Pranav Agarwal

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Experience

- **INRIA RITS** — **Paris**
  End to End Self Driving Car — *Aug 2019–ongoing*
  Implemented a Curriculum driven Reinforcement Learning Algorithm, using Proximal Policy Algorithm, which can learn to drive using only maps as input on Carla Simulator without any complex dense reward engineering. Further developed an OpenAI gym like environment for Carla simulator for testing different RL algorithms. Also, implemented an end to end RL agent which can learn to drive efficiently using dense rewards with TD3 algorithm.
  Supervised by–**Dr. Raoul de Charette**

- **INRIA Flowers** — **Paris**
  Egoshots and Semantic Fidelity Metric — *May 2019–Apr 2020*
  Proposed a new Image captioning metric Semantic Fidelity (SF) to evaluate image captioning models over the captions predicted without labels.
  Supervised by–**Dr. Natalia Díaz-Rodríguez**

- **Singapore University of Technology and Design** — **Singapore**
  Human Vision Based Face Recognition System — *May 2018–July 2018*
  Implemented a Human Vision based face recognition system on Face Scrub dataset and Image Classification on ImageNet dataset using Eccentricity Convolutional Neural Network. The project was successful in disproving a hypothesis that the ability of humans to recognize face reduces drastically if the focal point of their vision on the face changes.
  Supervised by–**Dr. Gemma Roig**

Education

- **Indian Institute of Information Technology Guwahati** — **C.G.P.A–9.40/10**
  Bachelors in Electronics and Communication Engineering — *2015–2019*
- **Creane Memorial School,Gaya** — **Score –96.2%**
  Intermediate/+2, C.B.S.E — *2013–2015*
- **Creane Memorial School,Gaya** — **C.G.P.A–10/10**
  Matriculation, C.B.S.E — *2003–2013*

Research Projects

- **EGOSHOTS: An ego-vision life-logging dataset and semantic fidelity metric to evaluate diversity in image captioning models**
  A new image captioning dataset and Semantic Fidelity metric to evaluate the diversity in image captioning models without labels. The Semantic Fidelity metric evaluate the quality of the predicted captions without a need of pre existing human annotated labels for a given image.
  Research Paper - ***Machine Learning in Real Life at ICLR 2020***

- **Learning to Synthesize Faces using Audio clips for Cross Modal Bio-Metric matching**
  Psycho Visual and Neurological Experiments have shown a direct link between Cross-modal perception in apes. The project used this relationship to develop a Cross-Modal Biometric matching system to synthesize faces using voice clips as a condition with the help of adversarial networks like Variational Autoencoder and Conditional GAN.
  Research Paper - ***IEEE TENSYMP 2019***

- **Fall Detection and Posture Recognition**
  Using Machine Learning Algorithms, Support Vector Machine and Random Forest Classifier for predicting the posture of an individual as well as the type of fall. The system got an accuracy of 96% for predicting the type of fall and 100% in predicting the type of posture. Developed a fully annotated dataset using IMU Sensor and Arduino
  Research Paper - ***ICSTEM-2019***

- **Video Based Automatic Commentary System in Cricket and Soccer**
  Players action and Commentary are always in synch with each other. The idea is to utilize this correlation in order to develop a real-time automatic commentary system using deep learning architectures. Successfully developed a fully annotated 450 clips of cricket videos for three classes. Implemented a 3-D CNN for classifying the videos into different classes with an accuracy of 55%. Improved the performance further using CNN+LSTM model which increased accuracy significantly to 80%.

- **Combinatorial Optimization Using Conditional GANs**
  Bin Packing and Knap Sack Problems are NP Hard problems and considered the most important algorithms of Computer Science with a number of applications. The project successfully implemented the knapsack problem for 2D rectangular packing using the advancements of Conditional GANs with length, width and area of each of the rectangles as a condition.

Technical Skills

- **Programming Languages:**-Python, C, Matlab
- **Software and tools:**- OpenCV in Python, Numpy, Scipy, Matplotlib, Carla, Matlab
- **Machine Learning Packages:**-Pytorch, Tensorflow, Keras.

Online Certifications

- Convolutional Neural Networks
- Neural Networks and Deep Learning
- Deep Learning for Business
- Hyperparameter tuning, Regularization and Optimization
- Machine Learning Foundations
- Algorithmic Toolbox
- Python Data Structures
- Getting Started with Python

Awards

- Awarded the **President's Gold Medal** for graduating with highest CGPA.
- Received the best **Technology award** by Government of Gujrat at Vibrant Gujrat-2019 (ICSTEM-2019)
- **Silver Medalist** at YUVAAN cricket - An Intra Collge sport's fest of IIIT Guwahati
- **Winner** of ElectroWarFare - An Intra College Techno Fest event of IIIT Guwahati