The 54th Annual Meeting of the Association for Computational Linguistics

Proceedings of the Conference, Vol. 1 (Long Papers)

August 7-12, 2016
Berlin, Germany

Platinum Sponsors

Gold Sponsors

Silver Sponsors

Bronze Sponsors

Order copies of this and other ACL proceedings from:

Association for Computational Linguistics (ACL)
209 N. Eighth Street
Stroudsburg, PA 18360
USA
Tel: +1-570-476-8006
Fax: +1-570-476-0860
acl@aclweb.org

ISBN 978-1-945626-00-5 (Volume 1)
ISBN 978-1-945626-01-2 (Volume 2)

Preface: General Chair

In my welcome to participants in this year's conference handbook, I especially welcomed those for which it was their first ACL. I expressed the hope that the conference fulfilled their expectations and remained in their memory as a great start. Trying to imagine the first experience of a present-day ACL, the magnitude of the whole event may be a bit overwhelming - our field is on an expanding trajectory, and even a selection of the best work fills a great number of parallel sessions over a number of days; plus, there are the workshops and tutorials to quench many topical thirsts. This ACL again promises to be a next peak in a progressive development.

ACL Conferences are the product of many people working together, kindly offering their services to the community at large. ACL-2016 is no exception to this. I would like to thank each and every person who has volunteered their time to make the event possible. I am deeply impressed with the sense of community that organizing an ACL brings about.

Priscilla Rasmussen, the ACL Business Manager, and the 2015 ACL Executive Committee (Chris Manning, Pushpak Bhattacharyya, Joakim Nivre, Graeme Hirst, Dragomir Radev, Gertjan van Nood, Min-Yen Kan, Herman Ney, and Yejin Choi) have been instrumental in setting ACL-2016 in motion and in guiding the ACL-2016 team along the path from concept to execution. Without the collective memory and hands-on guidance of the committee, an ACL conference will never happen.

The ACL-2016 team was formidable in building all the components of the conference and connecting them together in an impressive programme: Katrin Erk and Noah Smith (Programme Committee Chairs); Valia Kordoni, Markus Egg (Local Arrangements Chairs) who brought together a fantastic local organization team; Sabine Schulte im Walde and Jun Zhao (Workshop Chairs), Alexandra Birch and Willem Zuidema (Tutorial Chairs); Hai Zhao, Yusuke Miyao, and Yannick Versley (Publication Chairs); Tao Lei, He He, and Will Roberts (Student Research Workshop Chairs), Yang Liu, Chris Biemann, and Gosse Bouma (Faculty Advisors for the Student Research Workshop), Marianna Apidianaki and Sameer Pradhan (Demonstration Chairs), Barbara Plank (Publicity Chair), Florian Kunneman and Matt Post (Conference Handbook Team), and Yulia Grishina (Student Volunteer Coordinator).

The Program Chairs selected outstanding invited speakers: Mark Steedman (University of Edinburgh) and Amber Boydstun (University of California, Davis).

I am deeply grateful to our sponsors for their generous contributions, allowing the conference not to become prohibitively expensive: Google, Baidu, Amazon (Platinum Sponsors); Bloomberg, Facebook, eBay, Elsevier, Microsoft Research, and Maluuba (Gold Sponsors); Huawei Technologies, Zalando SE (Silver Sponsors); Nuance, Grammarly, Voicebox, Yandex, and Textkernel (Bronze Sponsors).

Finally, I would like to express my deep appreciation for the hard work carried out by all area chairs, workshop organizers, tutorial presenters, and the massive army of reviewers. Kudos to all.

Welcome to ACL-2016!

Antal van den Bosch
General Chair

Preface: Program Committee Co-Chairs

Welcome to the 54th Annual Meeting of the Association for Computational Linguistics! This year, ACL received 825 long paper submissions (a new record) and 463 short paper submissions.[1] Of the long papers, 231 were accepted for presentation at ACL—116 as oral presentations and 115 as poster presentations. 97 short papers were accepted—49 as oral and 48 as poster presentations. In addition, ACL also features 25 presentations of papers accepted in the *Transactions of the Association for Computational Linguistics* (TACL). With 353 paper presentations at the main conference, this is the largest ACL program to date.

