

The 28th

# ROCLING 2016

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The 28th international Conference on  
Computational Linguistics and Speech Processing

**Proceedings of the Twenty- Seventh Conference  
on Computational Linguistics and Speech**

**Processing ROCLING XXVIII (2016)**

**October 6-7, 2016**

**National Cheng Kung University, Tainan, Taiwan**

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## **Welcome Message of the ROCLING 2016**

On behalf of the organization committee and program committee, it is our pleasure to welcome you to the National Cheng Kung University, Tainan, Taiwan, for the 28th Conference on Computational Linguistics and Speech Processing (ROCLING), the flagship conference on computational linguistics, natural language processing, and speech processing in Taiwan. ROCLING is the annual conference of the Computational Linguistics and Chinese Language Processing (ACLCLP) which is held in autumn in different cities and universities in Taiwan. This year, we have 15 oral papers and 19 poster papers, which cover the areas of spoken language processing and speech recognition, natural language processing, speech emotion recognition and information retrieval, and word semantics. We are grateful to the contribution of the reviewers for their extraordinary efforts and valuable comments.

ROCLING 2016 features three distinguished lectures from the renowned speakers in speech processing as well as natural language processing. Prof. Shrikanth (Shri) S. Narayanan (Professor at the Signal and Image Processing Institute of USC's Electrical Engineering department) will lecture on “Deriving Behavioral Informatics From Speech and Language” and Dr. Ming Zhou (Manager of Microsoft Research Asia Natural Language Computing Group) will speak on “Entertaining with Language Gaming Play-Computer Couplet, Poetry, Riddle and Lyric”. Moreover, Prof. Huan Liu (Professor at Ira A. Fulton Schools of Engineering, Arizona State University) will give a talk about “On Evaluation Dilemmas in Social Media Research”. This ROCLING also features one Industry Panel, two Doctoral Consortiums, which provide forums and show-and-tells for graduate students, industrial and academic researchers and developers.

Finally, we thank to the generous government, academic and industry sponsors and appreciate your enthusiastic participation and support. Best wishes a successful and fruitful ROCLING 2016 in Tainan.

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## Keynote 1 –

### Deriving Behavioral Informatics From Speech and Language

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#### **Prof. Shrikanth (Shri) S. Narayanan**

Professor at the Signal and Image Processing  
Institute of USC's Electrical Engineering department  
Thursday, October 6 10:00 - 11:00

Location: Conference Venue

#### **Biography**

Prof. Shrikanth Narayanan received his M.S., Engineer,  
and Ph.D., all in electrical engineering, from UCLA.

Currently, he is a Professor at the Signal and Image Processing Institute of USC's Electrical Engineering department and holds joint appointments as Professor in Computer Science, Linguistics, Psychology, Neuroscience and Pediatrics. He is also the inaugural director of the Ming Hsieh Institute at USC. He was a Research Area Director of the Integrated Media Systems Center, an NSF Engineering Research Center at USC, and was the Research Principal for the USC Pratt and Whitney Institute for Collaborative Engineering, a unique partnership between academia and industry (2003-2007). He is a Fellow of the Acoustical Society of America (ASA), the Institute of Electrical and Electronics Engineers (IEEE) and the American Association for the Advancement of Science (AAAS), and a member of Tau Beta Pi, Phi Kappa Phi and Eta Kappa Nu.

His research interests are in signals and systems modeling with an interdisciplinary emphasis on speech, audio, language, multimodal and biomedical problems and applications with direct societal relevance. His laboratory is supported by federal (NSF, NIH, DARPA, ONR, Army and DHS) and industry grants. He has published over 600 papers and has 17 granted U.S. patents.

#### **Abstract**

The confluence of sensing, communication and computing technologies is allowing capture and access to data, in diverse forms and modalities, in ways that were unimaginable even a few years ago. These include data that afford the analysis and interpretation of multimodal cues of verbal and non-verbal human behavior to facilitate human behavioral research and its translational applications. They carry crucial information about a person's intent, identity and trait but also underlying attitudes and emotions. Automatically capturing these cues, although vastly challenging, offers the promise of not just efficient data processing but in tools for

discovery that enable hitherto unimagined scientific insights, and means for supporting diagnostics and interventions.

Recent computational approaches that have leveraged judicious use of both data and knowledge have yielded significant advances in this regards, for example in deriving rich, context-aware information from multimodal signal sources including human speech, language, and videos of behavior. These are even complemented and integrated with data about human brain and body physiology. This talk will focus on some of the advances and challenges in gathering such data and creating algorithms for machine processing of such cues. It will highlight some of our ongoing efforts in Behavioral Signal Processing (BSP)—technology and algorithms for quantitatively and objectively understanding typical, atypical and distressed human behavior—with a specific focus on communicative, affective and social behavior from speech and language. The talk will illustrate Behavioral Informatics applications of these techniques that contribute to quantifying higher-level, often subjectively described, human behavior in a domain-sensitive fashion. Examples will be drawn from mental health and well being realms such as Autism Spectrum Disorders, Couple therapy, Depression and Addiction counseling.

