Asli Celikyilmaz

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h-index: 20 i10-index: 35 Citations : 1545 (as of June 2018)

Employment

Senior Researcher, Microsoft Research
09/2016 – Present
Neural Methods for text generation, and language understanding

Senior Research Scientist, Microsoft Bing
09/2010 – 09/2016
Language understanding and policy learning for conversational dialog systems

Postdoctoral Research Employee, University of California, Berkeley
09/2008 – 09/2010
Question answering, textual entailment, topic models for document summarization

*Research Assistant**,** University of Toronto*
09/2003 – 09/2008
Software risk analysis, credit worthiness analysis, ontology engineering

Machine Learning and Data Scientist, Information Intelligence, Co. Toronto
09/2002 – 09/2004
Building data mining and machine learning software

Education

Post-Doctorate Research, Computer Science, University of California, Berkeley
05/2008 - 10/2010
Probabilistic Graphical Models with applications to question answering, textual entailment and multi-document summarization

Ph.D., Information Science, University of Toronto
05/2005 - 10/2008
Uncertainty modeling with evolutionary functions.

Master of Applied Science, Information Science, University of Toronto
01/2003 - 05/2005
Ontology engineering and applications of soft computing.

Computer Programming and Analysis, Information Science, Seneca College
01/2000 - 05/2002
Enterprise web applications.

Bachelor of Applied Science, Industrial Engineering, Istanbul Technical University
09/1993 - 06/1997
Multi-objective decision making.

Honors and Awards

- Best Paper Award, IEEE Int. Conference on Semantic Computing, Berkeley, 2009.
- Postdoctoral Fellowship from British Telecom University of California, Berkeley, 2008-2010.
- NSERC - Natural Science and Engineering Research Council of Canada, Postdoctoral Fellowship (PDF), 2008-2010.
- NSERC - Natural Science and Engineering Research Council, Graduate Scholarships and Fellowships, PGSD2, 2007-2009.
- OGS-Ontario Graduate Scholarships in Science and Technology, Ph.D., 2007-2008.
- Ph.D. Fellowship, University of Toronto, 2005-2008.
- Student Travel Grant from IEEE Computational Intelligence Society, 2007.
- Best Paper Award, North American Fuzzy Information Processing Society, 2007.
- Ontario, Canada Graduate Scholarship in Science and Tech. (OGS-ST), 2006-2007.
- Research Assistantship Support, University of Toronto, 2005-2006.
- Master of Science Fellowship, University of Toronto, 2004-2005.
- Research Assistantship Support, University of Toronto, 2004-2005
- Full Grant for Undergraduate Study, ISTEK Foundation (Turkey), 1993-1997

Recent Publications

1. *Reinforced Latent Variable Models for Dialog Generation*
   Asli Celikyilmaz, Antoine Bosselut, Yejin Choi
   In preparation, 2018
2. *Hierarchically Reinforcement Learning for Topically Coherent Visual Story Generation*
   Qiuyuan Huang, Zhe Gan, Asli Celikyilmaz, Dapeng Wu, and Xiaodong He,
   Arxiv preprint, 2018
3. *Deep Communicating Agents for Abstractive Summarization*
   Asli Celikyilmaz, Antoine Bosselut, and Xiaodong He, Yejin Choi,
   NAACL 2018
4. *Learning and analyzing vector encoding of symbolic representations*
   Roland Fernandez, Asli Celikyilmaz, Rishabh Singh, Paul Smolensky
   ICLR 2018
5. *Discourse-Aware Neural Rewards for Coherent Text Generation*
   Antoine Bosselut, Asli Celikyilmaz, and Xiaodong He, Jianfeng Gao, Po-Sen Huang, Yejin Choi
   NAACL 2018

