

## DAN ROTH

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## ACADEMIC POSITIONS

- Eduardo D. Glandt Distinguished Professor**, Department of Computer and Information Science, University of Pennsylvania, May 2017 – Present.
- Adjunct Professor**, University of Illinois at Urbana-Champaign, May 2017 – Present.
- Founder Professor of Engineering**, University of Illinois at Urbana-Champaign, January 2016 – May 2017.
- Professor**, University of Illinois at Urbana-Champaign, Department of Computer Science, July 2006 – May 2017.
- Adjunct Professor**, University of Illinois at Urbana-Champaign, Department of Linguistics (since 2005); Department of Statistics (since 2008), Graduate School of Library and Information Science (since 2009); Department of Electrical and Computer Engineering (since 2012).
- Adjunct Professor**, Toyota Technological Institute at Chicago, 2015–2019.
- Associate Professor**, University of Illinois at Urbana-Champaign, Department of Computer Science, July 2002 – July 2006.
- Assistant Professor**, University of Illinois at Urbana-Champaign, Department of Computer Science, July 1997 – July 2002.
- Faculty Member**, Beckman Institute of Advanced Science and Technology, UIUC, July 1998 – Present.
- Faculty Member**, Computational Science and Engineering Program, UIUC, March 1999 – Present.
- Postdoctoral Researcher**, Weizmann Institute, Israel, Department of Applied Mathematics and Computer Science, Sept. 1995 – Aug. 1997.
- Research Scientist**, Harvard University, Division of Applied Sciences, July 1996 – Oct. 1996.
- Postdoctoral Fellow**, Harvard University, Division of Applied Sciences, Jan. 1995 – Aug. 1995.

## EDUCATION

## HARVARD UNIVERSITY

S.M., Computer Science, 1992.

Ph.D., Computer Science, 1995.

Dissertation: *Learning in Order to Reason*; Advisor: Leslie G. Valiant

## TECHNION, ISRAEL

B.A., *Summa cum laude* in Mathematics, 1981.

## AWARDS AND HONORS

The 2020 Heilmeier Award for Excellence in Faculty Research, University of Pennsylvania, School of Engineering and Applied Science.

Member of DARPA's Information Science and Technology (ISAT) study group (2018–)

The International Joint Conference on AI (IJCAI) John McCarthy Award, 2017.

Eduardo D. Glandt Distinguished Professor, University of Pennsylvania.

Founder Professor of Engineering, University of Illinois at Urbana-Champaign.

David F. Linowes Faculty Fellow, Cline center for Democracy, University of Illinois, 2015, 2016.

Fellow, the American Association for the Advancement of Science (AAAS), 2014.

College of Engineering Council Outstanding Advising Award, 2013.

Fellow, the Association for Computational Linguistics,(ACL), 2012.

Fellow, the Association for Computing Machinery (ACM), 2011.

University Scholar, the University of Illinois, 2010.

Fellow, the Association for the Advancement of Artificial Intelligence (AAAI), 2009.

Best student paper award, 11th Conference on Natural Language Learning (CoNLL), 2011. Title: "Adapting Text instead of the Model: An Open Domain Approach."

Best paper award, 27th Army Science Conference, 2010. Title: "Comprehensive Trust Metrics for Information Networks."

Lady Davis Visiting Professorship, Technion- Israel Institute of Technology, 2006-2007.

University of Illinois Award for Excellence in Guiding Undergraduate Research, Honorable Mention, 2006.

Software Awards: 1st place, software system competition for Semantic Role Labeling (Semantic Parsing). Run by the Conference on Natural Language Learning (CoNLL), June 2005 (out of 19 systems). 1st place, software system competition for Grammatical Text Correction. Run by the Conference on Natural Language Learning (CoNLL), June 2013 (out of 19 systems).

Xerox Award for Faculty Research (Senior Faculty), 2005.

Willett Faculty Scholar Award, University of Illinois, 2002.

University of Illinois Award for Excellence in Guiding Undergraduate Research, Honorable Mention, 2002.

Fellow at the Center of Advanced Studies, University of Illinois, 2001-2002.

Incomplete List of Teachers Ranked as Excellent by Their Students, UIUC, Spring 2001.

Xerox Award for Faculty Research (Junior Faculty), 2001.

American Association of Artificial Intelligence, Innovative Applications of AI Award, 2001 (with an IAAI paper award, "Scaling Up Context Sensitive Text Correction").

C. W. Gear Outstanding Junior Faculty Award, Computer Science Dept., UIUC, 2000.

NSF Career Award, 2000.

Best paper award, IJCAI'99, the 16th International Joint Conference on Artificial Intelligence.  
Title: "Learning in Natural Language".

IBM Faculty Equipment Award, 1999.

The Feldman Foundation Postdoctoral Fellowship, 1995–1996.

Nominee for ACM Best Dissertation Award, 1995

Harvard University, Derek Bok Excellence in Teaching Award, 1993.

Technion, Israel, Yuval Levi Award for Best Undergraduate Mathematics Student, 1980.

Technion President's Fellowship 1979–1981.

## INDUSTRIAL EXPERIENCE

**Consultant**, Machine Learning; Natural Language Processing; Information Extraction and Text Mining, 1994–Present.

**Advisory Board**, On the board of several start-up companies in the area of Machine Learning, Natural Language Processing, and Text Analytics. 2005–Present.

**Officer**, Israeli Defense Forces, R&D Unit, 1981–1990. Last rank: Major.

**Senior Researcher and Project Manager**, Israeli Defense Forces, R&D Unit, 1988–1990.  
*Managed a R&D project in intelligent real-time systems.*

**Software Manager and Lead Designer**, Israeli Defense Forces, R&D Unit, 1985–1988.

**Researcher and Software Engineer**, Israeli Defense Forces, R&D Unit, 1982–1985.

## ENTREPRENEURSHIP

**NexLP, Inc.** A startup that leverages the latest advances in Natural Language Processing (NLP), Cognitive Analytics, and Machine Learning in the legal and compliance domains. Co-Founder and Chief Scientist; Chicago, IL. 2012–Present.

**DRLT, Inc.** Dan Roth Language Technologies. Consultancy. Philadelphia, 2019–Present.

**Text-IE, Inc.** Middleware for Text Analytics, Founder and President; Champaign, IL. 2011–Present.

**Semantica, Inc.** Co-Founder; Haifa, Israel. 2006–Present.

## GRANTS

1. *RESIN: Reasoning about Event Schemas for Induction of Knowledge*, DARPA. Subcontract from RPI. PI, 2019-2024. \$3,150,000.
2. *Learning to Reason with Learned Models and Domain Knowledge*, ONR. PI, 2019-2021. \$400,000.
3. *Learning with Less Labels (LwLL)*, DARPA. PI, 2019-2022. \$3,500,000.

4. *BETTER: Better Extraction from Text Towards Enhanced Retrieval*, IARPA. Subcontract from BBN. PI, 2019-2022. \$1,250,000.
5. *Weak Supervision for Information Extraction from Low Resource Languages*, DARPA. PI, 2018-2019. \$900,000.
6. *Incidental Supervision for Low Resource Languages*, DARPA. Subcontract from BBN, PI, 2018-2019. \$600,000.
7. *Learning and Inference Protocols for Recuperating from Information Pollution*, Google Focused Award. PI, 2017—2019, \$900,000.
8. *The Semantics of Information Pollution*, Tencent Award. PI, 2018, \$40,000.
9. *Natural language understanding, questions answering and reasoning from natural language text*, Allen Institute of AI Award. 2017-2018 \$80,000.
10. *IBM-Center of Cognitive Systems Research. IBM, Co-PI, 2016-2019*. \$1,000,000.
11. *Cognitively Coherent Human-Computer Communication: Communication with Computers (CwC)*, DARPA. PI, 2015-2019. \$3,000,000.
12. *Low Resource Languages for Emergent Incidents (LORELEI)*, DARPA. PI, 2015-2019. \$1,800,000.
13. *Profiler: A Paradigm for Global Knowledge Acquisition and Grounding*, Google Award. PI, 2015-2016, \$78,500.
14. *Verb Learning and the Early Development of Sentence Comprehension*, NIH Award. 2014-2019 (continuation of NIH Award no. 42), co-PI with Cynthia Fisher. \$1,861,557.
15. *Verb Learning and the Early Development of Sentence Comprehension: Experimental and Computational Studies*, NSF. 2014-2018 (complements the NIH Award no. 14), co-PI with Cynthia Fisher. \$426,012.
16. *Representation and Reasoning for Answering Quantitative Questions from Text*, Allen Institute of AI Award. 2014-2017 \$300,000.
17. *KnowEng, a Scalable Knowledge Engine for Large-Scale Genomic Data*, NIH BD2K Center for Excellence. 2014-2019. co-PI. \$15,000,000.
18. *Insight, A comprehensive, multidisciplinary brain training system*, IARPA SHARP program. 2014-2017. co-PI. \$12,500,000.
19. *Deep Exploration and Filtering of Text (DEFT)*, DARPA. PI, 2012-2016, \$2,500,000.
20. *Integrated Social History Environment for Research (ISHER) - Digging Into Social Unrest*, NSF (As part of an International NSF Challenge.) PI. 2012-2013, \$125,000.
21. *System for foresight and understanding from scientific exposition (FUSE)*, IARPA, through a subcontract from SRI. PI, 2011-2015, \$2,335,000.
22. *Information Network Academic Research Center (INARC): An Integrated Approach Towards Information Integration, Modeling, Retrieval, and Discovery*. Army Research Lab (ARL) through a subcontract from BBN. co-PI (Jiawei Han, PI). 2009-2017, \$8,152,000.
23. *SHARPS, Strategic Health IT Advanced Research Projects on Security*, HHS. co-PI (Carl Gunter, PI). 2010-2014, \$15,000,000.
24. *Cyber Analytics*. Boeing. PI, 2010-2013, \$400,000.

25. *MIAS, Multimodal Information Access and Synthesis*, a partner in CCICADA, a DHS Center of Excellence for Command, Control, & Interoperability. Illinois PI and Center Director. DHS, through Rutgers University. 2009-2014, \$2,000,000.
26. *Analytical Enhancements to a Unique UI Resource: The Cline Center's Digitized Global News Archive.*, UIUC Grant, Co-PI (Scott Althaus, PI) 2012. \$50,000.
27. *Knowing what to Believe: Trustworthiness of information*, Google Award. PI, 2010-2011, \$75,000.
28. *PASI: Methods in Computational Discovery for Multidimensional Problem Solving (Workshop)*, NSF. co-PI. 2013, \$100,000.
29. *MRI: Development of a Novel Computing Instrument for Big Data in Genomics*, NSF. Senior Personal. 2013-2017, \$1,800,000.
30. *Guiding Learning and Decision Making in the Presence of Multiple Forms of Information*, ONR Award. PI, with Gerald DeJong. 2009-2013. \$1,350,000.
31. *A Universal Machine Reading System*, DARPA, through a subcontract from SRI. PI, 2009-2014, \$2,400,000.
32. *The Assess-As-You-Go Writing Assistant*, Department of Education Award. co-PI, with William Cope, 2009-2012, \$1,500,000.
33. *A Writing Assistant*, An Award from the Grainger Program in Emerging Technologies. PI. 2009-2010. \$100,000.
34. *Microsoft Research Research Gift*, Microsoft Research. PI, 2008, \$10,000.
35. *The Universal Parallel Computing Research Center*, Microsoft & Intel. One of 18 co-PIs, 2008–2012, \$18,000,000.
36. *Meta-Data Annotation and Data Integration*, Library of Congress. PI of Subcontract from GSLIS. 2008-2009, \$143,000.
37. *NSF REU (research experience for undergraduates)*. 2008, \$12,000. Supports 2 undergraduate students as a supplement to NSF Science of Design Grant titled “Learning Based Programming.”
38. *Free-speech command classification for Car Navigation Systems*, Honda Research Lab. PI. . 2007-2008, \$60,000.
39. *Populating Ontologies: Named Entities and Relations.*, Lawrence Livermore National Lab PI. 2007, \$100,000.
40. *MIAS, Multimodal Information Access and Synthesis*, A DHS Institute of Discrete Science. PI and Center Director. 2007-2009, \$2,400,000.
41. *PLATO: Phased Learning Using Active Thought & Observation: Bootstrap Learning*, DARPA. PI, with a subcontract from SRI. 2007-2010, \$1,431,000.
42. *Verb Learning and the Early Development of Sentence Comprehension*, NIH Award. 2007-2012, co-PI with Cynthia Fisher. \$1,331,821.
43. *Learning Based Programming*, NSF Science of Design Award, 2006-2009, \$471,000.
44. *Textual Entailment*, Google Award. PI, 2006-2007, \$50,000.

