

Kevin Patel

Ph.D. Scholar at IIT Bombay

E-mail: kevin.patel@cse.iitb.ac.in

Mobile: +91 900 454 0814

<http://www.cse.iitb.ac.in/~kevin.patel>

Objective

Study of word embeddings and deep learning techniques and their application in Natural Language Processing.

Educational Qualifications

Pursuing Ph.D. in Computer Science, under guidance of *Prof. Pushpak Bhattacharyya*, at Indian Institute of Technology Bombay, Mumbai.

Qualification	University	Year	CPI
Ph.D. (Computer Science and Engineering)	Indian Institute of Technology Bombay, Mumbai	Since July 2014 to <i>present</i>	8.64 (out of 10)
M.E. (Computer Science)	Indian Institute Of Science, Bangalore	July 2013	6.1 (out of 8)
B.Tech. (Computer Engineering)	Sardar Vallabhbhai National Institute of Technology, Surat	May 2010	7.74 (out of 10)

Relevant Course Work

IIT Bombay

1. Topics in Natural Language Processing
2. Speech, Natural Language Processing and the Web
3. Artificial Intelligence

IISc Bangalore

1. Natural Language Understanding
2. Machine Learning
3. Cognition and Machine Intelligence
4. Probability and Statistics
5. Linear Algebra

Research Work

Ph.D.

- **Studies in Word Embeddings and Explainability.**(*Current*)

Ph.D thesis topic under guidance of Prof Pushpak Bhattacharyya.

Description: Deep Learning is making great strides in various fields of computer science. One of the major contributions of deep learning in the area of natural language processing is the advances in representation learning of words, and other complex lexical units. Such representations, known as word embeddings, have proven to be extremely useful in various natural language processing tasks. However, they are still used in a black box manner, without much understanding of their working. Moreover, such representations suffer from some qualitative problems.

In our work, we investigate questions of the following kind: Does there exist any lower or upper bounds on the number of dimensions for word embeddings? If so, how to compute them beforehand? How can lexical resources aid in improving quality of word embeddings? How can word embeddings assist lexical

resources? What word embeddings should be used such that the decisions made by the corresponding neural network can be explained to some extent?

Relevant Publications:

1. Towards Lower Bounds on Number of Dimensions for Word Embeddings, Kevin Patel and Pushpak Bhattacharyya, In *IJCNLP'17*
2. An Iterative Approach for Unsupervised Most Frequent Sense Detection using WordNet and Word Embeddings, Kevin Patel and Pushpak Bhattacharyya, In *GWC'17*
3. Semi-automatic WordNet Linking using Word Embeddings, Kevin Patel, Diptesh Kanojia and Pushpak Bhattacharyya, In *GWC'17*
4. Adapting Pre-trained Word Embeddings For Use In Medical Coding, Kevin Patel, Divya Patel, Mansi Golakiya, Pushpak Bhattacharyya and Nilesh Birari, In *BioNLP'17*
5. Are Word Embedding-based Features Useful for Sarcasm Detection? Aditya Joshi, Vaibhav Tripathi, Kevin Patel, Pushpak Bhattacharyya and Mark Carman, In *EMNLP'16*

For full publication list, check out [my Google Scholar profile](#).

M.E.

- **Study and Enhancement of Dialog System Components** (*Aug 2012 to July 2013*)
M.E. dissertation under guidance of Prof. C. E. Veni Madhavan at IISc Bangalore.

Description: Advances in the fields of natural language processing, computational linguistics prompt the development of more complex natural dialog driven interfaces. However, such interfaces are not that prevalent. This is in spite of the fact that various frameworks exist for developing such systems.

We attempted to remedy this situation. We studied the architecture of dialog systems, and then explored a few prominent frameworks. We then augmented one of these with additional functionalities which could lead to rapid development of more accurate and efficient dialog systems. We demonstrated the augmented framework capabilities with a few prototype applications.

Talks

- Will be delivering a tutorial on **Explaining Deep Learning models for Natural Language Processing** at ICON'17
- Delivered a tutorial on **Deep Learning for Natural Language Processing** at ICON'17
- Conducted a training session on Deep Learning at LG Soft in June 2017
- Delivered a tutorial on **Deep Learning and Distributed Word Representations** at ICON'15

Technical Skills

- **Programming Language:** Python, C/C++, Java
- **Platform:** Linux
- **Deep Learning Framework and Libraries:** PyTorch, TensorFlow, Theano, Keras

Achievements

- Secured an All India Rank **11** in **GATE 2011**.
- Stood **11th** in **UCSD Data Mining Competition 2010**.
- Qualified for and participated in the **ACM International Collegiate Programming Competition Asia Regionals** (Indian Sites) four times — the best rank being in the **top 15**.

References

- Prof. Pushpak Bhattacharyya
- Prof. C. E. Veni Madhavan

Personal Details

Contact Address: Hostel 14 (Room: C510)
IIT Bombay,
Mumbai (IN) – 400 076

Permanent Address: B-134, Dindayal Society,
Palanpur Patiya,
Rander Road,
Surat (IN) – 395 005

E-mail: kevin.patel@cse.iitb.ac.in
kevin.svnit@gmail.com

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Kevin Patel