

# Yun-Nung (Vivian) Chen

ASSISTANT PROFESSOR · NATIONAL TAIWAN UNIVERSITY

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## Education

### Carnegie Mellon University (CMU)

*Pittsburgh, PA*

M.S. & PH.D. IN COMPUTER SCIENCE – LANGUAGE AND INFORMATION TECHNOLOGIES

*2011 - 2015*

- GPA: 3.92/4.0; Received Graduate Research Fellowships.

### National Taiwan University (NTU)

*Taipei, Taiwan*

B.S. & M.S. IN COMPUTER SCIENCE AND INFORMATION ENGINEERING

*2005 - 2011*

- GPA: 4.0/4.0; Graduated with College Honors and received five Presidential Awards.

## Honors & Awards

### RESEARCH

- 2017 **NVIDIA GTC 2017 Best Scientific Research Award**, NVIDIA *San Jose, CA*
- 2017 **Google Faculty Research Awards 2016**, Google Research *Mountain View, CA*
- 2013 **Best Student Paper Award**, IEEE ASRU 2013 [1/ 170; < 0.6%] *Olomouc, Czech*
- 2013 **Best Poster Award**, CMU LTI SRS 2013 *Pittsburgh, U.S.A*
- 2012 **Best Student Paper Shortlist**, ISCA INTERSPEECH 2012 [10/ 1300; < 0.8%] *Portland, U.S.A*
- 2010 **Best Student Paper Award**, IEEE SLT 2010 [2/ 150; < 2%] *Berkeley, U.S.A.*
- 2011 **ACLCLP Thesis Award**, ACLCLP *Taipei, Taiwan*

### ACADEMIC

- 2011 **Phi Tau Phi Award**, Member of the Phi Tau Phi Scholastic Honor Society *Taipei, Taiwan*
- 2010 **Excellent Teaching Assistant Award**, NTU CSIE Dept. *Taipei, Taiwan*
- 2006–2009 **Presidential Award**, NTU CSIE Dept. (Spring'07, Fall'07, Spring'08, Fall'08, Spring'09) *Taipei, Taiwan*
- 2008 **Connected Life Special Prize**, Yahoo! 2008 Open Hack Day [1/42; <0.1%] *Taipei, Taiwan*

### SCHOLARSHIP

- 2013 **MOE Technologies Incubation Scholarship**, Ministry of Education *Taiwan*
- 2013 **Government Scholarship for Studying Abroad**, Ministry of Education *Taiwan*
- 2013 **The US Google Anita Borg Memorial Scholarship Finalist**, Google Inc. *U.S.A.*
- 2009–2011 **Advanced Speech Technologies Scholarship**, NTU EECS *Taipei, Taiwan*
- 2011–2015 **Graduate Research Fellowship**, CMU *Pittsburgh, U.S.A.*
- 2008 **Pen Wen Yuan Scholarship**, NTU EECS *Taipei, Taiwan*

## Experience

### National Taiwan University, Dept. Computer Science & Information Engineering

*Taipei, Taiwan*

ASSISTANT PROFESSOR / LEAD MACHINE INTELLIGENCE & UNDERSTANDING LABORATORY

*Aug. 2016 - Present*

- Multi-sense word representation: [6]
- Deep dialogue modeling: [3], [4], [7], [9]
- Deep abstract summarization: [8]

### Microsoft Research, Deep Learning Technology Center

*Redmond, U.S.A.*

POSTDOCTORAL RESEARCHER

*Feb. 2016 - Aug. 2016*

- Deep conversation understanding: [11], [1], [12], [14]
- Deep dialogue modeling: [5]

## Carnegie Mellon University, School of Computer Science

GRADUATE RESEARCH ASSISTANT

- Spoken language understanding: [13], [15], [17]–[20], [22], [24]
- Multi-party speech summarization: [23], [27], [28]
- Brain-enabled multimodal speech application: [25]

Pittsburgh, U.S.A.

Aug. 2011 - Dec. 2015

## Microsoft Research, Speech & Dialog Research Group

RESEARCH INTERN

- Intent modeling & understanding: [10], [16]
- Unsupervised relation detection: [21]

Mountain View, U.S.A

Summer 2014 & Summer 2015

## National Taiwan University, Digital Speech Processing Laboratory

GRADUATE RESEARCH ASSISTANT

- Key term extraction: [2], [26], [31]
- Speech summarization: [30]
- Spoken term detection: [29]

Taipei, Taiwan

Jul. 2009 - Aug. 2011

## Selected Publications

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### Journal Articles

- [1] Y.-N. Chen, D. Hakkani-Tur, G. Tur, A. Celikyilmaz, J. Gao, and L. Deng, "Knowledge as a teacher: Knowledge-guided structural attention networks," *ArXiv preprint arXiv:1609.03286*, 2016.
- [2] H.-Y. Lee, S.-R. Shiang, C.-F. Yeh, Y.-N. Chen, Y. Huang, S.-Y. Kong, and L. shan Lee, "Spoken knowledge organization by semantic structuring and a prototype course lecture system for personalized learning," *IEEE/ACM Transactions on Audio, Speech, and Language Processing (TASLP)*, vol. 22, no. 5, pp. 883–898, 2014.