In keeping with the tremendous growth of our field, we introduced some changes to the conference. Oral presentations were shortened to fifteen (twelve) minutes for long (short) papers, plus time for questions. While this places a greater demand on speakers to be concise, we believe it is worth the effort, allowing far more work to be presented orally. We also took advantage of the many halls available at Humboldt University and expanded the number of parallel talks during some conference sessions.

We introduced a category of outstanding papers to help recognize the highest quality work in the community this year. The 11 outstanding papers (9 long, 2 short, 0.85% of submissions) represent a broad spectrum of exciting contributions; they are recognized by especially prominent placement in the program. From these, a best paper and an IBM-sponsored best student paper have been selected; those will be announced in the awards session on Wednesday afternoon.

Following other recent ACL conferences, submissions were reviewed under different categories and using different review forms for empirical/data-driven, theoretical, applications/tools, resources/evaluation, and survey papers. We introduced special fields in the paper submission form for authors to explicitly note the release of open-source implementations to enable reproducibility, and to note freely available datasets. We also allowed authors to submit appendices of arbitrary length for details that would enable replication; reviewers were not expected to read this material.

Another innovation we explored during the review period was the scheduling of short paper review before long paper review. While this was planned to make the entire review period more compact (fitting between the constraints of NAACL 2016 and EMNLP 2016 at either end), we found that reviewing short papers first eliminated many of the surprises for the long paper review process.

We sought to follow recently-evolved best practices in planning the poster sessions, so that the many high-quality works presented in that format will be visible and authors and attendees benefit from the interactions during the two poster sessions.

ACL 2016 will have two distinguished invited speakers: Amber Boydstun (Associate Professor of Political Science at the University of California, Davis) and Mark Steedman (Professor of Cognitive Science at the University of Edinburgh). We are grateful that they accepted our invitations and look forward to their presentations.

There are many individuals we wish to thank for their contributions to ACL 2016, some multiple times:

[1] These numbers exclude papers that were not reviewed due to formatting, anonymity, or double submission violations (9 short and 21 long papers) or that were withdrawn prior to review (approximately 59 short and 52 long papers).

- The 38 area chairs who recruited reviewers, led the discussion about each paper, carefully assessed each submission, and authored meta-reviews to guide final decisions: Miguel Ballesteros, David Bamman, Steven Bethard, Jonathan Berant, Gemma Boleda, Ming-Wei Chang, Wanxiang Che, Chris Dyer, Ed Grefenstette, Hannaneh Hajishirzi, Minlie Huang, Mans Hulden, Heng Ji, Jing Jiang, Zornitsa Kozareva, Marco Kuhlmann, Yang Liu, Annie Louis, Wei Lu, Marie-Catherine de Marneffe, Gerard de Melo, David Mimno, Meg Mitchell, Daichi Mochihashi, Graham Neubig, Naoaki Okazaki, Simone Ponzetto, Matthew Purver, David Reitter, Nathan Schneider, Hinrich Schuetze, Thamar Solorio, Lucia Specia, Partha Talukdar, Ivan Titov, Lu Wang, Nianwen Xue, and Grace Yang.
- Our full program committee of 884 hard-working individuals who reviewed the conference's 1,288 submissions (including secondary reviewers).
- The ACL coordinating committee members, especially Yejin Choi, Graeme Hirst, Chris Manning, and Shiqi Zhao, who answered many questions as they arose during the year.
- TACL editors-in-chief Mark Johnson, Lillian Lee, and Kristina Toutanova, for coordinating with us on TACL presentations at ACL.
- Ani Nenkova and Owen Rambow, program co-chairs of NAACL 2016, and Michael Strube, program co-chair of ACL 2015, who were generous with advice.
- Yusuke Miyao, Yannick Versley, and Hai Zhao, our well-organized publication chairs, and the responsive team at Softconf led by Rich Gerber.
- Valia Kordoni and the local organization team, especially webmaster Kostadin Cholakov.
- Antal van den Bosch, our general chair, who kept us coordinated with the rest of the ACL 2016 team and offered guidance whenever we needed it.
- Antal van den Bosch, Claire Cardie, Pascale Fung, Ray Mooney, and Joakim Nivre, who carefully reviewed papers under consideration for outstanding and best paper recognition.
- Priscilla Rasmussen, who knows everything about how to make ACL a success.

