SATYADEV NTV

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SUMMARY

I am the Technical Lead (Machine Learning) at Teachmint, working on applications of LLMs for Information Retrieval in the K12 domain. I am also a Machine Learning Researcher working in the areas of Optimization, Domain Adaptation, Deep Learning. Prior to this, I worked (4+ years) on design and development of large scale IoT solutions.

EDUCATION

Indian Institute of Technology, Guwahati   2012 - 2016
Bachelor of Technology in Electronics and Electrical Engineering
B.Tech Project: Discrete Cosine Transform using Redundant arithmetic
Advisor: Dr. Shaik Rafi Ahmed.

PUBLICATIONS / CONTRIBUTIONS

- B. Mishra, **N T V Satya Dev**, H. Kasai, and P. Jawanpuria. *Manifold optimization for optimal transport*, arXiv preprint arXiv:2103.00902, 2021.
- P. Jawanpuria, **N T V Satya Dev**, B. Mishra. *Efficient optimal transport using feature correlations*, IEEE CDC 2021.
- P. Jawanpuria, **N T V Satya Dev**, B. Mishra. *Efficient robust optimal transport: formulations and algorithms*, OPT @ NeurIPS 2020.
- P. Jawanpuria, **N T V Satya Dev**, A. Kunchukuttan, and B. Mishra. *Learning Geometric Word Meta-Embeddings*. RepL4NLP @ ACL 2020.
- Contributed *RASA* and *Doubly Stochastic* manifold factory to McTorch.
- Contributed *GeoIMC* algorithm to Microsoft's Recommenders repo.

EXPERIENCE

Teachmint Technologies Pvt.Ltd

Technical Lead (ML)   Jun 2022 - Present
- Developing a system for the K12 domain that retrieves content such as lectures, study materials, practice exercises personalized to user's requirement/progress in an academic year.
- **ML**: Developed a content retrieval system that achieves an F1-score of 0.8 (against the in-house labeled gold dataset) using a neural retriever based on transformer. This includes challenges such as, transcribing lectures, deduplication of contextually similar content.
- **MLOps**: Developed a training & evaluation framework based on PyTorch and huggingface transformers. MLFlow is integrated as a first-class feature for model tracking. Developed a distributed ETL and inference pipeline to operate on data at the scale of TBs.

Vayve Technologies Pvt.Ltd

Machine Learning Research Engineer   Sept 2019 - May 2022
In addition to my research, I worked on developing an end-end solution for
autonomous driving.   Sept - Nov 2021
- Developed a computer vision driven perception module based on PyTorch with primary focus on configurability and extensibility of DNN in terms of per-block feature selection from backbone network, addition of task specific heads etc.
- Developed a Path Planning & Control module in Python and C++ (Pybind11) that provides stage wise insights of the planner, which can be integrated to tensorboard or other monitoring tools.
- Used Robot Operating System (ROS) for in-vehicle sensors communication. Developed the sensor interfaces to simulate variety of behaviours like non-synchronized data, communication lag at read & write pipelines.
- Used CARLA (driving simulator) as our virtual test environment. Developed tools that interface with CARLA in generating training data with automatic labeling.
- Evaluated the solution on Lane hugging & Lane switching across CARLA environments (eg: towns, weather).

Project Manager   March - Aug 2020
Vehicle Tracking system: Designed and developed a generic IoT solution, with a PoC on vehicle tracking system. Used Kafka as the broker and PostgreSQL as the event store. Developed features such as, alerts based on geofence, SOS, live monitoring of device etc. Worked on high precision GPS (via RTKLIB) and path compression algorithms for GPS data.

Lead Software Engineer   Sept 2016 - Feb 2020
- Designed and developed an end-end IoT solution for *BARC* (Broadcast and Research Council of India) that facilitates real-time collection & processing of TV viewership information across India. Developed the solution to be scalable upto a 1,000,000 of these IoT nodes.

References available on request.

