

ICON-2017

**14th International
Conference on Natural
Language Processing**

Proceedings of the Conference

18-21 December 2017
Jadavpur University, Kolkata, India

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Preface

Research in Natural Language Processing (NLP) has taken a noticeable leap in the recent years. Tremendous growth of information on the web and its easy access has stimulated large interest in the field. India with multiple languages and continuous growth of Indian language content on the web makes a fertile ground for NLP research. Moreover, industry is keenly interested in obtaining NLP technology for mass use. The internet search companies are increasingly aware of the large market for processing languages other than English. For example, search capability is needed for content in Indian and other languages. There is also a need for searching content in multiple languages, and making the retrieved documents available in the language of the user. As a result, a strong need is being felt for machine translation to handle this large instantaneous use. Information Extraction, Question Answering Systems and Sentiment Analysis are also showing up as other business opportunities.

These needs have resulted in two welcome trends. First, there is much wider student interest in getting into NLP at both postgraduate and undergraduate levels. Many students interested in computing technology are getting interested in natural language technology, and those interested in pursuing computing research are joining NLP research. Second, the research community in academic institutions and the government funding agencies in India have joined hands to launch consortia projects to develop NLP products. Each consortium project is a multi-institutional endeavour working with a common software framework, common language standards, and common technology engines for all the different languages covered in the consortium. As a result, it has already led to development of basic tools for multiple languages which are inter-operable for machine translation, cross lingual search, hand writing recognition and OCR.

In this backdrop of increased student interest, greater funding and most importantly, common standards and interoperable tools, there has been a spurt in research in NLP on Indian languages whose effects we have just begun to see. A great number of submissions reflecting good research is a heartening matter. There is an increasing realization to take advantage of features common to Indian languages in machine learning. It is a delight to see that such features are not just specific to Indian languages but to a large number of languages of the world, hitherto ignored. The insights so gained are furthering our linguistic understanding and will help in technology development for hopefully all languages of the world.

For machine learning and other purposes, linguistically annotated corpora using the common standards have become available for multiple Indian languages. They have been used for the development of basic technologies for several languages. Larger set of corpora are expected to be prepared in near future.

This conference proceedings contains papers selected for presentation in technical sessions of ICON-2017 and short communications selected for poster presentation. We are thankful to our excellent team of reviewers from all over the globe who deserve full credit for the hard work of reviewing the high quality submissions with rich technical content. From 141 submissions, 64 papers were selected, 32 for full presentation, 32 for poster presentation, representing a variety of new and interesting developments, covering a wide spectrum of NLP areas and core linguistics.

We are deeply grateful to Bjrn W. Schuller, University of Passau, Germany, NG Hwee Tou, National University of Singapore (NUS), Singapore and Vasudeva Varma, IIIT Hyderabad, India for giving the keynote lectures at ICON. We would also like to thank the members of the Advisory Committee and

Programme Committee for their support and co-operation in making ICON 2017 a success.

We thank Anil Kumar Singh, Chair, Student Paper Competition and Dipankar Das, Chair, NLP Tools Contest for taking the responsibilities of the events. We are thankful to Sudip Kumar Naskar and Dipankar Das for making the organization of the event at Jadavpur University a success.

We convey our thanks to P V S Ram Babu, G Srinivas Rao, B Mahender Kumar and A Lakshmi Narayana, International Institute of Information Technology (IIIT), Hyderabad for their dedicated efforts in successfully handling the ICON Secretariat. We also thank IIIT Hyderabad team of Vineet Chaitanya, Vasudeva Varma, Soma Paul, Radhika Mamidi, Manish Shrivastava, Suryakanth V Gangashetty and Anil Kumar Vuppala. We heartfully express our gratitude to Somnath Banerjee, Tapabrata Mondal, Sainik Mahata and other team members at Jadavpur University for their timely help with sincere dedication to make this conference a success.

We also thank all those who came forward to help us in this task.

Finally, we thank all the researchers who responded to our call for papers and all the participants of ICON-2017, without whose overwhelming response the conference would not have been a success.

December 2017
Varanasi

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We gratefully acknowledge the excellent quality of refereeing we received from the reviewers. We thank them all for being precise and fair in their assessment and for reviewing the papers in time.

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Conference Program

Tuesday, December 19, 2017

+ 9:00-9:30 Inaugural Ceremony

+ 9:30-10:30 Keynote Lecture 1 by Prof. Bjorn W. Schuller

Keynote Lecture 1: NLP in Tomorrow's Profiling - Words May Fail You
Björn W. Schuller

+ 10:30-11:00 Tea Break

+ 11:00-13:00 Technical Session I: Machine Translation and Speech:

Deriving Word Prosody from Orthography in Hindi
Somnath Roy

Three-phase training to address data sparsity in Neural Machine Translation
Ruchit Agrawal, Mihir Shekhar and Dipti Sharma

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A vis-à-vis evaluation of MT paradigms for linguistically distant languages
Ruchit Agrawal, Jahfar Ali and Dipti Misra Sharma

+ 11:00-13:00 Technical Session II : Text Categorization:

Textual Relations and Topic-Projection: Issues in Text Categorization
Lahari Chatterjee, Samir Karmakar and Abahan Datta

POS Tagging For Resource Poor Languages Through Feature Projection
Pruthwik Mishra, Vandan Mujadia and Dipti Misra Sharma

An Exploration of Word Embedding Initialization in Deep-Learning Tasks
Tom Kocmi and Ondrej Bojar

Tuesday, December 19, 2017 (continued)

