AVINASH MADASU

avinashmadasu17@gmail.com ⋄ https://github.com/avinashsai
https://www.linkedin.com/in/avinash-madasu-623b1a12a/

EDUCATION

Master of Science, Computer Science   August 2021 - May 2023
University of North Carolina Chapel at Hill   CGPA: -/4.0

Bachelor of Technology, Computer Science   July 2014 - May 2018
National Institute of Technology Tiruchirappalli   CGPA: 7.73 /10

PEER REVIEWED PUBLICATIONS

- Sequential Domain Adaptation through Elastic Weight Consolidation for Sentiment Analysis
  Avinash Madasu and Vijjini Anvesh Rao
  ICPR 2020

- A Position Aware Decay Weighted Network for Aspect based Sentiment Analysis
  Avinash Madasu and Vijjini Anvesh Rao
  NLDB 2020

- Sequential Learning of Convolutional Features for Effective Text Classification
  Avinash Madasu and Vijjini Anvesh Rao
  EMNLP 2019

- Efficient Feature Selection techniques for Sentiment Analysis
  Avinash Madasu and Sivasankar E
  Multimedia Tools and Applications Journal 2019

- Effectiveness of Self Normalizing Neural Networks for Text Classification
  Avinash Madasu and Vijjini Anvesh Rao
  CICLing 2019

- Gated Convolutional Neural Networks for Domain Adaptation
  Avinash Madasu and Vijjini Anvesh Rao
  NLDB 2019

- A Study of Feature Extraction techniques for Sentiment Analysis
  Avinash Madasu and Sivasankar E
  IEMIS 2018

MANUSCRIPTS SUBMITTED (UNDER REVIEW)

- A Unified Framework for Slot based Response Generation in a Multimodal Dialogue System
  Avinash Madasu*, Mauajama Firdaus* and Asif Ekbal
  ACM TOMM Journal

- A Syntax Aware BERT Based Approach for Identifying Well-Formed Queries in a Curriculum Framework
  Avinash Madasu, Vijjini Anvesh Rao and Javaid Nabi

- A Unified Framework for Emotion Identification and Generation in Dialogues.
  Avinash Madasu*, Mauajama Firdaus* and Asif Ekbal

- Two-in-One: A Joint Training mechanism for Intent Detection and Response Generation in a Multimodal Dialogue System
  Avinash Madasu*, Mauajama Firdaus*, Asif Ekbal and Pushpak Bhattacharyya

EXPERIENCE

UNC Chapel Hill   **August 2021 - Present**
Graduate Research Assistant   Advisor: Prof. Shashank Srivastava

- Working on the problem statement "learning from explanations as substitute for labels" in fine-tuning pre-trained language models.
- Worked on exploring inductive biases in pre-trained language models such as BERT, DeBERTa for solving non-linguistic tasks in a few-shot setting. This work will be submitted to ACL rolling review and subsequently to ACL.

UNC Chapel Hill   **August 2021 - Present**
Project Work   Advisor: Prof. Gedas Bertasius

- Working on the research problem "interactive video retrieval using dialog" on audio visual scene aware dataset.
- Experimenting with pre-trained video and dialog models to improve the performance of video retrieval by leveraging dialog with the users.

Samsung R&D Institute India - Bangalore   **June 2018 - July 2021**
Senior Software Engineer on Bixby NLU

- Successfully developed and deployed Named Entity Recognition models to identify user sensitive information like phone number, name, bank details etc. These details will be anonymized to the developers of Bixby.
- Successfully built a model which identifies utterance executed in a wrong application. This model is built with Triplet Loss and with a very less data of 150 samples for each application.
- Successfully built a Neural Network model which identifies queries that are not well formed in Samsung TV. These identified queries are corrected which enhances the performance of search engine and user experience. A paper is currently under review in Multimedia Tools and Applications Journal regarding this work.
- Worked on Federated Learning approaches to bring Bixby User Analytics to On-Device. Explored Federated Learning to suggest user specific analysis on the device while preserving user privacy.

IIT Patna   **July 2020 - January 2021**
Research Assistant   Advisor: Prof. Asif Eqbal

- Worked with Prof Dr.Asif Eqbal on multi-modal dialogue systems involving text and image.
- Proposed an End-to-End model capable of identifying slots from user utterances without external slot labels. A paper is under review in the journal TOMM regarding this work.
- Proposed a multi-task framework capable of identifying intents and uses these representations for better generation. Intent and generation sub-networks were trained jointly.

