

CONTACT INFORMATION	<p>KU Leuven, BioMechanics (BMe)            Celestijnenlaan 300            box 2422            3001 Leuven</p>	<p>(+32) 45-614-22-10   <a href="mailto:fahimeh.azari@kuleuven.be">fahimeh.azari@kuleuven.be</a>   <a href="https://fahimehazari.github.io">https://fahimehazari.github.io</a> </p>
RESEARCH INTERESTS	Computational Engineering, Scientific Computing, Computational Biomechanics, Bone Mechanics, Medical Imaging, Finite Element Analysis	
EDUCATION	<p><b>Katholieke Universiteit Leuven (KU Leuven)</b>, Leuven, Belgium, June 2019 – Present            Ph.D. in Mechanical Engineering (Biomechanics)  <b>Thesis:</b> <i>Mechanical and structural alterations after surgical treatment of knee osteoarthritis</i>  <b>Adviser:</b> Prof. G. Harry van Lenthe</p> <p><b>Sharif University of Technology</b>, Tehran, Iran, Sep 2014 – Sep 2018            M.Sc. in Mechanical Engineering (Applied Design) GPA: 18.5 / 20  <b>Thesis:</b> <i>Passive Finite Element Model Combined with a Musculoskeletal Model of the Spine to Estimate in vivo Load Sharing in the L4-L5 Motion Segment</i>  <b>Adviser:</b> Prof. Navid Arjmand and Prof. Mohamad Parnianpour</p> <p><b>Amirkabir University of Technology (Tehran Polytechnic)</b>, Tehran, Iran, Sep 2010 – Sep 2014            B.Sc. in Biomedical Engineering (Biomechanics) GPA: 18.91 / 20  <b>Project:</b> <i>Design and Implementation of an Elastography Apparatus for Mechanical Characterization of Soft Tissues</i>  <b>Adviser:</b> Prof. Nasser Fatourae</p> <p><b>Amirkabir University of Technology (Tehran Polytechnic)</b>, Tehran, Iran, Sep 2011 – Sep 2014            B.Sc. in Industrial Engineering, studying two majors at the same time (double degree) GPA: 17.71 / 20</p>	
RESEARCH EXPERIENCE	<p><b>PhD Researcher</b>, June 2019 – Present            BioMechanics (BMe), Bone Group, <b>KU Leuven</b>, Leuven, Belgium  <ul style="list-style-type: none"> <li>Visualization and quantification of bone microstructure in knee osteoarthritis.</li> </ul> </p> <p><b>Research Assistant</b>, August 2018 – June 2019            BioMechanics (BMe), Bone Group, <b>KU Leuven</b>, Leuven, Belgium  <ul style="list-style-type: none"> <li>Developing a computational study of line-to-line versus undersized cementing techniques of short-stem total hip arthroplasty with experimental verification.</li> </ul> </p> <p><b>Research Assistant</b>, Sep 2016 – Sep 2017            Biomechanics Lab, <b>Sharif University of Technology</b>, Tehran, Iran  <ul style="list-style-type: none"> <li>Finite element analysis based on CT scans modeling; developing a combined passive and active musculoskeletal model study to estimate L4-L5 load sharing based.</li> </ul> </p> <p><b>Member of Research and Development (R&amp;D) group</b>, Sep 2017 – August 2018            R&amp;D group, <b>Dideban Tajhiz Alborz Co.</b>, Tehran, Iran</p>	
TEACHING EXPERIENCE	<p><b>Teaching Assistant</b>, October 2022            Department of Mechanical Engineering, <b>KU Leuven</b>, Leuven, Belgium  <b>Course: Advanced Tissue Mechanics</b>  <ul style="list-style-type: none"> <li>Tutoring Materialise software packages (mimics and 3-matic) for developing subject-specific finite element models of implanted femora to identify critical locations prone to failure under physiological loading conditions.</li> </ul> </p> <p><b>Teaching Assistant</b>, November 2021            Department of Mechanical Engineering, <b>KU Leuven</b>, Leuven, Belgium  <b>Course: Numerical Modelling in Biomedical Engineering</b>  <ul style="list-style-type: none"> <li>Tutoring students in developing a python tool for computed tomography-based structural rigidity analysis (CTRA) to predict and monitor fracture risk associated with metastatic bone lesions.</li> </ul> </p> <p><b>Teaching Assistant</b>, October 2021, October 2022            Department of Mechanical Engineering, <b>KU Leuven</b>, Leuven, Belgium  <b>Course: Advanced Study Topics in Musculoskeletal Biomechanics</b>  <ul style="list-style-type: none"> <li>Tutoring Materialise software packages (mimics &amp; 3-matic) and ABAQUS to quantify bone tissue modulus in CT-based finite element models of the femur using three-point bending and beam theory.</li> </ul> </p>	

