

## Education

### PhD | Biomedical Engineering

Rensselaer Polytechnic Institute

- Research: machine learning, image processing, brain imaging, surgical skill assessment
- Advisors: Suvranu De, Xavier Intes

### MS | Biomedical Engineering

Rensselaer Polytechnic Institute

- Research: image processing, virtual simulators, surgical skill assessment

### BS Biomedical Engineering

University of Minnesota - Twin Cities

## Skills

### Languages

Expert

Python • SQL • bash

Proficient

Terraform • CSS • Matlab • C++ • R

### Machine Learning

Open source frameworks

Tensorflow • Keras • PyTorch • scikit-learn • pandas • numpy • scipy • catboost • airflow • XGBoost • dask • shap • matplotlib • lifelines

### Algorithms

deep learning • CNN • transformers • gradient boosting • contrastive-learning • clustering • regression • classification • survival • PCA / LDA • decision trees • model selection • model validation

### Healthcare

Real world data (RWD) • EHR • ICD-9/10 • Electrocardiograms • Echocardiograms • Medical imaging • Cardiology • Oncology

### General

AWS • GCP • Azure • (yup, all three) •  $\LaTeX$  • linux • UNIX • git • docker • spark • DBT • CUDA • OpenCV • Kubernetes • CI/CD



## Experience

### Senior Staff Machine Learning Scientist | Tempus AI

Aug 2019 - present | 40 Hours/Week

- Co-invented the **FDA 510(k) approved** Tempus Atrial Fibrillation (AF) algorithm aimed to predict first time AF risk within one year. Deep learning model is trained on **3.5M ECGs across 2M patients** (ROC - AUC = **0.84**) and is deployed in over **four** hospital systems.
- Inventor and owner of Tempus ECG training platform, a cloud-based distributed GPU modeling framework powering all multi-modal research and cardio ECG production models, generating **\$3M+** in revenue.
- Served as lead data engineer for Tempus Cardio with responsibilities ranging from creating databases for EHR and imaging data and successful integration of four healthcare partners consisting of **2.5M+ patients and 10TB+ worth of data** enabling data access to **10+** team members.
- Validated and implemented a de-identification pipeline to scalably de-identify **1 billion** clinical notes from **2.5M** patients within **40** hours yielding **98%** sensitivity.
- Led org-wide documentation protocols to establish best practices on coding standards, cloud computing fundamentals, and clinical validation methods.

### Founder and Chief Scientist | Draycon Labs

Jul 2019 - present | 40 Hours/Week

- Founder of a consultancy focused on implementing ML/AI solutions for medical imaging, laboratory workflow optimizations, and pre-clinical studies.
- Build, validated, and deployed a cloud-based deep learning segmentation platform for end-end histology and automated imaging analysis workflows for Fortune 500 medical device firms with **100%** license renewal rate for **5** years.

### Sr. Data Scientist | Food Genius (acquired by US Foods)

Jul 2018 - Jul 2019 | 40 Hours/Week

- Designed, built, and deployed a full-stack, machine-learning based web app that predicts supply chain service levels enterprise wide, with **36%** higher balanced accuracy than food industry standards
- Managed four data scientists to execute on cross-functional business initiatives.




### Doctoral Researcher | Rensselaer Polytechnic Institute

Sep 2010 - Dec 2017 | 40 Hours/Week

- Invented and validated a brain imaging based machine learning model to predict surgical motor skill (ROC - AUC = **0.92**) with a **113%** higher accuracy than current US Surgery Board Certification methods. Thesis work resulted in **two R01 grants**.

## Key Publications and Patents

### Articles

- Prediction of mortality from 12-lead electrocardiogram voltage data using a deep neural network *Nature Medicine* 
- Deep Neural Networks Can Predict New-Onset Atrial Fibrillation From the 12-Lead ECG and Help Identify Those at Risk of Atrial Fibrillation-Related Stroke *Circulation* 
- Assessing bimanual motor skills with optical neuroimaging *Science Advances* 

### Patents

- US11869668B2, US20230245782A1, US11657921B2, US20230028783A1, US20210076960A1