Asli Celikyilmaz

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Interests

Natural Language Processing, Understanding Conversational Dialog, Machine Learning.

Employment

Microsoft, Senior Scientist — Sunnyvale, CA, USA
Work on Understanding Conversational Dialog, Natural Language Processing and Machine Learning — October 2010 - currently
Main research areas include natural conversational interaction, focusing on open-domain natural language processing and dialog, lexical semantics, and inference/reasoning under uncertainty.

University of California, Berkeley, Postdoctoral Research Employee — Berkeley, CA, USA
Work on Question Answering, Textual Entailment, Coreference Resolution, and Topic Models for Multi-Document Summarization — May 2008 - October 2010

University of Toronto, Research Assistant — Toronto, ON, Canada
Work on Software Risk Analysis, Credit Worthiness Analysis, Ontology Engineering — Sept. 2003 - Sept. 2008

Information Intelligence Co., Data Mining Specialist — Toronto, ON, Canada
Work on Building Data Mining and Machine Learning Software — Sept. 2002 - Sept. 2004

Education

University of California, Berkeley — Berkeley, CA, USA
Post-Doctorate Research Degree in Computer Science — May 2008 - October 2010
Research Topic: Question Answering, Textual Entailment and Multi-Document Summarization

University of Toronto — Toronto, ON, Canada
Ph.D. in Information Science, Department of Engineering — May 2005 - May 2008
Research Topic: Uncertainty Modeling with Evolutionary Functions

University of Toronto — Toronto, ON, Canada
Master of Applied Science in Information Science — January 2003 - May 2005
Research Topic: Ontology Engineering, Applications of Soft Computing

Seneca Collage — Toronto, ON, Canada
Computer Programming and Analysis in Information Science — January 2000 - May 2002
Research Topic: Enterprise Web Applications

Istanbul Technical University — Istanbul, Turkey
Bachelor of Applied Science, Industrial Engineering — September 1993 - June 1997
Research Topic: Multi-objective Decision Making

Recent Projects @ Microsoft

Enriching Representation of Vocabulary in Spoken Language Understanding Models by Automatically Learning Representations from Big-Data and Knowledge Graph. In an effort for scaling natural language processing systems, we construct different representations for spoken language words in conversational dialogs using unsupervised clustering and word embedding methods. Enriching neural network based word embeddings by inject entity and their relational information from knowledge graph (e.g., Freebase) helps improve the semantic understanding tasks with little effort from the domain expert to obtain rich semantic features. REF: [Interspeech'14][AAAI-15].

Flexible Item Selection for Targeted Human to Computer Dialog Systems.
A statistical based approach that can identify referring expressions in user's spoken utterances in order to disambiguate the intended item from among other on-screen item(s). The system uses context signals from the client, on-screen screen items as well as the dialog state history (from previous turns) to detect user's intended selection. REF: [EMNLP-14].

Eye Gaze for Spoken Language Understanding in Multi-Model Conversational Interactions.
A statistical model approach for detecting eye gaze and using with combination with speech to improve flexible item selection task. The model resolves references to visual (screen) elements in a conversational web browsing system. The system detects eye gaze, recognizes speech, and then interpret the user's browsing intent (e.g., click on a specific element) through a combination of spoken language understanding and eye gaze tracking. REF: [ICMI-14].

New Intent Detection @ Microsoft
Unsupervised approach to discover new user intents using Bayesian hierarchical models. Search query click logs are used to provide implicit supervision and knowledge graph (e.g., Freebase) is used to extract and extend the relational information learnt from the model. REF: [ICML'11] [InterSpeech'13][MSR-ML Summit'13]

Easy Dialog State Update Model for Multi-Domain Dialog System @ Microsoft
Learning to update current information state in a multi-domain dialog based on user responses. A simple and easily interpretable discriminative classification approach is used. [Interspeech'12]

Joint Models for Spoken Language Understanding in Dialog @ Microsoft
Investigation of joint structural learning for identifying user *intents* as well as *semantic slots* in natural language utterances. Relational priors on user intent, entities and semantic slots extracted from query click logs and knowledge graph are injected into the joint learner to enhance the natural language understanding task. REF: [ACL'13][ACL'12]

Natural Language Query Detection @ Microsoft
Investigation of naturalness aspect of sentences in structured text and user queries of web search. An efficient statistical approach to filter web search queries to select the natural language like queries to boost language understanding. REF: [InterpSeech'13] [NAACL'12] [ACL'11]

Sentiment Analysis in User Utterances and Short Conversations @ Microsoft
Study of visual language, both literal and sentimental, for building human computer interaction systems, i.e., build your own avatar via visual descriptions. The model uses our new dataset (publicly available) for learning the relationship between literal and semantic descriptions. [REF: NAACL'13]

Earlier Projects @ UC Berkeley

Multi-Document Summarization @ UC Berkeley
Learning salient aspects of utterances to construct coherent and accurate summaries using various topic models. REF: [ACL'10]

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]

International Conference Proceedings (Refereed) A Selection of Recent Publications.

