University of Pennsylvania

Michael Furr – Project Portfolio

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RightAir
Pneumatic Sensor Station

Flow and pressure sensor station for COPD assistive medical device

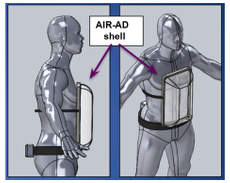
PCB Design / Autodesk EAGLE | C++ (Atom & GitHub) | LabVIEW
Medical Device Design | 3D Printing Training | Autodesk EAGLE
Autodesk Fusion 360 | Machine Shop Training | Arduino Prototyping

LabVIEW Code Link

Arduino Initial Prototype Link

Autodesk EAGLE Link

Core Product

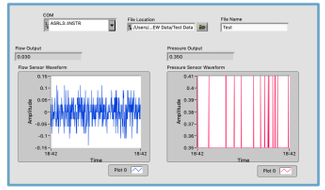


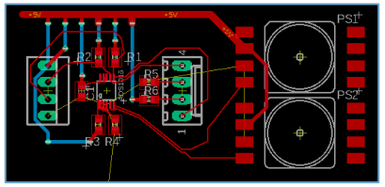
RightAir is designing a light-weight, wearable vest for COPD patients that uses a negative pressure shell and compact vacuum to help patients breath

Current Project

Designing a custom LabVIEW panel and physical sensor station to calibrate and measure flow and pressure values on the pneumatic pump driving the core device

LabVIEW Custom User Interface Design





Autodesk EAGLE PCB Development

DePuy Synthes
Tibial Nail Targeting System

Distal targeting system to reduce X-Ray use in Operating Room

Designed and developed a novel slotted nail and aiming arm design

Tested final prototype using clinical grade surgical drills and attachments

Note: Final design protected under NDA

Requirements Gathering | Machine Shop Training
Stress Testing | Medical Device Design
3D Printing | SolidWorks

Medtronic

Product Development & Process Engineering

Designed the discrete manufacturing process for a capsule designed to hold a deployable valve treating pediatric congenital heart defects

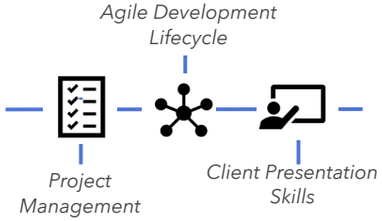
Minitab | TMV / Gage R&R | Extrusion / Braiding | Plastics Eng | Quality Eng | COS Mfg

Deloitte Consulting

Project Management and Tech Strategy

Performed Project Management role in effort to refactor 50+ year-old machine language code into Java

Relevant Skills



University of Pennsylvania
Master's Candidate - Bioengineering

Project Files Link

Master's Thesis – Fall 2019

Designed and deployed a machine learning algorithm using Tensorflow and Python Scripts to identify breathing patterns in various patients. Features were extracted through a custom RightAir assistive breathing shell (shown in sections above) and performed self training to identify 3 unique classes of breathing. This classification will result in a more custom and optimized experience for the user during assistance.

PCB Development | Tensorflow / Python | Google Coral MCU / Data Collection

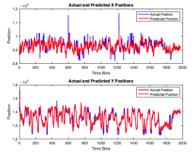
Rehab Engineering & Design

Completed a rehab robotics project to design and develop a functioning social robot to assist an elderly man with autism and anxiety

Assistive Device Design | SolidWorks | Laser Cutting
Arduino Prototyping

Demo Video Link

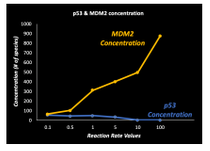
Brain Comp Interfaces (BCI)



Studied and designed a machine learning algorithm to predict various biomedical applications such as seizure development

MATLAB / LATEX | Machine Learning

Mathematical Modeling



Generated a MATLAB mathematical model of tumor suppressor regulators and their impact on cancer development

MATLAB | Technical Presentation Skills

University of Delaware
Mechanical Engineering

Project Files Link

Junior & Soph Machine Design

Scissor Link Trash Compactor

Children's Bike Design

Completed multiple machine design courses and received extensive SolidWorks and machine shop experience both in the classroom and in a composite materials lab

SolidWorks | Machine Shop Training | Biomechanics Research

Biomechanics Publications

Contributed to three biomechanics research publications including the study of articular cartilage mechanical properties