



Mechanical Engineer

ENGINEERING PORTFOLIO

Anitez Gautam

1 . G E A R B O X

PERSONAL PROJECT

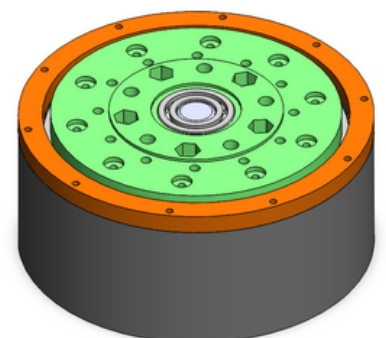
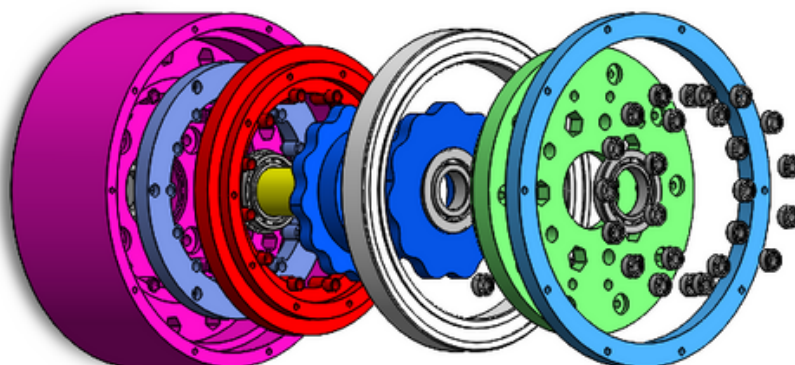
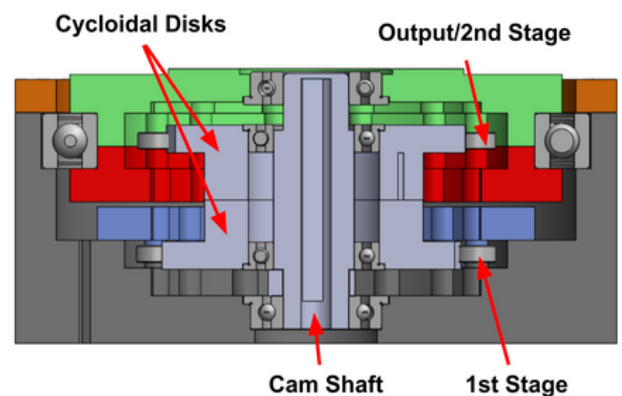
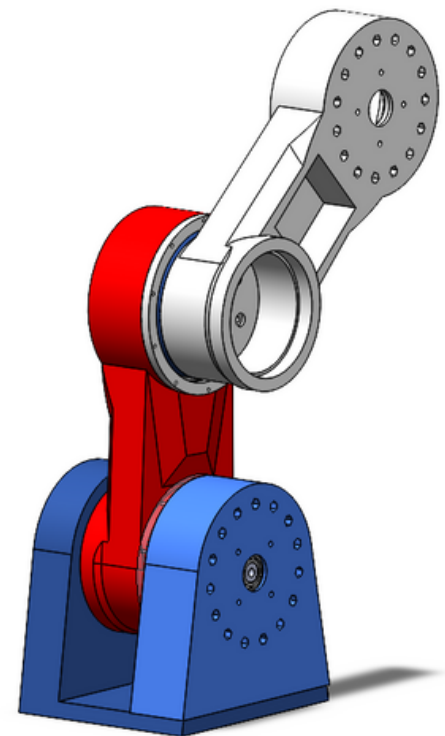
Two-Stage Cycloidal Gearbox

Designed, fabricated, and tested a new **two-stage cycloidal gearbox** concept achieving a total reduction ratio of 85:1.

This gearbox was fully modeled in **SolidWorks, 3D printed, and assembled** by me.

This project demonstrates proficiency in **mechanical design, tolerance analysis, Additive fabrication, and electromechanical integration** using a NEMA-17 stepper motor

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INDIVIDUAL PROJECT

BOSTON SCIENTIFIC CORP.

