

KARTIK VASUDEV SHENOY

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EDUCATION

University of Southern California

Master of Science in Computer Science (Artificial Intelligence) with Honors

January 2021 – Exp. Dec 2022

GPA: 4 / 4

University of Mumbai, India

Bachelor of Technology in Computer Engineering; **Department Rank: 1**

August 2014 – June 2018

GPA: 9.56 / 10

EXPERIENCE

Bill.com

May 2022 – August 2022

Machine Learning Engineer Intern

San Jose, CA (Remote)

- Generated a dataset of **1 million** invoices and statements from user data after sanity checks for improving the amount OCR model.
- Leveraged an ensemble of document classification models to fix the imbalanced data distribution of statements in training dataset.
- Improved the amount prediction test accuracy from 75.5% to **77.67%** with 50% confidence threshold.

Information Sciences Institute, USC

January 2022 – May 2022

Research Assistant, May Team

Los Angeles, CA

- Worked on designing bots capable of understanding communication and strategizing for the board game – diplomacy.
- **Increased the win rates by an average of 5%** for the powers in the game by generating and understanding DAIDE messages and using rules on top of the pre-trained reinforcement learning based Dipnet bot.

Information Sciences Institute, USC

February 2021 – Present

Research Assistant, Centre of Knowledge Graphs

Los Angeles, CA

- Constructed a framework for identifying low quality statements in Wikidata knowledge graph amongst **1.1 billion** statements on the basis of deleted, deprecated statements and constraint violations.
- Enhanced the **graph embeddings** of nodes using retrofitting based on **BERT** embeddings and structural, textual properties extracted from **Wikidata, Probase and DBPedia** datasets increasing **Spearman correlation from 0.66 to 0.73** on WordSim353 benchmark.

Barclays Global Service Centre

July 2018 – December 2020

Software Developer, Barclaycard UK

Pune, India

- Devised a prototype fraud detection system to identify mule accounts by building a pipeline of **Kafka** queues, **Cassandra DB** and **PySpark** servers having an ensemble of ML models.
- Designed a tweets **sentiment analysis** engine which fetches tweets where Barclays accounts were tagged in real-time to enable quick customer service response achieving an accuracy of around **90 %** in pilot runs.
- Created a classifier application utilizing **ML algorithm Latent Dirichlet Allocation** to extract insights by generating ontologies from iOS and Android application reviews and customer complaints.
- Spearheaded the design of a system that helps in connecting the colleagues with available bandwidth and skillsets with the colleagues needing assistance in their work, using **AngularJS, Java, MySQL**, saving more than **900 man-hours** annually.
- Translated VISA, Mastercard scheme mandates into system code which processes millions of transactions every day.

Virtual Labs, Indian Institute of Technology, Bombay

March 2017 – August 2017

Web Development Intern, Team Leader

Mumbai, India

- Led a team of three to develop a [Virtual Lab](#) for the online demonstration of machine learning concepts such as neural networks, learning rules and optical character recognition. This lab has won the [Global Online Laboratory Consortium International Lab Award](#).

PROJECTS

Alexa Social Bot

- Contributed to the development of Alexa social bot including conversational elements such as **Sentence BERT**, offensive speech classification, **SNIPS NLU** intent classifier, **FSMs**, **DialogPT** and neural text generation modules.

Generation Augmented Retrieval for Question Answering

- Addressed the Question Answering task by fine-tuning BART-large model and using OTS Dense Passage Retriever models achieving **92.6% top-1000 retrieval accuracy** and **43.9% EM accuracy** on Natural Questions dataset.

VeriSign [\[Demo Link\]](#) [\[Github Link\]](#)

- Deployed an application to verify signatures by comparing with the original one and detect forgery.
- Achieved an accuracy of 96 % by training a Convolutional Siamese Network using the concept of One-Shot Learning.

Pneumonia Detection from Chest X-Ray Scans [\[Github Link\]](#)

- Trained a CNN on Chest X-Ray Scans with histogram equalization achieving 94.56 % accuracy and a recall score of 0.97.