+ 11:00-13:00 Technical Session III : Parsing Code-mixed Data:

Curriculum Design for Code-switching: Experiments with Language Identification and Language Modeling with Deep Neural Networks

Monojit Choudhury, Kalika Bali, Sunayana Sitaram and Ashutosh Baheti

Quantitative Characterization of Code Switching Patterns in Complex Multi-Party Conversations: A Case Study on Hindi Movie Scripts

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Towards developing a phonetically balanced code-mixed speech corpus for Hindi-English ASR

Ayushi Pandey, Brij Mohan Lal Srivastava and Suryakanth Gangashetty

+ 13:00-14:00 Lunch

+ 14:00-15:00 Keynote Lecture 2 by Prof. NG Hwee Tou

Keynote Lecture 2: Grammatical Error Correction: Past, Present and Future

NG Hwee Tou

+ 15:00-16:30 Technical Session IV : Information Extraction:

Hybrid Approach for Marathi Named Entity Recognition

Nita Patil, Ajay Patil and B.V. Pawar

Sentiment Analysis: An Empirical Comparative Study of Various Machine Learning Approaches

Swapnil Jain, Shrikant Malviya, Rohit Mishra and Uma Shanker Tiwary

Tuesday, December 19, 2017 (continued)

+ 15:00-16:30 Technical Session V : Discourse and Dialogue:

Handling Multi-Sentence Queries in a Domain Independent Dialogue System

Prathyusha Jwalapuram and Radhika Mamidi

Document Level Novelty Detection: Textual Entailment Lends a Helping Hand

Tanik Saikh, Tirthankar Ghosal, Asif Ekbal and Pushpak Bhattacharyya

Is your Statement Purposeless? Predicting Computer Science Graduation Admission Acceptance based on Statement Of Purpose

Diptesh Kanojia, Nikhil Wani and Pushpak Bhattacharyya

+ 15:00-16:30 Technical Session VI : Lexical Analysis:

Natural Language Programing with Automatic Code Generation towards Solving Addition-Subtraction Word Problems

Sourav Mandal and Sudip Kumar Naskar

Unsupervised Separation of Transliterated and Native Words for Malayalam

Deepak P

Known Strangers: Cross Linguistic Patterns in Multilingual Multidirectional Dictionaries

Rejitha K. S. and Rajesha N.

+ 16:30-17:30 Tea Break

+ 16:30-17:30 Poster and Demo Session-I:

Tutorial for Deaf Teaching Punjabi Alphabet using Synthetic Animations

Lalit Goyal and Vishal Goyal

SemTagger: A Novel Approach for Semantic Similarity Based Hashtag Recommendation on Twitter

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Normalization of Social Media Text using Deep Neural Networks

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Cross Linguistic Variations in Discourse Relations among Indian Languages

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Tuesday, December 19, 2017 (continued)

RULE BASED APPROCH OF CLAUSE BOUNDARY IDENTIFICATION IN TELUGU

Ganthoti Nagaraju, Thennarasu Sakkan and Christopher Mala

+ 17:30-19:30 NLP AI Meeting

+ 19:00-20:00 Cultural Programme

+ 20:00-Onwards Dinner

Wednesday, December 20, 2017

+ 9:30-10:30 Keynote Lecture 3 by Vasudeva Varmaa

Keynote Lecture 3: Towards Abstractive Summarization

Vasudeva Varma

+ 10:30-11:00 Tea Break

+ 11:00-13:00 Technical Session VII: Socio-Psycho Text Analysis: Emerging Trends

"Who Mentions Whom?"- Understanding the Psycho-Sociological Aspects of Twitter Mention Network

R Sudhesh Solomon, Abhay Narayan, Srinivas P Y K L and Amitava Das

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Bibekananda Kundu and Sanjay Choudhury

A Deep Dive into Identification of Characters from Mahabharata

Apurba Paul and Dipankar Das

Wednesday, December 20, 2017 (continued)

+ 11:00-13:00 Technical Session VIII: Deep Neural Networks:

Neural Networks for Semantic Textual Similarity

Derek Prijatelj, Jugal Kalita and Jonathan Ventura

Open Set Text Classification Using CNNs

Sridhama Prakhya, Vinodini Venkataram and Jugal Kalita

Predicting User Competence from Linguistic Data

Yonas Woldemariam, Henrik Björklund and Suna Bensch

Neural Morphological Disambiguation Using Surface and Contextual Morphological Awareness

Akhilesh Sudhakar and Anil Kumar Singh

+ 11:00-13:00 Technical Session IX: Semantics:

Word Sense Disambiguation for Malayalam in a Conditional Random Field Framework

Junaida M K, Jisha P Jayan and Elizabeth Sherly

Semisupervised Data Driven Word Sense Disambiguation for Resource-poor Languages

Pratibha Rani, Vikram Pudi and Dipti M. Sharma

Notion of Semantics in Computer Science - A Systematic Literature Review

Sai Prasad Vrij Gollapudi and Venkatesh Choppella

Semantic Enrichment Across Language: A Case Study of Czech Bibliographic Databases

Pavel Smrz and Lubomir Otrusina

Wednesday, December 20, 2017 (continued)

+ 13:00-14:00 Lunch Break

+ 14:00-15:00 Industry Talk

+ 15:00-15:30 Tea Break

+ 15:30-17:00 Technical Session X: Student Paper Contest

+ 15:30-17:00 Technical Session XI: NLP Tools Contest

+ 17:00-17:30 Valedictory Session