45. *Verb Learning and The Early Development of Sentence Comprehension: Experimental and Computational Studies*, NSF Award, 2007-2012, co-PI with Cynthia Fisher. \$391,000.
46. *NSF REU (research experience for undergraduates)*. 2006-2008, \$49,000. Supports 2 undergraduate students as a supplement to NSF Grant titled “Natural Language Technology for Guided Study of Bioinformatics.”
47. *Focused Textual Entailment*. Boeing. PI, 2006-2009, \$200,000.
48. *Machine Learning for Security: Digital Guards for Insider Threat Detection*. Boeing. PI, 2005-2007, \$170,000.
49. *Learning by Reading*. Seedling funding from DARPA via a subcontract from SRI. PI. 2005-2006, \$105,000.
50. *Natural Language Technology for Guided Study of Bioinformatics*. NSF ITR. PI with S. Cooper, D. Litman, J. Pellegrino, S. Goldman, S. Rodriguez-Zas and C. Zhai as co-PIs. 2004-2007, \$1,025,000.
51. *Automated Methods for Second-Language Fluency Assessment*, A Critical Research Initiative (CRI) grant, UIUC Research Board. co-PI, with Richard Sproat, Chilin Shih, Mark Hasegawa-Johnson, Brian Ross, Kate Bock, 2005-2006, \$70,000.
52. *Reflex: Named Entity Recognition and Transliteration for 50 Languages*. Department of Interior, the REFLEX Program. co-PI with Richard Sproat, Abbas Benmamoun and Chengxiang Zhai (UIUC). 2004-2006, \$378,000.
53. *Kindle: Knowledge and Inference via Description Logics for Natural Language*. ARDA, the AQUAINT Program. PI with U. of Pennsylvania (Martha Palmer) as a subcontract. 2004-2006, \$700,000.
54. *Cross-Document Entity Identification & Tracing*. ONR, via the TRECC and the NCASSR Programs. PI, along with the ALG group at NCSA. 2004-2005, \$280,000.
55. *Business Intelligence Systems*. Motorola. PI, in a collaboration with NCSA. 2004-2006, \$200,000.
56. *NSF REU (research experience for undergraduates)*. 2003-2004, \$20,000. Supports 2 undergraduate students as a supplement to NSF Grant titled “Learning Coherent Concepts: Theory and Applications to Natural Language”.
57. *Programming Environments and Applications for Clusters and Grids*, National Science Foundation CISE Research Resources program. S. V. Adve (PI), W. W. Hwu, L. Kale, D. Padua, S. Patel, V. S. Adve, S. Lumetta, D. Roth, M. Snir, and J. Torrellas. 2002-2004, \$120,000 (additional \$60,000 matched by UIUC).
58. *Multimodal Human Computer Interaction: Toward a Proactive Computer*. NSF ITR. co-PI with T. Huang, D. Brown, D. Kriegman, S. Levinson, G. W. McConkie. 2000-2005, \$3,152,068.
59. *From Bits to Information: Statistical Learning Technologies for Digital Information Management and Search*. NSF ITR, co-PI with a MIT team, 2000-2003, \$2,039,989. PI of subcontract from MIT, \$321,000.
60. *Learning Coherent Concepts: Theory and Applications to Natural Language*, NSF Career Award, 2000-2003, \$300,000.

61. *Decision Making Under Uncertainty*, ONR, MURI Award. \$4,730,000. Co-PI with a UCLA-UCI team. PI of a subcontract from UCLA, 2000-2004, \$541,000.
62. *Context-Sensitive Natural Language Inferences*, IBM Equipment Award, 2000, \$100,000.
63. *The Role of Experience in Natural Language*, NSF (KDI/LIS), co-PI with G. Dell, K. Bock, J. Cole, C. Fisher, S. Garnsey, A. Goldberg, and S. Levinson. 1999-2001, \$600,000.
64. *NSF REU (research experience for undergraduates)* grant. 1999-2000, \$12,000. Supports 2 undergraduate students as a supplement to NSF Grant titled “Learning to Perform Knowledge Intensive Inferences”.
65. *Learning to Perform Knowledge Intensive Inferences*, NSF, 1998-2000, \$255,000.
66. *Learning and Inference in Natural Language*, UIUC Research Board, May 1998, \$25,000.
67. *Learning Common Sense Knowledge Base to Support Information Extraction and Retrieval*, Israeli Ministry of Science and the Arts, PI, with S. Edelman, 1996, \$32,000.

## PATENTS

US Patent 5,907,839, “*An algorithm for learning to correct context-sensitive spelling errors.*” Granted, May 1999.

US Patent 5,956,739, “*System for text correction adaptive to the text being corrected.*” Granted, Sept. 1999.

## SOFTWARE

(See <http://cogcomp.org/page/software/> and <https://github.com/CogComp> for a complete list of publicly available software, and <http://cogcomp.org/page/demos/> for on-line demonstrations). See also: “CogCompNLP: Your Swiss Army Knife for NLP”.

Saul, A a next generation Declarative Learning Based Programming Language.

Learning Based Java (LBJava): A modeling language that expedites the development of systems with one or more learning components, along with Constrained Optimization inference.

Structured Learning (SL): A Java based Structured Learning Library.

Joint Learning with Indirect Supervision (JLIS): A software package for structured prediction and structured prediction with latent variables.

SNoW: A Learning Architecture tailored for learning in the presence of a very large number of features.

FEX: A relational feature extractor for the generation of intermediate knowledge representations for large scale learning.

NLP Pipeline: Learning based natural language processing tools. Software includes the basic tools for an NLP pipeline, from Tokenizer, Sentence Segmentation, Lammatizer, Part of Speech tagger, to Shallow Parsing and Dependency Parser. Includes an interactive Web demonstration.

Information Extraction Tools: Basic Machine Learning Tools for Information Extraction. Includes: Named Entity Recognition Package, Event Extractor, Temporal Reasoning, and Quantitative Reasoning. Integrated with the aforementioned pipeline and includes an interactive Web demonstration.

Textual Entailment: A Machine Learning based tool and components for supporting open domain textual entailment. Includes an interactive Web demonstration.

Co-Reference Resolution: A Machine Learning based tool for co-reference resolution and for resolving hard pronoun resolution problems. Includes an interactive Web demonstration.

Entity Resolution and Wikification: A Machine Learning based tool for “wikification” – disambiguating entities and concepts and mapping them to an encyclopedic resource. Includes an interactive Web demonstration.

Semantic Role Labeling (Semantic Parsing): A Machine Learning based package that provides a shallow semantic analysis of sentences (E.g., Who did What to Whom, When, When, How). The system includes extensions over the standard verb-based SRL, and includes noun predicates, prepositional predicates, and others. The verb-SRL system was the top system at the Shared Task competition (out of 19 systems) run by the Conference of Natural Language Learning (CoNLL), June 2005. Includes an interactive Web demonstration.

Grammar Checker for (ESL) English As a Second Language: A Machine Learning based package for context sensitive grammar correction, focusing on adapting to errors made by non-native English writers. The system was the top system at the Shared Task competition (out of 19 systems) run by the Conference of Natural Language Learning (CoNLL), June 2013. Earlier versions won two other software competitions – HOO (Helping Our Own) Text Correction Challenges, 2012, 2011.

## PROFESSIONAL ACTIVITIES

### CONFERENCE CHAIR:

The Seventh Conference on Natural Language Processing and Chinese Computing (NLPC 2018), Hothot, China. August 26-30 2018.

### PROGRAM CHAIR:

The Conference of the Association of Artificial Intelligence 2011 (AAAI 2011), San Francisco, CA., August 2011.

41st Annual Meeting of the Association for Computational Linguistics (ACL 2003), Sapporo, Japan, July 2003.

Sixth conference on Natural Language Learning (CoNLL'02), Taipei, Taiwan, Aug. 2002.

### EDITOR

Journal of Artificial Intelligence Research (JAIR): Editor-in-Chief January 2015 – February 2017.

Journal of Artificial Intelligence Research (JAIR): Associate Editor-in-Chief January 2013 – January 2015.



Special Issue of the Italian Journal of Computational Linguistics (IJCoL) on “Language and Learning Machines” 2017, Editor.

Special Issue of the Machine Learning Journal on “Learning Semantics” 2012, Editor.

Special Issue of the Natural Language Engineering Journal on “Textual Entailment”, Summer 2009, Editor.

Special Issue of the Machine Learning Journal on “Machine Learning in Speech and Natural Language”, Winter 2005, Editor.

Special Issue of the Computational Linguistics Journal on “Semantic Role Labeling”, Winter 2006, Program Committee.

Special Issue of the *Linguisticae Investigationes* Journal on “Named Entities”, Fall 2007, Program Committee.

#### EDITORIAL BOARDS:

Editorial Board of *Frontiers in Big Data* <https://www.frontiersin.org/>

*Journal of Artificial Intelligence Research* (JAIR): Associate Editor, 2006–2010. (Editorial Board 2004-2005.)

AI Access, a not-for-profit book publisher for free access books, Advisory Board, 2013–2017

*International Journal Machine Learning and Cybernetics* (IJMLC), Advisory Board, 2010–.

*Machine Learning Journal*: Associate (Action) Editor, 2004–2011. (Editorial Board: 2001-2004; 2012-2014)

ECML/PKDD, *The Journal of the European Conference on Machine Learning*, Editorial Board, 2013.

*Computational Intelligence*, 2003-2010.

*Computational Linguistics*, 2000-2003.

TALIP, *ACM Transactions on Asian Language Information Processing*, 2003-2005.

#### REVIEW BOARDS

On a National Review committee for the Statistics Department, Purdue University, 2010.

NSF review of the Penn Discourse Tree Bank (PDTB) project, co-chair, 2012.

#### STEERING/ADVISORY COMMITTEES:

Science advisor to the U.S.-Israel Bi-national Science Foundation (BSF), 2016 – 2019.

Allen AI Institute, Scientific Advisory Board; 2014–.

AI Summit, a joint AAAI/IJCAI committee of AI leaders; 2014.

AI Access Books, An Open Access Publisher, 2014–.

Cline Center for Democracy, University of Illinois, Advisory Committee, 2014–.

IJCAI, the International Joint Conference on AI, Advisory Board (2011, 2016).

Excitement, a European Union project on Recognizing Textual Enticement, Advisory Board, 2011–.

Association of Computational Linguistics, Special Interest Group on Natural Language Learning, 2007–.

IEEE SMC Technical Committee on Cognitive Computing 2007–.

NIST Advisory Committee on Recognizing Textual Entailment 2008–.

**PRESIDENT (ELECTED):**

Association of Computational Linguistics, Special Interest Group on Natural Language Learning, 2003–2005.

**SECRETARY:**

Association of Computational Linguistics, Special Interest Group on Natural Language Learning, 2002–2003.

**PROGRAM COMMITTEES:**

**ACL** The International Conference of the Association on Computational Linguistics 2000, 2001, 2002, 2003 (Program Chair), 2004, 2005, 2007 (Senior Program Committee Member), 2010, 2012, 2013 (Area Chair).

**ALT** The International Conference on Algorithmic Learning Theory (ALT) 2001.

**AAAI**, The Conference of the American Association for Artificial Intelligence, 1996, 1998, 1999, 2000, 2002 (Senior Program Committee Member), 2006 (Senior Program Committee Member), 2008 (Senior Program Committee Member), 2011 (Program Chair), 2012 (Senior Program Committee Member), 2013 (Senior Program Committee Member), 2015 (Senior Program Committee Member), 2016 (Senior Program Committee Member), 2017 (Senior Program Committee Member), 2018 (Senior Program Committee Member), 2020 (Area Chair).

**SBIA** The Brazilian International Symposium on Artificial Intelligence 2008.

**BISFAI** The Biennial Bar-Ilan International Symposium on the Foundations of Artificial Intelligence 2001, 2005.

**COLT** The Annual Conference on Learning Theory (COLT), 1998, 2005, 2006.

**CoNLL** The ACL conference on Natural Language Learning 2001, 2002 (Program Chair), 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2017.

**COLING** The International Conference on Computational Linguistics, 2008 (Area Chair), 2012.

**EMNLP** The ACL Conference on Empirical Methods in Natural Language, 2005 (Area Chair), 2007, 2009, 2010, 2012, 2019 (Area Chair).

