

VISHAL KESWANI

Status: Senior undergraduate

Skills: Python | MATLAB | R | C | C++ | HTML | CSS | JavaScript

Minors: ML, Computer Systems, CGS

Packages: pytorch, pm4py, numpy, pandas, nltk, keras, textblob, sklearn

EDUCATION

I.I.T. Kanpur		B.S. Economics		CPI: 8.6/10	(May 2020)
K.V.1 Ajmer		C.B.S.E.		Grade: 96.4%	(May 2015)
E.P.S. Ajmer		R.B.S.E.		Grade: 94.2%	(May 2013)

SCHOLASTIC ACHIEVEMENTS

- » Stood 1st in Task 8A (Sentiment Analysis of Memes) under SemEval International Challenge (2020)
- » Received Commendation Certificate for excellent performance under SURGE'18 program (2018)
- » Bagged the Best Staff's Pick Project Award in the course TA201A in a batch of 380 (2018)
- » Ranked among top 1.1% out of 0.2 million students in JEE Advanced 2016 with City Rank 2 (2016)
- » Secured AIR 538 in JEE Mains 2016 out of 1.5 million candidates with City Rank 1 (2016)

PROJECTS

Multimodal Sentiment Classification of memes (Image & Text), SemEval'2020 (Jan'20-Present)

Special topics in NLP, Department of Computer Science and Engineering, IIT Kanpur

- » Implemented image-only CNN and text-only ANN, combined using SVM, also trained text-only Naive Bayes
- » Fine-tuned BERT (text-only) and Multimodal Bitransformer; best was ANN with word2vec improving baseline by 63%

Scalable sampling using Variational Autoencoders and Normalizing Flows (Jan'20-Present)

Undergraduate Project, Department of Electrical Engineering, IIT Kanpur

- » Implemented VAE and planar flows for approximating complex known densities and MNIST handwritten digits
- » Currently working on flow-based models (GLOW, Sylvester) for Boltzman distribution (used in stochastic NNs)

Product Recommendation System (Aug'19-Nov'19)

Introduction to Machine Learning, Department of Computer Science and Engineering, IIT Kanpur

- » Explored different algorithms from the extreme multi-label classification repository (manikvarma.org)
- » Parabel, PfastreXML and FastXML were the top picks based on performance on most evaluation metrics
- » Trained the 3 on a dataset of 10k users, represented by ~16k features, with ~3k labels of interest
- » FastXML performed overall best with model size 1.42mb, prec@1 80.4% & prec@3 49.7% on test dataset

EXTREME
CLASSIFN

Non-negative Matrix factorization for Image Classification (Aug'19-Nov'19)

Machine Learning for Signal Processing, Department of Electrical Engineering, IIT Kanpur

- » Implemented Principal Component Analysis & Non-negative Matrix Factorization from scratch in python
- » Performed dimensionality reduction, plotted transformed data, basis vectors and reconstructed samples
- » Used NMF for classification of MNIST digits and obtained an accuracy of around ~80% on test data for K=3
- » Also implemented Neural Network, GMM and Regression variants in the course from scratch

IMAGE
CLASSIFN

Twitter sentiment analysis: Public opinion on US-China trade war (Aug'19-Nov'19)

International Economics and Finance, Department of Economic Sciences, IIT Kanpur

- » Extracted twitter data (~10m tweets) filtered by keyword 'tradewar' from Jan 2018 (beginning of trade war)
- » Performed data preprocessing - lowercasing, removing stop words etc, & replacing emoticons with words
- » Trained Naive Bayes, Maximum Entropy & Decision Tree; NB gave the best accuracy (~74%) & training time
- » Classification(+/-) probabilities gave a polarity score for each tweet, aggregated them to get daily trend

SENTIMENT
ANALYSIS

ARIMA vs LSTM: Modeling and Forecasting of deseasonalized US real GDP				(Jan'19-Apr'19)	TIME SERIES
Econometrics II, Department of Economic Sciences, IIT Kanpur					
» Performed ACF, Dickey-Fuller & Phillips-Perron tests, all supported first differencing for stationarity					
» Used 9:1 train-test split due to high prediction time and walk-forward validation (rolling forecasts)					
» Used MSE for tuning and model evaluation, ARIMA(1,1,1) performed best among econometric models					
» LSTM showed ~23% reduction in test MSE with 2 neurons & 18% with just 1 (batch-size = 1, epochs = 10)					
RELEVANT COURSES					
Intro. to Machine Learning		Probability & Statistics		Econometrics	Data Structures & Algorithms
ML for Signal Processing		Stochastic Processes		Linear Algebra	Principles of Database Systems*
Natural Language Processing*		Bayesian Econometrics		Process Mining	Real Analysis & Calculus
INTERNSHIP EXPERIENCE					
Anomaly detection in telecommunication event logs				(May'19-July'19)	PROCESS MINING
Nokia Solutions and Networks, CodeAnalytics Research, Gurugram, India					
» Assigned case ids to log data (stream of unlabelled events) using iterative Expectation-Maximization					
» Discovered process using alpha & inductive miner, the resulting petri net revealed a Spaghetti process					
» Performed conformance checking, classified events as anomalous based on aggregate trace fitness score					
Auto-Suggesting inquiry questions to care engineer based on client case				(May'19-July'19)	NLP
Nokia Solutions and Networks, CodeAnalytics Research, Gurugram, India					
» Extracted e-mail bodies from Word, then tokenized, removed stop words, stemmed, & lower-cased					
» Used keyword search to create a query & CE questions repository with correspondence between them					
» Calculated tf-idf scores, performed k-means & k-medoids on client queries using cosine-similarity					
» For new query, reported inquiry questions for 3 nearest centroids clusters (based on correspondence)					
Web Experiment for effect of probabilistic sample size on preference behavior				(May'18-Dec'18)	WEBDEV
SURGE, Department of Computer Science and Engineering, IIT Kanpur					
» Designed a web-based betting game-cum-experiment using HTML, CSS, JavaScript with 4 types of trials					
» Used the Logistic function to simulate outcomes of bets, applied Box-Muller method to generate a Random Gaussian sample used to calculate percentile of players based on total amount after every bet					
» Computed mean reaction times and performed outlier detection using IQR method in MATLAB					
POSITIONS OF RESPONSIBILITY					
Company Coordinator, Student Placement Office, IIT Kanpur				(Aug'17 - Apr'18)	
» Ensured smooth conduction of internship and placement processes throughout the season					
» Organized PPTs, GDs, invigilated during tests and interacted with company officials while managing interviews					
Senior Executive Media & Publicity, E-cell, IIT Kanpur					
				(Apr'17 - Apr'18)	
» Created articles and posts for online media for promotion of various events and the E-cell of IIT Kanpur					
» Aided in organization of eSummit and TEDx, interviewed Mr. Sandeep Aggarwal (founder of ShopClues & Droom)					
EXTRA-CURRICULAR ACTIVITIES					
» Secured 1st position in British Parliamentary Debate in Galaxy (Inter-pool cultural fest of IITK)				(2017)	
» Worked as Secretary in Fine Arts Club and performed speed art in batch Freshers' night				(2017)	
» Became School Captain of Kendriya Vidyalaya 1, Ajmer, also won Best Student award				(2015)	
» Best Speaker from region in Youth Parliament Competition, Zonal level (5 zones in India)				(2013-14)	
» Captained School Cricket Team and won Fair-Play award in an open cricket tournament				(2013)	
» Stood in top 150 in Tata Building India Essay Competition among 2m participants twice				(2010-11 & 11-12)	