We hope that you enjoy ACL 2016 in Berlin!

ACL 2016 program co-chairs
Katrin Erk, University of Texas
Noah A. Smith, University of Washington

ACL 2016 Organizing Committee

General Chair

Antal van den Bosch, Radboud University Nijmegen

Program Co-Chairs

Katrin Erk, University of Texas at Austin
Noah A. Smith, University of Washington

Local Organizing Committee

Valia Kordoni (local chair), Humboldt University
Markus Egg (local co-chair), Humboldt University
Kostadin Cholakov, Humboldt University
Maja Popović, Humboldt University
Manfred Stede, University of Potsdam
Anke Lüdeling, Humboldt University
Manfred Krifka, Humboldt University
Ulf Leser, Humboldt University
Yulia Grishina (Student Volunteer Coordinator), University of Potsdam

Workshop Chairs

Jun Zhao, Chinese Academy of Sciences
Sabine Schulte im Walde, IMS Stuttgart

Tutorial Chairs

Alexandra Birch, University of Edinburgh
Willem Zuidema, University of Amsterdam

Publication Chairs

Yannick Versley, Ruprecht-Karls-Universität Heidelberg
Hai Zhao, Shanghai Jiao Tong University
Yusuke Miyao, National Institute of Informatics, Japan

Demonstration Chairs

Sameer Pradhan, Boulder Learning
Marianna Apidianaki, LIMSI-CNRS

Student Research Workshop Chairs

Will Roberts, Humboldt-Universität zu Berlin
Tao Lei, Massachusetts Institute of Technology
He He, University of Maryland

Faculty Advisors to the Student Research Workshop

Yang Liu, Tsinghua University

Chris Biemann, Technische Universität Darmstadt
Gosse Bouma, University of Groningen

Student Volunteer Coordinator

Yulia Grishina, University of Potsdam

Publicity Chair

Barbara Plank, University of Groningen

Conference Handbook Chair

Florian Kunneman, Radboud University Nijmegen

Business Manager

Priscilla Rasmussen, ACL

Professional Conference Organiser

Con gressa GmbH, Berlin

ACL 2016 Program Committee

Omri Abend, Steven Abney, Amjad Abu-Jbara, Heike Adel, Stergos Afantenos, Nitish Aggarwal, Željko Agić, Eneko Agirre, Cem Akkaya, Iñaki Alegria, Laura Alonso Alemany, Enrique Alfonseca, Afra Alishahi, Alexandre Allauzen, David Alvarez-Melis, Waleed Ammar, Jacob Andreas, Ion Androutsopoulos, Gabor Angeli, Masahiro Araki, Ron Artstein, Yoav Artzi, Kristjan Arumae, Nicholas Asher, AiTi Aw,

