

Masod Sadipour

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Executive Summary

- **MATLAB** and **Python** Programmer with 5 Years of Experience, Skilled in **Machine Learning** Tools.
- Experienced in **Statistical Analysis**, **DOEs**, and **Six Sigma** (Certificate of **Lean Six Sigma** Yellow Belt [link](#)).
- Hands-on Lab Experience in **Manufacturing**, **Functional Verification**, and **ISO** Requirements.
- Proficient in **2D and 3D CAD** (7+ Years of Design Experience in **SOLIDWORKS**), **FEA** and **CFD**.
- Highly Skilled **Researcher** with Several **Publications** and **Presentations** ([Scholar.Google/Masod Sadipour](https://scholar.google.com/citations?user=MasodSadipour)).

Education

Ph.D. in Biomedical Engineering, Minor in Computer Science, University of North Carolina at Chapel Hill/North Carolina State University, NC **Aug. 2023 – Present**

- Thesis Title: Simulating Cardiac Fluid Dynamics in the Human Heart. PI: [Dr. Boyce E. Griffith](#)

M.Sc. in Mechanical Engineering, University of Denver, Denver, CO **Mar. 2021 – Jun 2023**

- GPA: 3.9/4.0
- Thesis Title: Numerical and Experimental Analysis of Longevity and Hemodynamic Performance of Bioprosthetic & Transcatheter Heart Valves. PI: [Dr. Ali Azadani](#)

M.Sc. in Mechanical/Aerospace Engineering, University of Tehran, Tehran, IR **Sep. 2016 – Feb. 2019**

- GPA: 3.7/4.0

B.Sc. in Mechanical Engineering, Ferdowsi University of Mashhad, Mashhad, IR **Sep. 2012 – Aug 2016**

Work Experience

R&D Engineering Intern – Anteris Technologies, Maple Grove, Minnesota, United States **May 2024 – Aug. 2024**

- Performed comprehensive transcatheter heart valve testing, including Hydro and AWT testing, system debugging, and conducting imaging inspections on the valves.
- Researched and evaluated various vendors for specialized heart valve assessments to verify compliance with standards.
- Designed and developed precise CAD models of valves using a portable scanner and SolidWorks for FSI simulations.
- Participated in animal testing and conducted echos in an in-vitro system to compare the MPG and EOA of different TAVRs.
- Manufactured and assembled custom crimpers for large valves, incorporating injection molding techniques.
- Authored a Standard Operating Procedure (SOP) for a valve science project (crimp profile measurement).

Research Associate – DU Cardiovascular Biomechanics Lab, University of Denver, CO **Mar. 2021 – Jun 2023**

- Performed in-vitro pulsatile flow tests on BHVs according to **ISO-5840 standards**.
- Developed a novel FSI framework to assess long-term **durability**, and **thrombosis** of BHVs, and validated the model by comparing its results with PIV measurements (finalist in the paper competition at the **SB3C** [link](#)).
- Ran several Design of Experiments (**DOEs**) to find the density of bovine pericardium patch used in BHVs.
- Conducted **FEA** simulations to assess durability of bioprosthetic and transcatheter heart valves using **Abaqus**, revealing up to **30.7%** reduction in the **maximum stress** levels with the new tissue properties (**SB3C 2023** [link](#)).

Research Assistant – Cardiovascular Hemodynamics Group, University of Tehran, IR **May 2019 – Jun 2020**

- Created personalized geometry model of the Aorta from CTA images in **SolidWorks** & **3D printed** the model.
- Improved the hemodynamic performance of the valve by modifying the geometry using **SolidWorks**, resulting in a 12% reduction in TKE. (The results were presented as two conference papers and one journal paper [link](#)).

Mechanical Engineer Intern – 3DierLab Co., Ferdowsi University of Mashhad, IR **Sep 2017 – May 2019**

- Designed and manufactured personalized teeth models and aligners using resin **3D printer**.
- Collaborated with dental professionals to create high-quality dental models, ensuring timely delivery (Reduced delivery time by 22% through implementing new postprocessing process).

Technical Skills

- **Computer:** SolidWorks, AutoCAD, ANSYS, FLUENT, ABAQUS, COMSOL, Blender, EES, IBM SPSS, JMP, MINITAB, HyperMesh, MIMICS, Adobe package (Photoshop, Illustrator), Microsoft Office, LaTeX.
- **Lab Skills:** 3D Printing, 3D Scanning, Injection Molding, LabVIEW, Mechanical Testing (Tension/Compression, Bending), Laser Cutting, GD&T, In-Vitro Valve Testing, Data Analyzing (T-test, ANOVA).
- **Programming:** MATLAB, Python, C++.

Selected Highlights

Biomedical Engineering

- Developed an Integrated Sensor System for Oxygen-Starvation-Induced Loss of Consciousness (OSI LOC) Prediction, tailored specifically for pilots of unpressurized aircraft.
- Attended live surgical procedure involving Mechanical Heart Valve Replacement.
- Designed (**SolidWorks**), developed, and manufactured (using **3D printer**) a personalized total hip replacement system by analyzing user needs, design inputs, design outputs, verification & validation, prototype generation, Quality Function Deployment (QFD), Dimensioning and Tolerancing, DFM and FMEA (**Project leader**).
- Conducted several **FEA** to examine the resistance of a Biolex delta ceramic femoral head to static load, via **Abaqus** (General Contact). Results showed in-plane stress about **one-third** of the **critical threshold**.
- Created the personalized geometry model of the Aorta (**Mimics & SolidWorks**), manufactured the model (using **3D printer**) and conducted in-vitro steady and pulsatile flow tests to validate a numerical simulation.
- Performed mechanical biaxial tests on samples that were excised from various parts of healthy calf hearts and carried out statistical analyses (**T-test & Anova**) and curve fitting on the data obtained by mechanical biaxial tests.

Mechanical Engineering and Machine learning (Python)

- Conducted large deformation **FE analysis** for a Slender Beam using **Abaqus** and MATLAB.
- Investigated the transient dynamic and quasistatic explicit response of overhead hoist using MATLAB and **Abaqus** (Comparing stiffness, displacement, strain/stress).
- Trained an image classifier for Caltech-101 dataset using Convolutional Neural Networks (**CNN**) and analyzed its accuracy and computational complexity by changing the critical parameters (**Python**).
- Developed a background subtraction algorithm for videos by solving the Robust Principal Component Analysis (RPCA) using **Python**.

Professional Certificates & Achievements

- **Finalist** in the MS paper competition at the SB3C 2023, a prestigious conference in the field of biomechanics.
- Certificate of Completion: PLA and Resin **3D Printing**, **Laser Cutting**, and **CNC**, University of Denver.
- Certificate of Completion: **Design of Experiments**, Arizona State University ([link](#)).
- Certificate of Completion: **Lean Six Sigma Principles**, University System of Georgia ([link](#)).
- Certificate of Completion: **Supervised Machine Learning**, Stanford University ([link](#)).

References

- References available upon request.