Prathic Sundararajan

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Education

Georgia Institute of Technology, Atlanta, GA **2018-2021**

- BS in Biomedical Engineering Major | Minor in Computing and Artificial Intelligence
- Faculty Honors [GPA: 4.0/4.0]

Experience

Vena Vitals **Irvine, CA**

Data Scientist *January 2022 - Present*

Exploratory Project in Stealth

- Characterizing capacitive sensor used to measure blood pressure using a varied range of techniques
- Extracting features from noisy data (motion artifacts, sensor scaling issues, etc) using MATLAB & Python

The Task Force for Global Health **Atlanta, GA**

R&D Engineering Intern (Capstone), Advisor: Dr. Stubbs *August 2021- December 2021*

Improving Soil Transmitted Helminths Diagnostic Methods (Kato-Katz)

- Investigating next generation technologies to revolutionize diagnostic methods for identifying Soil Transmitted Helminths (a parasitic worm affecting 1.5 billion people in developing countries)
- Conducted user needs research by holding 20+ interviews with a diverse group of international stakeholders ranging from epidemiologists to field workers (CDC, WHO, Tanzanian Government, etc)
- Designed & built a device utilizing a reverse lens technique in combination with a phone to implement smartphone-based microscopy and replace the standard microscope that is used in the field
- Redesigned industry standard Kato-Katz process with a Wet Mount Procedure that will allow for stool samples to be imaged up to 90% faster (reduction of sample prep time from 20 minutes to 2 minutes)
- Designing a Computer Vision Algorithm to detect Helminths (parasitic eggs) in imaged samples
- Won a golden ticket to advance to Second Round of Inventure Prize as a part of Capstone Expo 2021

Edwards Lifesciences **Irvine, CA**

R&D/Manufacturing Engineering Co-op, Supervisor: Neal Avery *Jan 2021 – August 2021*

Automatic Diagnosis of Cardiac Arrythmias from ECG Recordings

- Initiated and led a cross functional ML project (team of Director, Sr. Manager & Engr II)
- Built a robust and state of the art machine learning pipeline for identifying cardiac arrythmias within ECGs
- Preprocessed 160,000 ECG recordings utilizing wavelet decomposition and other tools for removing forms of noise such as baseline wander, leader reversal, powerline interface, etc.
- Investigated methods of transforming ECG data to 3D planes in the form of resonance plots and VCGs
- Utilized state of the art ML Algorithm: MINImally RandOm Convolutional Kernel Transform (miniRocket)

Implementing Proprietary Data Analytics System

- Facilitator between the software developers and manufacturing engineers deploying the system
- Diagrammed and mapped the system to help convey technical terms to non-technically savy individuals
- Focused efforts on ensuring that information pulled from machine would help make data driven decisions that have a positive impact on the key performance objectives of teams

New Process Development of Hydrophilic Coatings

- Developed new coating tech to improve performance and address scale-up issues for Edwards' devices
  - Cost analysis models show a potential decrease in coating cost up to 88% per device
  - Potential savings up to $3MM per year by eliminating royalties and reducing material cost
- Executed 5+ DOE's for process optimization to advance proof-of-concept coating method to commercial
  - Decreased cycle time by 764% (from 12 mins to less than 90 seconds per part)
  - Improved reliability of coating head by more than 800% (3 to 20+ parts) between failures
- Designed & tested multiple fixtures to achieve process improvements using Solidworks, 3D Printers & Mills

The Gleason Lab **Atlanta, GA**

Undergraduate Researcher, PI: Dr. Rudolph Gleason *August 2019-August 2020*

Feature Extraction & Quality Standards for PPG Waveform Using MATLAB

- Implemented live data visualization to streamline testing (reduce number of failed recordings by 50%)
- Created feature extraction techniques to allow for live quality assessment during data recording
- Developing a novel quality standards system using extracted features to assess device quality in real time

Healthcare Evolutions, **Mission Viejo, CA**
Quality/R&D Engineering Intern, Supervisor: Siddharth Desai *May 2019-October 2020*