**Teaching Assistant**, Fall 2016, Fall 2015Department of Mechanical Engineering, **Sharif University of Technology**, Tehran, Iran**Course: Statics****Teaching Assistant**, Fall 2015Department of Mathematics, **Sharif University of Technology**, Tehran, Iran**Tutoring MATLAB software** to Bachelor Students**Teaching Assistant**, Spring 2016, Spring 2015Department of Mechanical Engineering, **Sharif University of Technology**, Tehran, Iran**Course: Material Science****Supervision and Mentoring**, 2022-2023Department of Mechanical Engineering, **KU Leuven**, Leuven, BelgiumEmma Van Riet, **MSc thesis project**: "Developing an open-source image analysis tool to assess bone microstructure in photon counting CT images"**Supervision and Mentoring**, 2022-2023Department of Mechanical Engineering, **KU Leuven**, Leuven, BelgiumErik Schulte, **MSc thesis project**: "Studying the performance of free subchondral screws in increasing stability in tibial plateau fractures"**Supervision and Mentoring**, Summer 2022Department of Mechanical Engineering, **KU Leuven**, Leuven, BelgiumKaren Vanhalle, **Honor program (BSc)**: "Association between osteoarthritis severity and bone matrix changes"**Supervision and Mentoring**, fall 2021Department of Mechanical Engineering, **KU Leuven**, Leuven, BelgiumPhachara Suklim, **Research visitor**: "Finite element modeling of tibia plateau fractures"**Supervision and Mentoring**, Summer 2021Department of Mechanical Engineering, **KU Leuven**, Leuven, BelgiumCamille Le Goff, **Semester thesis**: "developing bone remodeling algorithm to investigate the long-term mechanical performance of cemented short short-stem total hip arthroplasty"INDUSTRIAL  
EXPERIENCE**Content Creator**, March 2021-Present

Udemy, Online platform

- Developing and producing video and written content for online courses on Materialise software packages (mimics & 3-matic).

**Beta Tester**, June 2020

Materialise Co., Leuven, Belgium

- Testing and providing feedback on the functionality and usability of the upcoming release of the company's materials software (version 23).

**Collaborated with Mathys company**, 2018-2019

Mathys Co., Bettlach, Switzerland

- Assessing the feasibility and mechanical performance of a cemented short stem for the first time in patients with poor bone stock.

## PUBLICATIONS

- [1] William Colyn, **Fahimeh Azari**, Johan Bellemans, G. Harry van Lenthe, Lennart Scheys  
**Microstructural adaptations of the subchondral bone are related to the mechanical axis deviation in end stage varus OA knees**  
*European Cells & Materials Journal*, February 2023
- [2] **Fahimeh Azari**, William Colyn, Johan Bellemans, Lennart Scheys, G. Harry van Lenthe  
**In the end-stage knee osteoarthritis the subchondral bone microarchitecture of the tibial plateau is correlated to that of the distal femur**  
*27th Congress of the European Society of Biomechanics*, June 2022, Porto, Portugal
- [3] **Fahimeh Azari**, Amelie Sas, Karl P Kutzner, Andreas Klockow, Thierry Scheerlinck, G Harry van Lenthe  
**Cemented short-stem total hip arthroplasty appears promising in patients with poor bone quality**  
*26th Congress of the European Society of Biomechanics*, August 2021, Milan, Italy

- [4] **Fahimeh Azari**, Amelie Sas, Karl P Kutzner, Andreas Klockow, Thierry Scheerlinck, G Harry van Lenthe  
**Cemented short-stem total hip arthroplasty: Characteristics of line-to-line versus undersized cementing techniques using a validated CT-based finite element analysis**  
*Journal of Orthopaedic Research*®, September 2021
- [5] Chadapa Rungruangbaiyok, **Fahimeh Azari**, G Harry van Lenthe, Jos Vander Sloten, Boonsin Tangtrakulwanich, Surapong Chatpun  
**Finite element investigation of fracture risk under postero-anterior mobilization on a lumbar bone in elderly with and without osteoporosis**  
*Journal of Medical and Biological Engineering*, June 2021
- [6] **Fahimeh Azari**, Navid Arjmand, Aboulfazl Shirazi-Adl, Shima Rahimi-Moghaddam  
**A combined passive and active musculoskeletal model study to estimate L4-L5 load sharing**  
*Journal of biomechanics*, March 2018

TALKS AND PRESENTATIONS **In the end-stage knee osteoarthritis the subchondral bone microarchitecture of the tibial plateau is correlated to that of the distal femur**  
*27th Congress of the European Society of Biomechanics*, June 2022, Porto, Portugal

**Microstructural adaptations of the subchondral tibial bone are related to the mechanical axis deviation in end-stage varus osteoarthritic knees**  
*OARSI 2022 World Congress on Osteoarthritis*, April 2022, Berlin, Germany

**Cemented short-stem total hip arthroplasty appears promising in patients with poor bone quality**  
*26th Congress of the European Society of Biomechanics (remote)*, August 2021, Milan, Italy

**The cemented optimys stem: A computational study of line-to-line and undersized stems with experimental verification**  
*18th National Day on Biomedical Engineering, Artificial Intelligence in Medicine*, November 2019, Brussels, Belgium

## HONORS

## AND AWARDS

- **PhD research assistantship**, Mechanical Engineering, The Pennsylvania State University, 2018 (declined)
- **PhD studentship** Institute of Bioengineering in the School of Engineering, École Polytechnique Fédérale de Lausanne (EPFL), 2018 (declined)
- **Membership of** National Elites Foundation, Iran, 2010-2018
- **Fellowship of** National Elites Foundation, Iran, 2014-2018
- **Exceptional Talents Fellowship** in Biomedical Engineering Department, Amirkabir University of Technology, Iran, 2014
- **Membership of** Exceptional Talent Center, Amirkabir University of Technology, Iran, 2010-2014
- **Ranked 1st** in cum. GPA among undergraduate biomedical engineering students, Amirkabir University of Technology, 2010-2014

## TECHNICAL SKILLS

*Programming Languages:*  
 Python, R

*Operating Systems:*  
 Linux, Windows

*Analysis/Simulation Tools:*  
 MATLAB, Neural Network in MATLAB, Identification System in MATLAB, Simulink, Business Process Modeling in Arena, ABAQUS

*Applications Software:*  
 CATIA, SolidWorks, AutoCAD, Mimics & 3-matic, Geomagic, Hypermesh, OpenSim, AnyBody

REFERENCES Available upon request