JinYeong Bak, Collin Baker, Alexandra Balahur, Timothy Baldwin, Borja Balle, Miguel Ballesteros, David Bamman, Srinivas Bangalore, Mohit Bansal, Libby Barak, Marco Baroni, Regina Barzilay, Roberto Basili, David Batista, Timo Baumann, Frederic Bechet, Daniel Beck, Núria Bel, I. Beltagy, Anja Belz, Fabrício Benevenuto, Jonathan Berant, Taylor Berg-Kirkpatrick, Sabine Bergler, Raffaella Bernardi, Robert Berwick, Steven Bethard, Archna Bhatia, Pushpak Bhattacharyya, Klinton Bicknell, Ann Bies, Alexandra Birch, Anders Björkelund, Frédéric Blain, Nate Blaylock, Bernd Bohnet, Ondřej Bojar, Ester Boldrini, Gemma Boleda, Danushka Bollegala, Claire Bonial, Georgeta Bordea, Antoine Bordes, Johan Bos, Samuel R. Bowman, Johan Boye, Kristy Boyer, Cem Bozsahin, S.R.K. Branavan, António Branco, Adrian Brasoveanu, Elia Bruni, Christian Buck, Paul Buitelaar, Harry Bunt, Hendrik Buschmeier,

Aoife Cahill, Lynne Cahill, José Camacho-Collados, Burcu Can, Nicola Cancedda, Hailong Cao, Kris Cao, Yunbo Cao, Claire Cardie, Xavier Carreras, John Carroll, Paula Carvalho, Francisco Casacuberta, Helena Caseli, Tommaso Caselli, Steve Cassidy, Irene Castellon, Giuseppe Castellucci, Asli Celikyilmaz, Özlem Çetinoğlu, Mauro Cettolo, Arun Chaganty, Hou-pong Chan, Jane Chandlee, Angel Chang, Kai-Wei Chang, Ming-Wei Chang, Wanxiang Che, Ciprian Chelba, Berlin Chen, Boxing Chen, Chen Chen, Hsin-Hsi Chen, Kehai Chen, Kuan-Yu Chen, Qian Chen, Wenliang Chen, Xixian Chen, Yun-Nung Chen, Zhiyu Chen, Colin Cherry, Sean Chester, Jackie Chi Kit Cheung, David Chiang, Hai Leong Chieu, Laura Chiticariu, Kyunghyun Cho, Eunsol Choi, Yejin Choi, Janara Christensen, Christos Christodoulopoulos, Grzegorz Chrupała, Alexander Clark, Stephen Clark, Ann Clifton, Maximin Coavoux, Moreno Coco, Trevor Cohn, Sandra Collovini, Miriam Connor, John Conroy, Paul Cook, Ann Copestake, Ryan Cotterell, Benoit Crabbé, Danilo Croce, James Cross, Montse Cuadros, Heriberto Cuayahuitl, Silviu-Petru Cucerzan, Xiaodong Cui, Jennifer Culbertson, Aron Culotta,

Walter Daelemans, Robert Daland, Amitava Das, Dipanjan Das, Hal Daumé III, Brian Davison, Munmun De Choudhury, Adrià de Gispert, Marie-Catherine de Marneffe, Gerard de Melo, Claudio Delli Bovi, Vera Demberg, Pascal Denis, Michael Denkowski, Leon Derczynski, Aliya Deri, Nina Dethlefs, Ann Devitt, Jacob Devlin, Giuseppe Di Fabbrizio, Mona Diab, Brian Dillon, Georgiana Dinu, Dmitriy Dligach, Simon Dobnik, Ellen Dodge, A. Seza Doğruöz, Doug Downey, Eduard Dragut, Mark Dras, Markus Dreyer, Gregory Druck, Lan Du, Kevin Duh, Jesse Dunietz, Long Duong, Nadir Durrani, Greg Durrett, Chris Dyer, Marc Dymetman,

Koji Eguchi, Patrick Ehlen, Vladimir Eidelman, Andreas Eisele, Jacob Eisenstein, Jason Eisner, Michael Elhadad, Micha Elsner, Nikolaos Engonopoulos, Katrin Erk, Miquel Esplà-Gomis, Paula Estrella, Keelan Evanini,

