Meghana Moorthy Bhat

CONTACT INFORMATION	2700 W El Camino Real, Apt 443, Mountain View, CA 94040 *E-mail:* meghanamoorthy@gmail.com meghana.bhat@salesforce.com *Website:* https://meghu2791.github.io/

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EXPERIENCE

Software development, AI/ML, weak-supervised and unsupervised learning, Natural Language Processing (NLP): fairness and model interpretability, few-shot learning for domain adaptation and transfer learning, data collection, summarization, dialogue systems, machine translation and language generation.

EDUCATION

Ohio State University, Columbus, OH, USA

Master of Science (Thesis), Computer Science   August 2019 - Jan 2022

University of Wisconsin-Madison, Madison, WI, USA

Master of Science (Professional), Computer Science   Sep 2017 - May 2019

(CGPA: 3.6/4.0)

Sri Jayachamarajendra College of Engineering (SJCE), Mysore, India

Bachelor of Engineering (Honours), Computer Science   Sep 2008 - Jun 2012

(CGPA: 9.21/10)

WORK EXPERIENCE

Salesforce Research, Palo Alto, CA, USA

Applied Scientist, Manager: Semih Yavuz   Jan 2022 - Present
(1) Automatically detecting potential high/impactful cases using NLP/ML models in the bug reporting system to reduce the burden and aid in decision-making for change case managers by providing explanations. (2) Researching on NLP problems involving weak-supervision and unsupervised learning for question answering (QA) systems and explainability.
Framework used: PyTorch, NLTK, Pandas, scikit-learn

Salesforce Research, Palo Alto (Remote), CA, USA

Research Intern, Mentors: Angela Lin, Yingbo Zhou   May 2021 - Aug 2021
(1) Investigating and mitigating societal biases in representations of smaller language models for language understanding tasks. (2) Constructed a semi-automated benchmark datasets to study biases in language understanding tasks. (3) Proposed bias mitigation strategies and observed improvement over prior methods.
Framework used: PyTorch, NLTK, Pandas, scikit-learn

Microsoft Research, Redmond (Remote), WA, USA

Research Intern   May 2020 - Aug 2020
Mentors: Saghar Hosseini, Ahmed Hassan Awadallah, Paul Bennett, Weisheng Li
(1) Proposed taxonomy, designed annotation guidelines for detecting and determining different classes toxic language. (2) Employed different techniques like weak supervision and self-training to address sparsity of toxic language in email conversations for data collection. *(EMNLP 2021)*
Framework used: PyTorch, NLTK, Pandas, scikit-learn, Spacy

(1) Proposed self-training based framework for rationale extraction in few-shot settings . (2) Devised

sampling method and auxiliary objective functions for a good rationale in self-training iteration. (3) Experiments show that our method with 100 labels perform within 3-5% trade-off of fully supervised setting. *(EMNLP 2021)*
Framework used: TensorFlow, Numpy, scikit-learn, NLTK

Montreal Institute for Learning Algorithms, Montreal, QC
Research Intern, Mentor: Laurent Charlin   June 2019 - Dec 2020
TPMS: (1) Studied and proposed methodology for expertise modeling to assign reviewers for the submitted papers in conferences using Microsoft CMT. (code). (2) Evaluated relevance and fairness of assignments using clustering, human evaluation.
Framework used: Python, PyTorch, scikit-learn, NLTK, Pandas

Qualcomm, San Diego, CA, USA
Machine Learning Intern, Mentor: Mark Charlebois   June 2018 - Aug 2018
Worked on enabling 8-bit CPU (Fixed point math) in SNPE (Snapdragon Neural Processor Engine) for better performance in overall speed-up and lesser memory consumption for SNPE AI powered phones.. The code was shipped to production after achieving 95% accuracy to 16-bit models on image classification tasks. (Language used: C++)

Intel Corporation, Bangalore, India

Design and Software Engineer (Infrastructure and performance modelling)   Jul 2012 - Jul 2017
(1) Lead performance modeling project that focused on identifying bottlenecks and tuning in virtual prototypes. (2) Developed libraries, unit-level and system-level validation framework in C++ for virtual prototypes. (3) Managed environment for internal customers across Intel teams that use virtual prototype simulators for firmware validation.

Papers and conferences

1. Srijan Bansal, Semih Yavuz, **Meghana Bhat**, Bo Pang, Yingbo Zhou "Analysis of Prompt Tuning for universal Question Answering in few-shot setting" *(Under submission - Title changed due to double blind policy)*.