**EACL** The European Conference on Computational Linguistics, 2009, 2012.

**ICALP** The International Colloquium on Automata, Languages and Programming, 1999.

**ICML**, The International Conference on Machine Learning, 2000, 2001, 2002, 2003 (Area Chair), 2005, 2006 (Area Chair), 2008, 2009 (Area Chair), 2010 (Area Chair), 2012, 2013 (Area Chair), 2015 (Area Chair), 2016 (Area Chair)

**IJCAI** The International Joint Conference on Artificial Intelligence, 2003 (Poster Committee), 2009 (Senior Program Committee; IJCAI advisory board), 2016 (IJCAI advisory board), 2018 (Area Chair), 2019 (Track Chair).

**ILP** The International Conference on Inductive Logic Programming, 2002, 2003, 2004.

**KR** The International Conference on Principles of Knowledge Representation and Reasoning (2000).

**NAACL**, The North American Conference on Computational Linguistics 2000, 2001, 2004, 2009, 2010 (Area Chair), 2012, 2016 (Area Chair), 2018 (Area Chair), 2019 (Demo track).

**NIPS**, The Neural Information Processing Systems Conference (reviewer) 2002, 2003, 2004, 2005, 2006, 2011.

**Workshops:** Served on committees of numerous ICML, AAAI, NIPS, ACL and EACL collocated workshops, as well as committees of AAAI and IJCAI Symposia on various topics. A selected subset of workshops in recent years include:

IJCAI-17 Workshop on Declarative Learning Based Programming (DeLBP 2017).

AAAI-16 Workshop on Declarative Learning Based Programming (DeLBP 2016).

EACL-2012 Workshop on Computational Models of Language Acquisition (Cognitive 2012).

ACL-2011-2016 Workshop on the Innovative Use of NLP for Building Educational Applications.

NAACL-HLT-2010 Workshop on Active Learning for NLP.

NAACL-HLT-2010 Workshop on Innovative Use of NLP for Building Educational Applications.

NAACL-HLT-2010 Workshop on Semantic Search.

ACL-2009 Workshop on Named Entities and Transliteration, 2009.

NSF Sponsored symposium on Semantic Knowledge Discovery, Organization and Use, 2008.

AAAI Workshop on Natural Language Processing and Wikipedia, 2008.

## TUTORIALS & COURSES:

Director of the Data Science Summer Institute (DSSI) 2007, 2008, 2010, 2011, 2012. A six weeks long summer school on the foundations and practice of Data Science, UIUC.

AAAI'20, The Conference of the Association for the Advancement of Artificial Intelligence; February, 2020. A tutorial on *Recent Advances in Transferable Representation Learning*.

ACL'18, The Conference of the Association on Computational Linguistics. June, 2018. A tutorial on *Multi-lingual Entity Discovery and Linking*.

EACL'17, The European Conference of the Association of Computational Linguistics; A tutorial on *Integer Linear Programming Formulations in Natural Language Processing*.

AAAI'16, The Conference of the Association for the Advancement of Artificial Intelligence; A tutorial on *Structured Prediction*.

A Summer School on Non-Convex Optimization in Machine Learning, Mumbai, India. June, 2015. A tutorial on *Learning, Inference and Supervision for Structured Prediction Tasks*.

ACL'14, The Conference of the Association on Computational Linguistics. June, 2014. A tutorial on *Entity Linking and Wikification*.

University of Heidelberg, Germany. October 2013. A Fall School tutorial on *Integer Linear Programming Methods in NLP*.

AAAI'13, The Conference of the Association for the Advancement of Artificial Intelligence, A Tutorial on *Information Trustworthiness*.

Data Science Summer Institute (DSSI) 2007, 2008, 2010, 2011, 2012. A tutorial on Machine Learning in Natural Language Processing.

COLING'12, The International Conference on Computational Linguistics. A Tutorial on *Temporal Information Extraction and Shallow Temporal Reasoning*.

NAACL'12, The North American Conference of the Association on Computational Linguistics. A Tutorial on *Constrained Conditional Models: Structured Predictions in NLP*.

NAACL'10, The North American Conference of the Association on Computational Linguistics. A Tutorial on *Integer Linear Programming Methods in NLP*.

Reconnect 2010, DHS funded course on Information Extraction, University of Southern California, June 2010.

NASSLLI 2010, Program committee for the North American Summer School in Logic, Language and Information.

EACL'09, The European Conference of the Association on Computational Linguistics. A Tutorial on *Constrained Conditional Models*.

ACL'07, The International Conference of the Association on Computational Linguistics. A Tutorial on *Textual Entailment*.

University of Barcelona, March 2004. An invited Ph.D. course on *Machine Learning and Inference in Natural Language Processing*.

ESSLLI 2001, 13th European Summer School in Logic, Language and Information, Helsinki, Finland, Aug. 2001. Advanced course on *Machine Learning: Theory and Application in Natural Language Processing*.

#### ORGANIZATION (SELECTED EVENTS):

Co-Chair, IJCAI-19, Special track on *Understanding Intelligence and Human-level AI in the New Machine Learning Era*, July 2019

A Dagstuhl Seminar on *“Multi-Document Information Consolidation.”* May 2019. The international Center for Computer Science in Schloss Dagstuhl, Germany. Together with Ido Dagan, Iryna Gurevych, and Amanda Stent.

Conference chair, The Seventh Conference on Natural Language Processing and Chinese Computing(NLPCC 2018).

Co-Organizer, A joint NAACL-ICML Symposium on Machine Learning and Natural Language, Atlanta, GA, June 2013.

Program Co-Chair, The Conference of the Association of Artificial Intelligence 2011 (AAAI 2011), San Francisco, CA. August 2011.

Co-Organizer, A joint ACL-ICML-ICSA Symposium on Machine Learning in Natural Language and Speech, Redmond, WA, June 2011.

Program Co-Chair, The 41st *Annual Meeting of the Association for Computational Linguistics (ACL 2003)*.

Program Co-Chair, The Sixth *Conference on Natural Language Learning (CoNLL-2002)*.

Workshops: Organized and co-chaired a large number of workshops collocated with major conferences. A selected recent subset includes:

AAAI-2016 Workshop on Declarative Learning Based Programming, Phoenix, AZ, February 2016.

NAACL-2012 Workshop on “From Words to Actions”: Semantic Interpretation in an Actionable Context”.

Co-Organizer and Chair, *Advanced Tutorial/Workshop on Learning DNF Rules*. Held in conjunction with the Eleventh International Conference on Machine Learning (ML94) and the Seventh Annual Conference on Computational Learning Theory (COLT 94).

#### SELECTED NSF AND DOD MEETINGS AND PANELS

CISE/DCA, 1997.

Learning and Intelligent Systems, Principal Investigators Conference, May 1999.

Review panel for NSF-CAREER proposals, 2000, 2001, 2002.

ITR PI meeting, Jan. 2001. National Academy of Science, Cambridge MA.

CDI Panel, 2009.

NSF review workshop on the Penn Discourse Tree Bank, chair of review committee, April 2012.

National Academy of Science panel on Alerts and Warnings using Social Media, Irvine, CA, February 2012.

Various NSF proposal review panels.

ARL planning meetings and panels 2010–2018.

ONR, Multi-University Research Initiative (MURI) Principal Investigators Conference, 2000, 2001, 2002, 2003, 2004, 2008

IARPA FUSE meetings, 2011, 2012, 2013, 2014

IARPA planning meeting: Information Extraction, NLP and Machine Learning, 2008.

AQUAINT Program meetings and Symposia, Principal Investigators Conference, 2004, 2005.

DARPA planning meetings and panels. 2005–2018 (multiple meetings a year).

Department of Homeland Security: presentations at multiple Science & Technology division meetings, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015.

NSF Smart & Connected Health Visioning Meeting, 2017

## REVIEW:

INTERNATIONAL REVIEW PANELS: International Review Panels for the European Union; An International Review Panel, China-Singapore Institute of Digital Media; Reviewer for the Israeli National Academy of Science; Reviewer for the Netherlands Organization for Scientific Research (NWO).

NATIONAL REVIEW PANELS: Multiple NSF Review Panels; Reviewer for Army Research Lab (ARL); Reviewer for ONR; Reviewer for DTRA; Reviewer for NSF-EPSCoR.

CONFERENCE REVIEWER: ACL, the Annual Meeting of the Association for Computational Linguistics; COLING, the International Conference on Computational Linguistics, ACM Conference on Computational Learning Theory (COLT); Neural Information Processing Systems (NIPS); The European Conference on Computational Learning Theory; The ACM Symposium on the Theory of Computing (STOC); The IEEE Symposium on the Foundations of Computer Science (FOCS); the International Joint Conference on Artificial Intelligence (IJCAI); Uncertainty in Artificial Intelligence (UAI).

JOURNAL REVIEWER: *Artificial Intelligence*; *Annals of Mathematics and AI*; *Computational Linguistics*; *Distributed Computing*; *IEEE Transactions on Neural Networks*; *IEEE Transactions on Knowledge and Data Engineering*; *IEEE Transactions on Pattern Analysis and Machine Intelligence*; *Information and Computation*; *Journal of Artificial Intelligence Research*; *Journal of Machine Learning Research*; *Machine Learning*; *Natural Language Engineering*; *SIAM Journal of Computing*; *The Journal of Logic Programming*; *The Constraints Journal*, *Theoretical Computer Science*.

## DISTINGUISHED LECTURES AND KEYNOTE TALKS

**Computer Science Distinguished Lecture Series**, Michigan State University, East Lansing, Michigan, MI, April 2020. *TBD*.

**Computer Science Distinguished Lecture Series**, Boston University, Boston, MA, April 2020. *It's Time to Reason*.

**Computer Science Distinguished Lecture Series**, Georgia Institute of Technology, Atlanta, GA, March 2020. *TBD*.

**Computer Science Distinguished Lecture Series**, University of California at Santa Barbara, Santa Barbara, CA, February 2020. *TBD*.

**AAAI'20 Workshop on Reasoning for Complex QA**, AAAI, New York, NY, February, 2020. *Why (and how) should we study Question Answering?*.

**AAAI'20 Workshop on Knowledge Discovery from Unstructured Data in Financial Services**, AAAI, New York, NY, February, 2020. *Learning from Incidental Supervision Signals*.

**EMNLP'19 Workshop on Deep Learning for Low-Resource Languages**, EMNLP, Hong Kong, November, 2019. *Information Extraction In Low Resource Languages: Incidental Supervision and Multilingual Representations*.

**Computer Science Distinguished Lecture Series**, University of Indiana, Bloomington, September 2019. *It's Time to Reason*.

**EmTech Mexico** An MIT Technology Review Event, Mexico City, Mexico, July 2019. *Navigating Information Pollution: A perspective from AI and Natural Language Understanding*.

**Google Workshop on Conversational System**. Mountain View, CA, June 2019. *Reasoning Interactively about Text*.

**Computer Science Distinguished Lecture Series**, University of California, Los Angeles, CA May 2019. *Beyond Classification: Reasoning for Natural Language Understanding*.

**Simon Foundation Symposium on New Directions in Theoretical Machine Learning**, Krn, Germany, May 2019. *Incidental Supervision and Reasoning*.

**The Dagstuhl Seminar** on "Multi-Document Information Consolidation" April 2019. The international Center for Computer Science in Schloss Dagstuhl, Germany. *On Reasoning in Multi-Documents Context*.

**The College of Information Sciences and Technology, Distinguished Lecture Series**, Penn State University, April 2019. *Natural Language Understanding with Incidental Supervision*.

**The 2019 ByteDance AI Symposium**, Tshingua University, Beijing, China. January 2018. Keynote Speaker. *Natural Language Understanding with Incidental Supervision*.

**EmTech China** An MIT Technology Review Event, Beijing, China, January 2019. *Navigating the Information Polluted World: Challenges and Opportunities*.

**The 2018 Fudan Data Science Conference**, Shanghai, China. December 2018. Keynote Speaker. *Natural Language Understanding with Incidental Supervision*.