## Keynote 2 -

### Entertaining with Language Gaming Play-Computer

#### Couplet, Poetry, Riddle and Lyric

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#### **Dr. Ming Zhou**

Manager of Microsoft Research Asia Natural Language Computing Group

Friday, October 6 14:10-15:10

Location: Conference Venue

#### **Biography**

Dr. Ming Zhou is a principal researcher and manager of Natural Language Computing Group in Microsoft Research Asia. He is the chair of Chinese Information Technology Committee of Chinese Computer Federation and executive member of Chinese Information Processing Society.

He designed the CEMT-I machine translation system in 1989, the first experiment of Chinese-English machine translation in Mainland China. He designed the famous Chinese-Japanese machine translation software product J-Beijing in Japan which was deployed in J-Server, the popular translation service in Japan that was granted Makoto Nagao Award by Japan Machine Translation Association in 2008. He is the leader of the famous AI gaming of Chinese Couplets/Poetry Generation and Riddles(<http://duilian.msra.cn>), and the English Assistance Search Engine, Engkoo, which won the Wall Street Journal's 2010 Asian Innovation Readers' Choice Award and was shipped in Bing in 2011 as Bing Dictionary(<http://cn.bing.com/dict/>), and Engkoo cloud IME which was shipped as Bing IME in 2012. Recently, his group has closely worked with MS product teams and shipped famous chat-bot products in China(Xiaoice), Japan(Rinna) and US(Tay).

Dr. Zhou received his B.S. degree in computer engineering from Chongqing University in 1985, and his M.S. degree and Ph.D. in computer science from Harbin Institute of Technology in 1988 and 1991. He did post-doctoral work at Tsinghua University from 1991 to 1993, then he became an associate professor. During 1996-1999, during his sabbatical leave, he worked for Kodensha Ltd. Co. in Japan as the leader of the Chinese-Japanese machine translation project. He joined the



natural language group at Microsoft Research China (now Microsoft Research Asia) in Sept. 1999.

## **Abstract**

Natural language processing (NLP) is often viewed as a hard problem and all people either researchers or users often feel frustrated by the limitations and mistakes of a NLP system. I have been thinking some topic which could change this mind by converting a hard NLP task into a gaming process so that people get fun and start to like NLP.

In this talk, I want to talk a series of effort that I and some colleagues and students have been working in last 10 years mostly at our spare time from which lots of entertainment having been generated for us and for the users. It is a series innovations about language gaming including computer generation of Chinese couplets in 2005, then computer generation of a classic poetry in 2010 and then computer solving and generation of riddles about Chinese characters in 2015 and most recently computer generation of a lyrics for a song. These tasks have been viewed as difficult problems in AI and have not been sufficiently explored in the research community. We

regard all these tasks as a kind of machine translation process and proposed a set of successful statistical machine translation approaches to solve them with promising results and deep user engagement.

## Keynote 3 -

### On Evaluation Dilemmas in Social Media Research

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#### **Prof. Huan Liu**

Professor at Ira A. Fulton Schools of Engineering,  
Arizona State University

Friday, October 7 9:00-10:00

Location: Conference Venue

#### **Biography**

Prof. Huan Liu's research focuses on developing computational methods for data mining, machine learning, and social computing, and designing efficient algorithms to enable effective problem solving ranging from basic research, text/Web mining, bioinformatics, image mining, to real-world applications. His work includes (i) dealing with high dimensional data via feature selection and feature discretization; (ii) social media mining/social computing, identifying the influentials in the blogosphere, group profiling and interaction; (iii) integrating multiple data sources to overcome ambiguity and uncertainty, (iv) employing domain knowledge for effective mining and information integration, and (v) assisting human experts by developing effective methods of ensemble learning, and active learning with hierarchical classification, subspace clustering, and meta data. Detailed information can be obtained via his publications and professional activities.

#### **Abstract**

Social media data is steeped with user-generated content and social information. Most of user-generated content can be text and multimedia. Social media is a new source of data and therefore, social media research faces novel challenges. We discuss one of such challenges - evaluation dilemmas. One evaluation dilemma is that there is often no ground truth in evaluating research findings of social media. Without ground truth, how can we perform credible and reproducible evaluation? Another associated dilemma is that we frequently resort to crowdsourcing mechanisms such as Amazon's Mechanical Turk for evaluation tasks. It costs even if a small group of Turkers is employed. Is it too small? Large-scale evaluation could be very costly. Can we find alternative ways of evaluation that are more objective, reproducible, or scalable? We use case studies to illustrate these dilemmas

and show how to overcome associated challenges in mining big social media data.

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