



ROCLING 2014

The 26th International Conference on
Computational Linguistics and Speech Processing



國立中央大學
National Central University

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Computational Linguistics and Speech Processing
ROCLING XXVI (2014)**

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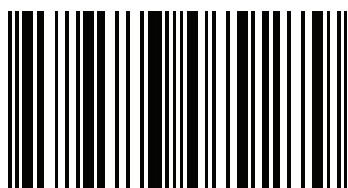
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Welcome Message from Chairs

On behalf of the program committee, it is our pleasure to welcome you to the National Central University, Jhongli, Taiwan, for the 26th 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 received 25 submissions, each of which was reviewed by two to four reviewers on the basis of originality, novelty, technical soundness, and relevance to the conference. Totally, we accept 16 oral papers and 5 poster papers which cover the areas of speech and speaker recognition, text mining, speech processing and synthesis, and natural language processing. We are grateful to the contribution of the reviewers for their extraordinary efforts and valuable comments.

ROCLING 2014 features two distinguished lectures from the renowned speakers in speech processing as well as natural language processing. Dr. Frank Soong (Principal Researcher/Research Manager of MSRA) will lecture on "Search for the Elementary Particles in Human Speech - Clues for the Common Units Across Different Speakers and Languages" and Dr. Hang Li (Chief Scientist of Huawei Technologies) will speak on "Semantic Matching: The Next Big Thing for Natural Language Processing?". This ROCLING also features two Doctoral Consortiums, one Industry Track and one Academic Demo Track which provide forums and show-and-tells for PhD students, industrial and academic researchers and developers.

Finally, we appreciate your enthusiastic participation and support. Wishes a successful and fruitful ROCLING 2014 in Jhongli.

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Keynote 1 -

Search for the “Elementary Particles” in Human Speech – Clues for the Common Units Across Different Speakers and Languages



Frank Soong

Principal Researcher / Research Manager of MSRA

Thursday, September 25

10:00 – 11:00

Location: International Conference Center

Biography

Frank Soong is a Principal Researcher and Research Manager of the Speech Group, where speech modeling, recognition, synthesis research is conducted. He received his BS, MS and Ph. D, all in EE from the National Taiwan University, the University of Rhode Island and Stanford University, respectively. He joined Bell Labs Research, Murray Hill, NJ, USA in 1982, worked there for 20 years and retired as a Distinguished Member of Technical Staff in 2001. In Bell Labs, he had worked on various aspects of acoustics and speech processing, including: speech coding, speech and speaker recognition, stochastic modeling of speech signals, efficient search algorithms, discriminative training, dereverberation of audio and speech signals, microphone array processing, acoustic echo cancellation, hands-free noisy speech recognition. He was also responsible for transferring recognition technology from research to AT&T voice-activated cell phones which were rated by the Mobile Office Magazine as the best among competing products evaluated. He was the co-recipient of the Bell Labs President Gold Award for developing the Bell Labs Automatic Speech Recognition (BLASR) software package. He visited Japan twice as a visiting researcher: first from 1987 to 1988, to the NTT Electro-Communication Labs, Musashino, Tokyo; then from 2002-2004, to the Spoken Language Translation Labs, ATR, Kyoto. In 2004, he joined Microsoft Research Asia (MSRA), Beijing, China to lead the Speech Research Group. He is a visiting professor of the Chinese University of Hong Kong (CUHK) and the co-director of CUHK-MSRA Joint Research Lab, recently promoted to a National Key Lab of Ministry of Education, China. He was the co-chair of the 1991 IEEE International Arden House Speech Recognition Workshop. He is a committee member of the

IEEE Speech and Language Processing Technical Committee of the Signal Processing Society and has served as an associate editor of the Transactions of Speech and Audio Processing. He published extensively and coauthored more than 200 technical papers in the speech and signal processing fields. He is an IEEE Fellow.