COVID-19 3-D Scanned Mask Design

- Led a 2-person team in spearheading a new project focused on addressing unmeet needs in face coverings
- Investigated innovative technologies to create a 3D scan of users' face with smartphone technology
- Demonstrated proof of concept in creating a custom fitting of a mask based on the 3D scan of the user to ensure it remained ergonomic regardless of the shape of the users face
- Pitched the idea to several sponsors in industry to secure further funding

Cooling System for Meropenem (Client Project)

- Developed a housing system using components that allow for storage of a drug while daily use by patients
- Conducted quality assessments on the prototyped housing system to document performance (able to retain cooling capabilities with minimal support for up to 24 hours)
- Facilitated a pivot to focus on usage during the COVID-19 pandemic for temporary vaccine storage
- Presented work to our client and led research transfer between entities

Hydrophilic Ultrasound Probe Pad

- Developed prototypes for in house technology that was recently patented (US10206653B2) – ultrasound technology aimed to replace the industry standard ultrasound gel
- Utilizing heat sealing technology, created a 3-Layered Hydrophilic Pad by sourcing various novel parts
- Received feedback from doctors & device has received all stages of approval and is commercially available

Infusion Pump Quality Assessment (Client Project)

- Spearheaded product analysis on an infusion pump as part of a project given to us by a client
- Improved the standard testing procedure followed in house by automating data collection and increasing efficiency by more than 150%
- Authored a 26-page technical report detailing performance & documented critical error margin of 20-30%

Leadership

BME Robotics (Brain Vision Team) – ***Technical Project Manager*** **2019-2021**

- Building a computer vision system on an autonomous robot with a Human Machine interface (early stage)

Suit Up Professional Preparation– ***President*** **2018-2021**

- Led a 30+ team in executing events (with 100+ attendees) while transitioning to a virtual environment
- Increased member retention by 33% and executive board applications by 325%
- Implemented an ambitious rotational program for members at all levels to gain leadership experience

Students Consulting for Non-Profit Organizations–*Sr. Business Analyst* **2018-2020**

- Authored a report to increase donor retention by identifying patterns & filtering 15,000 data points (MATLAB)

Poster Presentations

Computing in Cardiology **2021**
Automatic Diagnosis of Cardiac Disease from Twelve-lead and Reduced-lead ECGs using Multi-label Classification

Biomedical Engineering Society **2020**
An Automated Real Time Quality Standards System for POC PPG Device for Early Assessment of Pre-eclampsia Risk

Projects & Awards

GT Data Analytics Hackathon [Won 2d Place out of 150 Contestants - $500 Cash Prize[**February 2022**
CDC/NASA Network Science ML Emerging Threat Detection [Won 1st Place - $7,500 Cash Prize] **February 2022**
Department of Education Automated Scoring Challenge [Won 4th Place - $1,250 Cash Prize] **January 2022**
Mayo Clinic Innovations Hackathon [Won 3rd out of ~100 individuals - $1,000 Cash Prize] **October 2021**
DOJ Prison Forecasting Challenge (ML/AI) [Won 4 Awards totaling $23,000 Cash Prize] **July 2021**
Georgia Tech $1B+ StartUp Hackathon [Finalist out of ~193 Contestants] **April 2021**
Pueblo Data Mine Analytics Challenge [2d Place out of ~100 Contestants - $800 Cash Prize] **March 2021**
CarMax ML/AI Data Analytics Showcase [1st Place out of ~200 Teams - $3,000 Cash Prize] **February 2021**
Emory/GT COVID-19 Hackathon [1st Place in Track out of 690 Participants - $1,000 Cash Prize] **May 2020**

Skills

Biomedical: Customer Research, Design Process, Market Research, Rapid Prototyping, Spectroscopy, Technical Reports
Software: Solidworks, Amazon Web Service (EC2, Lambda, S3 Bucket), SQL, Arduino IDE
Programming: Python, Java, MATLAB & Simulink, GIT
Tools: 3D Printing, Laser Cutters, Machining [Familiar] (Soldering, Mill, Lathes)