

Hossein Sharifi

CONTACT INFORMATION	University of Kentucky Department of Mechanical Engineering, Lexington, KY, 40506 Links: Personal Website , Google Scholar , Github , Linkedin	(859) 213-6972 Hossein.sharifi@uky.edu
RESEARCH INTERESTS	Cardiac Biomechanics, Multiscale Modeling, Computational Mechanics, Finite Element Analysis, Machine Learning, Data-Driven Modeling	
EDUCATION	University of Kentucky , Lexington, KY, USA	
	Ph.D., Mechanical Engineering	Expected May 2023
	<ul style="list-style-type: none">• Thesis Topic: <i>Multiscale Modeling of Cardiac Growth and Remodeling</i>• Advisors:<ol style="list-style-type: none">1. Jonathan F. Wenk, Ph.D2. Kenneth S. Campbell, Ph.D• GPA: 3.94/4.0	
	University of Kentucky , Lexington, KY, USA	
	M.S., Civil Engineering (majored in Structural Engineering)	May 2018
	<ul style="list-style-type: none">• Thesis Topic: <i>Finite Element Evaluation of 2-Cell RC Box Culverts</i>• Advisor: Issam E. Harik, Ph.D• GPA: 4.0/4.0	
	Shiraz University Shiraz, Iran	
	B.S., Civil and Environmental Engineering,	December 2014
RESEARCH AND EXPERIENCE	Dassault Systems Living Heart Project (Industry Technical Solution Intern)	May 2022 - present
	<ul style="list-style-type: none">• ENRICHMENT <i>in silico</i> clinical trial<ul style="list-style-type: none">• Created a semi-automated framework to execute hundreds of FE simulation of mitral valves (explicit FEM).• Conducted sensitivity analyses to study the influential parameters of a template model of secondary mitral valve.• Built a ML-based "Virtual Patient Engine (VPE)" to create a virtual patient cohort inspired by physics-based data.• Performed an <i>in silico</i> clinical trial by clipping a virtual cohort of patients with secondary mitral regurgitation.	
	University of Kentucky Department of Mechanical Engineering (Research Assistant)	August 2018 - present
	<ul style="list-style-type: none">• Developed an implicit FEM of left ventricular mechanics using FEniCS solver. (MyoFE project)<ul style="list-style-type: none">• Multiscale modeling of LV growth• Multiscale modeling of acute myocardial infarction• Multiscale modeling of baroreflex control of arterial pressure• Developed PyCMLuti Python package for generating scientific plots.• Contributed in developing of a single hemispherical model of left ventricle (PyMyoVent project).• Acquired cardiac magnetic resonance imaging (DENSE, dark and bright blood) of mice using 7T Bruker MR scanner.<ul style="list-style-type: none">• Strain analysis of mice heart using cardiac magnetic resonance feature tracking	

University of Kentucky

Jan 2017 - May 2018

Department of Civil and Environmental Engineering (Research Assistant)

- Finite Element Modeling of 2-cell reinforced concrete box culverts

Kentucky Transportation Center (Research Assistant)

- 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 software: Abaqus, FEniCS Project, ParaView, CANDE, STAAD Pro, SAP 2000, ETABS, SAFE, CSI Bridge, BRASS-CULVERT, Auto CAD, Microsoft Office, LATEX
- Programming languages: 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: Multiscale modeling of cardiac growth in simulations of valvular disease-
PhD project February 2023
Conference: **The Living Heart Project webinar**, United States, (Virtual)
2. 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)
3. 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
4. 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)

	<p>5. 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)</p> <p>• Poster presentations</p> <p>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)</p> <p>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)</p> <p>3. Title: Quantifying the Effects of Hypertrophic Cardiomyopathy (HCM) using MRI July 2019 Conference: University of Kentucky Gill Heart & Vascular Institute, Cardiovascular Research Day</p>
LEADERSHIP AND TEAMWORKING	<p>Dassault Systems (Living Heart Project team) May 2022 - present</p> <ul style="list-style-type: none"> • ENRICHMENT of <i>in silico</i> clinical trials for treating patients with secondary mitral regurgitation <p>University of Kentucky August 2018 - present Department of Mechanical Engineering</p> <ul style="list-style-type: none"> • Cardiac magnetic resonance imaging of more than 500 mice using 7T MR scanner <p>University of Kentucky - Kentucky Transportation Center (KTC)</p> <ul style="list-style-type: none"> • 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	<p>Teaching Assistant</p> <ul style="list-style-type: none"> • ME 501 - Mechanical Design with Finite Element Methods Instructor: Jonathan F. Wenk, Ph.D Department of Mechanical Engineering, University of Kentucky Fall 2019 • CE 584 - Design of Timber and Masonary Structures Instructor: Hans Gesund, Ph.D Department of Civil and Environmental Engineering, University of Kentucky Fall 2017
RELEVANT COURSES	<p>University of Kentucky, Department of Civil Engineering</p> <ul style="list-style-type: none"> • Biostatistics - CPH 580 Fall 2018 • 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 <p>Coursera (Online Course)</p>

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