Sign Language Translator [\[Github link\]](#)

- Managed a team of four to develop an Android application for recognizing Indian Sign Language used by the hearing- and speech-impaired. This is connected to a remote Python server.
- Extracted centroid contour distance curve of hand poses followed by normalization with FFT for feature-set generation.
- Trained **HMMs** for Gesture Recognition from gesture videos with 97.23 % accuracy and **k-NN** for Hand Pose Recognition with 99.7 % accuracy. Results published in a paper indexed by IEEE Xplore.

Feed-Forward Neural Network Implementation in NumPy [\[Github link\]](#)

- Implemented Neural Network Training using Back Propagation with Mini-Batch Gradient Descent, regularisation, variable momentum and learning rate annealing. Used this flexible implementation to train MNIST dataset achieving 96.81 % accuracy.

PUBLICATIONS & ARTICLES

- “Viola: A Topic Agnostic Generate-and-Rank Dialogue System”, 4th Proceedings of Alexa Prize (Alexa Prize 2020). [\[paper link\]](#)
- “A Study of the Quality of Wikidata”, Preprint submitted to Elsevier, July 2021. [\[paper link\]](#)
- “Keystroke Dynamics Analysis and Prediction”, Towards Data Science, January 2021. [\[Part 1 \(EDA\)\]](#), [\[Part 2 \(Model Training\)\]](#)
- “LSTM Back-Propagation - the Math Behind the Scenes”, Medium, July 2020. [\[Article Link\]](#)
- “Real-time Indian Sign Language (ISL) Translation”, 9th International Conference on Computing, Communication and Networking Technologies (ICCCNT). Published in IEEE Xplore, October 2018. [\[paper link\]](#)
- “An Effective Pixel-Wise Approach for Skin Colour Segmentation - Using Pixel Neighbourhood Technique”, International Journal on Recent and Innovation Trends in Computing and Communication (IJRITCC), 2018. [\[paper link\]](#)

SKILLS

Programming Languages: Python, C++, Java, JS

Machine Learning: TensorFlow, Pandas, Keras, Scikit-learn, NLTK, Spacy

Frameworks: OpenCV, Numpy, Matplotlib, Kafka

Web: LAMP stack, Angular4, NodeJS, Flask

Database: MySQL, MongoDB, CassandraDB

Tools: AWS (EC2, RDS, S3, EKS, Comprehend), Git, Firebase, Matlab, Google Colab, Heroku

CERTIFICATIONS

- [Natural Language Processing with Classification and Vector Spaces](#)
- [Natural Language Processing with Probabilistic Models](#)
- [Natural Language Processing with Sequence Models](#)
- [Deep Learning Specialization \(Coursera\)](#)
- [Machine Learning \(Stanford Online\)](#)
- [Angular 2 \(Udemy\)](#)

ACHIEVEMENTS & INVOLVEMENTS

- **Guided 900+ students** as a **Teaching Assistant** for the courses Artificial Intelligence and Algorithms (Jan 2022 – Present) at USC.
- Volunteered at **Graffiti Removal** and **Urban Farm** events through USC Volunteer Center.
- **Semifinalist** of Alexa Socialbot Grand Challenge 4 (2020 – 2021) as part of Team Viola.
- Bagged the **Barclays Award of Stewardship** for automating the generation of real-time delivery metrics of more than 30 teams from Agile Central and Jira data sources. These dashboards have been saving around 150 man-hours annually.
- **Sir Dorabji Tata Trust scholarship** for securing 1st Rank in a class of 120 students during undergraduate studies.
- ‘**Vice-President - Membership**’ of Barclays Pune 2 Toastmasters Club (January 2019 – June 2019).
- Active member of Junior Chambers International Club – contributing to **social service** activities such as creating seed balls for afforestation in areas devastated by floods and blood donation.
- **Taught basic computer skills** of Microsoft Office to underprivileged students over a span of 10 days.
- **Placement Coordinator** during under-graduation, managing logistics for around 40 companies and 800 students.
- Indian Classical Music Level 3 certified singer and Harmonium player and a beginner guitar player.