

VISHAL KESWANI

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WORK EXPERIENCE

VMOCK INDIA PVT LMT | Data Scientist

(Jul'21-Present)

Transformer-based Content Feedback for Technical Transcripts

- Developed and deployed sentence and entity level language models for customized feedback on Elevator Pitch transcripts
- Experimented with transformer (**BERT**, DistilBERT) and RNN (**Bi-LSTM**, LSTM, QRNN with GloVe and Word2vec)
- Achieved macro-F1 score of **82%** on sentence classification and **75%** on NER, further improved by post-processing logics

Automatic Speech Recognition for interview transcription

- Streamlined the 3 step ASR pipeline, removing third party dependency and saving upto **\$2k per month** variable costs
- Voice Activity Detection: compared low-latency vad models, used **silero-vad** to find no speech regions for audio splitting
- Audio Transcription: developed in-house **speech-to-text** capability with **Whisper**, testing across sizes and frameworks
- Phoneme Alignment: used **wav2vec2** for generating time-stamps of text over audio for subtitling and targeted feedback
- Reduced word error rate by **51%** on technical transcripts and **29%** overall, reduced latency by **20%** using onnx format

LLM-based Smart Composition for Resume Builder

- Designed a predictive text feature for faster & convenient bullet completion, trained baseline **gpt-neo-125m** from scratch
- Performed parameter efficient fine-tuning of gpt-neo-1.3b with **LoRA** & **QLoRA** on a single 16GB Nvidia Tesla T4 gpu
- Achieved a perplexity reduction of **60%** using rank 8 adapter for all linear layers, improved latency by **12%** using 4-bits

Updation and maintenance of Resume Samples API

- Engaged in logic updation, database expansion & **containerization** of API for predicting similar bullet using Word2vec
- Oversaw migration to OpenSearch resulting in latency gains of upto **30x** & quality improvement using **Sentence-BERT**

PUBLICATIONS

Formulating Sentence Ordering as the Asymmetric Travelling Salesman Problem

14th International Conference on Natural Language Generation, INLG 2021

- Classified Sentence-Pairs with BERT, used probabilities as distance input for asymmetric TSP (exact and heuristic)
- Predicted orders overtook baseline by upto **20%** in Perfect Match, **11%** in Kendall Tau, **6%** in Position-wise Accuracy

Hypernym Detection in the Financial Domain via Context-Free and Contextualized Word Embeddings

FinNLP-2020, 2nd International Workshop on Financial Technology and NLP, IJCAI-PRICAI 2020

- Used **Word2vec** word-embeddings trained from scratch and pre-trained **BERT** word-embeddings with simple classifiers
- Word2vec with **Naïve Bayes** and BERT with **Logistic Regression** gave best test accuracy of **88%** and mean rank 1.2

Unimodal and Bimodal Sentiment Analysis of Internet Memes

SemEval-2020, 14th International Workshop on Semantic Evaluation, COLING-2020

- Implemented Naïve Bayes (text), Combined **CNN** (image) and **Feed-Forward Neural Network** (text) using **SVM**
- Fine-tuned BERT and Multimodal Bitransformer, text-only FFNN with Word2vec gave best macro-F1 **63%** > baseline

INTERNSHIP PROJECTS

MURATA VIOS | Computer Vision Intern

(May'20-Aug'20)

Computer Vision on Edge devices for the visually impaired using TensorFlow Lite

- Customized **Object detection** (COCO dataset) and **Face Detection** (Open Images dataset) for Raspberry Pi 4
- Trained quantized **MobileNet V2** on LFW dataset and user faces, obtained **Face Recognition** accuracy upto **93%**

NOKIA SOLUTIONS AND NETWORKS | Data Science Intern

(May'19-Jul'19)

Auto-Suggesting inquiry questions to Care Engineer based on client case

- Extracted e-mail bodies (doc to csv), followed by tokenization, removal of stop words, stemming, lower casing in **nlTK**
- Clustered client queries using **k-means** (using **tf-idf** scores and **cosine-similarity**), reported 3 most similar questions

SURGE, CSE Department | Research Intern | Mentor: Dr Nisheeth Srivastava

(May'18-Dec'18)

Effect of probabilistic sample size on preference behavior via web game

- Designed web experiment using HTML, CSS, JavaScript; simulated bets via **Box-Muller** method & Logistic function
- Made 4 types of trails, computed mean reaction times & performed outlier detection using **IQR** method in MATLAB

RELEVANT SKILLS

Programming: Python, R, C, C++, HTML, CSS, JavaScript | **Others:** SQL, Bash, Linux, Windows, MS Office, Latex

Python: HuggingFace, PyTorch, TensorFlow, Keras, Spacy, MLFlow, Gradio, NumPy, Pandas, Flask, Onnx, DeepSpeed

Tools: Git, Docker, DVC, Devspace, Kubernetes, Celery, Redis, New relic, AWS S3, Sagemaker, Copilot, OpenSearch

ACHIEVEMENTS

- Recognized as **STAR** employee of Capabilities team at VMock for outstanding contribution to Interviews product
- Ranked 1st** in FinSim 2020 international challenge under FinNLP Workshop on NLP in the FinTech Domain
- Stood 1st** in Memotion Analysis task (Sentiment Analysis of Memes) under SemEval 2020 International Challenge
- Received Commendation Certificate and Research Grant for excellent performance under SURGE 2018 program of IITK
- Secured **AIR 538** in JEE Mains (City Rank 1) and AIR 2191 in JEE Advanced (City Rank 2) among 1.5 million

EDUCATION

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|--|---|---------------------------|---|------|
| Indian Institute of Technology, Kanpur | BS-MS - Economic Sciences Minor - Machine Learning | 10/10 (PG) 8.6/10 (UG) | Department Rank 1 in MS batch Graduated with Distinction | 2021 |
| Kendriya Vidyalaya 1, Ajmer | CBSE - Senior Secondary | 96.4/100 | School Rank 1 and Best Student | 2015 |
| East Point School, Ajmer | RBSE - Secondary | 94.2/100 | School Rank 1 and House Captain | 2013 |