6. *Deep Learning for Spoken and Text Dialog Systems*
   Asli Celikyilmaz, Li Deng, Dilek Hakkani-Tur
   Springer, Book Chapter, 2018.
7. *Deep Learning in Conversational Language Understanding*
   Gokhan Tur, Asli Celikyilmaz, Xiaodong He, Dilek Hakkani-Tur, Li Deng
   Springer, Book Chapter, 2018.
8. *End-to-End Task-Completion Neural Dialogue Systems*
   Xiujun Li, Yun-Nung Chen, Lihong Li, Jianfeng Gao, Asli Celikyilmaz
   IJCNLP 2017
9. *Composite Task-Completion Dialogue Policy Learning via Hierarchical Deep Reinforcement Learning*
   Baolin Peng, Xiujun Li, Lihong Li, Jianfeng Gao, Asli Celikyilmaz, Sungjin Lee, Kam-Fai Wong
   EMNLP 2017
10. *Spoken language understanding and interaction: machine learning for human-like conversational systems*
    Milica Gasic, Dilek Hakkani-Tur, Asli Celikyilmaz
    Computer Speech and Language, 2017
11. *Investigation of Language Understanding Impact for Reinforcement Learning Based Dialogue Systems*
    Xiujun Li, Yun-Nung Chen, Lihong Li, Jianfeng Gao, Asli Celikyilmaz
    arXiv preprint, March 21, 2017
12. *Scaffolding Networks for Teaching and Learning to Comprehend*
    Asli Celikyilmaz, Li Deng, Lihong Li, Chong Wang
    arxiv preprint, February 28, 2017
13. *Associative Adversarial Networks*
    Tarik Arici, Asli Celikyilmaz
    NIPS 2016 Workshop on Generative Adversarial Networks
14. *Syntax or Semantics? Knowledge-Guided Joint Semantic Frame Parsing*
    Yun-Nung (Vivian) Chen, Dilek Hakkani-Tur, Gokhan Tur, Asli Celikyilmaz, Jianfeng Gao, Li Deng
    SLT 2016 (IEEE Workshop on Spoken Language Technology)
15. *An Overview of End-to-End Language Understanding and Dialog Management for Personal Digital Assistants*
    Ruhi Sarikaya, Paul A. Crook, Alex Marin, Minwoo Jeong, Jean-Philippe Robichaud, Asli Celikyilmaz, Young-Bum Kim, Alexandre Rochette, Omar Z. Khan, Xiaohu Liu, et.al.
    SLT 2016 (IEEE Workshop on Spoken Language Technology)
16. *Intent Detection using Semantically Enriched Word Embeddings*
    Joo-Kyung Kim, Gokhan Tur, Asli Celikyilmaz, Bin Cao, Ye-Yi Wang
    SLT 2016 (IEEE Workshop on Spoken Language Technology)
17. *Knowledge as a Teacher: Knowledge-Guided Structural Attention Networks*
    Yun-Nung Chen, Dilek Hakkani-Tur, Gokhan Tur, Asli Celikyilmaz, J. Gao, Li Deng
    arXiv preprint September 12, 2016

