Aviral Joshi

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Education

Carnegie Mellon University - School of Computer Science   Pittsburgh, PA
Master of Computational Data Science | QPA: 3.56   December 2020
Coursework: Machine Learning, Deep Learning, Interactive Data Science, Neural Networks for NLP, Cloud Computing

PES University - Computer Science Department   Bangalore, India
Bachelor of Technology in Computer Science and Engineering | GPA: 8.86 / 10   June 2019
Coursework: Machine Learning, Advanced Algorithms, Image Processing, Data Analytics, Linear Algebra, NLP
- Secured First Class with Distinction and received a certificate of Specialization in Data Science

Experience

Robotics Institute – Carnegie Mellon University   Pittsburgh, PA
Research Assistant   May 2020 - Present
- Formulating an approach for visual dialog-based navigation of an autonomous agent in simulated environment
- Designed a data collection pipeline in Python to collect over 10K annotated image, dialog pairs from Mturk

VMware   Bangalore, India
Research and Development Intern   January 2019 - June 2019
- Upgraded VMware's on-disk metadata analyzer to support Spanned and Grown Volumes on VMFS6 filesystem and built data structures for efficient in memory caching of filesystem metadata, thus improving runtime performance

VISIO.AI   Bangalore, India
Cofounder, Artificial Intelligence Analyst   May 2017 - May 2018
- Designed a Face Verification algorithm with a Resnet inspired architecture trained with triplet-loss to authenticate employees of a small business (under 50) and guaranteed less than 1% error rate in real-world setting
- Developed a License Plate Recognition system using YOLO object detection to operate in high traffic environments with end-to-end latency of under 100ms. Deployed the solution Chief Minister's office in Lucknow, India
- Patent pending on a method to monitor driver fatigue levels from facial cues using deep learning to suggest risk mitigation strategies while operating under computational constraints of a microcontroller (Raspberry pi)

Projects

Language Generation from Structured Data   Carnegie Mellon University | Spring 2020
- Developed a prototype-based language generation model using LSTM with Copy Attention to generate textual descriptions from tables present in the WikiBio dataset and efficiently calculated Jaccard similarity using locality sensitive hashing
- Outperformed autoregressive models on the BLEU score metric by over 20 points

Semi-Supervised Subtomogram Classification (In review at BMVC)   Carnegie Mellon University | Spring 2020
- Developed a novel semi-supervised clustering approach to identify macro-molecular structures in 3D Cryo-ET images
- Outperformed state-of-the-art on all datasets and achieved an improvement of over 3x on model inference time

Unsupervised Scene change identification (Video)   Carnegie Mellon University | Spring 2020
- Introduced a novel generative approach that uses a Beta-VAE to identify scenes changes in videos by measuring KL divergence between images. Proposed approach reduces manual effort in annotating data for downstream tasks

Speech to Text for English   Carnegie Mellon University | Spring 2020
- Designed a speech-to-text translation system using a Pyramidal Bi-LSTM + Attention architecture
- Improved BLEU by 10 points over baseline by adding Gumbel Noise, varying teacher forcing and using Beam Search

YouTube Trending Analytics (Website)   Carnegie Mellon University | Spring 2020
- Analyzed factors that govern the YouTube trending page and visualized the presence of user and platform bias
- Constructed a Machine Learning pipeline with XGBoost classifier to determine attributes that best predict trending videos

Stance Detection to Identify Fake News (Video) (Report)   PES University | Spring 2019
- Developed a LSTM model with state-of-the-art Contextualized word Embeddings ELMo, to detect discrepancies between claim present in a news article and other authoritative news sources to identify potential fake news.

Unconstrained Face Recognition (Publication)   PES University | Spring 2018
- Introduced a novel pipeline architecture for face recognition which used the highly optimized CloudForest algorithm to achieve 10-15x training time improvement over other ensemble classifiers such as Random Forest

Skills

Programming: Python, C, Java, JavaScript, R
Databases: MySQL (Intermediate), MongoDB (Basic)
Machine Learning: Pytorch, TensorFlow, Scikit-Learn, Google AutoML and Azure Cognitive Services
Data Analysis and Processing: Panda, Plotly, Tableau, Docker, Elastic MapReduce, ETL, OpenCV

Recognition and Awards

2018: My start-up VISIO.AI was listed amongst "20 Most Promising AI Providers of India" by C.I.O. review
2017: Received recognition from news media outlets for work done on Driver Fatigue detection system
2016: Won 2nd runners-up at a Hackathon for developing an automobile crash alert detection Android application