

## Hossein Sharifi

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CONTACT INFORMATION	University of Kentucky Department of Mechanical Engineering, Lexington, KY, 40506 Links: <a href="#">Personal Website</a> , <a href="#">Google Scholar</a> , <a href="#">Github</a> , <a href="#">Linkedin</a>	(859) 213-6972 <a href="mailto:Hossein.sharifi@uky.edu">Hossein.sharifi@uky.edu</a>
RESEARCH INTERESTS	Cardiac Biomechanics, Multiscale Modeling, Computational Mechanics, Finite Element Analysis, Data-Driven Modeling	
EDUCATION	<b>University of Kentucky</b> , Lexington, KY, USA	
	Ph.D., Mechanical Engineering	Expected May 2023
	<ul style="list-style-type: none"><li>• Thesis Topic: <i>Multiscale Modeling of Cardiac Growth and Remodeling</i></li><li>• Advisors:<ol style="list-style-type: none"><li>1. Jonathan F. Wenk, Ph.D</li><li>2. Kenneth S. Campbell, Ph.D</li></ol></li><li>• GPA: 3.94/4.0</li></ul>	
	<b>University of Kentucky</b> , Lexington, KY, USA	
	M.S., Civil Engineering (majored in Structural Engineering)	May 2018
	<ul style="list-style-type: none"><li>• Thesis Topic: <i>Finite Element Evaluation of 2-Cell RC Box Culverts</i></li><li>• Advisor: Issam E. Harik, Ph.D</li><li>• GPA: 4.0/4.0</li></ul>	
	<b>Shiraz University</b> Shiraz, Iran	
	B.S., Civil and Environmental Engineering,	December 2014
RESEARCH AND EXPERIENCE	<b>Dassault Systems</b>	May 2022 - present
	Industry Technical Solution Intern within the Living Heart Project	
	<ul style="list-style-type: none"><li>• ENRICHMENT of <i>in silico</i> clinical trials<ul style="list-style-type: none"><li>• Created a semi-automated framework to execute hundreds of FE simulation of mitral valves (explicit FEM).</li><li>• Conducted sensitivity analyses to study the influential parameters of a template model of secondary mitral valve.</li><li>• Built a ML-based "Virtual Patient Engine (VPE)" to create a virtual patient cohort inspired by physics-based data.</li><li>• Performed an <i>in silico</i> clinical trial by clipping a virtual cohort of patients with secondary mitral regurgitation.</li></ul></li></ul>	
	<b>University of Kentucky</b>	August 2018 - present
	Department of Mechanical Engineering	
	<ul style="list-style-type: none"><li>• Developed an implicit FEM of left ventricular mechanics using <a href="#">FEniCS</a> solver. (<a href="#">MyoFE</a> project)<ul style="list-style-type: none"><li>• Multiscale modeling of LV growth</li><li>• Multiscale modeling of acute myocardial infarction</li><li>• Multiscale modeling of baroreflex control of arterial pressure</li></ul></li><li>• Developed <a href="#">PyCMLuti</a> Python package for generating scientific plots.</li><li>• Contributed in developing of a single hemispherical model of left ventricle (<a href="#">PyMyoVent</a> project).</li><li>• Acquired cardiac magnetic resonance imaging (DENSE, dark and bright blood) of mice using 7T Bruker MR scanner.<ul style="list-style-type: none"><li>• Strain analysis of mice heart using cardiac magnetic resonance feature tracking</li></ul></li></ul>	

## University of Kentucky

Jan 2017 - May 2018

Department of Civil and Environmental Engineering

- Finite Element Modeling of 2-cell reinforced concrete box culverts
- Kentucky Transportation Center (KTC)
- Load rating of reinforced concrete arch and box culverts

## Shiraz University

May 2015 - March 2016

Department of Civil and Environmental Engineering

- Experimental study on seismic behavior of retrofitted reinforced concrete beam-column joints by FRP sheets

## COMPUTER SKILLS

- Engineering softwares: Abaqus, FEniCS Project, ParaView, CANDE, STAAD Pro, SAP 2000, ETABS, SAFE, CSI Bridge, BRASS-CULVERT, Auto CAD, Microsoft Office, LATEX
- Programming language: Python, JavaScript, HTML, MATLAB
- Python packages: Numpy, pandas, SciPy, scikit-learn, Keras, TensorFlow, MPI4PY, Matplotlib

## PUBLICATIONS

### • Published

1. **Sharifi H.**, Mann, C.K., Wenk J. F., Campbell K. S. *A multiscale model of the cardiovascular system that regulates arterial pressure via closed loop baroreflex control of chronotropism, cell-level contractility, and vascular tone*, Biomech Model Mechanobiol, (2022).  
<https://doi.org/10.1007/s10237-022-01628-8>
2. **Sharifi, H.**, Mann, C.K., Rockward, A.L. et al. *Multiscale simulations of left ventricular growth and remodeling*, Biophys Rev 13, 729–746 (2021).  
<https://doi.org/10.1007/s12551-021-00826-5>
3. **Sharifi H.**, Mann, C.K., Noor, A.Z., et al. *Reproducibility of systolic strain in mice using cardiac magnetic resonance feature tracking*, Cardiovasc Eng Tech, (2022). <https://doi.org/10.1007/s13239-022-00621-7>
4. **Sharifi H.**, Peiris A., Harik I. E., *Triage Method for Load Rating Bridge Size Two-Cell Reinforced Concrete Box Culverts for the AASHTO LRFD Design Load*, Structure and Infrastructure Engineering (2021).  
<https://doi.org/10.1080/15732479.2021.2015793>

