Prathyush S.P

AI Engineer, Journeyman Fellow at U.S. Army CCDC Army Research Laboratory

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PROFESSIONAL SUMMARY

- Experienced AI Engineer (6+ years) with a mentoring background.
- Skilled at building scalable end-to-end AI pipelines, starting from pure research to MVP to scalable production-ready deployments.
- Research areas of interest are AI Safety and Explainability, Solutions to enhance AI Consumerism augmenting Human Intelligence.
- Pioneered time step specific interpolation to explain deep time series classifiers, Innovated HMI model to actively derive explanations from CNN, Designed state-of-the-art distributed DL and RL modeling libraries, and Context-Aware Shared Agile Platform.

EXPERIENCE

U.S. Army CCDC Army Research Laboratory, Massachusetts — Journeyman Fellow

AUGUST 2020 - Present | 7 Months

- Transform ARL's vision into actionable short-term objectives and facilitate the necessary infrastructure required for the projects.
- Trained and supervised a 20-member team handling applied machine learning research projects on Adhesives, Corrosion, STABAS, and Cold Spray.
- Architect of Context-Aware Shared Agile Platform aimed at smart material discovery with Human-in-the-loop based active learning.

DAISY Lab WPI, Massachusetts — Research Assistant

FEBRUARY 2020 - Present | 1 Year

- Lead researcher of XAI group at WPI
- Pioneered PERT, a learnable time step-specific interpolator to explain deep time series classifiers. The devised algorithm significantly outperforms 6 state-of-the-art methods on 9 real-world datasets by 53%

CHLST Lab WPI, Massachusetts — Research Assistant

JUNE 2020 - AUGUST 2020 | 3 Months

- Architect of Real-Time software system and enabled support for high-frequency image sampling for Ultrasound applications.
- Designed complex pipelines involving object localization, particle tracking, and experiment automation.

Razorthink Technologies, Bengaluru — AI Engineer

JULY 2015 - JULY 2019 | 4 Years

- Mentored and scaled the team for developing Deeplearning Infrastructure for the Razorthink AI Platform.
- Developed state-of-the-art modeling library (model-design, training, inference, and deployment), scalable data pipelines, blueprint architecture and transfer learning.
- Developed "Human Machine Interoperable", a multi-model design to derive explanations from a DCNN on time series data.

CORE COMPETENCE

- Astute and Polymathic - Problem Identification and Solution Architect
- Swift Prototyping – Rapid development from idea to prototype
- Design and Architect AI Systems, End-to-End Pipelines and Python Libraries
- Full Stack Technical Literacy

SKILL SET

- Python, Javascript, Java, and Bash Scripting - Languages.
- Predictive Modelling, NLP, Computer Vision, Gradient Optimisations, Decision trees, Convolution Nets, Recurrent Nets (LSTM & GRU), Reinforcement Learning - Deeplearning
- TensorFlow, PyTorch, Keras, Flask, OpenCV, JQuery, Pandas, Numpy, Sklearn, PySpark - Frameworks
- Mysql, MongoDB, Neo4J - Databases
- Hadoop, Spark, Kafka- Big Data
- Web Stack, React - UI/UX
- Docker, Jenkins, Kubernetes - Continuous Integration.
- Jira,Jira, Confluence - Product Management.

OPEN SOURCE CONTRIBUTIONS

(https://github.com/kingspp)

- Tensorflow Contrib Analyser[1]
- PyDSP
- Tensorflow Playground
- PMark
- Python Module Boilerplate
- Android TCP IP Socket
- Device to Device Communication
- DocuMat - DCompiler[2]
- RPi AUI

[1] The project was praised by *Martin Wicke* - software engineer at tensorflow and *Edd Wilder-James* - An open Source Strategist, Machine Learning at Google brain team which aided their api designs in tensorflow.

[2] A non-profit educational institution where I work as a software consultant on a need-basis (2011 to present).