### Peer-Reviewed Conference Papers

- [3] P.-C. Chen, T.-C. Chi, S.-Y. Su, and Y.-N. Chen, "Dynamic time-aware attention to speaker roles and contexts for spoken language understanding," in *Proceedings of 2017 IEEE Workshop on Automatic Speech Recognition and Understanding (ASRU)*, Dec. 2017.
- [4] T.-C. Chi, P.-C. Chen, S.-Y. Su, and Y.-N. Chen, "Speaker role contextual modeling for language understanding and dialogue policy learning," in *Proceedings of The 8th International Joint Conference on Natural Language Processing (IJCNLP)*, Nov. 2017.
- [5] B. Dhingra, L. Li, X. Li, J. Gao, Y.-N. Chen, F. Ahmed, and L. Deng, "Toward end-to-end reinforcement learning of dialogue agents for information access," in *Proceedings of The 55th Annual Meeting of the Association for Computational Linguistics (ACL)*, Jul. 2017.
- [6] G.-H. Lee and Y.-N. Chen, "MUSE: Modularizing unsupervised sense embeddings," in *Proceedings of The 2017 Conference on Empirical Methods in Natural Language Processing (EMNLP)*, Sep. 2017, pp. 327–337.
- [7] X. Li, Y.-N. Chen, L. Li, J. Gao, and A. Celikyilmaz, "End-to-end task-completion neural dialogue systems," in *Proceedings of The 8th International Joint Conference on Natural Language Processing (IJCNLP)*, Nov. 2017.
- [8] B. R. Lu, F. Shyu, Y.-N. Chen, H.-Y. Lee, and L.-S. Lee, "Order-preserving abstractive summarization for spoken content based on connectionist temporal classification," in *Proc. of 18th Annual Conference of the International Speech Communication Association (INTERSPEECH)*, ISCA, Aug. 2017.
- [9] X. Yang, Y.-N. Chen, D. Hakkani-Tur, P. Crook, X. Li, J. Gao, and L. Deng, "End-to-end joint learning of natural language understanding and dialogue manager," in *Proc. of Proceedings of The 42nd IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, IEEE, Mar. 2017.
- [10] Y.-N. Chen, D. Hakkani-Tür, and X. He, "Zero-shot learning of intent embeddings for expansion by convolutional deep structured semantic models," in *Proc. of The 41st IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, IEEE, Mar. 2016.
- [11] Y.-N. Chen, D. Hakkani-Tür, G. Tur, J. Gao, and D. Li, "End-to-end memory networks with knowledge carryover for multi-turn spoken language understanding," in *Proc. of The 17th Annual Meeting of the International Speech Communication Association (INTERSPEECH)*, Sep. 2016.
- [12] Y.-N. Chen, D. Hakkani-Tür, G. Tur, A. Celikyilmaz, J. Gao, and L. Deng, "Syntax or semantics? knowledge-guided joint semantic frame parsing," in *Proc. of 2016 IEEE Spoken Language Technology Workshop (SLT)*, IEEE, Dec. 2016.
- [13] Y.-N. Chen, M. Sun, A. I. Rudnicky, and A. Gershman, "Unsupervised user intent modeling by feature-enriched matrix factorization," in *Proc. of The 41st IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, IEEE, Mar. 2016.
- [14] D. Hakkani-Tur, G. Tur, A. Celikyilmaz, Y.-N. Chen, J. Gao, L. Deng, and Y.-Y. Wang, "Multi-domain joint semantic frame parsing using bi-directional RNN-LSTM," in *Proc. of 17th Annual Conference of the International Speech Communication Association (INTERSPEECH)*, ISCA, Sep. 2016.
- [15] M. Sun, Y.-N. Chen, and A. I. Rudnicky, "An intelligent assistant for high-level task understanding," in *Proc. of the 21st Annual Meeting of the Intelligent Interfaces Community (IUI)*, ACM, Mar. 2016.
- [16] Y.-N. Chen, D. Hakkani-Tür, and X. He, "Detecting actionable items in meetings by convolutional deep structured semantic models," in *Proc. of 2015 IEEE Workshop on Automatic Speech Recognition and Understanding (ASRU)*, IEEE, Dec. 2015, pp. 375–382.
- [17] Y.-N. Chen, M. Sun, A. I. Rudnicky, and A. Gershman, "Leveraging behavioral patterns of mobile applications for personalized spoken language understanding," in *Proc. of The 17th ACM International Conference on Multimodal Interaction (ICMI)*, ACM, Nov. 2015, pp. 83–86.

