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Ayush K. Rai

Graduate Student, Artificial Intelligence, Ecole CentraleSupelec Paris

Education

Ecole CentraleSupelec, University of Paris-Saclay, Paris, France
Master of Science (MSc) , Artificial Intelligence *Sep' 18 - Jan' 20*
Current GPA: 17.6/20.0

LNM Institute of Information Technology, Jaipur, India
Bachelor of Technology, Electronics and Communication Engineering *Jul' 11 - May' 15*
Bachelor's Thesis: 3D Reconstruction of a Scene using Stereo and Multiview Images
GPA: 7.18/10.0

Research & Work Experience

Deep Learning Engineer (Software Development)
StegoSOC Cloud Security Inc (Cloudadic Intelligent Solutions), Bangalore *Feb'17 - June'18*

- Worked on text localization and recognition problem (extended OCR) by implementing end to end trainable CNN & LSTM based deep learning models using PyTorch.
- Built a pipeline for generating synthetic & artificial data for text recognition problem and used it to train a supervised deep learning model in order to improve the efficiency of OCR system.
- Also engaged in designing Machine Learning systems to aid Security Analysts to identify probable Cyber threats, attack patterns and anomalous user-behavior in Cyber Physical Systems.

Data Science Intern
Cube26 Software Pvt Ltd (Acquired by Paytm), New Delhi *Jan'16 - July '16*

- Worked on Image Classification problem by finetuning various ImageNet pretrained CNN based models like AlexNet, VGG-16,19 and ResNet-152 using Caffe. Dataset Used : Yelp Restaurant, LSUN 2015 dataset.[Link].
- Also participated in LSUN 2016 Challenge (Scene Classification) and obtained a top 1 accuracy of 83.02 on the test dataset.[Link].

Research Associate/Intern — IIITD, New Delhi
Supervisor : Dr. Saket Anand, Assistant Professor, IIIT-Delhi *May '15 - Nov '15*

- Involved in Stereo Correspondence and Lane Marker Detection modules of IIITDs project on Autonomous Car (Spark The Rise : Driverless Car Challenge) for Indian roads.
- Implemented Semi Global Matching for disparity map computation and spline fitting & hough line transform for lane marker detection. Analyzed results on public stereo and lane datasets (Middlebury stereo, KITTI, Malaga urban etc). [Code]

Research & Academic Projects

Instance Level Object Segmentation in Videos
Graduate Course : Introduction to Visual Computing (Ecole CentraleSupelec) *Jan '19 - Mar '19*

- Worked on the problem of Instance Level Object Segmentation in videos using Mask-RCNN Architecture. This work is based on CVPR 2018 WAD Video Segmentation Kaggle Challenge.
- [Report]

Learning to Play TORCS using Deep-RL
Graduate Course : Reinforcement Learning (Ecole CentraleSupelec) *Jan '19 - Apr '19*

- Worked on a project to learn to drive in TORCS Racing Simulator using deep reinforcement learning techniques like Deep Deterministic Policy Gradient (Actor-Critic Based Method).
- [Report]

Music Genre Classification using Machine Learning
Graduate Course : Foundations of Machine Learning (Ecole CentraleSupelec) Sept '18 - Dec '18

- Worked on music genre classification problem by extracting acoustic and audio features by applying various machine learning techniques and deep learning techniques on Free Music Archive Data [FMA]
- [Code] [Report]

Attention-based Graph Neural Networks for Semi-Supervised Fake News Detection
Graduate Course : Network Science Analytics (Ecole CentraleSupelec) *Dec '18 - Jan '19*

- Applied text classification for fake news detection with small amount of labeled data (Semi-Supervised Learning) using a graph neural network method based on attention. Results were obtained on public datasets like Cora, Pubmed and fake news dataset like Buzzfeed Political News.
- [Code] [Extended Report]

Bachelor's Thesis : 3D Reconstruction of a Scene using Stereo/Multiview Images
Supervisor : Dr. Sonam Nahar, Assistant Professor, LNMIIT *Dec '14 - May '15*

- Reconstructed the 3D view of a scene using stereo/multiview images with known intrinsic camera calibration parameters using the technique of Structure from Motion.
- Reprojection error was used as the evaluation metric and results were evaluated on EPFL Multi-view Stereo Dataset
- [Code] [Bachelor's Thesis]

Emotion Recognition using Facial and Audio Features
Emotiw Challenge in ICMI-2013 *May '13 - Sep '13*

- Predicted the emotion (happy, angry, sad, neutral, surprise, disgust, fear) of the main actor in the video playbacks of AFEW dataset (part of EmotiW challenge in ICMI 2013) by extracting facial features using techniques like optical flow and gabor transformation from the face images and then applying SVM for classification of the emotion.[Link].

Counter Measures to 2D Face Spoofing Attacks
Biometric Challenge in ICB-2013 *Dec '12 - Mar '13*

- Improved the efficiency of the 2D Face Authentication Systems against Spoofing attacks (printed photo/video/high definition video) on the REPLAY-ATTACK dataset (part of ICB-2013) by extracting features using Local Binary Patterns, 2D FFT and Background Modeling.[Link]

Computer Skills

Languages Known: C, C++, Python, R.
Software Packages: Caffe, PyTorch, Robot Operating System, Matlab, Keras, LaTex.

Other Activities

Content Writer - Actively blogging on my personal website and Linkedin on variety of topics like education, business intelligence, entrepreneurship, data science and artificial intelligence. [Blog Link].