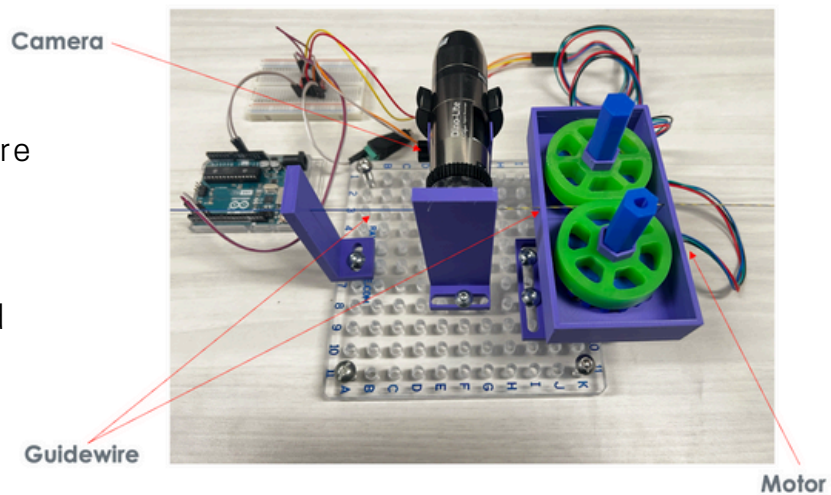
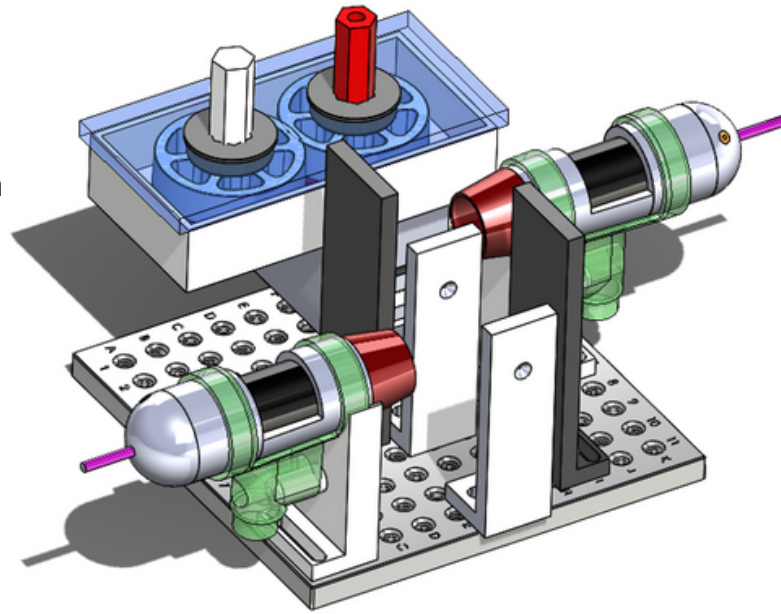
Automated Visual Inspection Tool

Developed an **automated inspection system** that uses microscopes and an AWS machine learning model to detect visual defects in medical devices.

The system reduces inspection time from **45-60 minutes to 2 minutes per device** while improving detection accuracy to **96.4%**.

Designed and fabricated the entire assembly in **SOLIDWORKS** and integrated **Arduino-controlled stepper motors** for synchronized imaging and device rotation.

This project streamlined the inspection workflow, saving **\$5,000** and **60 engineering hours annually per device.**



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3. KNEEVIVE

PRESIDENT

UMASS MEDTECH TEAM

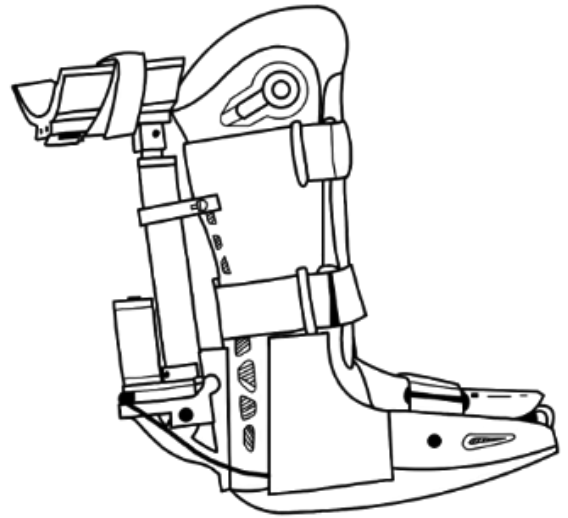
Osteoarthritis Traction Therapy Boot

Led a 10-person engineering team to design and prototype **KneeVive**, a non-invasive knee traction therapy device that alleviates joint compression and pain for arthritis patients.

Developed the mechanical assembly in **SOLIDWORKS**, incorporating a **controlled traction mechanism** that provides adjustable, repeatable force through a custom-designed system.

Fabricated and tested multiple prototypes to validate force consistency and user comfort, while optimizing for portability and manufacturability.

This project was selected as a finalist in the **UMass Tech Challenge**, earning **\$2,500** in funding for further development and validation.



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4. PULSEPAL

PRESIDENT

UMASS MEDTECH TEAM

PEDIATRIC PULSE OXIMETER

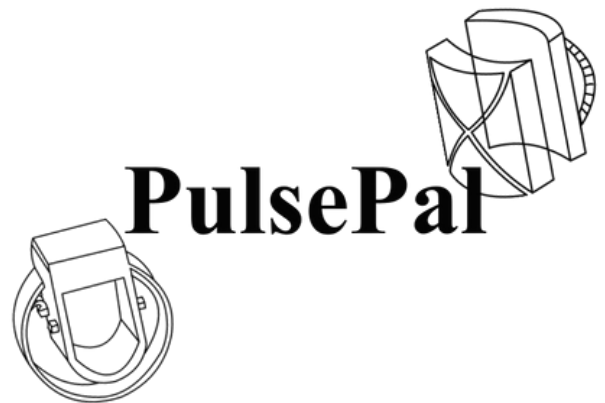
Led the design and prototyping of PulsePal, a compact and affordable pulse oximeter designed for pediatric patients in low-resource healthcare environments.

Developed mechanical housing and ergonomic finger clip in **SOLIDWORKS**, integrating a **MAX30102 optical sensor** and **Arduino-based microcontroller** for real-time SpO₂ and heart-rate monitoring.

Designed a low-power circuit and OLED display interface for improved usability and reliability.

Performed bench top testing to validate accuracy and ensure consistent contact pressure for small pediatric fingers.

Presented and won **\$1,000** in funding at a university design competition.



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