Tejas Lodaya

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Research interests : systems (distributed, data-intensive computation), storage and ML

Education

- **PES Institute of Technology** *2013 – 2017*
  Bachelor of Engineering in Computer Science; CGPA: 9.00/10.0 (Top 5%)
  Thesis title: A low-cost method to create chalk-talk videos (supervised by Dr. Viraj Kumar)
- **Chetan Pre-University Science College** *2011 – 2013*
  Board of Intermediate Education (12th grade); AIR: 340 (Top 1%)

Professional Experience

- **Swiggy** Bangalore, India
  Senior Machine Learning Engineer *May 2019 - Present*
  - Built end-to-end platform to deploy deep learning models at scale using tensorflow serving. Achieved latencies of 15ms at peak 10k RPS using sidecar containers and gRPC network calls
  - Maintaining and operating ML platform with over 5k feature jobs and ~150 scala models in production
  - Streamlined visibility and monitoring of ML models by feature pipeline quality checks, alerts on data drifts, erroneous models, and infrastructure failures. Reduced TAT for model failures from 1 day to 2 hours
  - Developed real-time and end-of-ride map-matching algorithm to snap driver GPS pings to the underlying road network. Powering accurate driver payouts, missing road detection, ETA predictions, and order assignments
  - Architected map-reduce style spatial querying and data manipulation engine for massive storage of point, line, and polygon data. Provides a real-time, cost-effective, and performant solution for efficient OLAP queries
  - Built a low-throughput, high-latency prototyping platform to serve python-based models at scale. Enables data scientists to conduct experiments and validate hypothesis without rewrite in high-performant scala/tensorflow
  - Deployed smart payments model into checkout springboot service with a peak throughput of 2mn requests per day. Generated real-time features from the order flow and wrote JUnit cases for compile-time testing
  - Built performance testing framework to measure how fast models can fetch features and produce results when deployed in critical software systems. Helps gauge whether model is production-ready and within latency budgets
  - Worked closely with data scientists to onboard multi-objective models optimizing for competing metrics – UE, CX
  - Involved in design and solutioning of platform's automated retraining capability, model orchestration framework, centralized feature store, and monitoring and alerting framework
- **Freshworks** Chennai, India
  Machine Learning Engineer *Oct 2018 - May 2019*
  - Migrated legacy codebase from in-memory redis cluster to disk-based cassandra, reducing burn-rate by $250k per year. Implemented memcached to increase the key-fetch rate further and minimize latency
  - Architected database model for storing normalized term frequency and document frequency across articles, achieving O(1) read and write speeds
  - Built APIs for exposing tf-idf ranking model to end customers through a chatbot. Also integrated diverse use-cases like smalltalk, open-domain question answering, gibberish detector, and custom intent detection engine
  - Worked on language-agnostic spell-correct microservice achieving average search complexity of O(1), at the cost of pre-calculation time and storage space of n deletions
- **Noodle.ai** Bangalore, India
  Associate AI Engineer *Jul 2017 - Sep 2018*
  - Built and orchestrated demand forecasting ecosystem for real-time consumption (using R). Wrote DAGs using airflow as the workflow schedule system to run batch jobs
  - Worked on scaling compute by employing SPMD on N cores using parallel backends like doSnow, doParallel in R
  - Developed an incremental learning framework using the global-local ensemble model, where global serves as a long term model and local serves as a short term model
  - Worked on a proprietary ensemble modeling technique consisting of multiple models such as arima, xgboost, croston, prophet to capture the heterogeneity of various time-series

  Software Engineer Intern *Jan 2017 - Jun 2017*
  - Developed an in-house EDA tool which automatically munges data to plot the features, performs statistical tests, and summarize the result
  - Built automated training and prediction backend batch jobs

Research Experience

- **National Institute of Rural Development** *Aug 2016 - Nov 2016*
  Research Intern (Remote)
  Non-invasive blood screening of hemoglobin using smartphone camera (supervisor: Dr. N V Madhuri)
  - Performed chromatic analysis of blood using a smartphone camera and LED light by measuring absorption properties at various wavelengths, using Beer-Lambert's law
  - Extracted peak and trough intensity of each pulse and a combination of high-pass filter and fast-fourier transform is applied on the waveform to obtain RGB time-series
  - Conducted extensive user-study of 320 participants and deployed app across 60 health camps in rural parts of India
- **Center for Cloud Computing and Big Data** *Jan 2016 - May 2016*
  Research Associate
  Standardization of docker events for auditing in OpenStack environment (supervisor: Dr. Dinkar Sitaram)
  - Extended cloud audit data federation (CADF) specification to support docker and contributed to pyCADF, open-source python implementation of the auditing model
  - Redesigned the audit filter in docker engine to read necessary parameters from docker API, convert it to CADF format, serialize it to JSON and push onto configured datastore (MongoDB, MySQL)
  - Extended docker auditing to detect intrusions and threats at packet, memory, and container level
- **Indian Institute of Technology, Bombay** *May 2015 - Jul 2015*
  Summer Intern
  An e-commerce platform to empower agricultural market in rural India (supervisor: Prof. Ganesh Ramakrishnan)
  - Developed a B2C, cross-platform 'Lokacart' client app that enables farmers to connect with consumers directly
  - Built analytics dashboards to track and monitor user interactions on both client and admin applications

Relevant Coursework

- **Systems**: Operating Systems, Database Management Systems, Computer Networks, Microprocessors, Computer Organization and Architecture, Unix System Programming, Compiler Design, Systems Modeling and Simulation
- **Algorithms**: Analysis and Design of Algorithms, Data Structures, Advanced Algorithms
- **ML**: Applied Machine Learning, Natural Language Processing

Skills

- **Languages**: Python, Scala, R programming, Golang
- **Datastores**: Redis, PostgreSQL, DynamoDB, Kafka (as a data-store)
- **Frameworks**: Spark, Tensorflow, Airflow, Apache Flink

Open Source Projects

- **Variational Recurrent Autoencoder**: Unsupervised, feature-based time-series clustering algorithm in pytorch
- **Troop**: A simple library to perform chunkwise processing on data.frame across multiple cores of a single machine using SNOW clusters with a low memory footprint

Awards and Accomplishments

- Twice Most Valuable Professional (MVP) Award at Swiggy, 2020
- The Red Shift Award - Fastest learner at Noodle.ai, 2018
- Outstanding Intern of the Year Award at Noodle.ai, 2017
- Distinction Award at PESIT, semester-wise cash prizes for excellent academic performance
- **3rd place**, Citi Mobile Challenge - APAC, 2015
- Chief Minister's Scholarship, **Top 1%** candidates in Board of Intermediate Education (12th grade), 2013