Ravsehaj Singh Puri

EDUCATION

Thapar Institute of Engineering & Technology (TIET), India — **PATIALA, INDIA**
Bachelor of Engineering, Computer Engineering | CGPA 8.67/10.0 — Jul'17 to present

RESEARCH INTERN EXPERIENCE

Thapar deepfake detection research group — **PATIALA, INDIA**
In collaboration with Tel Aviv University, Israel — Jul'20 to Nov'20
Supervisor: Prof. Parteek Kumar Bhatia
Working with a team of 3 researchers to develop an efficient data pipeline for sub-setting large deepfake datasets into smaller subsets; ensuring scalability and computational efficiency; proposed a deep VGG16-LSTM model for deepfake detection

- Handling large deepfake datasets with a focus on Celeb-DF
- Analyzing pixel-level and temporal CNN architectures
- Documentation of results and observations and manuscript compilation Code

PROJECT EXPERIENCE

Machine Learning and Computer Vision

- **Multi Object Tracking** — **CHANDIGARH, INDIA**
  Collaborated with a team working under Prof. Animesh Garg at PAIR lab, University of Toronto — Oct'20 to present
  Objective is to Implement MOT on procedural datasets like 50 salads dataset which have varied class and instance settings as compared to the baseline approach
  - Performed extensive research in existing State of the Art models in Multi-Object Tracking (MOT) like FairMOT and CenterTrack
  - Performed their implementation by reproducing quantitative and qualitative results
- **Final year capstone project: Computer Vision based autonomous food delivery bot** — **PATIALA, INDIA**
  Collaborated with a team of 4 students for our undergraduate thesis at TIET, Patiala — Jan'20 to Nov'20
  - Developed an autonomous food delivery vehicle using AI powered computer vision
  - Includes a cross-platform mobile application for booking and tracking and IoT based locking
  - Autonomous steering angle model based on NVIDIA end-to-end architecture Code
- **Emotion Detection using Convolutional Neural Networks** — **CHANDIGARH, INDIA**
  Command line application for detecting human face from webcam and predicting emotion out of 7 emotion categories — Jun'19 to Sep'19
  - Developed and trained the model on FER2013 dataset
  - Face detection model based on dlib and OpenCV library; emotion prediction model using a CNN Code

AI for Medicine — **CHANDIGARH, INDIA**

- **Detecting Medical Issues from Chest X-Ray Images using Convolutional Neural Networks and Gram-Cam to Visualize the Results** — Apr'20 to May'20
  - Capable of detecting medical issues like Atelectasis, Cardiomegaly and Edema
  - Employed Grad-CAM technique to construct a gradient based heat map to show location of the disease
- **Medical Question Answering System Fine Tuned on the BERT Model introduced by Google** — Jun'20 to July'20
  - Used BERT (Bi-Directional encoder representation transformer) fine-tuned on the SQuAD (Stanford question answering dataset) for medical question answering
- **Building Medical Prognostic Models using Machine Learning** — May'20 to Jun'20
  - Implemented two approaches to develop a model for predicting the survival probability of a patient after treatment
  - The model is trained on the PBC dataset which stands for Primary Biliary Cirrhosis
  - This project was a part of AI for Medicine specialization Code

Machine Learning and Data Analytics — **PATIALA, INDIA**

- **Twitter Sentiment Analysis** — Nov'19 to Dec'19
  - Developed a model to classify a tweet as positive/negative, trained on a dataset of 10,000 tweets
  - Trained and compared Logistic Regression and Naive Bayes model Code
- **Development of Python Package for TOPSIS Technique** — Jan'20 to Feb'20
  - Implemented TOPSIS technique in Python as part of Data Analytics and Visualization course
  - Developed a python package and pushed it to PyPI.org Code

CERTIFICATIONS

- **AI for Medical Diagnosis** (*Coursera*) Apr'20
  - Using deep learning and computer vision to detect diseases from chest X-ray images, detecting tumor from brain MRI images
  - Focused various image pre-processing techniques and evaluation metrics specific to medical imaging
- **AI for Medical Prognosis** (*Coursera*) May'20
  - Studied various survival models which predict the survival probability of a patient after treatment
  - Trained and evaluated two survival models– Cox proportional hazard model and Random survival tree model
- **AI for Medical Treatment** (*Coursera*) Jun'20
  - Learned different approaches which use machine learning to assist medical treatment
  - Trained model which can read unstructured radiology reports and convert it to structured format
  - Learned about medical question answering systems and how to interpret machine learning models
- **Natural Language Processing with Classification and Vector Spaces** (*Coursera*) Jul'20
- **Bitcoin and Cryptocurrencies** (*eDX*) Jun'20

PUBLISHED MEDIUM ARTICLES

- "The Ultimate Beginners Guide to Implement A Neural Network from Scratch" [*towardsdatascience*] Article; May 15th 2020
- "Building Medical Prognostic Models for Patients with Primary Biliary Cirrhosis" [*towardsdatascience*] Article; May 10th 2020

TECHNICAL SKILLS

- **Programming Languages -** C, C++, MATLAB, HTML, CSS, Python, Linux Shell and Oracle SQL
- **Deep Learning Frameworks -** TensorFlow, PyTorch and Keras
- **Image Processing Frameworks –** OpenCV, Scikit-image, Scikit-Video

EXTRA-CURRICULAR ACTIVITIES

- **Sports**
  - Won gold medal in UT lawn tennis tournament organized at Lake Club, Chandigarh [2014]
  - Led school team and won gold medal in UT table tennis tournament organized in Chandigarh [2012]
  - Remained gold medalist in table tennis and carrom for 3 consecutive years at St. John's High School, Chandigarh [2012,2013,2014]
- **Volunteering and Vocational activities**
  - Actively participated in Model United Nations conferences throughout Chandigarh and Punjab Circles [2014,2015]
  - Regular volunteering at The Blind School, Chandigarh [2013,2014]