Siddhartha Mishra

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Education

University of Massachusetts Amherst **MA, US**
MS in Computer Science, 4.0/4.0 GPA *Jan 2021 - Present*
Courses: Advanced Natural Language Processing, Reinforcement Learning, Machine Learning, Distributed Systems

Indian Institute of Technology **Hyderabad, India**
B.Tech. in Computer Science and Engineering, 8.78/10 GPA *Aug 2015 - May 2019*
Courses: Deep Learning, Bayesian Data Analysis, Theory of Learning and Kernel Methods, Data Mining, Information Retrieval

Publications

Word2Box: Capturing Set-Theoretic Semantics of Words using Box Embeddings **[PrePrint]**
*Shib Dasgupta, **Siddhartha Mishra**, Michael Boratko, Dhruvesh Patel, Andrew McCallum* ***In Sub. ACL 2022***

An Evaluative Measure of Clustering Methods Incorporating Hyperparameter Sensitivity
Siddhartha Mishra**, Nicholas Monath, Michael Boratko, Ari Kobren, Andrew McCallum* ***AAAI 2022

Experience

Information Extraction and Synthesis Lab, UMass Amherst
Summer Research Intern, Prof. Andrew McCallum *May 2021 - Sep 2021*
- Formulated geometric region-based embeddings for representing words using n-dimensional hyper-rectangles trained with a CBOW objective on the Wikipedia corpus.
- Obtained 3 - 15% improved performance on Word similarity benchmarks over vector-based baselines and qualitatively evaluated the set-theoretic expressivity. [*PyTorch, Huggingface, AllenNLP*]

Goldman Sachs Private Ltd
Analyst (Machine Learning Engineer) *May 2019 - Dec 2020*
- Worked in Enterprise Machine Learning platform team on metric analysis, models for alert prediction and automatic resolution using serverless frameworks. [*TensorFlow, AWS Lambda*]
- Maintained dashboards for monitoring real-time alerts and managed model deployment pipeline. [*Prometheus, Grafana, Kubernetes*]
- Improved performance of search queries by 25% in Big data log analysis platform by migrating to Elastic Stack. [*Elasticsearch, Kibana, ReactJS*]

Goldman Sachs Private Ltd
Summer Analyst *May 2018 - July 2018*
- Built a plugin for a graphical pipeline design tool for constructing workflows to automatically resolve alerts. [*Angular*]
- Designed and implemented a compiler for validating the pipeline and transform one payload format to another. [*NodeJS, Java*]

Research

Syntactic Features for Semantic Parsing **[Github]**
Prof. Mohit Iyyer *Sep 2021 - Present*
- Incorporated parsing information by input/feature level augmentation for dual intent classification and slot-filling semantic parsing using BERT-based pretrained language models.
- Obtained 2 - 4% improvement in Slot F1 in Conversational AI datasets such as SNIPS, ATIS and Facebook TOP and analyzed which constituency parsing components benefit the semantic slots. [*PyTorch, Huggingface, AllenNLP, Spacy*]

Evaluating Robustness to Hyperparameters in Unsupervised Learning **[Github]**
Prof. Andrew McCallum *Feb 2021 - Aug 2021*
- Designed a novel evaluation metric and model selection procedure based on black-box bayesian hyperparameter optimization methods to measure robustness of clustering algorithms.
- Performed an exhaustive analysis of algorithms on datasets from different domains such as Natural Language, Computer Vision, Speech and Genomics. [*BoTorch, Ray Tune, Facebook Ax, Hydra*]

Query Segmentation using LSTMs **[Github]**
Dr. Maunendra Deskar *Aug - Dec 2019*
- Designed a novel approach to the Query Segmentation problem by mapping it to a sequence tagging task.
- Used bi-directional LSTMs with/without CRF layers and evaluated the model on webis-qsec dataset. [*PyTorch, NLTK*]

Open Source

- **AllenAI/natural-language-instructions** Defined 34 tasks of natural language instructions in Parts-of-Speech Tagging, Question Answering and Knowledge Graphs. To be included as co-author of a benchmark paper with analysis/results.
- **Python Software Foundation/coala** Improved the design of the caching framework and added performance optimizations to the codebase.

Academic Achievements

- Academic Excellence Award for the highest GPA in the Department for the Academic year 2016-2017 and graduated 2^{nd} in class.
- Qualified for ACM ICPC Amritapuri regionals and Kharagpur regionals 2017. Secured 30^{th} position among 265 teams in Amritapuri regionals 2017.
- Winner of "Honeywell Machine Learning Hackathon 2019" for the task of Automated Feature Extraction of Cockpit Images in Aircrafts.
- KVPY Fellowship by Indian Institute of Science, Bangalore; secured All India Rank 210 *(out of 20000 candidates)*.
- 97.66 percentile in JEE Advanced *(out of 150,000 candidates)*.
- Qualified INMO (Indian National Mathematics Olympiad) by clearing two stage regionals KVS-JMO and RMO; secured All India Rank 7 *(out of 20000 candidates)*.

Academic Responsibilities

COMPSCI-589: Machine Learning — **Prof. Justin Domke**
Teaching Assistant — *Fall 2021*

MA2140: Statistics — **Prof. J. Balasubramaniam**
Teaching Assistant — *Spring 2019*

CS3530: Computer Networks-I — **Prof. Anthony Franklin**
Teaching Assistant — *Fall 2018*

MA2110: Probability — **Prof. J. Balasubramaniam**
Teaching Assistant — *Fall 2017*

Technical skills

- **Languages** `Python, C/C++, Go, Java, MATLAB`
- **ML/Data Science** `PyTorch, Tensorflow, AllenNLP, Spacy, Huggingface, NumPy, SciPy, Pandas`
- **Web** `Angular, React, NodeJS, Django, MongoDB`
- **Devops/Tools** `Kubernetes, Prometheus, Kafka, Kibana, Elasticsearch`