- Efficiently scaled CRNN's using transfer learning, data augmentation, and data parallelism to train on nearly 9 million images and achieved over 97% accuracy in recognizing alphanumeric words.
- Lead a team of young professionals to design, develop and deploy a DL model to predict customer churn by analyzing cross-sectional and historical transactional data and achieved a GINI score of 68 when trained on a skewed transactional dataset
- Devised a multi-stage DL model for multidimensional time-series data along with achieving over a GINI of 72 in predicting customer propensity to buy insurance in the financial sector.
- Developed an algorithm using KLD for auto-naming derived segments and optimized architecture by model funnel methodology for targeted campaigning in the telecom sector.
- Designed High performance, streaming, and flexible and lazily evaluated data pipelines for training and evaluation of DNNs using tensorflow dataset API.
- Designed a state-of-the-art Reinforcement learning library with support for shared state, memory, action spaces in a distributed environment.

EDUCATION

Worcester Polytechnic Institute, Massachusetts — *Master of Science in Data Science*, GPA 4.0

AUGUST 2019 - AUGUST 2021 (Intended Graduation)

- Concentration - Explainable AI, MS Thesis track
- Relevant Coursework - Reinforcement Learning, Big Data Analytics, AutoML, and Deeplearning.

Maharaja Institute of Technology, Mysuru — *Bachelor of Engineering in Electronics and Communication, VTU,* Distinction

AUGUST 2011 - JULY 2015 | 4 Years

- Concentration - Real-time digital signal sampling (PiScope)
- Relevant Coursework - 8051/8086 Microprocessor programming, logic design, and Digital Signal Processing.

PUBLICATIONS

SP. Prathyush, D. Ramesh, T. Hartvigsen, E. Rundenstiner, Learning Saliency Maps to Explain Deep Time Series Classifiers, SIGKDD2021*

Identify the need for attribution-based explanations for deep neural network-based time series classifiers. Design of PERT, a method that learns to highlight the timesteps that are most responsible for the classifier's prediction

SP. Prathyush, S. Narasimhamurty, Differentiable Learning by means of Neural Network Pruning, CoRR2021*

A probabilistic system to find optimal solutions for *"What to feed"* and *"When to stop"* queries in the deeplearning domain. Devised an algorithm for Information transfer and achieved a 25% reduced loss in less than 50% of the epochs using the "Dynamic Short Circuit" model compared to Simple FFN on MNIST Dataset.

SEMINARS PRESENTED

- The advent of Deeplearning, SGD, and Predictive Modelling - Axis Bank, Mumbai
- Efficient utilization of hardware resources by exploiting Model and Data Parallelism Architectures – Razorthink Technologies, Bengaluru
- Meta-learning and scalable efficient multi-task learning - Razorthink Technologies, Bengaluru
- Boltzmann Machines – Razorthink Technologies, Bengaluru
- Model agnostic explanations using LIME and Grad-CAM – Razorthink Technologies, Bengaluru

POSTER PRESENTATIONS

- Curious Agent – DS595, WPI, Worcester
- Android – Tech Utkarsh by MIT, Mysuru
- Memristors – Impulse, by IEEE VVCE, Mysuru
- PyDSP – PyShop, IEEE SJCE, Mysuru

AWARDS

Best DQN-Agent – WPI, Massachusetts

Young Dynamite – Razorthink Technologies, Bengaluru

Microsoft Yappon Event Awardee – MIT, Mysuru

White Monkoon Awardee – AMS, Mysuru

EXTRACURRICULAR

- Active volunteering for NGO's - Isha Foundation, Let's Do It Mysore, Siddaganga Mutt
- Participated and Organized Marathons as a part of the college cultural fest
- Kickboxing and Indian Classical Instruments - Tabla and Mridangam
- Design and build top-tier computer systems.
- Passionate traveler and nature/wildlife photographer (https://www.flickr.com/kingspp)

ADDITIONAL PROJECTS

- ResultGenie, PiScope - PRODUCTS
- RSI using Sentiment Analysis - AI SOLUTIONS

* - In submission. References upon request | Appendix - https://kingspp.github.io/cv