**Google Assistant and Dialog Workshop.** Sunnyvale, CA, June 2018 Sunnyvale, CA June 2018. *Incidental Supervision.*

**The North American Conference of the Association of Computational Linguistics** Workshop on New Forms of Generalization in Deep Learning and Natural Language Processing, New Orleans, LA. June 2018. *Incidental Supervision.*

**EmTech China** An MIT Technology Review Event, Beijing, China, January 2018. *Making Sense of Unstructured Data: The Emergence of AI.*

**Computer Science Distinguished Lecture Series**, Northwestern University, Chicago IL, October 2017. *Natural Language Understanding with Incidental Supervision.*

**IJCAI John McCarthy Award Lecture.**, IJCAI 2017, Melbourne, Australia, August 2017. *The Necessity Of Learning and Reasoning: An Natural Language Understanding Perspective.*

**Illinois Health Data Analytics Summit**, University of Illinois, May 2017. *Natural Language Processing in Support of Healthcare*

**NSF Smart & Connected Health Visioning Meeting**, Boston University, March 2017. *Natural Language Processing in Support of Healthcare*

**American Bar Association (ABA) Antitrust Law Spring Meeting**, Washington DC, March 2017. *Expert Testimony of the Future of Machine Learning in the Legal Domain*

**Workshop on India's Tryst with Artificial Intelligence**, Bangalore, India, January 2017. *Making Sense of Unstructured Data: The Emergence of AI*

**NIPS 2016 Workshop on Cognitive Computation**, Barcelona, Spain, December 2016. A keynote speech on *Natural Language Understanding with Common Sense Reasoning.*

**15th Conference of the Italian Association for Artificial Intelligence**, Genoa, Italy, November 2016. A keynote speech on *Inducing Semantics with Minimal (or No) Supervision.*

**Computer Science Distinguished Lecture Series**, Northeastern University, Boston MA, November 2016. *Making Sense of (And Trusting) Unstructured Data.*

**The Conference of the Association of Computational Linguistics**, The 7th Workshop on Cognitive Aspects of Computational Language Learning, August 2016. Berlin, Germany. An invited talk on *Starting from Scratch in Semantic Role Labeling.*

**The North American Conference of the Association of Computational Linguistics**, The 4th Workshop on EVENTS, June 2016. San Diego, CA. An invited talk on *Events in Natural Language Text.*

**The University of Amsterdam**, A EU workshop on Semantic Processing. June 2016. Amsterdam, The Netherlands. An invited talk *Inducing Semantics with Minimal (or No) Supervision.*

**University of Wisconsin**, Madison, WI, May 2016. Department of Computer Science Distinguished Lecture Series on Data Management and Analysis . *Making Sense of (And Trusting) Unstructured Data.*

**Rutgers University**, New Brunswick, NJ, April 2016. Department of Homeland Security Retreat. An Invited Lecture on *Information Trustworthiness.*



**University of Pennsylvania**, Philadelphia, PA, February 2016. Department of Computer Science Distinguished Lecture Series. *Constraints Driven Learning and Inference for Natural Language Understanding*.

**AAAI'16, Phoenix, AZ. A workshop on Declarative Learning Based Programming**, January 2016. A keynote speech on *Declarative Learning Based Programming*.

**The University of Utrecht**, The Netherlands, October 2015. A workshop on Common Sense and Logic for Reasoning in Natural Language. Keynote Speaker. *Common Sense Reasoning for Natural Language Understanding*.

**NLPCC**, Nanchang, China, October 2015. The 4th China Computer Federation Conference on Natural Language Processing & Chinese Computing. Keynote Speaker. *Learning and Inference for Natural Language Understanding*.

**TSD**, Plzen, Czech Republic, September 2015. The 18th International Conference on Text, Speech and Dialogue. Keynote Speaker. *Learning and Inference for Natural Language Understanding*.

**IJCAI'15**, Buenos Aires, Argentina, July 2015. The 10th International Workshop on Neural-Symbolic Learning and Reasoning (NeSy'15). Distinguished Workshop Speaker. *Natural Language Understanding with Common Sense Reasoning*.

**Microsoft Research**, Redmond, WA, July 2015. An Invited Lecture in the MSR Faculty Summit. *Common Sense Reasoning for Natural Language Understanding*.

**Data Science Initiative, Distinguished Lecture Series**, Boston University, Boston MA, April 2015. *Learning and Inference for Natural Language Understanding*.

**Advanced Digital Sciences Center**, Singapore, December 2014. Workshop on Natural Language Processing. A keynote talk on *Learning and Inference for Natural Language Understanding*.

**Rochester Institute of Technology**, Rochester, NY, October 2014. Distinguished Computational Linguistics Lecture on *Learning and Inference for Natural Language Understanding*.

**Rutgers University**, New Brunswick, NJ, October 2014. A Fusion Fest Workshop in honor of Paul Kantor. An Invited Lecture on *Making Sense of Unstructured Data*.

**Andreessen Horowitz, Academic Roundtable**. Palo Alto, CA. September 2014. *Data Science: Making Sense of Unstructured Data*.

**AutoML, an ICML workshop**, June 2014. Beijing, China. A keynote speech on *Learning Based Programming*.

**EACL'14, The European Conference on Computational Linguistics**. Gutenberg, Sweden, April 2014. A keynote speech on *Learning and Inference for Natural Language Understanding*.

**Allen Institute for AI (AI2)**, Seattle, WA., March 2014. A Distinguished Lecture Series talk on *Learning and Inference for Natural Language Understanding*.

**ITA 2014, The Information Theory and Applications Workshop**, San Diego, CA, February 2014. An invited talk on *Amortized Integer Linear Programming Inference*.

**NIPS 2013 Workshop on Output Representation Learning**, Lake Tahoe, CA, December 2013. A keynote speech on *Amortized Integer Linear Programming Inference*.

**Fondazione Bruno Kessler, The Center for Information and Communication Technology**, Trento, Italy, November 2013. Distinguished Lecture Colloquium on *Amortized Integer Linear Programming Inference*.

**JSSP 2013 - Joint Symposium on Semantic Processing**, Trento, Italy, November 2013. A keynote speech on *Computational Frameworks for Supporting Textual Inference*.

**Institute of Computational Linguistics, Distinguished Lecture Colloquium**, The University of Heidelberg, Heidelberg, Germany, October 2013. *Better Natural Language Analysis and Amortized Integer Linear Programming*.

**The CIKM Workshop on Exploiting Semantic Annotations in Information Retrieval (ESAIR'13)**, San Francisco, CA, October 2013. A keynote speech on *Computational Frameworks for Semantic Analysis and Wikification*.

**The University of Washington & Microsoft Research Summer Institute on Understanding Situated Language in Everyday Life**, July 2013. A keynote speech on *Starting from Scratch in Semantic Role Labeling*.

**The Second AAAI workshop on Combining Constraint Solving with Mining and Learning**, July 2013. A keynote speech on *Amortized Integer Linear Programming Inference*.

**Inferning: Interactions between Learning and Inference, an ICML workshop**, June 2013. A keynote speech on *Amortized Integer Linear Programming Inference*.

**Structured Learning: Inferring Graphs from Structured and Unstructured Inputs, an ICML Workshop**, June 2013. A keynote speech on *Decomposing Structured Prediction via Constrained Conditional Models*.

**22nd Annual Belgium-Netherlands Conference on Machine Learning (BENELEARN-2013)**, Nijmegen, the Netherlands, June 2013. A keynote speech on *Constrained Conditional Models: Towards Better Semantic Analysis of Text*.

**KU Leuven Distinguished Lecture Series**, Leuven, Belgium, May 2013. *Constrained Conditional Models: ILP Formulations for Natural Language Understanding*.

**Computational Science and Engineering Center, University of Illinois**. Keynote Speech at the Annual Meeting, April 2013. *Making Sense of and Trusting, Unstructured Data*.

**A COLING Workshop on Information Extraction & Entity Analytics on Social Media Data**, December 2012. A keynote speech on *Constraints Driven Information Extraction and Trustworthiness*.

**The Annual Italian Operation Research Meeting (AIRO 2012)**, Salerno, Italy, September 2012. A keynote speech on *Constrained Conditional Models Integer Linear Programming Formulations for Natural Language Understanding*.

**The 2012 Workshop on Statistical Relational AI (STAR-AI 2012)**, Catalina Island, CA, August 2012. A keynote speech on *Constrained Conditional Models Integer Linear Programming Formulations for Natural Language Understanding*.

**An NAACL'12 Workshop on "From Words to Actions"**, Montreal, Canada, June 2012. A keynote speech on *Learning from Natural Instructions*.

**Semantic Representation and Inference**, A Workshop sponsored by the NSF and the Stanford Center for Language and Information (CLSI), Stanford, CA, March 2012. *Constrained Conditional Models for Natural Language Understanding*.

**National Academy of Science Workshop on Alerts and Warnings using Social Media**, Irvine, CA, February 2012. *Trustworthiness of Information: Can you believe what you read?*.

**NIPS'11**, Workshop on Domain Adaptation, Granada, Spain, December 2011. *Adaptation without Retraining*.

**IJCAI'11**, Workshop on Agents Learning Interactively from Human Teachers, Barcelona, Spain, July 2011. *Learning from Natural Instructions*.

**National University of Singapore, Department of Computer Science, Distinguished Lecture Series**, Jun. 2011, *Constraints Driven Structured Learning with Indirect Supervision*.

**The Dagstuhl Seminar** on "Constraint Programming meets Machine Learning and Data Mining." May 2011. The international Center for Computer Science in Schloss Dagstuhl, Germany. *Integer Linear Programming for NLP and Constraints Driven Structured Learning*.

**University of Maryland at College Park**, Workshop on Multimedia Analytics, the Visual Analytics Community Consortium, May 2011. *Data Science: Challenges, Opportunities and Some Solutions*.

**University of Pennsylvania, Department of Computer Science, Distinguished Lecture series.**, Nov. 2010. *Constraints Driven Structured Learning with Indirect Supervision*.

**Microsoft Research Lab., Beijing, China** August 2010, *Constraints Driven Structured Learning with Indirect Supervision*.

**ACL-2010** The Named Entities Workshop, July 2010, Uppsala, Sweden. *Constraints Driven Structured Learning with Indirect Supervision*.

**ICML-2010** Workshop on Budgeted Machine Learning, June 2010, Haifa, Israel. *Constraints Driven Structured Learning with Indirect Supervision*.

**DARPA Meeting on Machine Reading**, St. Petersburg, FL., April, 2010. *Constraints Driven Structured Learning with Indirect Supervision*.

**University of Saarland and Max Planck Institute**, Saarland, Germany, January, 2010. *Constrained Conditional Models: Learning and Inference for Natural Language Understanding*.

**NATO Advanced Workshop on Web Intelligence and Security**, Dead Sea, Israel, November 2009. *Title: Making Sense of Unstructured Textual Data*.

**University of Pittsburgh, Department of Computer Science, Distinguished Lecture series.**, Oct. 2009. *Constrained Conditional Models: Learning and Inference for Natural Language Understanding*.

**Integer Linear Programming for Natural Language Processing**, June 2009. Workshop co-located with HLT-NAACL 2009. *Title: Constrained Conditional Models: Learning and Inference for Natural Language Understanding.*

**International Conference on Machine Learning and Applications (ICMLA)**, San Diego, California. Keynote speaker. Dec. 2008. *Title: Constrained Conditional Models: Learning and Inference for Natural Language Understanding.*

**Discovering Opportunities for Information Extraction in Digital Government** , An NSF Sponsored Joint US-China meeting, UCS/ISI, Los Angeles, California. Sept. 2008. *Title: Constraints as Prior Knowledge for Information Extraction.*

**Kauffman Foundation's Meeting on Global Development, Information Technology, and the Frontiers of Knowledge**. Organized by the Cline Center for Democracy, Chicago, IL. April 2008. *Title: Machine Learning and Natural Language Processing for Information Access and Extraction.*

**NATO workshop on Security, Informatics and Terrorism** Ben-Gurion University, Beer-Sheva, Israel, June 2007. *Title: Semantic Abstraction and Integration across Text Documents and Data Bases.*

**IBM Haifa Research Lab (HRL) Annual seminar on Machine Learning** Haifa, Israel, June 2007. *Title: Global Learning and Inference with Constraints.*

**DIMACS-ONR workshop on Data Analysis**, Rutgers University, NJ, April 2007. *Title: Global Learning and Inference with Constraints.*

**A Workshop on Machine Learning in Natural Language Processing** CRI, The Caesarea Rothchild Institute at the University of Haifa, Haifa, Israel, December 2006. *Title: Global Inference and Learning: Towards Natural Language Understanding.*

**AAAI-06, The Conference of the American Association of Artificial Intelligence**, Boston, MA., July 2006. *Title: Global Inference and Learning: Towards Natural Language Understanding.*

**Computationally Hard Problems and Joint Inference in Speech and Language**, New York, NY., June 2006 (Workshop co-located with HLT-NAACL 2006). *Title: Global Inference in Learning for Natural Language Processing.*

**AAAI-05 Sister Conference Highlights**, Pittsburgh, Pennsylvania, July 2005. *Trends in Natural Language Research*. Representing The Association of Computational Linguistics (ACL) in the AAAI-05 Sister Conference.

