

# Mohammad Omar Khursheed

✉ omarkhu@gmail.com    🌐 omarkhursheed    in mkhursheed    ☎ 413-230-8914

## Education

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**University of Massachusetts Amherst** 2021  
M.S. in Computer Science GPA: 3.967/4.0  
*Relevant Coursework:* Machine Learning, Advanced Topics in NLP, Reinforcement Learning, Algorithms for Data Science

**Aligarh Muslim University** 2019  
B.Tech. in Computer Engineering GPA: 9.52/10  
*Honors:* Sir Syed Global Scholar Award

## Research Experience

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**NGRAM Lab, UMass Amherst** *January 2020 – December 2020*  
Graduate Student Researcher (Advisor: Prof. Mohit Iyyer)

- Developed novel methodologies for analyzing gender bias in narrative tropes through large-scale dataset construction
- Created genderedness scoring system correlating narrative content with creator demographics
- Research resulted in publication at EMNLP 2020 Workshop on NLP and Computational Social Science

**MOSAIC Lab, UMass Amherst** *December 2019 – January 2020*  
Graduate Student Researcher (Advisor: Prof. Tauhidur Rahman)

- Developed systems for predicting brain activity from multimodal stimuli analysis
- Implemented face recognition and landmark feature extraction pipeline for emotion regulation studies

## Industry Research Experience

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**Amazon** *January 2021 – Present*  
**Applied Scientist I & II** *(Promoted December 2022)*

- Developed fairness strategies for underperforming customer cohorts and trained wakeword detection models for Echo device users across multiple regions, achieving 10% FRR reduction across demographics
- Pioneered dynamically slimmable transformer architectures for resource-constrained keyword spotting, published at ICASSP 2023
- Led device-directedness prediction project using fusion between audio metadata and neural network outputs
- Led research team in developing low-power wakeword detection techniques
- Achieved 60% relative FRR improvement using novel semi-supervised learning approaches for keyword spotting implementations on Amazon Echo Buds and other products
- Published innovative latency reduction techniques at INTERSPEECH 2022
- Won the Amazon Deliver Results Award for Q1-Q2 2021 for research in the service of product launches

**Amazon** *May 2020 – September 2020*  
**Applied Scientist Intern**

- Developed compact CRNNs for keyword spotting, achieving 25% performance gain with 10% parameter reduction against CNNs, published at ASRU 2020
- Implemented efficient on-device inference through parallel LSTM architectures

## Capital Float

June 2018 – August 2018

### Decision Sciences Intern

- Engineered MySQL-based analytics tool reducing loan disbursement report generation time by 60%
- Designed monitoring systems for detecting anomalous user behavior in Checkout Finance program

## Publications

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1. **Small Footprint Slimmable Networks for Keyword Spotting**  
Akhtar Z, **Khursheed MO**, Du D, Liu Y  
*IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2023
2. **Latency Control for Keyword Spotting**  
Jose C, Wang J, Strimel GP, **Khursheed MO**, Mishchenko Y, Kulis B  
*INTERSPEECH*, 2022
3. **Tiny-CRNN: Streaming Wakeword Detection in a Low Footprint Setting**  
**Khursheed MO**, Jose C, Kumar R, Fu G, Kulis B, Cheekatmalla SK  
*IEEE Automatic Speech Recognition and Understanding Workshop (ASRU)*, 2021
4. **Analyzing Gender Bias within Narrative Tropes**  
Gala D, **Khursheed MO** (co-first author), Lerner H, O'Connor B, Iyyer M  
*Workshop on NLP and Computational Social Science, EMNLP*, 2020
5. **Stock Market Predictions using Hybrid Models**  
Akhtar Z, **Khursheed MO**  
*Symposium on Machine Learning and Metaheuristics Algorithms and Applications*, 2019
6. **Generative Adversarial Networks: A Survey of Techniques and Methods**  
**Khursheed MO**, Khan AM, Saeed D  
*International Conference on Computer Networks, Big Data and IoT*, 2018

## Academic Service

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- Conference Reviewer: NeurIPS 2024, SIGIR 2022, AMLC 2023, AMLC 2024
- Journal Reviewer: Journal of Medical Internet Research (JMIR)
- Total Reviewing Experience: 20+ peer reviews completed

## Technical Skills

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**Programming:** Python, PyTorch, TensorFlow, scikit-learn

**Areas of Expertise:** Machine Learning, Natural Language Processing, Speech Recognition, Deep Learning