

SRIKAR NEKKANTI

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Professional Experience

Frontier Ultrasound and Robotic Instrumentation Lab WPI

Worcester, MA

Research Associate: Engineer

08/2020 - 05/2023

- Implemented a **U-net-based image regression convolutional neural network** to improve image quality in transcranial ultrasound imaging on Python and MATLAB
- Used MATLAB to implement a **Point-Net-based deep learning algorithm** to track tissue deformation and movement for thyroid imaging
- Performed **hyper-parameter optimization**, training, and testing for a variety of deep and machine learning algorithms on Python and MATLAB
- Directed **data collection, aggregation, and analysis** for ultrasound imaging tests and simulations
- Implemented a **beam-forming algorithm** for functional ultrasound using **advanced imaging techniques** in MATLAB - cut down processing times by 40%

ZOLL Medical Corporation

Chelmsford, MA

Co-op: Advanced Development (R&D) Engineer

08/2021 - 07/2022

- Collaborated with the Advanced Development team on **cardiac rhythm, CPR feedback, and novel sensor algorithms** using MATLAB and Python
- Developed and implemented **testing and verification protocols** for algorithms and prototype medical devices
- Authored MATLAB scripts for **enhanced data organization, formatting, calculation, and analysis** during product testing, cutting down testing times by 25%
- Led **premarket application testing** for ZOLL AED, X-series, Propaq-MD, and R-series devices for new features and **software updates**
- Collaborated with Quality, Software, and Electrical Engineering teams in a **JIRA environment** to debug and **release 16 software sprints** for prototype devices
- Led the complete **automation** and implementation of over 50 manual device testing protocols using purpose-built robots
- Contributed to **data-driven decision-making** for electrode sensor development using **advanced analytics and modeling**

Education

Worcester Polytechnic Institute WPI

MS in Data Science | GPA: **4.0** / 4.0

05/2023 - Present

Worcester Polytechnic Institute WPI

BS in Biomedical Engineering (Distinction) | GPA: **3.6** / 4.0

08/2018 - 05/2023

PROGRAMMING & APPLICATIONS

MATLAB • Python • Keras • Pytorch • NumPy • SciPy • SQL • Arduino-IDE • R-Studio • HTML/CSS • Ruby • JavaScript • SQLITE3 • Anaconda

Fusion 360 • IBM DOORS • AWS • Spark • JIRA • LabVIEW • SolidWorks • TeraTerm • ImageJ • Fiji • Tableau • PowerBI

Projects

GAN- Generated Synthetic Image detection using Res-Net-derived Model Architecture

11/2023 - Present

- Defined and Trained a **GAN** to generate **synthetic images** for Human Faces as part of **image classification pipeline**
- Utilized **Res-Net 50, VGG-16, VGG-19** and custom architecture to train on generated data-set and **detect synthetic images**
- Achieved high testing accuracy ranging from 95 to 98.5% with low validation loss figures

Improving Edge Detection for Low-Contrast Images using Image Processing Techniques

01/2024 - Present

- Implemented a **Deep Neural Network approach** with a VGG based algorithm that performs **end-to-end edge detection** on images on Python
- Utilized **Holistically Nested Edge Detection** techniques to achieve significantly improved outcomes in comparison to conventional filters such as Canny Edge

Evaluation of Dense-Net Deep learning architecture in chest X-ray image classification

08/2023 - 01/2024

- Implementing **Dense-Net 201, 121, Ensemble Methods, and custom deep learning architectures** for **multi-label classification** in chest X-rays on Python
- Utilized **under, over, and stratified sampling** for **class-imbalanced data**
- Achieved high accuracy and AUROC scores across 15 different disease classes

R Shiny Data Visualization Application

08/2023 - 10/2023

- Created an **R Shiny** Application to explore **SVMs** and **K-nearest neighbors** using the Iris dataset
- Analyzed the response of **decision boundaries** based on user inputs for **predictor variables**

Continuous Ambulatory Peritoneal Dialysis Algorithm & Sensor-based Volume Tracking

01/2023 - 06/2023

- Worked as part of a team to evaluate the use of **supervised learning techniques** to evaluate dialysis outcomes along with flow sensor dialysis volume tracking
- Implemented **Linear, Logistic and Generalised regression** techniques to forecast expected dialysis volumes to provide patients with feedback
- Devised a "clamp-on" flow sensor solution for existing CAPD dialysis tubing to ensure a low-cost solution to measure incoming and outgoing dialysis volumes

Publications

SPIE Proceedings Medical Imaging 2023: Ultrasonic Imaging and Tomography — <https://doi.org/10.1117/12.2654685>

Deep-learning-based skull-induced artifact reduction for transcranial ultrasound imaging: a simulation study

• Tang Y, Nekkanti S, Rohera V, Nephew B, King JA, Zhang HK

This work explored the feasibility of using DL-based methods to reduce skull-induced artifacts in US imaging. Simulated data was used to train a U-Net-derived, image-to-image regression network. Results suggest the proposed method can reduce skull-induced artifacts and enhance target signals in B-mode images.