- [18] Y.-N. Chen, W. Y. Wang, A. Gershan, and A. I. Rudnicky, "Matrix factorization with knowledge graph propagation for unsupervised spoken language understanding," in *Proc. of the 53rd Annual Meeting of the Association for Computational Linguistics and The 7th International Joint Conference on Natural Language Processing of the Asian Federation of Natural Language Processing (ACL-IJCNLP)*, ACL, Jul. 2015, pp. 483–494.
- [19] Y.-N. Chen, W. Y. Wang, and A. I. Rudnicky, "Jointly modeling inter-slot relations by random walk on knowledge graphs for unsupervised spoken language understanding," in *Proc. of 2015 Conference of the North American Chapter of the Association for Computational Linguistics - Human Language Technologies (NAACL-HLT)*, ACL, May 2015, pp. 619–629.
- [20] Y.-N. Chen, W. Y. Wang, and A. I. Rudnicky, "Learning semantic hierarchy with distributional representations for unsupervised spoken language understanding," in *Proc. of 16th Annual Conference of the International Speech Communication Association (INTERSPEECH)*, ISCA, Sep. 2015, pp. 1869–1873.
- [21] Y.-N. Chen, D. Hakkani-Tür, and G. Tur, "Deriving local relational surface forms from dependency-based entity embeddings for unsupervised spoken language understanding," in *Proc. of 2014 IEEE Spoken Language Technology Workshop (SLT)*, IEEE, Dec. 2014, pp. 242–247.
- [22] Y.-N. Chen and A. I. Rudnicky, "Dynamically supporting unexplored domains in conversational interactions by enriching semantics with neural word embeddings," in *Proc. of 2014 IEEE Spoken Language Technology Workshop (SLT)*, IEEE, Dec. 2014, pp. 590–595.
- [23] Y.-N. Chen and F. Metze, "Multi-layer mutually reinforced random walk with hidden parameters for improved multi-party meeting summarization," in *Proc. of The 14th Annual Conference of the International Speech Communication Association (INTERSPEECH)*, ISCA, Aug. 2013, pp. 485–489.
- [24] Y.-N. Chen, W. Y. Wang, and A. I. Rudnicky, "Unsupervised induction and filling of semantic slots for spoken dialogue systems using frame-semantic parsing," in *Proc. of 2013 IEEE Workshop on Automatic Speech Recognition and Understanding (ASRU)*, IEEE, Dec. 2013, pp. 120–125.
- [25] Y.-N. Chen, K.-M. Chang, and J. Mostow, "Towards using EEG to improve asr accuracy," in *Proc. of The 2012 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies (NAACL-HLT)*, ACL, Jun. 2012, pp. 382–385.
- [26] Y.-N. Chen, Y. Huang, H.-Y. Lee, and L.-S. Lee, "Unsupervised two-stage keyword extraction from spoken documents by topic coherence and support vector machine," in *Proc. of The 37th International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, IEEE, Mar. 2012, pp. 5041–5044.
- [27] Y.-N. Chen and F. Metze, "Intra-speaker topic modeling for improved multi-party meeting summarization with integrated random walk," in *Proc. of The 2012 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies (NAACL-HLT)*, ACL, Jun. 2012, pp. 377–381.
- [28] Y.-N. Chen and F. Metze, "Two-layer mutually reinforced random walk for improved multi-party meeting summarization," in *Proc. of The 4th IEEE Workshop on Spoken Language Technology (SLT)*, IEEE, Dec. 2012, pp. 461–466.
- [29] Y.-N. Chen, C.-P. Chen, H.-Y. Lee, C.-A. Chan, and L.-S. Lee, "Improved spoken term detection with graph-based re-ranking in feature space," in *Proc. of The 36th International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, IEEE, May 2011, pp. 5644–5647.
- [30] Y.-N. Chen, Y. Huang, C.-F. Yeh, and L.-S. Lee, "Spoken lecture summarization by random walk over a graph constructed with automatically extracted key terms," in *Proc. of The 12th Annual Conference of the International Speech Communication Association (INTERSPEECH)*, ISCA, Aug. 2011, pp. 933–936.
- [31] Y.-N. Chen, Y. Huang, S.-Y. Kong, and L.-S. Lee, "Automatic key term extraction from spoken course lectures using branching entropy and prosodic/semantic features," in *Proc. of The 3rd IEEE Workshop on Spoken Language Technology (SLT)*, IEEE, Dec. 2010, pp. 265–270.