2. Rui Meng, Ye Liu, Semih Yavuz, Divyansh Agarwal, Lifu Tu Ning Yu, Jianguo Zhang, **Meghana Bhat**, Yingbo Zhou "Unsupervised Dense Retrieval Deserves Better Positive Pairs: Scalable Augmentation with Query Extraction and Generation" (paper)

3. **Meghana Moorthy Bhat**, Angela S Lin, Nazneen Rajani, Nitish Shirish Keskar, Yingbo Zhou. "Fairness of distilled BERT models in NLU tasks" *(Under review - Title changed due to double blind policy)*.

4. **Meghana Moorthy Bhat**, Subhabrata Mukherjee, Alessandro Sordoni. "Self-training with Few-shot Rationalization" *Conference on Empirical Methods in Natural Language Processing (EMNLP), Punta Cana, Dominican Republic, 2021.* (paper) (code)

5. **Meghana Moorthy Bhat**, Saghar Hosseini, Ahmed Hassan Awadallah, Paul Bennett, Weisheng Li. "Say 'YES' to Positivity: Detecting Toxic Language in Workplace Communications" *Findings of Empirical Methods in Natural Language Processing (EMNLP), Punta Cana, Dominican Republic, 2021.* (paper) (code)

6. **Meghana Moorthy Bhat**, Srinivasan Parthasarathy. "How Effectively Can Machines Defend Against Machine-Generated Fake News? An Empirical Study." Workshop on Insights from Negative Results in NLP, *Conference on Empirical Methods in Natural Language Processing (EMNLP), Virtual, 2020.* (paper) (code)

7. **Meghana Moorthy Bhat**, Zhixuan Zhou "Fake News Detection via NLP methods becomes harder." Women in Machine Learning associated with NeurIPS 2019, Vancouver, BC, Canada (WiML).

8. **Meghana Moorthy Bhat**, Yogesh Chockalingam, Manjunath NS "DeepRepair:A framework for error detection and correction." Montreal AI Symposium 2019, Montreal, QC, Canada (MAIS). (paper) (code)

9. Zhixuan Zhou, Huankang Guan, **Meghana Moorthy Bhat** and Justin Hsu "Detecting Fake News with NLP: Challenges and Possible Directions." International Conference on Agents and Artificial Intelligence (ICAART) 2019. (paper)

10. **Meghana Moorthy Bhat**, Josef Eckmueller, Melwyn Scudder. "Performance Optimization of Virtual Prototypes." DTTC Intel, Portland, Oregon, USA 2015. (DTTC is Intel global internal conference)

11. **Meghana Moorthy Bhat**, Melwyn Scudder, Kartik Shah. "Virtual Prototype (VP) Quality Improvement Methodology." DvCon India, Bangalore, India, 2015.

PROJECTS	**Study of stylometry in misinformation detection.**

Ohio State University   Sep 2020 - Dec 2021

Masters thesis on analyzing effectiveness of stylometry to detect machine-generated fake news and exaggeration detection with weak supervision.

Stance-based summarization of debates.

Ohio State University   Sep 2020 - Dec 2020

Generating extractive summary of debates from online forums.

Data Cleaning and Augmentation

UW-Madison   Jan 2018 - June 2018

Proposed models (LSTMs) on tabular data to perform error detection and correction. (paper) (code)

Entity Matching of tabular data using deep learning

UW-Madison (Course: Data Science, with Prof. AnHai Doan)   Feb 2018 - Apr 2018

Performed analysis of different entity matching techniques and studied the respective trade-offs. (code)

TECHNICAL SKILLS   Programming & Scientific Computing - Python (Numpy, Pandas, NLTK, Spacy, scikit-learn, PyTorch, TensorFlow, Keras), Google Cloud Platform (GCP), Slurm

Others - Java, C++

HONOURS AND ACHIEVEMENTS

NSF Student Travel Grant to attend WiML co-located with NeurIPS 2019.

Student Travel Award to attend NeurIPS 2019.

Qualcomm Hackathon Finalist - Award for Innovation, 2018.

Department Recognition Award at Intel Corporation for successful critical project completion, 2015.

Employee Recognition Award at Intel Corporation for acceptance of poster presentation in DvCon India, 2015.

Conferral of the Honours degree in CSE, SJCE Mysore, 2012 (Requires minimum of 8.5 CGPA throughout the last two years of undergraduate studies).

State Board Merit Scholarship, Karnataka Secondary Education Examination Board (KSEEB) India, for 4 years of undergraduate study covering 75% of undergraduate tuition fee, 2008-2012.

EXTRACURRICULAR ACTIVITIES Carnatic classical vocalist - Performed over 300+ concerts across India and USA.

Reviewer - KDD TrueFact Workshop 2020, Workshop on Insights from Negative Results in NLP 2021.

WiML Workshop (2019) volunteer.