18. *A New Pre-training Method for Training Deep Learning Models with Application to Spoken Language Understanding*
    Asli Celikyilmaz, Ruhi Sarikaya, Dilek Hakkani-Tür, Xiaohu Liu, Nikhil Ramesh, et.al.
    Interspeech 2016
19. *Multi-Domain Joint Semantic Frame Parsing using Bi-directional RNN-LSTM*
    Dilek Hakkani-Tür, Gokhan Tur, Asli Celikyilmaz, Yun-Nung Vivian Chen, Jianfeng Gao, Li Deng, Ye-Yi Wang
    Interspeech 2016
20. *Task Completion Platform: A self-serve multi-domain goal oriented dialogue platform*
    Paul A. Crook, Alex Marin, V. Agarwal, K. Aggarwal, T. Anastasakos, R. Bikkula, D. Boies, Asli Celikyilmaz, S. Chandramohan, Z. Feizollahi, R. Holenstein, M. Jeong, et. al.
    ACL 2016
21. *Natural Language Understanding for Partial Queries*
    Xiaohu Li, Asli Celikyilmaz, Ruhi Sarikaya
    ICASSP 2015
22. *Convolutional Neural Network Based Semantic Tagging with Entity Embeddings*
    Asli Celikyilmaz, Dilek Hakkani-Tur
    NIPS 2015
23. *Investigation of ensemble models for sequence learning*
    Asli Celikyilmaz, Dilek Hakkani-Tur
    ICASSP 2015
24. *Enriching Word Embeddings Using Knowledge Graph for Semantic Tagging in Conversational Dialog Systems*
    Asli Celikyilmaz, Dilek Hakkani-Tur, Panupong Pasupat and Ruhi Sarikaya
    AAAI 2015
25. *A Toolkit for Building Conversational Understanding Models using Semantic Graphs*
    (Demo) Dilek Hakkani-Tur, Asli Celikyilmaz and Geoff Zweig
    SLT-2014
26. *Resolving Referring Expressions in Conversational Dialogs for Natural User Interfaces*
    Asli Celikyilmaz, Zhaleh Feizollahi, Dilek Hakkani-Tur and Ruhi Sarikaya
    EMNLP 2014
27. *Eye Gaze for Spoken Language Understanding in Multi-Model Conversational Interactions*
    Dilek Hakkani-Tur, Malcolm Slaney, Asli Celikyilmaz, Larry Heck
    ICMI 2014
28. *No Evidence Left Behind: Understanding Semantics in Dialogs using Relational Evidence Based Learning*
    Asli Celikyilmaz, Dilek Hakkani-Tur and Minwoo Jeong
    PMLC 2014
29. *A Variational Bayesian Model for User Intent Detection*
    Yangfeng Ji, Dilek Hakkani-Tur, Asli Celikyilmaz, Larry Heck, Gokhan Tur
    ICASSP 2014

30. *Semi-Supervised Semantic Tagging for Conversational Understanding Using Markov Topic Regression*
    Asli Celikyilmaz, Dilek Hakkani-Tur, Gokhan Tur, Ruhi Sarikaya
    ACL 2013
31. *Learning to Relate Literal and Sentimental Descriptions of Visual Properties*
    Mark Yatskar, Svitlana Volkova, Asli Celikyilmaz, Bill Dolan, Like Zettlemoyer
    NAACL-HLT 2013
32. *IsNL? A Discriminative Approach to Detect Natural Language Like Queries for Conversational Understanding*
    Asli Celikyilmaz, Gokhan Tur, Dilek Hakkani-Tur
    Interspeech 2013
33. *Discovering New User Intents from Search Query Logs for Spoken Language Understanding*
    Dilek Hakkani-Tur, Asli Celikyilmaz, Larry Heck, Gokhan Tur
    Interspeech 2013
34. *Easy Contextual Intent Prediction and Slot Detection*
    Aditya Bhargava, Asli Celikyilmaz, Dilek Hakkani-Tur, Ruhi Sarikaya
    ICASSP 2013
35. *Latent Semantic Modeling for Slot Filling in Conversational Understanding*
    Gokhan Tur, Asli Celikyilmaz, Dilek Hakkani-Tur
    ICASSP 2013
36. *Weakly Supervised Approach for Building Conversational Interaction System*
    Dilek Hakkani-Tur, Asli Celikyilmaz, Gokhan Tur, Larry Heck
    MSR-ML-SUMMIT 2013
37. *A Joint Model for Discovery of Aspects in Utterances*
    Asli Celikyilmaz, Dilek Hakkani-Tür
    ACL 2012
38. *Mining Search Query Logs for Spoken Language Understanding*
    Dilek Hakkani-Tur, Gokhan Tur, Asli Celikyilmaz
    NAACL 2012 (Workshop on Future Directions and Needs in the Spoken Dialog Comm.)
39. *A Discriminative Classification-Based Approach to Information State Updates for a Multi-Domain Dialog System*
    Dilek Hakkani-Tür, Gokhan Tür, Larry Heck, Ashley Fidler, Asli Celikyilmaz
    Interspeech 2012
40. *Statistical Semantic Interpretation Modeling for Spoken Language Understanding with Enriched Semantic Features*
    Asli Celikyilmaz, Dilek Hakkani-Tür, Gokhan Tür
    SLT 2012
41. *An Overview of Speech and Related Papers @ACL 2012*
    Asli Celikyilmaz
    IEEE Spoken Language Technologies (SLT) Newsletter, 2012.

