

Nikita Moghe

Natural Language Processing, Dialogue Systems

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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

○ 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.

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

Intermediate Knowledge Representation in Conversation Systems

Jan 2020 - Present

○ Task: Learn a representation of the conversation history as a SQL statement.

○ Executed baseline architectures on the popular text-to-SQL benchmarks: SParC and CoSQL.

○ Observed that existing architectures fail at (i) Schema linking and (ii) Resolving complex contextual dependencies.

○ Future prospects include extending the knowledge representation to a cross-lingual setting.

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.

○ Created a dataset of ~ 9K movie conversations containing ~ 90K utterances explicitly linked to background knowledge.

○ 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

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.

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 dropout to improve accuracy.

AMIGO - Your Tennis Chat Buddy

June 2015 - April 2016

Undergraduate Thesis

Sardar Patel Institute of Technology

- Developed an interactive Question Answering system for Men's Tennis using statistical data over 30 years.
- Implemented a hybrid approach in generating responses using template based approaches and information retrieval techniques.

Positions of Responsibility

- Reviewer: AAAI (2020), ACL (2020).
- Teaching Assistant: Reinforcement Learning, IIT Madras (Spring 2018, 2019).
- Teaching Assistant: Introduction to Machine Learning, IIT Madras (Fall 2017).

Achievements

Poster Presentations

- Extended abstract on the Dialogue-GCN work accepted at EurNLP '19.
- First Position at 4th 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

- Programming Languages: Python, C.
- Tools: PyTorch, Tensorflow, nltk, spaCy, numpy, Scikit-learn, L^AT_EX.

Updated: 4th July, 2020