SHINJAN DUTTA

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EDUCATION

Northwestern University **Expected: June,2021**
Candidate for Master of Science in Electrical Engineering (specializing in Artificial Intelligence)
Relevant Courses: Machine Learning, Deep Learning from scratch, Statistical Pattern Recognition, Deep Learning for Practitioners, Advanced Computer Vision, Statistical Machine Learning, Design and Analysis of Algorithms

Manipal University, Karnataka, India **June, 2019**
Bachelor of Technology in Mechanical Engineering with *Distinction*
Relevant courses: Intro to Robotics, Signal Processing, Linear Algebra, Calculus

PROFESSIONAL EXPERIENCE

Image and Video Processing Lab (IVPL), Northwestern University **January, 2020 - Present**
Graduate Student Research Assistant
Working on my master's thesis under the guidance of Professor Aggelos Katsaggelos in the domain of using deep learning in medical imaging. I am working with Graph Neural Nets, Convolutional Neural Nets, Generative Adversarial Networks, etc.

Indian Institute of Space, Science and Technology (IIST), Kerala, India **December, 2018- May, 2019**
Research Intern

- Worked on a team building an autonomous humanoid robot to be used by the Indian Space Research Organisation. Designed control algorithms for the knee movement of the robot.
- Worked on Object detection for the robot to avoid obstacles while walking using YOLO

ACADEMIC PROJECTS

- **Predicting areas of the brain affecting Personality traits using Graph Convolutional Networks**
  Working on using Graph Convolutional Neural Networks (GCNNs) on Structural MRI scans of the brain to help predict areas of the brain responsible for personality traits such as Neuroticism, Openness, etc. We are using data from the Human Connectome Project (HCP)
- **Detecting Covid-19 on Lung X-Ray images and developing state of the art for covid detection using AI**
  Worked on predicting Covid-19 patients based on lung x-ray images using ensemble convolutional neural networks. We used 7 different CNNs pre-trained them on the NIH lung x-ray dataset to detect diseases and then trained on 15000 images with a hold out test set of 2000 images. Our algorithm performed better than the state of the art for covid detection using AI, and outperformed 3 radiologists from Northwestern Hospital. Our paper has been accepted in the journal Radiology.
- **Detection of Cardiac Amyloidosis using 2D and 3D Nuclear imaging data of the heart**
  Worked on detecting Cardiac Amyloidosis on Nuclear imaging data of the heart with cardiologists from Northwestern Hospital by fusing 2D and 3D imaging data in a CNN architecture. 2D and 3D data both were used in our algorithm since cardiologists use both 2D and 3D data while diagnosing Cardiac Amyloidosis.
- **WaveGlow: Audio generation using flow based generative models**
  WaveGlow is an audio generation architecture developed by Nvidia. I was involved in rebuilding and implementing WaveGlow from scratch for the class Deep Learning for Practitioners. WaveGlow uses invertible transformations and the model learns the data distribution of the input signal and is able to generate audio resembling the input.
- **Sincerity Classifier: Kaggle competition on classifying questions asked on Quora based on sincerity**
  Built a classifier to classify questions asked on Quora as sincere or insincere using machine learning techniques- Naive Bayes with Bag of Words, Naive Bayes with TF/IDF, and Logistic Regression with TF/IDF

TECHNICAL SKILLS

- **Languages:** Python, C++, Matlab, SQL
- **Libraries and Tools:** Keras, PyTorch, Tensorflow, Pandas, OpenCV, Numpy, Matplotlib, Scikit-Learn, NLTK
- **Other Skills:** Linear Algebra, Multivariate Calculus, Algorithms and Optimization, Probability Theory, Statistics,