42. *Leveraging Web Query Logs to Learn User Intent via Bayesian Latent Variable Model*
Asli Celikyilmaz, Dilek Hakkani-Tur, Gokhan Tur
ICML 2011 (Workshop on Combining Learning Strategies to Reduce Label Cost)

43. *Discovery of Topically Coherent Sentences for Extractive Summarization*
Asli Celikyilmaz, Dilek Hakkani-Tur
ACL 2011

44. *Exploiting Distance Based Similarity in Topic Models for User Intent Detection*
Asli Celikyilmaz, Dilek Hakkani-Tur, Gokhan Tur, Ashley Fidler, Dustin Hillard
ASRU 2011

45. *Employing Web Search Query Click Logs for Multi-Domain Spoken Language Understanding*
Dilek Hakkani-Tür, Gokhan Tur, Larry Heck, Asli Celikyilmaz, Ashley Fidler, Dustin Hillard, Rukmini Iyer, S. Parthasarathy
ASRU 2011

46. *Multi-Domain Spoken Language Understanding with Approximate Inference*
Asli Celikyilmaz, Dilek Hakkani-Tür, Gokhan Tur
Interspeech 2011

47. *Learning Weighted Entity Lists from Web Click Logs for Spoken Language Understanding*
Dustin Hillard, Asli Celikyilmaz, Dilek Hakkani-Tür, Gokhan Tur
Interspeech 2011

48. *Towards Unsupervised Spoken Language Understanding: Exploiting Query Click Logs for Slot Filling*
Gokhan Tur, Dilek Hakkani-Tür, Dustin Hillard, Asli Celikyilmaz
Interspeech 2011

49. *Concept-based Classification for Multi-Document Summarization*
Asli Celikyilmaz, Dilek Hakkani-Tür
ICASSP 2011

50. *The Actor-Topic Model for Extracting Social Networks in Literary Narrative*
Asli Celikyilmaz, Dilek Hakkani-Tur, Hua He, Grzegorz Kondrak, Denilson Barbosa
NIPS 2010 (Workshop on Machine Learning for Social Computing Workshop)

51. *A Hybrid Hierarchical Model for Multi-Document Summarization*
Asli Celikyilmaz, Dilek Hakkani-Tür
ACL 2010

52. *LDA Based Similarity Modeling for Question Answering*
Asli Celikyilmaz, Dilek Hakkani-Tür, and Gokhan Tur
NAACL-HLT 2010 (Workshop on Semantic Search)

53. *A Graph-Based Semi-Supervised Learning for Question Semantic Labeling*
Asli Celikyilmaz, Dilek Hakkani-Tür
NAACL-HLT 2010 (Workshop on Semantic Search)

54. *Semantic Question Answering System with Topic Models*
Asli Celikyilmaz
NIPS 2010 (Workshop on Applications of Topic Models : Text and Beyond)

