

# Nikita Moghe

Natural Language Processing, Dialogue Systems

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## Education

### University of Edinburgh

Ph.D. in Natural Language Processing

Advisors: Alexandra Birch

September 2019 -

### Indian Institute of Technology Madras

M.S. (by Research), Computer Science and Engineering

Advisors: Balaraman Ravindran and Mitesh M. Khapra

Thesis: Incorporating External Knowledge in Domain Specific Conversation Systems

2016 - 2019

C.G.P.A: 8.8/10

### University of Mumbai

B.E., Computer Engineering

Sardar Patel Institute of Technology

2012 - 2016

C.G.P.A: 9.53/10

## Publications

- **Nikita Moghe**, Siddhartha Arora, Suman Banerjee, Mitesh M. Khapra  
**Towards Exploiting Background Knowledge for Building Conversation Systems.**  
*In Proceedings of 2018 Conference on Empirical Methods in Natural Language Processing.* [arXiv:1809.08205](#)
- Suman Banerjee, **Nikita Moghe**, Siddhartha Arora, Mitesh M. Khapra  
**A Dataset for Building Code-Mixed Goal Oriented Conversation Systems.**  
*In Proceedings of COLING 2018, International Committee on Computational Linguistics.* [arXiv:1806.05997](#)

## Professional Experience

### Robert Bosch Centre for Data Science and AI, IIT Madras

Project Associate (Deep Learning for NLP)

Presented ongoing/published work in Web Science Symposium, three RBC-DSAI poster sessions.

Also associated with Intel India Network Representation Learning group.

May 2018 - June 2019

### Microsoft Research India

Participant, Workshop on Artificial Social Intelligence

June 2017

## Key Projects

### Improving Dialogue Response Generation by Using Structural Information

June 2018 - May 2019

- Incorporated structural information at sentence and document level to improve the representation of unstructured background knowledge for background aware conversation systems (Holl-E dataset).
- Developed a framework to combine semantic information from word embeddings, sequential word order information from LSTMs, and structural information using Graph Convolutional Networks.
- Explored different linguistic structures - dependency parse, entity co-reference, entity co-occurrence.
- Observed performance gain over vanilla Seq2Seq as well as architectures using deep contextualized representations like ELMo or BERT with explicit addition of structural information.

*Work currently under review.*

### Incorporating Background Knowledge in Conversation Systems

April 2017 - May 2018

- A paradigm shift from treating conversation as a sequence modelling problem to using relevant external information for meaningful and coherent responses.
- Created a dataset of ~ 9K movie conversations containing ~ 90K utterances explicitly linked to background knowledge.
- Evaluated the dataset on state-of-the-art models from Seq2Seq, copy-or-generate and span prediction paradigms.
- Observed that existing architectures for the mentioned paradigms are not scalable and generate incoherent responses.

## Minor Projects

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### HollyChat! Domain Specific Conversation Systems

June 2017

*Workshop on Artificial Social Intelligence*

Microsoft Research

- Developed a minimalist conversation strategy that could keep the user engaged for seven turns using insights from crowd sourced conversations.
- Improved domain specific conversations using information from knowledge graphs and case-based response generation.

### Transliteration

April 2017

*Deep Learning Course Project*

IIT Madras

- Implemented basic Seq2Seq architecture to transliterate data from English to regional languages.
- Implemented beam search decoder without any high-level API; used early stopping and dropouts to improve accuracy.

### AMIGO - Your Tennis Chat Buddy

June 2015 - April 2016

*Undergraduate Thesis*

Sardar Patel Institute of Technology

- Interactive Question Answering system for Men's Professional Tennis using statistical data over 30 years.
- Implemented a hybrid approach in generating responses using template based modeling language (AIML) and information retrieval techniques.

### Food Smiles

January 2015 - April 2015

*Innovation and Entrepreneurship Development Cell*

Sardar Patel Institute of Technology

- Socio - Technological initiative to reduce food wastage at global and local level.
- Shortlisted in the top 10 among 250 project proposals.
- Global level: Portal for connecting NGOs and hotels to distribute excess food to the needy.
- Local Level: Use leftover ingredients with a search-by-ingredient recipe engine.

## Positions of Responsibility

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- Teaching Assistant, Reinforcement Learning, IIT Madras (Spring 2018, 2019).
- Teaching Assistant, Introduction to Machine Learning, IIT Madras (Fall 2017).

## Achievements

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### Poster Presentations

- First Position at 4<sup>th</sup> RBC-DSAI Workshop May 2019. Awarded a travel grant of 250\$.
- First Position at Grace Hopper Celebration India 2018 (GHCI '18).

### Travel Grants

- EMNLP 2018 Student Travel Scholarship.
- Microsoft Research India Student Travel Grant 2018.
- Grace Hopper Celebration India 2018 (GHCI '18) Student Scholarship.

### Awards

- Computer Society of India Highest Committed Student Award 2015.
- Infibeam's Most Innovative Project Idea 2015.

### Scholarships

- J.R.D. Tata Scholarship (Full Tuition Fee Waiver) 2013-14, 2014-15.
- Finalist for Narotam Seksaria Foundation's Engineering Excellence Scholarship 2015.

## Skills and Tools

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- Programming Languages: Python, C.
- Tools: PyTorch, Tensorflow, nltk, spaCy, numpy, Scikit-learn, L<sup>A</sup>T<sub>E</sub>X.