Talha Hanif Butt

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My interests and experience include Computer Vision, Machine Learning, Deep Learning and Data Science. Furthermore, I have hands-on experience in developing data driven models using Tensorflow, Keras and Caffe

Education

- **National University of Computer and Emerging Sciences** — Lahore
  Master of Science in Data Science — *Aug 2018 – Present*
- **National University of Computer and Emerging Sciences** — Islamabad
  Bachelor of Science in Computer Science — *Aug 2013 – June 2017*

Experience

Vision Processing Lab — ITU, Lahore
Summer Intern — *Summer 2018*

- Worked on an end-to-end model for Indoor Self Driving Car

Recognition, Vision and Learning Lab — FAST NUCES, Islamabad
Machine Learning Intern — *Sep 2016 - May 2018*

- Worked on several problems including Mastering Tic Tac Toe using Self play and Reinforcement Learning, Autonomous driving in car simulations, Textual Image deblurring, Neural Steganography, Image Super Resolution and Nerve Segmentation

Recognition, Vision and Learning Lab — FAST NUCES, Islamabad
Summer Intern — *Summer 2016*

- Participated in DiDi Research Algorithm Competition For predicting number of drivers required in a certain area at a certain time
- Participated in group meetings to study Research Papers on Computer Vision and Machine Learning

Dr. Majid Khan — FAST NUCES, Islamabad
Research Assistant — *Aug 2015 - Dec 2015*

- Worked on practical implementation of data security and information hiding algorithms

Projects

- **Skin Classification**: Built a deep learning model that classifies skin images with samples of 8 common skin pathologies and carcinoma
  - Applied Transfer Learning using GoogleNet and ResNet
  - Generated Images using a Generative Adversarial Network
  - Test Accuracy : 0.935
- **Sentiment Analysis**: Built a model for sentiment analysis of movie reviews
  - Performed Visualization using t-SNE, Yellowbrick and WordCloud Pre processing using NLTK
  - AUC_ROC : 0.75
  - BAC : 0.528
  - Test Accuracy : 0.652
- **Indoor Self Driving Car**: Built a model for driving in a corridor

- Successfully trained a model to predict steering angle from front view images

- **Alpha Go Zero on Tic Tac Toe**: Mastering tic tac toe using self play and reinforcement learning
  - 40-0 against seventh generation player on 3x3 Maze in 40 games

- **Autonomous Driving in Car Simulations**: Worked on simulators including Carla and TORCS along with Euro Truck Simulator 2
  - Successfully trained an initial model for steering prediction on ETS2
  - Applied DeepLabV3+ for Segmentation to use it as a side task
  - Worked on some other simulators including Carla and TORCS

- **Textual Image Deblurring**: Textual Image Deblurring using Convolutional Neural Networks
  - Validation PSNR on ihradis : 18.64

- **Image Super Resolution**: Densely connected networks and perceptual losses for image transfer tasks
  - PSNR on Set 5 : 28.25
  - PSNR on Set 14 : 29.48
  - PSNR on Sun-Hays80 : 29.04
  - PSNR on Urban 100 : 29.35

- **Neural Steganography**: End to end trained cnn encoder-decoder networks for image steganography
  - Using CIFAR 10 and MNIST PSNR encoder : 32.9
  - Using CIFAR 10 and MNIST PSNR decoder : 32.0

- **Nerve Segmentation**: Predict nerve structure from ultrasound images of the neck
  - Built models using CNN, Skip connections, Xgboost, Residual Blocks
  - Different models tried with modifications include U-Net, Fully Convolutional Networks for Semantic Segmentation
  - Achieved score of 0.69 using dice coefficient

- **Fish Localizer**: Predict bounding box of fishes in images
  - Labeled regions of images containing fishes with help of students

- **User Activity Recognition**: Predict user activity based on sensors data
  - 99% Accuracy and log loss of < 0.001 using Random Forest Classifier

Technical Skills

- **Languages**: Python, C/C++, R, C#, Java, Go, JavaScript, MATLAB/Octave, Lua
- **Frameworks**: Tensorflow, Scipy, Keras, Scikit-learn, OpenCV, Caffe, Torch, Django
- **Others**: Bash, Git, Android, Latex, SSH