55. *Extractive Summarization using A Latent Variable Model*
    Asli Celikyilmaz, Dilek Hakkani-Tür
    Interspeech 2010
56. *Probabilistic Model-Based Sentiment Analysis of Twitter Messages*
    Asli Celikyilmaz, Dilek Hakkani-Tür, Junlan Feng
    SLT 2010
57. *Decision Making With Imprecise Parameters*
    Asli Celikyilmaz, I. Burhan Turksen
    IJAR 2010 (International Journal of Approximate Reasoning)
58. *Information Extraction From Text - Dealing With Imprecise Data*
    Asli Celikyilmaz, I. Burhan Turksen
    INTECH 2010 - Book Chapter.
59. *A Graph-based Semi-Supervised Learning for Question Answering*
    Asli Celikyilmaz, Marcus Thint, Zhiheng Huang
    ACL 2009
60. *Investigation of Question Classifier in Question Answering*
    Zhiheng Huang, Marcus Thint, Asli Celikyilmaz
    EMNLP 2009
61. *Accurate Semantic Class Classifier for Coreference Resolution*
    Zhiheng Huang, Guangping Zeng, W. Xu, Asli Celikyilmaz
    EMLNP 2009
62. *Soft-Link Spectral Clustering for Information Extraction*
    Asli Celikyilmaz
    ICSC 2009 (Third IEEE Int. Conf. on Semantic Computing)
    Winner of Best Paper Award*
63. *Graph-Based Semi-Supervised Learning for Learning Semantic Relations from Text*
    Asli Celikyilmaz
    NIPS 2009 (Women in Machine Learning Workshop)
64. *Spectral Learning with Type-2 Fuzzy Numbers for Question/Answering System*
    Asli Celikyilmaz, I. Burhan Turksen
    IFSA 2009 (World Congress EUSFLAT Conference, 2009)
65. *Kernel Based Hybrid Fuzzy Clustering for Non-Linear Fuzzy Classifiers*
    Asli Celikyilmaz, I.Burhan Turksen
    NAFIPS 2009 (Int. Conf. on North American Fuzzy Inf. Processing Society Annual Conf.)
66. *Modeling Uncertainty with Fuzzy Logic: With Recent Theory and Applications*
    Asli Celikyimaz, I. Burhan Turksen
    Springer Book 2009
67. *A Soft Link Spectral Model for Link Prediction*
    Asli Celikyilmaz
    International Journal of Semantic Computing 3:4 2009
68. *Genetic Fuzzy System Based on Improved Fuzzy Functions*
    Asli Celikyilmaz, I. Burhan Turksen

Journal of Computers 4:2 2009

69. *Increasing Accuracy of Two Class Pattern Recognition with Improved Fuzzy Functions*
Asli Celikyilmaz, I. Burhan Turksen
Expert Systems with Applications, volume 36, 2009

70. *Semantic Approach to Text Entailment for Question Answering*
Asli Celikyilmaz, Marcus Thint
ICCI 2008 (IEEE Intern. Conf. on Cognitive Informatics)

71. *Type-2 Fuzzy Classifier Ensembles for Text Entailment*
Asli Celikyilmaz, I. Burhan Turksen
JCIS 2008 (Joint Conference on Information Sciences

72. *Uncertainty Bounds of Fuzzy C-Regression Method*
Asli Celikyilmaz, I. Burhan Turksen
WCCI 2008 (IEEE Int. Conf. on Fuzzy Systems-World Congress on Comp. Intelligence)

73. *Genetic Type-2 Fuzzy Classifier Functions*
Asli Celikyilmaz, I. Burhan Turksen
NAFIPS 2008 (Int. Conf. of North American Fuzzy Information Processing Society Annual Conf.)

74. *A Type-2 Fuzzy C-regression Method*
Asli Celikyilmaz, I. Burhan Turksen
IPMU 2008 (Int. Conf. on Information Processing and Management of Uncertainty in Knowledge-Based Systems)

75. *A New Classifier Design with Fuzzy Functions*
Asli Celikyilmaz, I. Burhan Turksen
RSKT 2007 (Int. Conf. on Rough Sets and Knowledge Technology)

76. *Evolution of Fuzzy System Models: An Overview and New Directions*
Asli Celikyilmaz, I. Burhan Turksen
RSKT 2007 (Int. Conf. on Rough Sets and Knowledge Technology)

77. *Type 2 Fuzzy System Models with Improved Fuzzy Functions*
Asli Celikyilmaz, I. Burhan Turksen
NAFIPS 2007 (Int. Conf. of North American Fuzzy Information Processing Society)
Winner of Best Student Paper Award*

78. *Evolutionary Fuzzy System Models with Improved Fuzzy Functions and Its Application to Industrial Process*
Asli Celikyilmaz, I. Burhan Turksen
IEEE-SMC 2007 (IEEE Int. Conf. on Systems, Man, Cybernetics)

79. *Improved Interval Valued Fuzzy Reasoning with Evolutionary Computing*
Asli Celikyilmaz, I. Burhan Turksen
JCIS (Int. Conf. on Fuzzy Theory & Technology)

80. *A New Cluster Validity Index with Fuzzy Functions*
Asli Celikyilmaz and I. Burhan Turksen
IFSA 2007 (Proc. of Int. Fuzzy Systems Association - World Congress EUSFLAT Conf.)