**Empirical Modeling of Semantic Equivalence and Entailment** , Ann Arbor, Michigan, June 2005 (Workshop co-located with ACL-2005). *Knowledge Representation and Inference Models for Textual Entailment.*

**The Learning Workshop**, Snowbird, Utah, April 2005. *An Inference Model for Semantic Entailment in Natural Language.*

**The Dagstuhl Seminar on Probabilistic, Logical and Relational Learning - Towards a Synthesis**. Jan. 2005. The international Center for Computer Science in Schloss Dagstuhl, Germany. *Knowledge Representations, Learning and Inference for Natural Language Understanding.*

**ISCOL'04** The Israeli Annual Symposium on Computational Linguistics, Bar Ilan University, Israel, Dec. 2004. *Learning and Inference with Structured Representations*.

**BIC'04** International Workshop on Biologically Inspired Computing, Tohoku University, Sendai, Japan. Nov. 2004. *Learning and Inference in Natural Language: from Stand Alone Learning Tasks to Structured Representations*.

**CSLI, Stanford University**. A Symposium on Reasoning and Learning in Cognitive Systems, Stanford, March 2004. *Learning and Inference with Structured Representations*.

**Haifa Winter Workshop on Computer Science and Statistics**, The Cesarea Edmond Benjamin de Rothschild Foundation Institute for Interdisciplinary Applications of Computer Science, international workshop on Computer Science and Statistics. Dec. 2003, Haifa, Israel. *Learning and Optimization in Natural Language*.

**University of Pennsylvania, Department of Computer Science, Distinguished Lecture series.**, Nov. 2003. *Learning and Reasoning in Natural Language*.

**QA Workshop**. An international workshop on Question Answering and Text Summarization (held in conjunction with ACL'03) Sapporo, Japan, July 2003. *Inference with Classifiers*.

**ECML'02 and PKDD'02**. The 13th European Conference on Machine Learning (ECML'02) and the 6th European Conference on Principles and Practice of Knowledge Discovery in Databases (PKDD'02). Helsinki, Aug. 2002. *Inference with Classifiers*.

**EMNLP'02**. The 2002 Conference on Empirical Methods in Natural Language Processing. Philadelphia, July, 2002. *Learning and Inference in Natural Language*.

**The UIC Informatics Visiting Speaker Program**, University of Illinois in Chicago. May 2002. *Learning and Inference in Natural Language*.

**The Learning Workshop**, Snowbird, Utah, April 2002. *On Generalization Bounds, Projection Profile and Margin Distribution*.

**The University of Illinois Symposium on Bioinformatics in Medicine and Biology** University of Illinois at Chicago, April, 2002. *Gene Recognition based on DAG Shortest Paths: NLP methods in Bioinformatics*.

**Haifa Winter Workshop on Computer Science and Statistics**, The Cesarea Edmond Benjamin de Rothschild Foundation Institute for Interdisciplinary Applications of Computer Science, international workshop on Computer Science and Statistics. Dec. 2001, Haifa, Israel. *Understanding Probabilistic Classifiers*.

**LLL'01 and ILP'01**, Third Learning Language in Logic Workshop and Eleventh International Conference on Inductive Logic Programming (Joint Session). Strasbourg, France. Sept. 2001. *Natural Language Learning: Relational Learning via Propositional Algorithms*.

**University of Michigan**, Computation, Language, and Information series. Nov. 2000. *Learning in Natural Language: Theory and Algorithmic Approaches*.

**CoNLL-2000**, Fourth Computational Natural Language Learning Workshop, Sep. 2000, Lisbon, Portugal. *Learning in Natural Language: Theory and Algorithmic Approaches*.

**ICML-2000** Workshop on Machine Learning from Sequential and Temporal Data July 2000, Stanford, CA. *Inferring Phrase Structure*.

**SOFSEM 99**, XXVI-th Seminar on Current Trends in Theory and Practice of Informatics, Nov. 1999, Czech Republic. *Toward a theory of learning coherent concepts.*

**DIMACS**, The Center for Discrete Mathematics and Theoretical Computer Science, June 98, Rutgers University, NJ. *On the characteristic models of Boolean functions.*

**NM'98**, *The 7th International Workshop on Nonmonotonic Reasoning*, May 1998, Trento, Italy. *Learning to Make Nonmonotonic Inferences.*

**AIMA'97**, *The 5th International Symposium on Artificial Intelligence and Mathematics*, Jan. 1998, Fort Lauderdale, FL. Invited session on Boolean functions. *On the characteristic models of Boolean functions.*

**MFCS'97**, *The 22nd International Symposium on Mathematical Foundations of Computer Science*, Aug. 1997, Slovakia. *Learning to perform knowledge-intensive inferences.*

**M3D'97**, *Mathematical Techniques to Mine Massive Data Sets*, An NSF Sponsored Tutorial Workshop, July, 1997, University of Illinois, Chicago, IL. *Learning and Managing Knowledge in Large Scale Natural Language Inferences.*

**The Dagstuhl Seminar** on *Theory and Practice of Machine Learning*. Jan. 1997. The international Center for Computer Science in Schloss Dagstuhl, Germany. *Learning to perform knowledge-intensive inferences.*

**SOFSEM 96**, XXIII-rd Seminar on Current Trends in Theory and Practice of Informatics, Nov. 1996, Czech Republic. *Learning in Order to Reason.*

**AAAI 96 Fall Symposium** on Learning Complex Behaviors in Adaptive Intelligent Systems, Nov. 1996, Cambridge MA. *Topics in Learning to Reason.*

#### OTHER INVITED TALKS (COLLOQUIA TALKS)

University of Texas, Austin, December 2019. *It's Time to Reason.*

Hebrew University of Jerusalem, Jerusalem, Israel, May 2019. *It's Time to Reason.*

ISI/USC. May 2029. *Incidental Supervision for Natural Language Understanding.*

Cornell University, NY. September 2018. *Natural Language Understanding with Incidental Supervision.*

Peking University, China, August 2018. *Natural Language Understanding with Incidental Supervision.*

The D.E. Shaw Group, NYC, New York. May 2018. *Learning and Inference for Natural Language Understanding.*

TU Darmstadt, Darmstadt, Germany, April 2018. *Natural Language Understanding with Incidental Supervision.*

Carnegie Mellon University, Language Technology Institute, Pittsburgh, Pennsylvania, February 2018. *Natural Language Understanding with Incidental Supervision.*

Toutiao Inc., Beijing, China. January 2018. *Learning and Inference Protocols for Recuperating from Information Pollution.*

IBM Research, White Planes, NY., September 2016. *Inducing Semantics with Minimal (or No) Supervision.*

Boston University, Boston, MA., January 2016. *Constraints Driven Learning and Inference for Natural Language Understanding.*

Peking University, Beijing, China, October 2015. *Learning and Inference for Natural Language Understanding.*

Charles University, Prague, Czech Republic, September 2015. *Learning and Inference for Natural Language Understanding.*

INRIA Lille, France, May 2015. *Learning, Inference and Supervision for Structured Prediction Tasks.*

INRIA, Paris, France, May 2015. *Learning and Inference for Natural Language Understanding.*

Wolfram Research, Champaign, IL, March 2014. *Progress in Natural Language Understanding.*

Google, Mountain View, CA., February 2015. *Top Ten Challenges in Natural Language Understanding.*

Ben-Gurion University, Beer-Sheva, Israel, December 2014. *Learning and Inference for Natural Language Understanding.*

Singapore National University, Singapore, December 2014. *Learning and Inference for Natural Language Understanding.*

Singapore University of Technology and Design, Singapore, December 2014. *Making Sense of Unstructured Data.*

Cornell University, Ithaca, NY, November 2014. *Learning and Inference for Natural Language Understanding.*

University of Rochester, Rochester, NY, October 2014. "Big Picture Series" Lecture on *Learning and Inference for Natural Language Understanding.*

Microsoft Research, Beijing, China., June 2014. *Learning and Inference for Natural Language Understanding.*

Rensselaer Polytechnic Institute (RPI), Troy, NY, April 2014. *Learning and Inference for Natural Language Understanding.*

Columbia University, NYC, NY, March 2014. *Learning and Inference for Natural Language Understanding.*

Google, Mountain View, CA., March 2014. *Learning and Inference for Natural Language Understanding.*

University of California, Santa Cruz. February, 2014. *Learning and Inference for Natural Language Understanding.*

\*SEM, The Second Joint Conference on Lexical and Computational Semantics. Atlanta, GA, June 2013. A Panel Presentation on *Extended Semantic Role Labeling.*

Google, New York, NY., August 2013. *Better Natural Language Analysis and Amortized Integer Linear Programming.*

IBM Research, White Planes, NY., February 2013. *Making Sense of and Trusting, Unstructured Data.*

West Point Military Academy, Network Science Center, West Point, NY, February 2013. *Making sense of, and Trusting Unstructured Data.*

New York City Natural Language Processing Seminar, City University of NY, NYC, NY, January 2013. *Constrained Conditional Models: Integer Linear Programming Formulations for Natural Language Understanding.*

Health Informatics Technology Center, Workshop at the University of Illinois, Champaign, IL, November 2012. *Constraints Driven Information Extraction in the Medical Domain.*

Johns Hopkins University, The Center for Language and Speech Processing, Baltimore, MD, September 2012. *Constrained Conditional Models: Integer Linear Programming Formulations for Natural Language Understanding.*

University of Illinois Technology Showcase, Champaign, IL, April 2012. *Making Sense of Unstructured Data.*

Illinois Informatics Institute Lecture Series, Champaign, IL, March 2012. *Making Sense of Unstructured Data.*

University of Colorado, Boulder, CO, March 2012. *Learning from Natural Instructions.*

Princeton Plasma Physics Laboratory, Princeton, NJ, February 2012 *Learning and Reasoning for Natural Language Understanding.*

Bar-Ilan University, Ramat Gan, Israel, Dec. 2011. *Learning from Natural Instructions.*

Technion, Israeli Institute of Technology, Haifa, Israel, Dec. 2011. *Learning from Natural Instructions.*

University of Toronto, Computer Science Department, Toronto, Canada, Sept. 2011. *Learning from Natural Instructions.*

Microsoft Research, Redmond, WA., June 2011. *Constraints Driven Learning for Natural Language Understanding.*

Microsoft Research, Cambridge, MA., December 2010. *Constraints Driven Learning with Indirect Supervision.*

Vulcan Labs., Seattle, WA., December 2010. *Constraints Driven Learning.*

Boeing, Bellevue, WA., December 2010. *Constraints Driven Learning.*

IBM Research, White Planes, NY., Sept. 2010. *Constraints Driven Structured Learning with Indirect Supervision.*

Carnegie Mellon University, Language Technology Institute, Pittsburgh, Pennsylvania, Apr. 2010. *Constraints Driven Structured Learning with Indirect Supervision.*

University of Illinois at Urbana/Champaign, Linguistics Department, Urbana, IL, Apr. 2010. *Constrained Conditional Models: Learning and Inference for Natural Language Understanding.*



Hebrew University of Jerusalem, Jerusalem, Israel, Nov. 2009. *Constrained Conditional Models: Learning and Inference for Natural Language Understanding.*

Toyota Technical Institute (TTI), University of Chicago, IL, Sept. 2009. *Constrained Conditional Models: Learning and Inference for Natural Language Understanding.*

The university of Maryland at College Park, Apr. 2009. *Title: Constrained Conditional Models: Learning and Inference for Natural Language Understanding.*

Brigham Young University, Utah, Feb. 2009. *Title: Constrained Conditional Models: Learning and Inference for Natural Language Understanding.*

The University of Tilburg, Tilburg, The Netherlands, Feb. 2009. *Title: Constrained Conditional Models: Learning and Inference for Natural Language Understanding.*

The University of Amsterdam, Amsterdam, The Netherlands, Feb. 2009. *Title: Constrained Conditional Models: Learning and Inference for Natural Language Understanding.*

The University of Illinois at Urbana/Champaign, Computer Science Department, Urbana, IL, Jan. 2009. *Title: Constrained Conditional Models: Learning and Inference for Natural Language Understanding.*

Accenture Research Group, Chicago, IL, Nov. 2008. *Title: Constrained Conditional Models: Learning and Inference for Natural Language Understanding.*

University of Edinburgh, Edinburgh, United Kingdom, February 2008. *Title: Constrained Conditional Models for Global Learning and Inference.*

University of California, Irvine, CA, January 2008. *Title: Global Inference and Learning: Towards Natural Language Understanding.*

The Director's Seminar. The Beckman Institute of Advance Science and Technology, University of Illinois at Urbana-Champaign, Urbana, IL, Nov. 2007. *Title: Natural Language Processing via Global Inference and Learning.*

University of Washington, Seattle, WA, April 2007. *Title: Global Inference and Learning: Towards Natural Language Understanding.*

Bar-Ilan University, Ramat Gan, Israel, Jan. 2007. *Title: Global Inference and Learning.*

Technion, Israeli Institute of Technology, Haifa, Israel, Dec. 2006. *Title: Global Inference and Learning: Towards Natural Language Understanding.*

Lawrence Livermore National Laboratory, Livermore, CA, October 2006. *MIAS: Multimodal Information Access and Synthesis.*

Thompson Legal & Regulatory , St. Paul, MN, May 2006. *Learning and Inference for Natural Language Processing and Intelligent Access to Information.*

Massachusetts Institute of Technology, MA, Apr. 2006. *Global Inference in Learning for Natural Language Processing.*

Boeing, Bellevue, WA, Dec. 2005. *Learning and Inference in Natural Language Processing and Intelligent Information Access.*

Cornell University, NY, Dec. 2005. *Global Inference in Learning for Natural Language Processing.*

University of Texas at Austin, TX, Nov. 2005. *Global Inference in Learning for Natural Language Processing*.

