

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

Amazon Alexa AI NLU

Graduate Student Researcher

Jan 2022 - Present

- Working on improving the generalization of Continuous Prompt tuning methods on NLU tasks by probing its geometric properties.

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. [\[BoTorch, Ray Tune, Facebook Ax, Hydra\]](#)

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

Teaching Assistant

[Prof. Justin Domke](#)

Fall 2021

MA2140: Statistics

Teaching Assistant

[Prof. J. Balasubramaniam](#)

Spring 2019

CS3530: Computer Networks-I

Teaching Assistant

[Prof. Anthony Franklin](#)

Fall 2018

MA2110: Probability

Teaching Assistant

[Prof. J. Balasubramaniam](#)

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