81. *Validation Criteria for Enhanced Fuzzy Clustering*
    Asli Celikyilmaz, I. Burhan Turksen
    Pattern Recognition Letters 29, 2008.
82. *Uncertainty modeling with evolutionary improved fuzzy functions approach*
    Asli Celikyilmaz, I. Burhan Turksen
    IEEE Systems, Man, and Cybernetics- Part B 38:4 2008.
83. *Enhanced Fuzzy System Models with Improved Fuzzy Clustering Algorithm*
    Asli Celikyilmaz, I. Burhan Turksen
    IEEE Transactions on Fuzzy Systems 16:3 2008.
84. *Fuzzy Functions with Support Vector Machines*
    Asli Celikyilmaz, I. Burhan Turksen
    Information Sciences, 177 2007.
85. *Comparison of Fuzzy Functions with Fuzzy Rule Bases*
    Asli Celikyilmaz, I. Burhan Turksen
    International Journal of Fuzzy Systems, 8:3 2006.

Invited Talks

1. Invited Talk ICML Workshop on Exploration in Reinforcement Learning, 2018.
2. Invited Talk NIPS Workshop on Conversational AI, 2017.
3. Panelist at NIPS Workshop on Conversational AI, 2017.
4. *Intelligent Personal Assistants and Signal Processing Challenges*, IEEE Signal Processing Society Santa Clara Valley Chapter, November 2014.
5. *Language Understanding*, Machine Learning Summer School, UC Santa Cruz, 2012.
6. *Conversational Understanding*, BISC Lab in Computer Science, UC Berkeley, 2011.
7. *Question Answering Made Easy*, Int. Computer Science Institute, Berkeley, 2010.
8. *Question Answering Effort in BISC Lab* IEEE Int. Conf. Semantic Computing, Stanford, CA, 2009.

Teaching Experience

1. Tutorial on Next Generation Conversational AI, COLING 2018.
2. Tutorial on Deep Learning for Conversational Dialog Systems, ACL 2017.
3. Tutorial on Deep Learning for Conversational Dialog Systems, Interspeech 2017.
4. Tutorial on Deep Learning for Conversational Dialog Systems, ICASSP 2017.
5. TA for “Knowledge Modeling and Management”, Univ. of Toronto, 2007.
6. TA for “Data Modeling”, University of Toronto, 2006.
7. TA for “Decision Analysis”, University of Toronto, 2005.
8. TA Training Program, a year-long peer-training program, 2006.
9. Supervised 2 Undergraduate Students, University of Toronto, 2005-2006.
10. TA for “Database Design and Modeling with Oracle”, Seneca College, 2001.

Interns Mentored

1. *Amr Sharaf*, University of Maryland, summer 2018
   Learning from Multi-Agents via Imitation Learning
2. *Elizabeth Clark*, University of Washington, summer 2018
   Evaluation for Text Generation
3. *Dinghan Shen*, Duke University, summer 2018
   Hierarchical Latent Variable Models for Text Generation
4. *Antoine Bosselut*, University of Washington, summer 2017, winter+ summer 2018
   Learning Neural Reward Functions for Text Generation.
5. *Baolin Peng*, Chinese University of Hong Kong, winter 2017
   Dialog Policy Learning with Hierarchical Reinforcement Learning
6. *Joo-Kyung Kim*, Ohio State University, summer 2016
   Intent Classification using Semantically Enriched Word Embeddings
7. *Yangfeng Ji*, Georgia Tech, summer 2013
   Latent Variable Models of Intent Detection
8. *Young-Bum Kim*, University of Wisconsin, Madison, summer 2013
   Task Dependent Word Embeddings for Slot Filling in Conversational Understanding
9. *Aditya Bhargava*, University of Toronto, summer 2012
   Context Analysis for Conversational Dialog.
10. *Svitlana Volkova*, John Hopkins University, summer 2011
    Sentiment Analysis in Conversational Text