Brown University, RI, August 2005. *Global Inference in Learning for Natural Language Processing*.

Lawrence Livermore National Laboratory, Livermore, CA, August 2005. *Learning and Inference in Natural Language Processing and Intelligent Information Access*.

Yahoo!, Sunnyvale, CA. August 2005. *Learning and Inference in Natural Language Processing and Intelligent Information Access*.

Institute for Theoretical Computer Science, Technische Universität Graz, Austria. Feb. 2005. *Learning and Inference in Natural Language: from Stand Alone Learning Tasks to Structured Representations*.

Haifa University, Haifa, Israel. Dec. 2004. *Learning and Inference with Structured Representations*.

Tokyo University, Tokyo, Japan. Nov. 2004. *Learning and Inference with Structured Representations*.

Universitat Pompeu Fabra, Barcelona, Spain. March 2004. *Learning and Inference with Structured Representations*.

Indian Institute of Technology (IIT) New Delhi, India. February 2004. *Learning and Inference in Natural Language*.

IBM Research Lab, New Delhi, India. February 2004. *Learning and Inference in Natural Language*.

Stanford University. March 2003. *Learning and Inference in Natural Language*.

ISI/USC. March 2003. *Learning and Inference in Natural Language*.

IBM Research, Almaden, CA., March 2003. *Learning and Inference in Natural Language*.

Google, Mountain View, CA., March 2003. *Learning and Inference in Natural Language*.

NIST, National Institute of Standards and Technology. Nov. 2002. *Reasoning with Classifiers: Theory and Application with Natural Language*.

IBM Research, White Planes, NY., Jun. 2002. *Learning and Inference in Natural Language*.

University of Alberta, Edmonton, Canada, Department of Computer Science Colloquium, Apr. 2002. *Natural Language Learning: Relational Learning via Propositional Algorithms*.

Ohio State University, OH., Department of Computer Science Colloquium, Apr. 2001. *Learning in Natural Language. Theory and Algorithmic Approaches*.

Technion, Israel, Department of Computer Science Colloquium, Dec. 2000. *Inference with Classifiers*.

IBM Research, White Planes, NY., Oct. 2000. *Context Sensitive Inferences*.

Department of Computer Science, University of Colorado at Boulder, Apr., 2000. *Learning in Natural Language*.

Department of Mathematics and Computer Science, Bar Ilan University, Israel. Dec., 1999. *Learning in Natural Language*.

Information Technology Research Institute (ITRI), University of Brighton, Brighton, UK. Dec., 1999. *Learning in Natural Language*.

Division of Informatics, University of Edinburgh, Edinburgh, UK. Dec., 1999. *Learning in Natural Language*.

Division of Engineering and Applied Science, Harvard University. Nov., 1999. *A learning centered approach to knowledge-intensive inferences*.

IBM Research, October, 1999. *A learning centered approach to knowledge-intensive inferences*.

Department of Mathematics and Computer Science, University of Waterloo, Canada, August, 1998 Title: *Learning and Managing Knowledge in Large Scale Natural Language Inferences*.

Department of Computer Science, Lucent Technologies, Bell Labs, May, 1997 Title: *Learning to perform knowledge-intensive inferences*.

Department of Computer Science, University of Illinois at Chicago, May, 1997 Title: *Learning to perform knowledge-intensive inferences*.

Department of Computer Science, University of Illinois at Urbana Champaign, May, 1997 Title: *Learning to perform knowledge-intensive inferences*.

Department of Computer Science, NEC Research institute, Princeton, April, 1997 Title: *Learning to perform knowledge-intensive inferences*.

Department of Computer Science, University of Pennsylvania, April, 1997 Title: *Learning to perform knowledge-intensive inferences*.

Department of Computer Science, Cornell University, April, 1997 Title: *Learning to perform knowledge-intensive inferences*.

Department of Computer Science, Ben Gurion University, Israel, March, 1997 Title: *Learning to perform knowledge-intensive inferences*.

Department of Computer Science, Tel Aviv Univ., Israel, June 1996 Title: *Learning to Correct Context-Sensitive Spelling Mistakes*.

Department of Computer Science, Technion, Israel, May 1996 Title: *Learning to Correct Context-Sensitive Spelling Mistakes*.

Department of Computer Science, Ben Gurion Univ., Israel, March 1996 Title: *Learning in Order to Reason*.

Israeli Symposium of Artificial Intelligence, February, 1996 Title: *Learning in Order to Reason*.

Department of Computer Science, Columbia Univ., NY, May 1995 Title: *Learning in Order to Reason*.

MIT, AI Lab, Cambridge MA., April 1995, Title: *Learning in Order to Reason*.

AT&T Bell Laboratories, Murray Hill, NJ, March, 1995. Title: *Learning in Order to Reason*.

NECI, Princeton, NJ, Feb. 1995 Title: *Learning in Order to Reason*.

Harvard's Society of Fellows, Dec 1994.

AT&T Bell Laboratories, Murray Hill, NJ, May, 1994. Title: *Reasoning with Models*.

Department of Computer Science, Rutgers University, April, 1994. Title: *Reasoning with Models*.

## STUDENTS

Graduated 36 Ph.D Students, 32 M.S. students, and over 40 undergraduate research assistants.

Graduate students got offers from universities such as Cambridge, Michigan, Purdue, Univ. of Pennsylvania, UCLA, Univ. of Virginia, and Utah; research labs such as Google Research, Microsoft Research, Amazon, and IBM, and have been post-docs at places such as MIT, Stanford, Columbia and Michigan.

Four undergraduate research assistants were nationally recognized by the Computing Research Association (CRA) for the Outstanding Undergraduate Research Award. Two with honorable mentions, and two were finalists for the Outstanding Undergraduate Award. Several of the undergraduate students went on to pursue Ph.Ds at MIT, Stanford and CMU. One undergraduate research assistant received the University of Illinois Undergraduate Employee of the Year Award (Honorable Mention).

Served on over 80 PhD committees at many institutions, including PhD committees in Belgium, Canada, France, Germany, Israel, Italy, the Netherlands, Spain, and the UK.

## LONG TERM VISITORS, POST-DOCS, RESEARCH FACULTY AND RESEARCH STAFF

1. Yuval Krymolowski, Bar Ilan University, Israel, 1999.
2. Chang-Hwan Lee, DongGuk Univ. Seoul, Korea, 2001 - 2002.
3. Xavier Carreras Perez, Universitat Politecnica de Catalunya, Spain, Spring 2002.
4. Charles La, CalTech, Summer 2003.
5. Roxana Girju, Visiting Research Assistant Professor, Aug. 2004 – Aug. 2005.
6. Fabio Aioli, Post-Doctoral Researcher, Nov. 2004 – May 2005.
7. Vasin Punyakanok, Post-Doctoral Researcher, Aug. 2005 – Aug 2006.
8. Mark Sammons, Research Programmer, Aug. 2004 – April 2007; Research Scientist, April 2007 – 2009; Principal Research Scientist, Nov. 2009 – June 2018.
9. Hiroya Takamura, Tokyo Institute of Technology, Visiting Assistant Professor, July 2006 – March 2007.
10. Sander Canisius, Tilburg University, The Netherlands, Sept. 2007 – Nov. 2007.
11. Adam Vogel, Research Programmer, March 2008 – September 2009.
12. Ivan Titov, Post-Doctoral Researcher, Feb. 2008 – September 2009.
13. James Clarke, Post-Doctoral Researcher, June 2008 – September 2010.
14. Shankar Vembu, Post-Doctoral Researcher, September 2009 – September 2010.

15. Joshua Gioja, Research Programmer, March 2009 – March 2012.
16. Yee Seng Chang, Post-Doctoral Researcher, November 2009 – November 2011.
17. Wei Lu, Post-Doctoral Researcher, October 2011 – August 2012.
18. Jeff Pasternack, Post-Doctoral Researcher, May 2012 – October 2012.
19. Yao-zhong Zhang, Post-Doctoral Researcher, September 2012 – October 2013.
20. Angel Conde Manjon, University of the Basque Country, Ph.D. Student, Fall 2012, Fall 2013.
21. Christos Christodoulopoulos, Post-Doctoral Researcher, August 2013 – Present.
22. Yangqiu Song, Post-Doctoral Researcher, October 2013 – April 2016.
23. Parisa Kordjamshidi, Post-Doctoral Researcher, December 2013 – August 2016.
24. Michael Roth, Post-Doctoral Researcher, September 2016 – April 2017.
25. Snigdha Chaturvedi, Post-Doctoral Researcher, July 2016 – July 2018.
26. Wenpeng Yin, Post-Doctoral Researcher, September 2017 – August 2019.
27. Hegler Tissot, Research Engineer, June 2019 – Present.
28. Muhao Chen, Post-Doctoral Researcher, August 2019 – Present.
29. Elior Sulem, Post-Doctoral Researcher, August 2019 – Present.

#### UNIVERSITY SERVICE

Served on a large number of Departmental and College of Engineering Committees.

Key leaderships roles include:

- Faculty Promotion Committee (FPC), College of Engineering, University of Pennsylvania 2018–2020.
- Chair of the UPenn School of Engineering and Applied Science Machine Learning Recruiting Committee 2018–2019.
- Chair of the UPenn Dept. of Computer and Information Science Faculty Recruiting Committee 2017–2018.
- Chair of the Dept. of Computer Science Graduate Admission Committee (UIUC) 2014–2016.
- Chair of the UIUC Dept. of Computer Science Advisory Committee (elected), 2005–2010. Responsible, among other issues, for a five year evaluation of the department head.
- Chair of the UIUC Dept. of Computer Science Laboratory Assignment Committee, 2006.
- Area Chair for the Artificial Intelligence (9 faculty, around 60 graduate students).
- College of Engineering Dean's Strategic Planning Advisory Group, 2002, 2003.
- College of Engineering Committee for fostering collaboration between CS and ECE, Co-Chair, 2008.
- Graduate College Fellowship Committee, 2012-2013
- University Scholars Committee, 2012-2014

# Publications

## BOOKS

- [1] I. Dagan, D. Roth, M. Sammons and F. Zanzotto, “Textual Entailment”, Morgan & Claypool Publishers. 2013.
- [2] W. Burgard, D. Roth, editors, Proceedings of the Twenty-Fifth AAAI Conference on Artificial Intelligence (AAAI-11), San Francisco, CA, USA, Aug. 2011.
- [3] E. Hinrichs and D. Roth, Editors, “ACL’03: 41st Annual Meeting of the Association for Computational Linguistics”, Sapporo, Japan, July 2003.
- [4] D. Roth and A. van den Bosch, Editors, “Proceedings of CoNLL-2002, The Sixth Conference on Natural Language Learning”, Taipei, Taiwan, Aug. 2002. Morgan Kaufman Publishers.

