

Adiba Ashrafee

CONTACT INFORMATION

Department of Biomedical Engineering
University of Colorado, Boulder
Boulder, CO 80309

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RESEARCH INTERESTS

- Biomedical: Image-based modeling for biofluids and biomechanics; Hemodynamics and vascular transport processes; Cerebrovascular flow; Biomechanics of cardiovascular diseases - stroke, thrombosis, embolisms; Cardiovascular biomedical device design; Biomedical image processing; Drug delivery.
- Computational: Computational fluid dynamics and transport processes; Fluid-particle and Fluid-structure interaction; Multiscale modeling; Finite element method; Discrete element method; Molecular Dynamics; High-performance computing.

EDUCATION

University of Colorado, Boulder - Boulder, CO 80309

P.h.D., Biomedical Engineering, August 2024 to present

- Advisor: Dr. Debanjan Mukherjee

Military Institute of Science and Technology - Dhaka, Bangladesh 1217

B.Sc., Biomedical Engineering, April 2023

- Dissertation: *Design of Experiment Approach to Identify the Dominant Geometrical Features of Left Coronary Artery Influencing Atherosclerosis*
- Advisor: Dr. Muhammad Tarik Arafat

PROFESSIONAL EXPERIENCE

Research Assistant, Bioinnovation lab

April, 2023 - May, 2024

Department of Biomedical Engineering, Bangladesh University of Engineering and Technology

Biomedical Engineering Intern

March, 2022- April, 2022

Evercare Hospital, Dhaka, Bangladesh

AWARDS & HONORS

1. *Enlisted for MIST Dean's List Award for consecutive 4 years as an academic achievement*
2. *Received MIST Scholarships for achieving a merit position in the top five of my class*
3. *Selection of 'Vascular Risk Assessment Tool (V-RAT)' in the Bangabandhu Innovation Grant-2023 among the top 255 projects selected from 7,000 startups nation-wide*

JOURNAL ARTICLES

Ashrafee, A., Yashfe, S.M.S., Khan, N.S., Islam, M.T., Azam, M.G. and Arafat, M.T. (2023). Design of Experiment Approach to Identify the Dominant Geometrical Features of Left Coronary Artery Influencing Atherosclerosis. *Biomedical Physics and Engineering Express*.10.1088/2057-1976/ad2f59.].

(* indicates that authors contributed equally)

PEER-REVIEWED PROCEEDINGS

1. **Ashrafee, A.**, Yashfe, S.M.S., Rahatuzzaman, M. and Ornob, A. (2023). A 3D Printed Shape Optimized and Modular Trans-Tibial Pylon with Adaptive Load Capacity. *14th Proceedings of ICME 2023, International Conference on Mechanical Engineering, Bangladesh University of Engineering and Technology, Dhaka, Bangladesh*
2. **Ashrafee, A.**, Yashfe, S.M.S., Khan, Rabbi, M.F. and Arafat, M.T. (2023). Coronary Arterial Tortuosity on Atherosclerosis in Normal and Hypertensive Conditions: A Hemodynamic Perspective. *14th Proceedings of ICME 2023, International Conference on Mechanical Engineering, Bangladesh University of Engineering and Technology, Dhaka, Bangladesh.*

ABSTRACTS &
PRESENTATIONS

Ashrafee, A.,Yashfe, S.M.S., Islam, M.T., Azam, M.G. and Arafat, M.T. On the rank of left coronary artery geometrical features influencing atherosclerosis - A design of experiment study. *Carnegie Mellon University Forum on Biomedical Engineering,Pittsburgh, PA*. September 2023.

RESEARCH
EXPERIENCE

- **Design of Experiment Approach to Identify the Dominant Geometrical Features of Left Coronary Artery Influencing Atherosclerosis**
 - CFD simulations were performed on left coronary artery (LCA) models extracted from CT images using physiological boundary conditions to determine how changes in artery geometry influences near wall and intravascular hemodynamic descriptors to induce atherosclerosis in LCA.
 - The Taguchi Design of Experiment statistical method was used to find out the dominant LCA geometric features that influence the risk of atherosclerosis.
- **Other experiences**
 - Impact of Left Coronary Arterial Tortuosity on Atherosclerosis in Normal and Hypertensive Patients – A Hemodynamic Perspective.
 - Vascular geometry based Real-time risk prediction system to predict vascular based on geometrical features, by integrating computational modelling and Machine Learning algorithms.
 - A 3D Printed Shape Optimized and Modular Trans-Tibial Pylon with Adaptive Load Capacity.
 - Contactless Door Handle Sterilization and Health Parameter Measurement Kit.

TEACHING &
ACADEMIC
EXPERIENCE

Graduate Teaching Assistant:BME Senior Capstone Design I

REFERENCES

Available upon request.