For the longer list, please see: http://research.microsoft.com/en-us/people/aslicel/

- *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)** Spring Symposium on "Knowledge Representation and Reasoning: Integrating Symbolic and Distributional Approaches, Submitted.
- *Resolving Referring Expressions in Conversational Dialogs for Natural User Interfaces*. Asli Celikyilmaz, Zhaleh Feizollahi, Dilek Hakkani-Tur and Ruhi Sarikaya. Empirical Methods in Natural Language Processing **(EMNLP-14)**, Duha, Quatar, October, 2014.
- *Eye Gaze for Spoken Language Understanding in Multi-Model Conversational Interactions*. Dilek Hakkani-Tur, Malcolm Slaney, Asli Celikyilmaz, Larry Heck. Int. Conference on Multimodal Interaction **(ICMI-14),** Istanbul, Turkey, November 2014.
- *Semi-Supervised Semantic Tagging for Conversational Understanding Using Markov Topic Regression*. Asli Celikyilmaz, Dilek Hakkani-Tur, Gokhan Tur, Ruhi Sarikaya. Proc of the 51st Annual Meeting of the Association for Computational Linguistic **(ACL '13)**, Sofia, Bulgaria, August 2013.
- *Learning to Relate Literal and Sentimental Descriptions of Visual Properties.* Mark Yatskar, Svitlana Volkova, Asli Celikyilmaz, Bill Dolan, Like Zettlemoyer. 2013 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies (**NAACL-HLT '13**), Atlanta, USA, June 2013.
- *Discovering New User Intents from Search Query Logs for Spoken Language Understanding*. Dilek Hakkani-Tur, Asli Celikyilmaz, Larry Heck, Gokhan Tur. 14th Annual Conference of the Intern. Speech Communication Association (**InterSpeech '13**), Lyon, France, August, 2013.
- *Latent Semantic Modeling for Slot Filling in Conversational Understanding*. Gokhan Tur, Asli Celikyilmaz, Dilek Hakkani-Tur. IEEE The 38th Int. Conf. on Acoustics, Speech, and Signal Processing (**ICASSP '13**), Vancouver, Canada, May 2013.
- *A Joint Model for Discovery of Aspects in Utterances*. Asli Celikyilmaz, Dilek Hakkani-Tür. 49th Annual Meeting of the Association for Computational Linguistics (**ACL '12**), Jeju, South Korea, June, 2012.
- *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. 13th Annual Conference of the International Speech Communication Association (**InterSpeech '12**), Portland, OR, September, 2012.
- *Discovery of Topically Coherent Sentences for Extractive Summarization.* Asli Celikyilmaz, Dilek Hakkani-Tur. The 49th Association for Computational Linguistics (**ACL '11**), Portland, Oregon. June 2011.

- *The Actor-Topic Model for Extracting Social Networks in Luterary Narrative*. Asli Celikyilmaz, Dilek Hakkani-Tur, Hua He, Grzegorz Kondrak, Denilson Barbosa. Neural Information Processing Systems (**NIPS '10**) in Machine Learning for Social Computing Workshop, Whistler, Canada, 2010.
- *A Hybrid Hierarchical Model for Multi-Document Summarization*. Asli Celikyilmaz, Dilek Hakkani-Tür. The 48th Association for Computational Linguistics (**ACL '10**), Uppsala, Sweden, July, 2010.
- *A Graph-based Semi-Supervised Learning for Question Answering.* Asli Celikyilmaz, Marcus Thint, Zhiheng Huang. The 48th Association for Computational Linguistics (**ACL '09**), August 2009, Singapore.

Invited Talks

- Intelligent Personal Assistants and Signal Processing Challenges, IEEE Signal Processing Society Santa Clara Valley Chapter, November, 2014.
- Natural Language Understanding, Machine Learning Summer School, UC Santa Cruz, 2012.
- Conversational Understanding, BISC Lab in Computer Science, UC Berkeley, 2011.
- Question Answering Made Easy, International Computer Science Institute, Berkeley, 2010.
- Question Answering Effort in BISC Lab IEEE Int. Conf. Semantic Computing, Stanford, CA, 2009.

Languages

Native Speaker of Turkish, Fluent in English.