- **Operating system**: Developed an embedded OS based on *gentoo* (a linux distro) for the IoT nodes and designed it to be extensible via OTA updates. Built several software modules to interface with hardware such as, GSM modem, Power controller, LED displays etc. Developed a reliable testing pipeline using *raspbian* to facilitate manufacturing, configuring and servicing of these IoT devices.
- **Cloud Services**: Developed an efficient and fault-tolerant cloud (device ↔ worker) communication system for real-time event collection into PostgreSQL-DB. Implemented a broker-less system by customizing NATS to achieve this. Built a software module using *SSH* protocol to debug any IoT device (Which is generally under the NAT of service provider) in the field.
- **DB and Client Dashboard Services**: Designed and developed schemas, tables and DB functions to assist challenges such as asset management, generating aggregates over the event store, live monitoring of devices etc.
  - Built a software module to derive and track location of these IoT devices using cell tower triangulation, and outlier detection via K-Means algorithm.
  - Developed a distributed processing module in *Python* using *DASK* for generating TV audience measurement reports over events in the scale of $\approx 5000 \times$ # nodes.
- **Ops**: Developed a tool to automate the deployment lifecycle of the entire system. Various features such as cluster/machine management, DB backup & restore, certificate generation, server monitoring & alerts etc were embedded as first class features in this tool.
- Received a certificate of appreciation from *BARC* for the developed system.

Software Engineer, Service Lee Technologies Pvt.Ltd   June-Aug 2016
Analytics Dashboard: Designed and developed a pipelined infrastructure in MongoDB and MySQL to generate real-time metrics such as number of registered consumers, live users, requests placed etc. Created auto-refreshing Graphing Web-UI in *RiotJS* and APIs in *NodeJS* to serve these metrics.

MISCELLA-NEOUS	**Consultant, SSV.network** Nov 2021 - Jan 2022

Consultant, SSV.network   Nov 2021 - Jan 2022
Worked on designing API & DB spec for SSV.network's explorer. In addition to the Ethereum 2.0 protocol insights, information such as iBFT consensus' rounds, ethereum client's performance, aggregated validator's & operator's performance are included as part of this explorer.

ACADEMIC PROJECTS

B.Tech project   Jul 2015-May 2016
Advisor: Dr. Shaik Rafi Ahmed
Developed an efficient Discrete Cosine Transform algorithm using redundant arthmetic on FPGA architecture. Xilinx was used for testing the efficiency, latency and design parameters.

Braille Printer   Sept-Dec 2015
Advisor: Dr. Suresh Sundaram
A Visual Guiding System for blind people that can convert text in an image to machine readable data and print them in Braille. Maximum Correlation of data is used as OCR technique, and is interfaced with Arduino to signal the motors and print the corresponding Braille pattern.

SCHOLASTIC ACHIEVEMENTS
- Secured All India Rank 1907 (99.602%) in IIT-JEE 2012.
- Secured 3rd position in district level for Ramanujan Mathematics Olympiad (RMO) that included all the competitive schools in Andhra Pradesh.
- Among the top 300 that qualified for Indian National Astronomy Olympiad (INAO) in the year 2008-2009.

TECHNICAL SKILLS
- **Programming languages**: C, C++, GoLang, Bash, Python, plpgsql, 8085 Assembly Language
- **Databases**: PostgreSQL, SQLite, MySQL, MongoDB
- **Software Packages:** MULTISIM
- **Operating Systems**: Linux, Windows
- **Versioning tools**: Git
- **Web Frameworks**: Django, Flask.
- **ML Frameworks**: PyTorch, McTorch, Pymanopt, Tensorflow, Keras.

POSITIONS OF RESPONSIBILITY

Transportation Head, Alcheringa   Mar 2014 - Mar 2015
Was a part of PR and branding Team of the cultural fest. Managed the budget for overall transportation facilities. Planned and executed transportation for the artists, judges, participants and the Guwahati crowd by leading a team of 30 members.

References available on request.