Abstract

In this talk, we will raise an interesting or even intriguing question: Can we find the “elementary particles” of a person’s speech in one language and use them for speech/speaker recognition and rendering his/her voice in a different language? A positive yes” can make “elementary particles” useful for many applications, e.g. mixed code TTS, second language learning, speech-to-speech translation, etc. We try to answer the question by limiting ourselves first to how to train a TTS in a different language with speech collected from a monolingual speaker. Additionally, a speech corpus in the targeted new language is recorded by a reference speaker. We then use our “trajectory tiling algorithm,” invented for synthesizing high quality, unit selection TTS, to “tile” the trajectories of the sentences in the reference speaker’s corpus with the most appropriate speech segments in the monolingual speaker’s data. To make the tiling proper across two different (reference and monolingual) speakers, the difference between them needs to be equalized with appropriate vocal tract length normalization, e.g., a bilinear warping function or formant mapping. All tiled, sentences are then used to train a new HMM-based TTS of the monolingual speaker but in the reference speaker’s language. Different length units of the ‘elementary particles’ have been tried and a label-less frame length (10 ms) segments have been found to yield the best TTS quality. Some preliminary results also show that training a speech recognizer with speech data of different languages tends to improve the ASR performance in each individual language. Also, in addition to the fact that audio “elementary particles” of human speech in different languages can be discovered as frame-level speech segments, the mouth shapes of a mono-lingual speaker have also been found adequate for rendering the lips movement of talking heads in different languages. Various demos will be shown to illustrate our findings in talking head lips rendering, speaker recognition in different languages, speech recognition model trained with the help of data collected in different languages.

Keynote 2 -

Semantic Matching: The Next Big Thing for Natural Language Processing?



Hang Li

Chief Scientist of Huawei Technologies

Friday, September 26

09:00 – 10:00

Location: International Conference Center

Biography

Hang Li is chief scientist of the Noah's Ark Lab at Huawei. He is also adjunct professor of Peking University and Nanjing University. His research areas include information retrieval, natural language processing, statistical machine learning, and data mining. He graduated from Kyoto University in 1988 and earned his PhD from the University of Tokyo in 1998. He worked at the NEC lab in Japan during 1991 and 2001, and Microsoft Research Asia during 2001 and 2012. He joined Huawei Technologies in 2012. Hang has more than 100 publications at top international journals and conferences, including SIGIR, WWW, WSDM, ACL, EMNLP, ICML, NIPS, and SIGKDD. He and his colleagues' papers received the SIGKDD'08 best application paper award, the SIGIR'08 best student paper award, and the ACL'12 best student paper award. Hang has also been working on the development of several products. These include Microsoft SQL Server 2005, Microsoft Office 2007 and Office 2010, Microsoft Live Search 2008, Microsoft Bing 2009 and Bing 2010. He has also been very active in the research communities and served or is serving the top conferences and journals. For example, in 2012, he is track co-chair of the web search track of WWW'12; senior program committee members or area chairs of WSDM'12, KDD'12, CIKM'12, ACML'12, AIRS'12; co-chair of KDD'12 summer school, etc.; and an editorial board member on the Journal of the American Society for Information Science, ACM Transaction on Intelligent Systems and Technology, and the Journal of Computer Science & Technology.

Abstract

Most of natural language processing (NLP) tasks, such as information retrieval, question answering, and machine translation, are based on matching between language expressions. This approach works quite well in practice; its limitation is also obvious, however. Sometimes mismatch between language expressions can occur. We argue that 'semantic matching' is an effective approach to overcome the challenge, that is to conduct more semantic analysis and perform matching between language expressions at semantic level. In this talk, I will first point out why semantic matching can help significantly enhance the performance of NLP. I will then justify my argument with some examples. More specifically, I will introduce our recent work on using machine learning techniques to construct models for semantic matching. These include latent space model for query document matching in search, string re-writing kernel for question answering, and deep matching model for short text conversation.

Proceedings of the Twenty-Sixth Conference on Computational Linguistics and Speech Processing ROCLING XXVI (2014)

TABLE OF CONTENTS

| | |
|---------------|---|
| Preface | i |
|---------------|---|

Oral Session 1: Speech and Speaker Recognition

運用概念模型化技術於中文大詞彙連續語音辨識之語言模型調適

| | |
|---|---|
| Po-Han Hao, Su-Cheng Chen and Berlin Chen | 1 |
|---|---|

探究新穎語句模型化技術於節錄式語音摘要

| | |
|--|---|
| Shih-Hung Liu, Kuan-Yu Chen, Yu-Lun Hsieh, Berlin Chen, Hsin-Min Wang, and Wen-Lian Hsu..... | 3 |
|--|---|