## Professional Talks

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### TUTORIALS

- Aug 2017 **Interspeech, Tutorial Speaker**, Deep Learning for Dialogue Systems (150 registered attendees) *Stockholm, Sweden*  
 Jul 2017 **ACL, Tutorial Speaker**, Deep Learning for Dialogue Systems (250 registered attendees) *Vancouver, Canada*  
 Mar 2017 **ICASSP, Tutorial Speaker**, Deep Learning for Dialogue Systems *New Orleans, LA*

### INVITED TALKS

- Aug 2017 **Facebook, Invited Speaker**, How the Context Matters Language and Interaction in Dialogues *Seattle, WA*  
 Aug 2017 **Amazon, Invited Speaker**, How the Context Matters Language and Interaction in Dialogues *Seattle, WA*  
 May 2017 **Google Research, Invited Speaker**, How the Context Matters Language and Interaction in Dialogues *Mountain View, CA*  
 May 2017 **University of California, Santa Babara, Invited Colloquium Speaker**, Deep Learning for Dialogue Systems *Santa Babara, CA*  
 Jul 2016 **Google Research, Invited Speaker**, Contextual Spoken Language Understanding *Mountain View, CA*  
 Jul 2016 **Appier Inc., Invited Speaker**, Conversational / Dialogue System *Taipei, Taiwan*  
 Jan 2016 **National Taiwan University, Invited Speaker**, Unsupervised Learning and Modeling of Knowledge and Intent for Spoken Dialogue Systems *Taipei, Taiwan*  
 Jan 2016 **National Tsing Hua University, Invited Colloquium Speaker**, "Sorry, I didn't get that!" – Statistical Learning from Dialogues for Intelligent Assistants *Hsinchu, Taiwan*

Nov 2015	<b>Microsoft Research, Invited Speaker</b> , Unsupervised Learning and Modeling of Knowledge and Intent for Spoken Language Understanding	<i>Redmond, WA</i>
Nov 2015	<b>VoiceBox Tech., Invited Speaker</b> , Unsupervised Learning and Modeling of Knowledge and Intent from Dialogues	<i>Redmond, WA</i>
Oct 2015	<b>National Taiwan University, Invited Colloquium Speaker</b> , “Sorry, I didn’t get that!” – Statistical Learning from Dialogues for Intelligent Assistants	<i>Taipei, Taiwan</i>
Oct 2015	<b>Academic Sinica, Invited Speaker</b> , Ontology Learning and Intent Modeling for Spoken Language Understanding	<i>Taipei, Taiwan</i>
Jul 2015	<b>Microsoft Research Asia, Invited Speaker</b> , Matrix Factorization with Knowledge Graph Propagation for Unsupervised Spoken Language Understanding	<i>Beijing, China</i>
Aug 2015	<b>Microsoft Research, Intern Presenter</b> , Detecting Actionable Items in Meetings by Convolutional Deep Structured Semantic Models	<i>Redmond, WA</i>
May 2015	<b>Microsoft Research, Invited Speaker</b> , Unsupervised Learning and Modeling of Knowledge and Intent for Dialogue Systems	<i>Mountain View, CA</i>
May 2015	<b>New York University, Invited Speaker</b> , Unsupervised Learning and Modeling of Knowledge and Intent for Dialogue Systems	<i>New York, NY</i>
Jan 2015	<b>National Chiao Tung University, Invited Speaker</b> , Unsupervised Learning and Modeling of Knowledge and Intent for Dialogue Systems	<i>Hsinchu, Taiwan</i>

## Professional Activities

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### AREA CHAIR

*2017 - Present*

- North American Chapter of the Association for Computational Linguistics: Human Language Technologies (NAACL-HLT) – 2018

### PROGRAM COMMITTEE

*2014 - Present*

- Association for Computational Linguistics (ACL) – 2016, 2017
- Empirical Methods in Natural Language Processing (EMNLP) – 2015, 2016, 2017
- North American Chapter of the Association for Computational Linguistics: Human Language Technologies (NAACL-HLT) – 2016
- AAAI Conference on Artificial Intelligence (AAAI) – 2017, 2018
- Automatic Speech Recognition Understanding (ASRU) – 2017
- Neural Information Processing Systems (NIPS) – 2016
- International Speech Communication Association (INTERSPEECH) – 2016, 2017
- International Conference on Acoustics, Speech, and Signal Processing (ICASSP) – 2016, 2017
- Spoken Language Technology (SLT) – 2014, 2016
- Computational Linguistics (COLING) – 2016
- Language Resources and Evaluation (LREC) – 2016
- International Conference on Multimodal Interaction (ICMI) – 2015
- International Conference on Data Mining (ICDM) – 2016
- NIPS-SLU – 2015
- MASC-SLL – 2015

### JOURNAL REVIEWER

*2013 - Present*

- IEEE/ACM Transactions on Audio, Speech and Language Processing: 2013, 2014, 2015, 2016, 2017
- Transactions of the Association for Computational Linguistics: 2015
- Artificial Intelligence Review: 2015
- International Journal on Artificial Intelligent Tools: 2014, 2015, 2016