Karan Jeswani

Quantitative Analytics Specialist · Wells Fargo

Intelligent Systems, Corporate Model Risk

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Work Experience

Wells Fargo — *Bangalore, India*

Quantitative Analytics Specialist, Intelligent Systems — *July, 2021 - Current*

- Created Python package for fully automatic model validations
- Implemented model explainability tests & model fairness checks as part of model validations
- Created Web App using FastAPI & SQLite DB for automatic report generation

Education

Indian Institute of Science (IISc) — *Bangalore, India*

M. Tech in Computational and Data Science (CDS) — *July 2019 - June 2021*

CGPA : 8.80 / 10, Sem-I and Sem-II — Lab: Medical Imaging Group

Veermata Jijabai Technological Institute (VJTI) — *Mumbai, India*

B. Tech in Mechanical Engineering (ME) — *July 2013 - May 2017*

CGPA : 8.40 / 10, Ranked 17th in a class of 70 — Lab: Statistical Thermodynamics

Projects

Model Validation as a Service — *August, 2021 - Current*

- Providing model as a service by using Remote Process Call (gRPC)
- Standardizing Model Diagnostic Validation Tests using and building upon open source libraries like SKLearn, EBM, DALEX, PyCaret
- Running Validation suites on remote model

Automatic Evaluation Metrics for Multi-Sentence Text — *January, 2020 - June, 2020*

- Implemented several common metrics in Natural Language Processing (NLP) like BLEU, ROUGE, BERTScore, Sentence Movers Similarity for evaluating single and multi-sentence text on 3 datasets, namely WMT-18, CNN News, Student Answer Scripts.
- Performed experiments with various embeddings like GloVe, ELMo, BERT, RoBERTa, with all types of metrics.
- In conclusion, Cosine similarity is a better metric for gauging correlation with humans in contrast to word matching or Wasserstein distance for both single and multi-sentence text.

MRI to CT Image Modality Translation using Conditional GAN — *January, 2020 - June, 2020*

- Implemented cGAN, commonly used for Image-to-Image Translation in Computer Vision (CV), to synthesize CT scan images given MRI-T1 images. Used smaller network that still achieves performance comparable with State-of-the-Art.
- Performed hyper-parameter tuning for both networks using grid search strategy for extracting best performance, in terms of PSNR and SSIM, for custom dataset.
- Observed performance improvement by adding perceptual loss using pre-trained VGG-19 with fixed weights and by incorporating neighboring slices as input.

Particle Filter for Video based Object Tracking — *January, 2020 - June, 2020*

- Applied the popular state estimation technique called Particle Filter for video based object tracking, and parallelized the algorithm to work on the GPU using OpenCV and C++.
- Improved the Parallel Resampling algorithm by exploiting non-decreasing property of cumulative distribution function.
- Observed an increased latency for video based object tracking owing to faster resampling technique.

Skills

Programming Languages	Python | C | C++ with MPI, OpenMP, using GPU accelarators with CUDA | Javascript, Node.js | Basic SQL.
Deep Learning Libraries	Pytorch | Tensorflow | Keras | Pyspark.
Numerical Computing	Numpy | Sci-kit Learn | Pandas | MATLAB.
Visualization Libraries	Matplotlib | Plotly | Processing and p5.js libraries for animation.

Relevant Courses

- **SEM- I :** Stochastic Models & Applications, Introduction to Scalable Systems, Numerical Linear Algebra, Numerical Methods.
- **SEM-II :** Machine Learning, Data Analysis & Visualization, Parallel Programming, Numerical Solution of Differential Equations.