Investigated bone remodeling and implant micromotion in cementless TKA/UKA designs

## 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 inferface 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

Journal of Biomechanics; The Knee; Applied Science; International Journal of Environmental Research and Public Health; Biology; Electronics; Healthcare; Symmetry; BMC Musculoskeletal Disorders; Engineering Analysis with Boundary Elements; Medicina; Journal of Clinical Medicine; Tomography; Osteology.

## Skills and Abilities

**Software:** ABAQUS, HyperMesh, ScanIP, SolidWorks

**Programming:** Python, MATLAB

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