## PRESENTATIONS

### • Podium presentations

1. Title: 2022 Living Heart Technology Update December 2022  
Conference: **8th International Symposium On The Living Heart And Virtual Twin For Humans**, United States, Brooklyn, NY (Virtual)
2. Title: Multiscale modeling of cardiac valve disease using cell-level signals to drive myocardial growth June 2022  
Conference: **Summer Biomechanics, Bioengineering, and Biotransport Conference (SB3C)**, United States, Cambridge, MD
3. Title: Multiscale modeling of LV growth under autonomic regulation of baroreflex feedback loop July 2021  
Conference: **Modeling the Cardiac Function: Theory, Numerical Methods, Clinical Applications**, Italy (Virtual)
4. Title: Multiscale modeling of LV growth under autonomic regulation of baroreflex feedback loop June 2021

Conference: **Summer Biomechanics, Bioengineering, and Biotransport Conference (SB3C)**, United States (Virtual)

• **Poster presentation**

1. Title: Multiscale modeling of cardiac valve disease using cell-level signals to regulate concentric and eccentric myocardial growth July 2022  
Conference: 9th World Congress of Biomechanics (WCB), Taiwan (Virtual)
2. Title: Multiscale modeling of cardiac valve disease using cell-level signals to regulate concentric and eccentric myocardial growth April 2022  
Conference: University of Kentucky Center for Clinical and Translational Science (CCTS)
3. Title: Quantifying the Effects of Hypertrophic Cardiomyopathy (HCM) using MRI July 2019  
Conference: University of Kentucky Gill Heart & Vascular Institute, Cardiovascular Research Day

LEADERSHIP AND TEAMWORKING **Dassault Systems** (Living Heart Project team) May 2022 - present  
• ENRICHMENT of *in silico* clinical trials for treating patients with secondary mitral regurgitation

**University of Kentucky** August 2018 - present  
Department of Mechanical Engineering  
• Cardiac magnetic resonance imaging of more than 500 mice using 7T MR scanner

**University of Kentucky** Kentucky Transportation Center (KTC)  
• Leading a group of undergraduate students in load rating of nearly 600 in-service reinforced concrete box culverts Jan 2017 - December 2017  
• Leading a group of visiting scholars in load rating of in-service reinforced concrete arch culverts using FEM Jan 2018 - May 2018

TEACHING EXPERIENCE Teaching Assistant  
• ME 501 - Mechanical Design with Finite Element Methods Fall 2019  
Instructor: Jonathan F. Wenk, Ph.D  
Department of Mechanical Engineering,  
University of Kentucky  
• CE 584 - Design of Timber and Masonary Structures Fall 2017  
Instructor: Hans Gesund, Ph.D  
Department of Civil and Environmental Engineering,  
University of Kentucky

RELEVANT COURSES University of Kentucky, Department of Civil Engineering  
• Mechanics of Plastic Solids I - ME 603 Spring 2019  
• Matrix Theory & Numeric Linear Algebra I - MA 522 Fall 2018  
• Mechanics of Composite Materials - ME 506 Fall 2017  
• Foundation of Solid Mechanics - ME 641 Fall 2017  
• Introduction to Finite Element Analysis - CE 621 Spring 2017  
• Advanced Structural Analysis - CE 682 Fall 2016  
Coursera (Online Course)  
• Introduction to Deep Learning & Neural Networks with Keras Spring 2022  
• Machine Learning with Python Spring 2022  
• Applied Plotting, Charting & Data Representation Summer 2020  
• Introduction to Data Science in Python Summer 2020

	<ul style="list-style-type: none"> <li>• Introduction to Programming with MATLAB</li> </ul>	Summer 2015
CERTIFICATES	<ul style="list-style-type: none"> <li>• <b>Introduction to Computer Vision and Image Processing</b></li> <li>• <b>Introduction to Deep Learning &amp; Neural Networks with Keras</b></li> <li>• <b>Machine Learning with Python</b></li> <li>• <b>Applied Plotting, Charting &amp; Data Representation</b></li> <li>• <b>Introduction to Data Science in Python</b></li> <li>• <b>Introduction to programming with MATLAB</b></li> <li>• HSE Management System training course by TUV Rheinland</li> </ul>	March 2022 Feb 2022 Feb 2022 July 2020 June 2020 Sept 2015 May 2014
VOLUNTEER ACTIVITIES	<ul style="list-style-type: none"> <li>• Participating in large vaccination of the University of Kentucky's employees and students against delta variant of COVID-19.</li> </ul>	Sep 2021
REFERENCES	Jonathan F. Wenk Gill Associate Professor Department of Mechanical Engineering University of Kentucky Kenneth S. Campbell Professor Department of Physiology University of Kentucky Issam E. Harik Raymond-Blythe Professor Department of Civil and Environmental Engineering University of Kentucky	Phone: (859) 218-0658 E-mail: <a href="mailto:jonathan.wenk@uky.edu">jonathan.wenk@uky.edu</a>  Phone: (859) 323-8157 E-mail: <a href="mailto:k.s.campbell@uky.edu">k.s.campbell@uky.edu</a>  Phone: (859) 257-3116 Email: <a href="mailto:harik@uky.edu">harik@uky.edu</a>