

# Nikita Moghe

Natural Language Processing, Dialogue Systems

✉ nikita.moghe@ed.ac.uk • 📄 nikitamoghe.github.io

## Education

### University of Edinburgh

Ph.D. in Natural Language Processing

Advisors: Alexandra Birch and Mark Steedman

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

- **The University of Edinburgh-Uppsala University's Submission to the WMT 2020 Chat Translation Task.**  
Nikita Moghe, Christian Hardmeier, Rachel Bawden  
To appear at Fifth Conference on Machine Translation (WMT 2020), EMNLP 2020.
- **On Incorporating Structural Information to improve Dialogue Response Generation.**  
Nikita Moghe, Priyesh Vijayan, Balaraman Ravindran, Mitesh M. Khapra  
In proceedings of the 2nd Workshop on Natural Language Processing for Conversational AI, ACL 2020.
- **Towards Exploiting Background Knowledge for Building Conversation Systems.**  
Nikita Moghe, Siddhartha Arora, Suman Banerjee, Mitesh M. Khapra  
In proceedings of 2018 Conference on Empirical Methods in Natural Language Processing (EMNLP 2018).
- **A Dataset for Building Code-Mixed Goal Oriented Conversation Systems.**  
Suman Banerjee, Nikita Moghe, Siddhartha Arora, Mitesh M. Khapra  
In proceedings of COLING 2018, International Committee on Computational Linguistics.

## 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.

May 2018 - June 2019

### Microsoft Research India

Participant, Workshop on Artificial Social Intelligence

June 2017

## Key Projects

### Intermediate Knowledge Representation in Conversation Systems

Jan 2020 - Present

- Task: Learn a representation of the conversation history as a SQL statement.
- Observed that existing architectures fail at (i) Schema linking and (ii) Resolving complex contextual dependencies.
- Currently looking at improving co-reference resolution within the input statements explicitly by building task specific co-reference resolution systems and implicitly via a multi-task learning setup.
- Future prospects include investigating the problem in a cross-lingual setup.

### Incorporating External Knowledge in Domain Specific Conversation Systems

Master's thesis

- Introduced a paradigm shift from treating conversation as a sequence modelling problem to using relevant external information for meaningful and coherent responses.
- Developed a framework to combine semantic information from word embeddings, sequential word order information from LSTMs, and structural information using Graph Convolutional Networks.
- Empirically showed that explicit adding of structural information improves dialogue response generation.

## Secondary Projects

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### Lemmatization for Corpus of Historical Mapudungun

September 2019 - December 2019

Group Project in NLP. Advisors: Sharon Goldwater and Benjamin Molineaux

University of Edinburgh

- Developed a framework for the lemmatization of a morphologically-rich language in a low-resource setting.
- Experimented with hard monotonic attention model for lemmatization and provided an early design for morpho-syntactic parser.

### 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.

## Positions of Responsibility

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- Organizer: Workshop on Graphs and more Complex structures for Learning and Reasoning (GCLR) at AAAI-21.
- Reviewer: AAAI (2020,2021), ACL (2020), COLING (2020).
- Teaching Assistant: Accelerated Natural Language Processing (Fall 2020), Doing Research in Natural Language Processing (Fall 2020), University of Edinburgh.
- Teaching Assistant: Introduction to Machine Learning (Fall 2017), IIT Madras.

## Achievements

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### Poster Presentations

- Extended abstract on the Dialogue-GCN work accepted at EurNLP '19.
- 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,  $\text{\LaTeX}$ .

Updated: 30<sup>th</sup> September, 2020