National Institute of Technology, Tiruchirappalli   **July 2017 - May 2018**
Research Assistant   Advisor: Prof. Sivasankar

- Worked with Prof Dr.Sivasankar on low resource sentiment analysis and hybrid recommender systems.
- Designed efficient lexicon based feature selection techniques that achieved excellent performance in resource scarce conditions.
- Explored the possibility of combining text reviews with numerical ratings to design a hybrid recommender system.

Intel Corporation   **July 2017 - May 2018**

Machine Learning Student Ambassador

- Selected as a student ambassador of machine learning for the college in the final Under Graduate year.
- Nervana cloud resources were offered by the company Intel for carrying out machine learning research

Samsung R&D Institute India - Bangalore   **May 2017 - July 2017**

Internship

- Developed a crucial module for testing communication among smart home devices.
- Module helped in finding crucial communication failures among smart home devices.

VOLUNTEER EXPERIENCE

Reviewer: ACL 2021, SocialNLP 2021, ICON 2021, EMNLP 2020.

PROJECTS (AVAILABLE IN GITHUB)

BERT-Aspect

- Fine-tuned BERT Base Uncased model on SemEval 2014 datasets Laptop and Restaurant for Aspect Based Sentiment Analysis.
- Hidden representations are taken from CLS token in each of the 12 hidden layers. These representations are trained using LSTM.
- Achieved near State-of-the-art results of 84% on Restaurant and 77% on Laptop (Metric:Accuracy).

Adaptive Methods for Nonconvex Optimization

- Successfully reproduced the results of the paper "Adaptive Methods for Nonconvex Optimization".
- Implemented Yogi optimizer as proposed in the paper. This implementation is included in the open source project "pytorch-optimizer".

Highway Networks

- Implemented a Highway Network for performing Image Classification on CIFAR-10 dataset.Achieved an accuracy of 70.35% with a simple 3 layer Highway Network.
- Experimentally verified that Highway layers improves the performance of neural networks compared to networks without Highway layers.

All you need to know about Normalization

- Studied the effects of using different Normalization techniques like Batch Normalization, Layer Normalization and RMS Normalization on CNN for Image Classification.
- Evaluated pros and cons of each of the Normalization techniques and their dynamics while training CNN.

Multi Domain Sentiment Classification

- Trained a Multi Task Learning model for performing Multi Domain Sentiment Classification.
- Domain Classification is trained simultaneously with sentiment classfication to enhance performance.

Attention CNN for Sentence Classification

- Implemented a Convolutional Neural Network with attention for performing Sentence Classification.
- Achieved State-of-the-art result 96.48% (accuracy) on TREC Question Classification Dataset.

Recurrent-Neural-Filters

- Implemented a class of Convolutional Neural Networks that utilize LSTM networks as convolutional filters
- Achieved a competitive accuracy of 88% on SST-2 dataset.

Gated CNN for Aspect Based Sentiment Analysis

- Designed a CNN for Aspect Based Sentiment Analysis based on Gating mechanism. Gated layers effectively incorporate aspect information into the sentence.
- This model achieved an accuracy of 79% on SemEval 2014 dataset.

Focal Loss Based Classification

- Explored the advantages of using Focal Loss for Imbalanced datasets like MNIST.
- Experimentally verified that focal loss helps in stable training of neural networks on imbalanced datasets compared to cross-entropy loss.

Flower Classification

- Fine-tuned several pretrained models such as DenseNet, ResNet, VGG for performing image classification on 102 class Flowers dataset. Extensive finetuning resulted in 92% accuracy on the dataset.

Text Classification

- Implemented a recurrent convolutional architecture for performing text classification. Model achieved 90% accuracy on IMDB dataset.

PROGRAMMING SKILLS

Languages: python, c++, c, Javascript, NodeJS.
Deep Learning Frameworks: PyTorch, Tensorflow, MxNet, Gluon, Keras

OPEN SOURCE DEEP LEARNING FRAMEWORKS CONTRIBUTIONS

- gluonnlp (Contributor and Member of Distributed Machine Learning Community- dmlc).

- pytorch-optimizer.

- catalyst

- AllenNLP

- PyTorch

- PyTorchLightning

AWARDS

Samsung Citizen Award 2019, 2020 (Research) - awarded quarterly to 4 employees for excellent contributions in research.

RELEVANT LINKS

- Google Scholar: `https://scholar.google.com/citations?user=YRe0ruYAAAAJ&hl=en`

- DBLP: `https://dblp.org/pid/241/5153.html`

- Semantic Scholar: `https://www.semanticscholar.org/author/Avinash-Madasu/115098946`

- ORCID iD: `https://orcid.org/0000-0002-3802-7618`