## JOURNAL ARTICLES

- [5] A. Mrinmaya Sachan, Avinava Dubey, Eduard Hovy, Tom Mitchell, Dan Roth and Eric P. Xing. “Discourse in Multimedia: A Case Study in Information Extraction”, *Computational Linguistics Journal*, To Appear, 2019.
- [6] Yangqiu Song, Shyam Upadhyay, Haoruo Peng, Stephen Mayhew, and Dan Roth, “Toward Any-language Zero-shot Topic Classification of Textual Documents”, *Artificial Intelligence*, Volume 274, Sept. 2019, Pp. 133–150.
- [7] M. Das, P. Odom, R. Islam, J. Doppa, S. Natarajan, and D. Roth, “Planning with actively eliciting preferences”, *The Journal of Knowledge-Based Systems*, Vol. 165, Feb. 2019.
- [8] A. Rozovskaya and D. Roth, “Grammar Error Correction in Morphologically Rich Languages: The Case of Russian”, *Transactions of the Association for Computational Linguistics*, Vol 7, 2019.
- [9] Tsai, C-T, S. Mayhew, Y. Song, M. Sammons, and D. Roth, “Illinois CCG LoReHLT 2016 named entity recognition and situation frame systems”, *Machine Translation*, Spacial Issue on NLP in Low Resource Languages. Vol. 1, 2018.
- [10] S. Roy and D. Roth, “Mapping to Declarative Knowledge for Word Problem Solving”, *Transactions of the Association for Computational Linguistics*, Vol. 1, 2018.
- [11] A. Rozovskaya, M. Sammons, and D. Roth, “Adapting to Learner Errors with Minimal Supervision”, *Computational Linguistics*. Vol. 34:4, December 2017. Accepted for Publication.
- [12] C-T. Tsai and D. Roth, “Multiple Knowledge Bases Concept Grounding via Indirect Supervision”, *Transactions of the Association for Computational Linguistics*, Vol. 4, 2016.
- [13] J. Wieting, M. Bansal, K. Gimpel, K. Livescu and D. Roth, “From Paraphrase Database to Compositional Paraphrase Model and Back”, *Transactions of the Association for Computational Linguistics*, Vol. 3, 2015.

- [14] V. Vydiswaran, C. Zhai, D. Roth and P. Pirolli, Overcoming bias to learn about controversial topics. *Journal of the American Society for Information Science and Technology (JASIST)*, 66(8):1655-1672, 2015.
- [15] S. Roy, T. Vieira and D. Roth, “Reasoning about Quantities in Natural Language”, *Transactions of the Association for Computational Linguistics*, Vol. 3, 2015.
- [16] A. Conde, M. Larraaga, A. Arruarte, J. A. Elorriaga and D. Roth, “LiteWi: A Combined Term Extraction Method for Eliciting Educational Ontologies from Textbooks”, *Journal of the American Society for Information Science and Technology (JASIST)*, 2015.
- [17] P. Kordjamshidi, D. Roth and M.F. Moens, “Structured Learning for Spatial Information Extraction from Biomedical Text”, *Bacteria Biotypes BMC Bioinformatics*, 2015.
- [18] A. Rozovskaya and D. Roth, “Building a State-of-the-Art Grammatical Error Correction System”, *Transactions of the Association for Computational Linguistics*, Vol 2, 2014.
- [19] E. Fersinia, E. Messina, G. Felice and D. Roth, “Soft-Constrained Inference For Named Entity Recognition”, *Journal of Information Processing & Management*, Vol. 50, 2014.
- [20] D. Goldwasser and D. Roth, “Learning from Natural Instructions”, *Machine Learning Journal*, Vol. 94 (2) , January 2014.
- [21] P. Jindal and D. Roth, “Extraction of Events and Temporal Expressions from Clinical Narratives”, *Journal of Biomedical Informatics (JBI)*, Vol. 46, Dec. 2013.
- [22] V. Srikumar and D. Roth, “Modeling Semantic Relations Expressed by Prepositions”, *Transactions of the Association for Computational Linguistics (TACL)*, Vol. 1, 2013.
- [23] P. Jindal and D. Roth, “Using Domain Knowledge and Domain-Inspired Discourse Model for Coreference Resolution for Clinical Narratives”, *JAMIA, Journal of American Medical Informatics Association*, Vol. 20 (2), Mar-Apr 2013.
- [24] Q. Do and D. Roth, “Exploiting the Wikipedia Structure in Local and Global Classification of Taxonomic Relations”. *Natural Language Engineering (NLE)*, Vol. 18 (2), pp. 235-262, 2012.
- [25] M. Chang, L. Ratinov and D. Roth, “Structured Learning with Constrained Conditional Models”, *Machine Learning Journal*, vol. 88 (3), pp. 399-431, June 2012.
- [26] O. J. Mengshoel, D. Roth and D. Wilkins, “Initialization and Restart in Stochastic Local Search: Computing a Most Probable Explanation in Bayesian Networks”, *IEEE Transactions on Knowledge and Data Engineering*, Vol. 23 (2) Feb. 2011.
- [27] O. J. Mengshoel, D. Roth and D. Wilkins, “Portfolios in Stochastic Local Search: Efficiently Computing Most Probable Explanations in Bayesian Networks”, *Journal of Automated Reasoning*, Vol. 46 (2), Feb. 2011.
- [28] K. Small and D. Roth, “Margin-based active learning for structured predictions”, *International Journal of Machine Learning and Cybernetics (IJMLC)*, 1:3-25, 2010.

- [29] D. Roth and R. Samdani, “Learning Multi-Linear Representations”, *Machine Learning*, Volume 76 (2), July 2009.
- [30] C. J. Godby, P. Hswe, L. Jackson, J. Klavans, Ratinov, D. Roth and H. Cho. “Who’s Who in Your Digital Collection: Developing a Tool for Name Disambiguation and Identity Resolution.” In *Journal of the Chicago Colloquium on Digital Humanities and Computer Science*, Nov. 2009.
- [31] V. Punyakanok, D. Roth and W. Yih, “The Importance of Syntactic Parsing and Inference in Semantic Role Labeling”, *Computational Linguistics, Special Issue on Semantic Role Labeling*. Vol. 34 (2), June 2008.
- [32] E. Daya, D. Roth and S. Wintner “Identifying Semitic Roots: Machine Learning with Linguistic Constraints”, *Computational Linguistics*, Vol. 34 (3), Sept. 2008.
- [33] Z. Zeng, J. Tu, M. Liu, T. S. Huang, B. Pianfetti, D. Roth and S. Levinson, “Audio-Visual Affect Recognition”, *IEEE Transactions on Multimedia*, Vol. (2), pp. 424-428 February 2007.
- [34] O. J. Mengshoel, D. Roth and D. Wilkins, “Controlled Generation of Hard and Easy Bayesian Networks: Impact on Maximal Clique Size in Tree Clustering”, *Artificial Intelligence*, 2006. Vol. 170, 16-17, Nov. 2006, pp. 1137-1174.
- [35] R. Khardon, D. Roth and R. Servedio, “Efficiency versus Convergence of Boolean Kernels for On-Line Learning Algorithms”, *Journal of Artificial Intelligence Research (JAIR)*, Vol. 24, pp. 341–356, July 2005.
- [36] X. Li and D. Roth, “Learning Questions Classifiers: The Role of Semantic Information”. *Natural Language Engineering (NLE)*, Vol. 11(4), 2005.
- [37] S. Agarwal, T. Greapel, R. Herbich, S. Har-Peled and D. Roth, “Generalization Bounds for the Area Under an ROC curve”, *Journal of Machine Learning Research (JMLR)*, vol. 6, pp. 393–425, 2005.
- [38] S. Agarwal, A. Awan and D. Roth, “Learning to Detect Objects in Images via a Sparse, Part-Based Representation”, *IEEE Transactions on Pattern Analysis and Machine Intelligence*, Vol. 20 (11) pp. 1475–1490, 2004.
- [39] R. Greiner, A. J. Grove and D. Roth, “Learning Cost-Sensitive Active Classifiers”, *Artificial Intelligence*, Vol. 139, 2, Sept. 2002, pp. 137–174.
- [40] D. Roth, M-H. Yang and N. Ahuja, “Learning to Recognize 3D Objects”, *Neural Computation*, Vol 14 (5), May 2002, pp. 1071–1104.
- [41] J. Chuang and D. Roth, “Gene recognition based on DAG shortest paths”, *Bioinformatics*, Vol. 17, Suppl. 1, Jul. 2001, pp. S56-S64.
- [42] A. Grove and D. Roth, “Linear concepts and hidden variables”, *Machine Learning*, Vol 42(1/2), Jan. 2001, pp. 123-141.
- [43] R. Khardon, H. Mannila and D. Roth, “Reasoning with Examples: Propositional Formulae and Database Dependencies”, *Acta Informatica* 36, 4, July 1999, pp. 267–286.



- [44] M. Mavronicolas and D. Roth, “Linearizable Read/Write Objects”, *Theoretical Computer Science*. Vol. 220(1), Jun. 1999, pp. 267-319.
- [45] R. Khardon and D. Roth, “Learning to Reason with Restricted View”, *Machine Learning*, Vol 35, 2, May 1999, pp. 95-117.
- [46] A. R. Golding and D. Roth, “A Winnow-Based Approach to Spelling Correction”, *Machine Learning*, Special issue on Machine Learning and Natural Language Processing, Vol. 34, 1/3, Feb. 1999, pp. 107-130.
- [47] H. Aizenstein, A. Blum, R. Khardon, E. Kushilevitz L. Pitt and D. Roth, “On Learning Read- $k$ -Satisfy- $j$  DNF”, *SIAM Journal on Computing*, Vol. 27, 6, Dec. 1998, pp. 1515-1530.
- [48] R. Khardon and D. Roth, “Defaults and Relevance in Model Based Reasoning”, *Artificial Intelligence* (97)1-2, Dec. 1997, pp. 169-193.
- [49] R. Khardon and D. Roth, “Learning to Reason”, *Journal of the Association for Computing Machinery*, Vol. 44, No 5, Sept. 1997, pp. 697-725.
- [50] K. Daniels, V. J. Milenkovic and D. Roth, “Finding the Maximum Area Axis-Parallel Rectangle in a Polygon”, *Computational Geometry: Theory and Applications*, Vol. 7, Nos. 1-2, Jan. 1997, pp. 125-148.
- [51] R. Khardon and D. Roth, “Reasoning with Models”, *Artificial Intelligence*, Vol. 87, 1-2, Nov. 1996, pp. 187-213.
- [52] E. Kushilevitz and D. Roth, “On Learning Visual Concepts and DNF Formulae”, *Machine Learning*, Vol. 24, 1, Jul. 1996, pp. 65-85.
- [53] D. Roth, “On the Hardness of Approximate Reasoning”, *Artificial Intelligence*, Vol. 82, 1-2, Apr. 1996, pp. 273-302.

#### INVITED PAPERS AND BOOK CHAPTERS

- [54] N. Rizzolo and D. Roth “Integer Linear Programming for Co-reference Resolution”, A Chapter invited to “Anaphora Resolution: Algorithms, Resources, and Applications”, Massimo Poesio, Roland Stuckardt & Yannick Versley, Editors. 2016.
- [55] J. Pasternack and D. Roth “Judging the Veracity of Claims and Reliability of Sources With Fact-Finders: Judging the Veracity of Claims and Reliability of Sources With Fact-Finders”. A Chapter invited to ”Computational Trust Models and Machine Learning”, Xin Liu, Anwitaman Datta, and Ee-Peng Lim, Editors. Chapman and Hall/CRC 2014.
- [56] A. Bordes , L. Bottou , R. Collobert , D. Roth , J. Weston and L. Zettlemoyer, “ Guest Editors. An Introduction to the special issue on learning semantics”, *Machine Learning Journal*. Vol. 94 Number 2 , January 2014.
- [57] M. Connor, C. Fisher and D. Roth “Starting from Scratch in Semantic Role Labeling: Early Indirect Supervision”, A Chapter invited to ”Cognitive Aspects of Computational Language Acquisition”, Afra Alishahi, Thierry Poibeau, Anna Korhonen, Editors. Springer. 2012.

