SHREESHA N MURTHY

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EDUCATION

Master of Science in Data Science |August 2019 – May 2021, Worcester Polytechnic Institute (GPA: 4.0)
Bachelor of Engineering in Computer Science |May 2011 – May 2015, VT University (GPA: 3.6)

RELEVANT COURSEWORK

Machine Learning, Deep Learning, Reinforcement Learning, Statistics, Big Data Analytics, Data Structures

WORK EXPERIENCE

Junior Software Engineer – Razorthink Technologies, India | July 2015 – Dec 2015
Artificial Intelligence Engineer – Razorthink Technologies, India | Jan 2016 – July 2019
Graduate Research Assistant – Worcester Polytechnic Institute, MA, USA | Jan 2020 – Till date

SKILLS

- **Languages**: Java, Python, C++, HTML, Javascript, Scala, R
- **Frameworks and Libraries**: TensorFlow, Pytorch, spaCy, Gensim, NLTK, OpenCV, Opensmile, Kaldi, Flask
- **Big data**: Hadoop, Spark, Tensorflow PS architecture, Horovod(distributed deep learning), Kafka
- **Databases**: MySQL(proficient), MongoDB(intermediate), Cassandra (basic)

PUBLICATIONS

S. N. Murthy, F. Asani, S. Srikanthan, E. Agu, *DeepSEAS: Smartphone-based Early Ailment Sensing using Coupled LSTM Autoencoders*, IEEE BigData 2020 (Accepted)

RESEARCH PROJECTS

- ***P. S Parvatharaju, S. Murthy, Differential Learning using Neural Network Pruning* (Deep Learning), *arXiv 2021*[1]**
  - Devised on a novel technique to prune nodes of an FFN* using weighted learnable short circuit connections, which are pruned off of the network based on a threshold.
  - The goal was to retain only crucial connections in the network.
  - Gained 85% accuracy on Fashion-MNIST in 1400 training iterations compared to 7000 training iterations using a plain FFN*.
- **Curiosity based exploration – DQN Agent(Reinforcement Learning)**
  - Identified a crucial issue while training a Deep-Q-network where an agent reaches a local minimum and loses motivation to train further due to the environment's sparse reward system.
  - Leveraged the curiosity concept to improve training by introducing an intrinsic reward system that generates rewards based on novelty in the scene.
  - Agent finished playing the game in 40% lesser time compared to plain Q-learning.

PROFESSIONAL PROJECTS

- **Explainable AI (Deep Learning) - Designed a novel method to explain the predictions of an FFN***
  - Trained an FFN with an extra layer right before the first layer and the input layer, The extra layer connects with the first layer in a 1-to-1 fashion (instead of a full connection).
  - Used Gradient Descent and Back Propagation to update weights of this extra layer.
  - Combined the trained weights with raw customer data to report explanations for the prediction.
  - Lessened the operations costs and cut man-hours of our client, a major Banking firm by 80%.
- **End to End Trainable OCR (Deep Learning)** – **Computer Vision**
  - Headed a team that developed an end-to-end trainable OCR.
  - Trained a Convolutional LSTM on a multi GPU distributed pipeline(Data parallelism).
  - The dataset contained 50 types of font - 10 million word images. Prediction across 104 unique characters. Saved $10k annually for our Banking client. Accuracy-81%.
  - Technologies used: Python|Tensorflow|GCP|Flask|spaCy.
- **Conversational AI (Deep Learning) – Natural Language Processing**
  - Implemented a chatbot for end-users to query their relational database in English.
  - The chatbot converts questions that are in English into MySQL syntax and queries the database.
  - Finetuned word2vec models to tweak and personalize the results for domain-specific needs, saving $25k annually for a fortune 500 financial services company

* FFN – Feed forward Neural Network | 1 – Publishing to arXiv in 2021 for moderator comments.