Ayisha's Portfolio

HOME EXPERIENCES PROJECTS ACHEIVEMENTS

Hello! I'm Ayisha.

Welcome to my personal portfolio! I am a recent graduate with a Bachelor of Engineering in Biomedical Engineering from Toronto Metropolitan University. My passion lies at the intersection of technology and healthcare, where I apply my skills in research, design, and innovation. From developing wearable medical devices to publishing scientific journal reviews, this website showcases my journey, projects, experiences, and achievements. Explore my work and feel free to get in touch!

EXPERIENCES

PROJECTS

ACHIEVEMENTS

RESUME LINKEDIN

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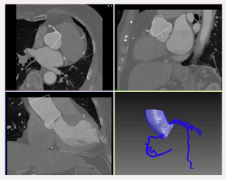
My Experience



Undergraduate Research Assistant

Cardiovascular Imaging Modelling & Biomechanics Lab (CIMBL), TMU

- Segment coronary arteries from real patient CTA scans and reconstruct them into 3D CAD models, with the eventual goal of automating the segmentation process.
- Utilize advanced software tools, including SimVascular for vascular segmentation and ParaView for 3D visualization and CAD model reconstruction.
- Analyze and differentiate between normal and diseased coronary artery segments.

Hardware Engineer Team Lead

GlucoSense

- GlucoSense is a student-led startup with the mission to make preventive care accessible, affordable and non-invasive for people with prediabetes.
  - Secured first place and a $20,000 prize at the DMZ Basecamp pitch competition.
- I lead the hardware team in the development of Continuous Glucose Monitor into a wearable device using near-infrared technology
  - Design and optimize hardware components, including device and circuit design.

Design + Research Quickathon

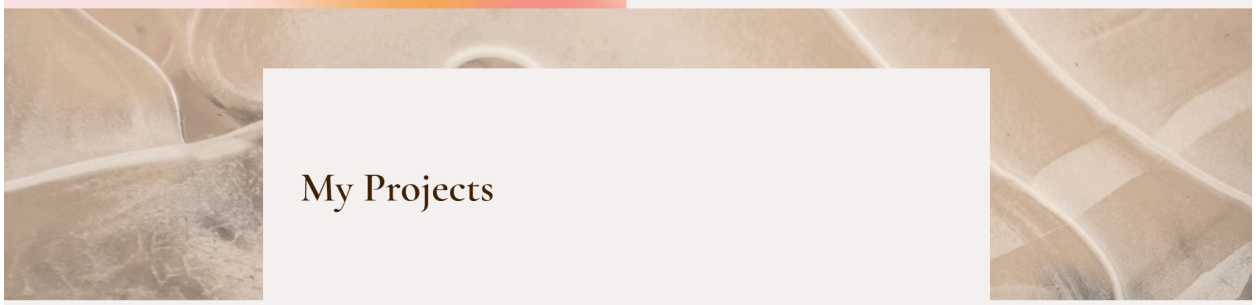
Innovation Boost Zone (IBZ)

- Collaborated within a team to research, design and pitch a solution to the given challenge of developing an innovative and wearable, non-invasive glucose monitoring device.
- Achieved first place out of 20 teams, winning a $650 prize.

Student Mentor

TMU Women in Engineering & Tri-Mentoring Program

- Provided academic and professional guidance to a first-year engineering students.
- Offered one-on-one support, shared resources, and helped build confidence in navigating engineering coursework and extracurricular opportunities.
- Supported mentee through their academic, professional, and personal development.



My Projects

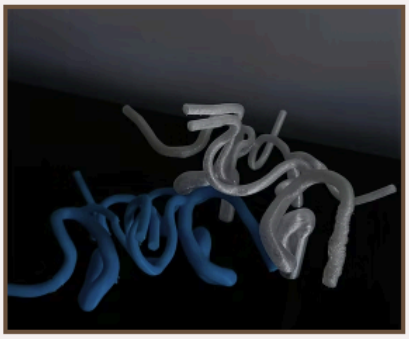
Simulating Biplane Fluoroscopy for Interventional Neuroradiology

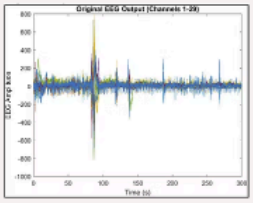
Fourth Year Biomedical Engineering Capstone Project

