SATYADEV NTV

Email:tvsatyadev@gmail.com Github:SatyadevNtv

SUMMARY I am 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

Vayve Technologies Pvt.Ltd

Machine Learning Researcher/Engineer Sept 2019- Present
In addition to the above 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. Designed the module 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. Integrated tensorboard into the module with additional features such as, training sample or per-epoch (random sample) ground-truth vs prediction comparisons.
- Developed a Path Planning & Control module in Python and C++ (Pybind11). Designed an interface 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.
- **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 $\leftrightarrow$ 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

References available on request.

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.

Developer Intern, Groctech Solutions Pvt.Ltd May-June 2015
Introduced an option for Sharing item carts among the users. Architected the system to support synchronization of offline changes, support for multiple device usage etc. to improve UX.

Miscellaneous

Consultant, Open.SSV Nov 2021 - Jan 2022
Worked on designing API & DB spec for Open.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.