Professional Activities

11. Transactions of ACL (TACL) Area Editor, selected in 2017-2019.
12. Elected SLTC Member, for the term of 2017-2020.
13. Senior Area Chair for AAAI 2018.
14. Senior Area Chair for Dialog and Interactive Systems for ACL 2018.
15. Area Chair for Discourse and Generation at IJCNLP 2017.
16. NIPS 2015 Workshop organizer: SLU and Interaction 1-day workshop.
17. Local Organization Chair of Spoken Language Technologies, SLT 2014.
18. Area Chair for Dialog and Interactive Systems at ACL 2014, NAACL 2016.
19. Co-Chair for the NAFIPS Soft Computing Conference in Berkeley, CA, 2012
20. Program Committee member for:
    - Association of Computational Linguistics (ACL) 2012-2018
    - North American Computational Linguistics (NAACL) 2010-2018
    - Special Interest Group on Discourse and Dialog (SIGDIAL) 2014
    - Int. Conf. on Computational Linguistics (COLING) 2014
    - Neural Information Processing Systems (NIPS) 2012-2018
    - Annual Conf. of the Int. Speech Communication Association, 2010-2016
    - IEEE Int. Conf. on Acoustics, Speech and Signal Processing (ICASSP) 2012-2013
    - IEEE Workshop on Spoken Language Technology, 2010-2014
2. Int. Conf. on Semantic Computing (ISCS) 2010-2013 - ACL Student Research Workshop and Mentorship 2013-2014.

Research Projects

1. *Neural Methods for Structural Learning @ Microsoft Research*

Build novel approaches with deep reinforcement learning for long form text generation. Defined new neural metrics to evaluate semantic similarity of two long text (e.g., list of instructions, or a paragraph). Designed a new framework for using multi-agent learning for building sequence-to-sequence structural learning. Worked on hierarchically structured structural learning for decoding stories, which is a novel approach to define "planning" in creative writing task. Leading a SIP 2018 project on Hierarchical Multi-Agent Learning methods for sequence to sequence learning. Ref: [NAACL 2018] [ACL 2018]

2. *Reinforcement Learning for Dialog for Cortana @ Microsoft Research*

Worked with the Cortana Sciences team on the dialog language understanding models with the goal of building reinforcement learning based dialog policy learning system combined with a deep learning-based language understanding. Also advised Cortana team's LU scientists on building LU models using deeper NN architectures and they use my Deep Language Understanding Modelling code. Ref: [EMNLP 2017]

3. *Language Understanding from Unstructured Text @ Microsoft Research*

Worked on automatic tools to convert unstructured data into machine readable and structured format. Implemented a new interactive learning approach, called scaffolding learning, that uses instructional scaffolding teaching for student neural agents by repetitive questioning, which systematically builds on students' experiences and knowledge as they are learning new 12 skills. This new deep architecture uses a dynamic memory and learns the information from the text through questioning analogous to scaffolding teaching. Our empirical results showed improvements over supervised learning methods proving the importance of using reinforcement learning for reasoning task. Ref: [arxiv preprint, 2017]

4. *Deep Conversational Understanding @ Microsoft Bing*

Built a new end-to-end scalable conversational understanding tool using Tensorflow. Worked with a team of applied scientists and developers for embedding the neural models into the Bing's platform. Investigated scalable cold start modelling for Bing Query Understanding. Built and supported the query understanding models for handling 2016 Summer Olympics queries. Worked on neural models to improve and enrich common sense knowledge with rich context that is beyond-Ngrams. These features improved the prediction accuracy of the query understanding models in production. Ref: [SLT 2016][Interspeech 2016]

5. *Referring Expression Resolution @ Microsoft Bing*

Built an entirely new locale independent on-screen item resolution model for Cortana. The tool is injected into the Cortana's Dialog pipeline as a new module. Also, built a feature engineering tool for finding similarity between an utterance and a subscript text item user sees on the X-Box or Cortana Screen. Extended the tool for other locales and languages. REF: [EMNLP 2014]