- [58] M. Sammons, V. Vydiswaran and D. Roth “Recognizing Textual Entailment”, A Chapter invited to ”Multilingual Natural Language Applications: From Theory to Practice”, D. Bikel and I. Zitouni, Editors. Prentice Hall Press, pp. 209-258, 2012.
- [59] D. Roth “Making Sense of Unstructured Data”, A chapter invited to “Web Intelligence and Security: Advances in Data and Text Mining Techniques for Detecting and Preventing Terrorist Activities on the Web”, Mark Last and Abraham Kandel, editors. NATO Science for Peace and Security Series, IOS Press, 2010.
- [60] I. Dagan, B. Dolan, B. Magnini and D. Roth, “Guest Editors Introduction: Recognizing Textual Entailment: Rational, Evaluation and Approaches”, An Introduction to a Special Issue of the Journal of General Engineering. Vol. 1, pp 1-17, 2009, Cambridge University Press.
- [61] D. Goldwasser, M.-W. Chang, Y. Tu and D. Roth, “Constraint Driven Transliteration Discovery,” in Recent Advances in Natural Language Processing. Nicolas Nicolov, eds., Springer-Verlag, 2009.
- [62] A. Klementiev and D. Roth, “Named Entity Transliteration and Discovery in Multilingual Corpora,” in Learning Machine Translation, Cyril Goutte, Nicola Cancedda, Marc Dymetman and George Foster, eds. MIT Press, 2008.
- [63] R. de Salvo Braz, E. Amir and D. Roth, “A Survey of First-Order Probabilistic Models”, in Innovations in Bayesian Networks. D.E. Holmes and L.C. Jain, eds. Springer-Verlag, 2008.
- [64] D. Roth and W. Yih, “Global Inference for Entities and Relations Identification via a Linear Programming Formulation,” in Statistical Relational Learning. L. Getoor and B. Taskar, eds. MIT Press, 2007.
- [65] R. de Salvo Braz, D. Roth and E. Amir, “Lifted First-Order Probabilistic Inference”, in Introduction to Statistical Relational Learning. L. Getoor and B. Taskar, eds. MIT Press, 2007.
- [66] M. Chang, Q. Do and D. Roth, “Multilingual Dependency Parsing: A Pipeline Approach,” in Recent Advances in Natural Language Processing. Nicolas Nicolov, eds., Springer-Verlag, 2006.
- [67] Fung, P. and Roth, D., “Guest Editors Introduction: Machine Learning in Speech and Language Technologies”, An Introduction to a Special Issue of the Machine Learning Journal. Vol. 60, no. 1-3, September 2005.
- [68] D. Roth, “Learning Based Programming”, in *Innovations in Machine Learning: Theory and Applications*, Springer-Verlag book, L.C. Jain and D. Holmes, Eds., 2005.
- [69] X. Li and P. Morie and D. Roth, “ Semantic Integration in Text: From Ambiguous Names to Identifiable Entities”, AI Magazine. Special Issue on Semantic Integration, 2005.
- [70] D. Roth, “Reasoning with Classifiers” (Invited). In Proceedings of *ECML’02, The European Conference on Machine Learning*, Aug. 2002.

- [71] D. Roth, “Learning in Natural Language: Theory and Algorithmic Approaches” (Invited). In Proceedings of *CoNLL’00: Computational Natural Language Learning*.
- [72] D. Roth, D. Zelenko, “Coherent Concepts, Robust Learning” (Invited). In J. Pavelka, G. Tel, M. Bartosek (Eds.), *SOFSEM’99: Theory and Practice of Informatics*, Springer-Verlag Lecture Notes in Computer Science (LNCS) LNCS 1725, pp. 260–272.
- [73] D. Roth, “Learning and Reasoning with Connectionist Representations”, A contribution to “Connectionist Symbol Processing: Dead or Alive”, A. Jagota (Eds.), *Neural Computing Surveys*, 2, 1999, pp. 1–40.
- [74] D. Roth, “Learning to perform knowledge intensive inferences” (Invited Abstract). In I. Privara and P. Ruzicka (Eds.), *MFC’S’97: Mathematical Foundations of Computer Science, 1997*, Springer-Verlag Lecture Notes in Computer Science (LNCS) 1295, pp. 108.
- [75] D. Roth, “Learning in Order to Reason: The Approach” (Invited). In K. G. Jeffery and J. Kral and M. Bartosek (Eds.), *SOFSEM’96: Theory and Practice of Informatics*, Springer-Verlag Lecture Notes in Computer Science (LNCS) 1175, pp. 112–124.
- [76] D. Roth, “Learning in Order to Reason” (Invited). *AAAI Symposium on Learning Complex Behaviors in Adaptive Intelligent Systems, Fall 1996*.

#### REFEREED CONFERENCE PROCEEDINGS

- [77] Karthikeyan K, Zihan Wang, Stephen Mayhew, and Dan Roth, “Cross-Lingual Ability of Multilingual BERT: An Empirical Study”, *ICLR, The International Conference on Learning Representations*, 2020.
- [78] Nitish Gupta, Kevin Lin, Dan Roth, Sameer Singh, and Matt Gardner, “Neural Module Networks for Reasoning over Text”, *ICLR, The International Conference on Learning Representations*, 2020.
- [79] Soham Dan, Hangfeng He, and Dan Roth, “Understanding Spatial Relations through Multiple Modalities”, *LREC, Proc. of the 12th International Conference on Language Resources and Evaluation*, 2020.
- [80] Soham Dan, Parisa Kordjamshidi, Archana Bhatia, Julia Bonn, Jon Cai, Martha Palmer, and Dan Roth, “From Spatial Relations to Spatial Configurations”, *LREC, Proc. of the 12th International Conference on Language Resources and Evaluation*, 2020.
- [81] Stephen Mayhew, Nitish Gupta, and Dan Roth, “Robust Named Entity Recognition with Truecasing Pretraining”, *AAAI, The 34th Conference on Artificial Intelligence*, Feb. 2020.
- [82] Stephen Mayhew, Tatiana Tsygankova, and Dan Roth, “ner and pos when nothing is capitalized”, *EMNLP, Proc. of the Conference on Empirical Methods in Natural Language Processing*, 2019.

- [83] Wenpeng Yin, Jamaal Hay, and Dan Roth, “Benchmarking Zero-shot Text Classification: Datasets, Evaluation, and Entailment Approach”, *EMNLP, Proc. of the Conference on Empirical Methods in Natural Language Processing*, 2019.
- [84] Daniel Deutsch and Dan Roth, “Summary Cloze: A New Task for Content Selection in Topic-Focused Summarization”, *EMNLP, Proc. of the Conference on Empirical Methods in Natural Language Processing*, 2019.
- [85] Ben Zhou, Daniel Khashabi, Qiang Ning, and Dan Roth, ““Going on a vacation” takes longer than “Going for a walk”: A Study of Temporal Commonsense Understanding”, *EMNLP, Proc. of the Conference on Empirical Methods in Natural Language Processing*, 2019.
- [86] Qiang Ning, Sanjay Subramanian, and Dan Roth, “An Improved Neural Baseline for Temporal Relation Extraction”, *EMNLP, Proc. of the Conference on Empirical Methods in Natural Language Processing*, 2019.
- [87] Haoruo Peng, Qiang Ning, and Dan Roth, “KnowSemLM: A Knowledge Infused Semantic Language Model”, *CoNLL’19, Proc. of the Annual Conference on Computational Natural Language Learning*, 2019.
- [88] Daniel Deutsch, Shyam Upadhyay and Dan Roth, “A General-Purpose Algorithm for Constrained Sequential Inference”, *CoNLL’19, Proc. of the Annual Conference on Computational Natural Language Learning*, 2019.
- [89] Hai Wang, Dian Yu, Kai Sun, Jianshu Chen, Dong Yu, David McAllester, and Dan Roth, “Evidence Sentence Extraction for Machine Reading Comprehension”, *CoNLL’19, Proc. of the Annual Conference on Computational Natural Language Learning*, 2019.
- [90] Stephen Mayhew, Snigdha Chaturvedi, Chen-Tse Tsai, and Dan Roth, “Named Entity Recognition with Partially Annotated Training Data”, *CoNLL’19, Proc. of the Annual Conference on Computational Natural Language Learning*, 2019.
- [91] Yanai Elazar, Abhijit Mahabal, Deepak Ramachandran, Tania Bedrax-Weiss and Dan Roth, “How Large Are Lions? Inducing Distributions over Quantitative Attributes”, *ACL, The Annual Meeting of the Association for Computational Linguistics*, 2019.
- [92] Yi Zhang, Zach Ives and Dan Roth, “Evidence-based Trustworthiness”, *ACL, The Annual Meeting of the Association for Computational Linguistics*, 2019.
- [93] Sihao Chen, Daniel Khashabi, Chris Callison-Burch, and Dan Roth, “PerspectroScope: A Window to the World of Diverse Perspectives”, *ACL, The Annual Meeting of the Association for Computational Linguistics (Demo Track)*, 2019.
- [94] Sihao Chen and Daniel Khashabi and Wenpeng Yin and Chris Callison-Burch and Dan Roth, “Seeing Things from a Different Angle: Discovering Diverse Perspectives about Claims”, *NAACL’19, The North American Conference on Computational Linguistics (2019)*
- [95] Qiang Ning and Hangfeng He and Chuchu Fan and Dan Roth, “Partial or Complete, That’s The Question”, *NAACL’19, The North American Conference on Computational Linguistics (2019)*

- [96] Abhijit Mahabal and Jason Baldridge and Burcu Karagol Ayan and Vincent Perot and Dan Roth, “Text Classification with Few Examples using Controlled Generalization”, *NAACL’19, The North American Conference on Computational Linguistics* (2019)
- Oshin Agarwal and Sanjay Subramanian and Ani Nenkova and Dan Roth, Evaluation of Named Entity Coreference Workshop on Computational Models of Reference, Anaphora and Coreference (CRAC),
- [97] Oshin Agarwal and Sanjay Subramanian and Ani Nenkova and Dan Roth, “Evaluation of Named Entity Coreference”, *NAACL’19, Workshop on Computational Models of Reference, Anaphora and Coreference (CRAC)* (2019)
- [98] Jana Doppa and Dan Roth, “Randomized Greedy Search for Structured Prediction: Amortized Inference and Learning”, *IJCAI’19, The 28th International Joint Conference on Artificial Intelligence* (2019)
- [99] Jana Doppa and Dan Roth, “Learning and Inference for Structured Prediction: A Unifying Perspective”, *IJCAI’19, The 28th International Joint Conference on Artificial Intelligence* (2019)
- [100] Sanjay Subramanian and Dan Roth, “Improving Generalization in Coreference Resolution via Adversarial Training”, *\*SEM, The Joint Conference on Lexical and Computational Semantics* (2019)
- [101] Ziheng Zeng and Snigdha Chaturvedi and Suma Bhat and Dan Roth, “DiAd: Domain Adaptation for Learning at Scale”, *LAK, the 9th International Learning Analytics and Knowledge Conference* (2019)
- [102] Ben Zhou and Daniel Khashabi and Chen-Tse Tsai and Dan Roth, “Zero-Shot Open Entity Typing as Type-Compatible Grounding” *EMNLP, Proc. of the Conference on Empirical Methods in Natural Language Processing*, 2018.
- [103] Shyam Upadhyay and Jordan Kodner and Dan Roth, “Bootstrapping Transliteration with Constrained Discovery for Low-Resource Languages” *EMNLP, Proc. of the Conference on Empirical Methods in Natural Language Processing*, 2018.
- [104] Wenpeng Yin and Dan Roth, TwoWingOS: “A Two-Wing Optimization Strategy for Evidential Claim Verification” *EMNLP, Proc. of the Conference on Empirical Methods in Natural Language Processing*, 2018.
- [105] Xiaodong Yu and Stephen Mayhew and Mark Sammons and Dan Roth, “On the Strength of Character Language Models for Multilingual Named Entity Recognition” *EMNLP, Proc. of the Conference on Empirical Methods in Natural Language Processing*, 2018.
- [106] Shyam Upadhyay and Nitish Gupta and Dan Roth, “Joint Multilingual Supervision for Cross-Lingual Entity Linking” *EMNLP, Proc. of the Conference on Empirical Methods in Natural Language Processing*, 2018. Mri
- [107] Qiang Ning and Ben Zhou and Zhili Feng and Haoruo Peng and Dan Roth, CogCompTime: “A Tool for Understanding Time in Natural Language” *EMNLP, Proc. of the Conference on Empirical Methods in Natural Language Processing (Demo Track)*, 2018.

- [108] M. Sachan and KA. Dubey and TM. Mitchell and D. Roth, EP. Xing “Learning Pipelines with Limited Data and Domain Knowledge: A Study in Parsing Physics Problems”, *NIPS, The 2018 Conference on Advances in Neural Information Processing Systems*. MIT Press, Dec. 2018.
- [109] Q. Ning, H. Wu, and D. Roth, “A Multi-Axis Annotation Scheme for Event Temporal Relations”, *ACL, The Annual Meeting of the Association for Computational Linguistics*, 2018.
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