MEGHANA HOLLA

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RESEARCH INTERESTS

Current Focus: Commonsense knowledge applied to *Natural Language Processing* and *Computer Vision* tasks
Areas of Interest: Natural Language/Multimodal Understanding, Commonsense Inference

EDUCATION

Virginia Tech — **Blacksburg, VA**
Master of Science, Computer Science — *Aug 2021 – May 2023 (Expected)*

PES University — **Bangalore, India**
Bachelor of Technology, Computer Science & Engineering (Specialization: Data Science) — *Aug 2016 – Jul 2020*

AWARDS AND HONORS

- Grace Hopper Celebration (GHC) 2022 Student Scholarship recipient — *June 2022*
- Full tuition scholarship from the Department of Computer Science, Virginia Tech — *August 2021*
- Prof. CNR Rao Merit Scholarship awarded to top 15% performers by PES University: 6x recipient — *April 2017 - December 2019*

PUBLICATIONS

[1] **Meghana Holla** and Ismini Lourentzou,"Commonsense priors for Zero-Shot Language Video Grounding"-*In Preparation, 2022*

[2] **Meghana Holla**, Das, B., "Detection of Emphasis Words in Short Texts – A Context Aware Label Distribution Learning Approach", Advanced Informatics for Computing Research (ICAICR), 2020 Springer, Singapore [link]

[3] M. Vijay*, **Meghana***, N. Aklecha* and R. Srinath, "Dialog Driven Face Construction using GANs", 2020 IEEE 32nd International Conference on Tools with Artificial Intelligence (ICTAI), 2020 [link]

[4] **Meghana Holla***, N. Aklecha*, O. Dsouza* and B. Das,"Polarity Estimation in a Signed Social Graph Using Graph Features" 2020 IEEE International Students' Conference on Electrical, Electronics & Computer Science [link]

[5] Vinay A*, Nishant Aklecha*, **Meghana***, K.N. Balasubramanya Murthy, S Natarajan. On Detectors and Descriptors based Techniques for Face Recognition, Procedia Computer Science, Volume 132, 2018 [link]

RESEARCH EXPERIENCE

PLAN (Perception + LANguage) Lab, Virginia Tech — **Blacksburg, VA**
Graduate Researcher (Advisor: Dr. Ismini Lourentzou) — *Sept 2021 – present*

- Investigating neuro-symbolic methods for language video grounding in raw videos; Manuscript [1] in preparation.
- Devising semantically grounded masking strategies for pretraining multimodal Transformers.

Center for Pattern Recognition and Machine Intelligence, PES University — **Bangalore, India**
Undergraduate Research Assistant (Advisor: Dr. Subramanyam Natarajan) — *Aug 2017 – Dec 2019*

- Proposed facial recognition methods that leverage key-point detectors, feature aggregation and ML; Resulted in published work [5].

TEACHING EXPERIENCE

Virginia Tech Department of Computer Science
Graduate Teaching Assistant, Virginia Tech
Intro to Software Design (Class size: 404) — *Spring 2022*
Computer Organization (Class size: 460, 366) — *Fall 2021, Fall 2022*

ACADEMIC SERVICE

Reviewer: EMNLP 2022, EMNLP 2022 Industry Track — *July 2022*

PROFESSIONAL EXPERIENCE

Bloomberg LP **New York, NY**
Machine Learning Intern *May 2023 – Aug 2023*

- Investigated neural methods for entity extraction on financial documents with focus on low deployment cost.
- Implemented DistilRoBERTa and BiLSTM, with DistilRoBERTa resulting in 20 points increase in F1 Score.
- Built plugin for off-the-shelf in-house ML development usage of the implemented neural entity models.

Morgan Stanley **Bangalore, India**
Technology Associate – Search and Analytics *Aug 2020 – Aug 2021*

- Architected a real-time trade reconciliation system handling 100,000 updates/day using Kafka, KSQL and Java.
- Programmed Python frameworks for Solr document parsing and real-time indexing using SolrAPI.
- Accomplished 50% reduction in search times for applicable cases by optimizing query pipelines using SolrJ.

Technology Analyst Intern *Jan 2020 – Jul 2020*

- Designed and developed a dashboard for aggregating data from systems involved in stages of a trade lifecycle.
- Built a self-service utility in Python for ad-hoc production requests - reduced wait from 3 hours to 5 minutes.

Summer Intern *May 2019 – Jul 2020*

- Refactored the in-house risk visualizer into a plug-and-play, highly configurable framework using Java & Angular.

MapMyIndia (CE Info Systems Ltd.) **Bangalore, India**
Machine Learning Intern *July 2018*

- Researched and evaluated Convolution Neural Network (CNN) variants for semantic segmentation, for localizing important street footage Eg: Frames containing objects such as roads, trees, and automobiles (using TensorFlow).
- Achieved over 92% Jaccard Index score on test data with a Dilation10 architecture.

SKILLS

Languages: Proficient: Python, C, Java | Familiar: R, JavaScript, MATLAB

Machine Learning: PyTorch, Keras, scikit-learn, NLTK, Spacy, OpenCV

Software Dev: Kafka, KSQL, Apache Solr, Angular, HTML/CSS, Lucidworks Fusion, Docker, Git, AWS

SELECTED PROJECTS

Dialog-driven Human Face Generation using GANs [Publication [3]] *(PES University, 2020)*

- Developed a "generate and edit" deep learning approach for face generation guided by Natural language (NL) feedback.
- Trained a cascade of two conditional Generative Adversarial Networks (GANs) that are conditioned on natural language descriptions extracted from a speech2text model, followed by a natural language parser.
- Achieved 73% mean maximum relevance score when tested on a retrieval task.

Emphasis Detection in Short Texts [Publication [2]] *(Personal, 2020)*

- Proposed novel deep learning approach for identifying segments of text that need emphasis.
- Accomplished performance boost of 10% over the state-of-the-art by training bi-directional LSTMs & employing Label Distribution Learning (LDL) paired with word and sentence level embeddings.

Trip Duration Prediction and Analysis in Bike Sharing Systems [Project Report] [Code] *(Virginia Tech, 2021)*

- Designed and developed change-agnostic algorithm for trip duration prediction that employs novel coarse-grained station encoding based on station location and purpose and analyzed necessity of drop-off station in trip prediction task.
- Achieved a 9.75% increase in Adjusted R-squared metric over traditional models that use fine-grained station information and a 300% increase with drop-off station's coarse-grained representation included in feature set.