6. Multi-Lingual Multi-Turn Conversational Understanding @ Microsoft Bing

Built a pipeline for building scalable conversational understanding (CU) model for different languages that uses joint features learnt from multi-language datasets as well as contextual information from dialog history. The CU models built through this pipeline are shipped as part of Xbox's Language expansion pipeline. Built a new annotator evaluation expert system extending Kappa. Ref: [MSR-Machine Learning-SUMMIT 2013]

7. Utterance Level Latent Context for Slot Filling @ Microsoft Bing

Proposed a new framework for semantic template filling in a conversational understanding (CU) system. Our method decomposed the task into two steps: latent n-gram clustering using a semi-supervised latent Dirichlet allocation (LDA) and sequence tagging for learning semantic structures in a CU system. This method is generic and theoretically sound mechanism for understanding natural language utterances that goes beyond local lexical features but rather enables longer dependencies using utterance level features for semantic tagging. Our context sensitive clustering approach naturally suggests semi-Markov CRF modeling, instead of linear CRF. REF: [ICASSP 2013]

8. Joint Models for Spoken Language Understanding in Dialog @ Microsoft Bing

Built a pipeline for joint structural learning for identifying user intents as well as semantic slots in natural language utterances. This approach defines relational priors on user intent, entities and semantic slots, which can be extracted from query click logs and knowledge graph are injected into the joint learner to enhance the natural language understanding task. Joint representations are used in Cortana's Language Understanding Models. REF: [ACL'13][ACL'12]

9. New Intent Detection @ Microsoft Bing

Developed an unsupervised approach to discover new user intents using Bayesian hierarchical models. In this model, search query click logs are used to provide implicit supervision and knowledge graph is used to extract and extend the relational information learnt from the model. This tool is used offline to capture hidden intents in user conversations in Cortana. We developed a toolkit for building conversational understanding models using semantic graphs. REF: [ICML'11][InterSpeech'13] [MSR-ML SUMMIT'13]

10. Easy Dialog State Update Model for Multi-Domain Dialog System @ Microsoft Bing

Built a model to learn to update current information state in a multi-domain dialog based on user responses. A simple and easily interpretable discriminative classification approach is used. This model is used in the Cortana Dialog Engine. REF: [Interspeech'12]

11. Natural Language Query Detection @ Microsoft Bing

Built an efficient statistical approach to filter web search queries to select the natural language like queries to boost language understanding. This model is shipped and embedding into the Cortana query classifier stack.

12. Sentiment Analysis in User Utterances and Short Conversations @ Microsoft Bing

Investigated visual language, both literal and sentimental, for building human computer interaction systems, i.e., build your own avatar via visual descriptions. The model I built uses our new dataset (publicly available) for learning the relationship between literal and semantic descriptions. [REF: NAACL'13]

13. Multi-Document Summarization @ Microsoft and @ UC Berkeley

Learning salient aspects of utterances to construct coherent and accurate summaries using various topic models. REF: [ACL'10]

14. *Question Answering and Textual Understanding @ UC Berkeley*

Semi-Supervised Graph-based approach to question answering via learning textual entailment relations from question and answer pairs, and propagating information onto the unlabeled search query-snippet pairs extracted from a search engine. REF: [ACL'09]

Patents

P1. Scaffolding Networks for Teaching and Learning Comprehension
Asli Celikyilmaz, Lihong Li, Chong Wang, Li Deng
2017

P2. *Composite Task Completion Dialog System Via Hierarchical Deep RL*
Jianfeng Gao, Asli Celikyilmaz, Sungjin Lee, Xiujun Li, Lihong Li, Baolin Peng
2017

P3. Knowledge-Guided Structural Attention Processing
Yun-Nung Chen, Dilek Hakkani-Tur, Gokhan Tur, Asli Celikyilmaz, J. Gao, et. al.
2016

P4. Multi-Domain Joint Semantic Frame Parsing
Dilek Hakkani-Tur, Asli Celikyilmaz, Yun-Nung Chen, Li Deng, Jianfeng Gao, Gokhan Tur, Ye-Yi Wang
2016

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