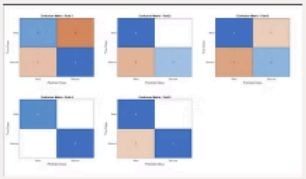
- Focuses on the development of a low-cost, patient-specific simulator designed to enhance interventional neuroradiology training without exposing physicians to radiation. The simulator replicates biplane fluoroscopy imaging using optical cameras and LED light sources in place of traditional X-ray systems, providing anterior-posterior and lateral views of the cerebral vasculature.
- Leveraging 3D printing and open-source patient anatomy data, the arterial model includes key brain vessels such as the internal carotid artery, middle cerebral artery, and anterior cerebral artery, along with an anterior communicating artery aneurysm. The system is engineered to allow real-time simulation of contrast flow through the vessel model using optically opaque fluid, along with image processing techniques to simulate Digital Subtraction Angiography (DSA) and roadmap views.

My Role & Contributions:

- Processed patient specific .stl file to generate a scaled version of hollow cerebral arteries.
- Designed and 3D printed artery models using optically transparent materials for contrast flow simulation.
- Conducted structural modifications and post-processing to support fluid dynamics and ergonomic simulator design.
- Ensured modularity of the artery model system for future anatomical variations and component integration.







EEG Based Detection of Epileptic Seizures

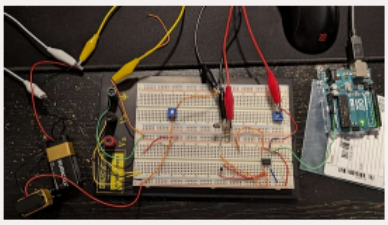
Biomedical Signal Analysis

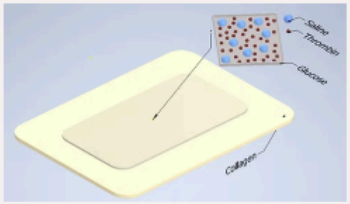
- Collaborated within a team to develop and implement a seizure detection system using advanced signal processing techniques, feature extraction methods, and machine learning algorithms.
- Leveraged MATLAB and EEGLAB to analyze EEG signals, employing a Support Vector Machine model for classification, achieving 80% accuracy in detecting seizure events.

Measuring Heart Rate Using Photoplethysmography (PPG)

Biomedical Instrumentation

- Designed a circuit incorporating an infrared emitter and photodiode sensor to measure heart rate.
- Interfaced the circuit with an Arduino Uno for data acquisition and processing.
- Utilized LabVIEW software for real-time signal analysis and visualization.





Fast Clotting Bandages

Introduction to Biomedical Engineering - Tissue Engineering Project

- Researched and developed a blood clotting bandage leveraging the functions of thrombin and collagen to increase blood coagulation speed, addressing excessive bleeding during surgery.
- Created a 3D model of the prototype using AutoCAD, prepared a detailed report, and pitched the design to over 40 peers and faculty members.

Awards, Certifications, and Publications

A showcase of my academic achievements and expertise

Awards

Gordon and Agnes (Twambley) Brash Award

Issued by Department of Electrical, Computer, and Biomedical Engineering at TMU · Nov 2024

- This prestigious award is granted to students who demonstrate outstanding academic performance and dedication to their field of study.

2023 - 2024 Dean's List

Issued by Toronto Metropolitan University · Jun 2024

2021 - 2022 Dean's List

Issued by Toronto Metropolitan University · Jun 2022

- Awarded by the Faculty of Engineering and Architectural Science in recognition of outstanding academic performance in the Biomedical Engineering program.
- This special recognition reflects considerable effort and ability and is a testament to my dedication to academic excellence and continuous learning. It has been an honor to be recognized among the top-performing students in the faculty.

Entrance Scholarship

Issued by Toronto Metropolitan University · Feb 2021

- Selected as a TMU Entrance Scholarship candidate for an admission average above 95%.

Certifications

- WHIMIS Certification
- Biosafety Awareness Training
- Emergency First Aid with CPR-B
- Quantitative Methods of Biology - Harvard X

Publications

Revolutionising Cancer Diagnosis and Treatment: A Review on Advancements in Nanomaterial-based Theranostics

International Journal of Engineering Materials and Manufacture · Oct 20, 2023

Read More

- Explored advancements in nanomaterials and nanoparticles for cancer nanotheranostics, emphasizing design, applications, and impact on Canadian healthcare. Highlighted economic implications, ethical considerations, and adherence to patient consent and privacy standards in emerging technologies.