台灣情緒語料庫建置與辨識

| | |
|---|----|
| Bo Chang Chiou and Chia-Ping Chen | 21 |
|---|----|

Sparse Representation Based Speaker Identification

| | |
|--|----|
| Kuang-Yao Wang, and Jia-Ching Wang | 31 |
|--|----|

Oral Session 2: Speech Processing and Synthesis

利用核依賴估計來進行多軌自動混音之研究

| | |
|--|----|
| Tsung-Ting Wu and Chia-Hui Chang | 42 |
|--|----|

Research of Hakka Word Segmentation Processes on Chinese-to-Hakka's Text-to-Speech System

| | |
|--|----|
| Hsin-Wei Lin, Feng-Long Huang, Ming-Shing Yu, and Yih-Jeng Lin | 58 |
|--|----|

基於發音知識以建構頻譜 HMM 之國語語音合成方法

| | |
|---|----|
| Hung-Yan Gu, Ming-Yen Lai, Wei-Siang Hong, and Yan-Hua Chen | 78 |
|---|----|

| | |
|---|----|
| Some Prosodic Characteristics of Taiwan English Accent | |
| Chao-yu Su, Chiu-Yu Tseng, and Jyh-Shing Roger Jang | 89 |

Oral Session 3:Text mining

網頁商家名稱擷取與地址配對之研究

| | |
|--------------------------------------|----|
| Yu-Yang Lin and Chia-Hui Chang | 91 |
|--------------------------------------|----|

Public Opinion Toward CSSTA: A Text Mining Approach

| | |
|---------------------------------|----|
| Yi-An Wu and Shu-kai Hsieh..... | 94 |
|---------------------------------|----|

Towards Automatic Enrichment of Standardized Electronic Dictionaries by Semantic Classes

| | |
|--|----|
| Bilel GARGOURI, Imen ELLEUCH, and Abdelmajid Ben Hamadou | 96 |
|--|----|

Collaborative Ranking between Supervised and Unsupervised Approaches for Keyphrase
Extractionen

| | |
|--|-----|
| Gerardo Figueroa and Yi-Shin Chen..... | 110 |
|--|-----|

Oral Session 4:Natural Language Processing

Semantic Representation of Ellipsis in the Prague Dependency Treebanks

| | |
|----------------------|-----|
| Marie Mikulová | 125 |
|----------------------|-----|

Sketching the Dependency Relations of Words in Chinese

| | |
|--|-----|
| Shih Meng-Hsien and Shu-kai Hsieh..... | 139 |
|--|-----|

使用中文字筆畫構形資料庫校正字形相似之別字

| | |
|--|-----|
| Tao-Hsing Chang, Hsueh-Chih Chen, and Jian-Liang Zheng | 153 |
|--|-----|

學術論文簡介的自動文步分析與寫作提示

| | |
|--------------------------|-----|
| 黃冠誠 吳鑑城 許湘翎 顏孜曦 張俊盛..... | 163 |
|--------------------------|-----|

Poster Session:

以二維共振峰分布建立語者音色模型及其在語者驗證上之應用

| | |
|---|-----|
| Jia-Guu Leu, Jyh-Bin Shiau, Chang En Pu, Ming-Ching Lee, and Chia-Long Wu | 165 |
|---|-----|

Unsupervised Approach for Automatic Keyword Extraction from Arabic Documents

| | |
|-------------------------|-----|
| Arafat Atwi Awajan..... | 175 |
|-------------------------|-----|

Testing Distributional Hypothesis in Patent Translation

| | |
|--|-----|
| Hsin-Hung LIN and Yves Lepage | 185 |
| Spectrum Analysis of Cry Sounds in Preterm and Full-Term Infants | |
| Li-mei Chen, Yu-Hsuan Yang, Chyi-Her Lin, Yuh-Jyh Lin and Yung-Chieh Lin | 193 |
| Web-Based Recording and Visualization Framework for Moving Trajectories | |
| Po-An Yang, LiJung Chi, Kun-Ta Chuang, Seth Chen, Jonathan Tsai and Yung-Chung Ku | 204 |



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