Federico Fancellu, Rui Fang, Manaal Faruqui, Adam Faulkner, Benoit Favre, Anna Feldman, Naomi Feldman, Raquel Fernandez, Daniel Fernández-González, Simone Filice, Katja Filippova, Orhan Firat, Nicholas FitzGerald, Margaret Fleck, Fabian Flöck, Enrique Flores, Evandro Fonseca, Mikel Forcada, Markus Forsberg, George Foster, James Foulds, Bob Frank, Michael Frank, Stefan L. Frank, Stella Frank, Alexander

Fraser, Dayne Freitag, Annemarie Friedrich, Akinori Fujino,

Yarin Gal, Michel Galley, Carlos Gallo, Björn Gambäck, Michael Gamon, Kuzman Ganchev, Kavita Ganesan, Juri Ganitkevitch, Jianfeng Gao, Wei Gao, Miguel A. García-Cumbreras, Claire Gardent, Matt Gardner, Dan Garrette, Milica Gasic, Kallirroi Georgila, Daniel Gildea, Kevin Gimpel, Maite Giménez, Jonathan Ginzburg, Dimitra Gkatzia, Goran Glavaš, Amir Globerson, Yoav Goldberg, Dan Goldwasser, Sharon Goldwater, Carlos Gómez-Rodríguez, Edgar González Pellicer, Matthew R. Gormley, Cyril Goutte, Joao Graca, Yvette Graham, Roger Granada, Edouard Grave, Nancy Green, Spence Green, Ed Grefenstette, Denis Griffis, Tom Griffiths, Liane Guillou, Curry Guinn, James Gung, Jiang Guo, Weiwei Guo, Yuhong Guo, Abhijeet Gupta, Iryna Gurevych, Yoan Gutierrez, Kelvin Guu,

Nizar Habash, Gholamreza Haffari, Hannaneh Hajishirzi, Dilek Hakkani-Tur, John Hale, David Hall, Keith Hall, William L. Hamilton, Michael Hammond, Bo Han, Greg Hanneman, Christian Hardmeier, Sasa Hasan, Helen Hastie, Claudia Hauff, Katsuhiko Hayashi, Daqing He, Luheng He, Xiaodong He, Yifan He, Kenneth Heafield, Carmen Heger, Michael Heilman, James Henderson, Matthew Henderson, Aurélie Herbelot, Karl Moritz Hermann, Daniel Hershcovich, Jack Hessel, Felix Hill, Keikichi Hirose, Graeme Hirst, Julian Hitschler, Anna Hjalmarsson, Kai Hong, Liangjie Hong, Andrea Horbach, Julian Hough, Dirk Hovy, Bo-June (Paul) Hsu, Liang Huang, Minlie Huang, Ruihong Huang, Mans Hulden, Tim Hunter, Jena D. Hwang,

Ignacio Iacobacci, Ryu Iida, Diana Inkpen, Naoya Inoue, Hitoshi Isahara, Hideki Isozaki, Mohit Iyyer,

Cassandra L. Jacobs, Guillaume Jacquet, Evan Jaffe, Jagadeesh Jagarlamudi, Zunaira Jamil, Peter Jansen, Laura Jehl, Yacine Jernite, Heng Ji, Yangfeng Ji, Sittichai Jiampojamarn, Jing Jiang, Wenbin Jiang, Xin Jiang, Salud María Jiménez Zafra, Anders Johannsen, Richard Johansson, Michael Johnston, Kristiina Jokinen, Arne Jonsson, Aditya Joshi, Shafiq Joty, Dan Jurafsky, Filip Jurcicek, David Jurgens,

Mijail Kabadjov, Nobuhiro Kaji, Jaap Kamps, Min-Yen Kan, Hiroshi Kanayama, Mladen Karan, Tatsuya Kawahara, Frank Keller, Casey Kennington, Chloé Kiddon, Douwe Kiela, Jae Won Kim, Joon Kim, Jooyeon Kim, Suin Kim, Sunghwan Kim, Yoon Kim, Young-Bum Kim, Irwin King, Brian Kingsbury, Svetlana Kiritchenko, Julia Kiseleva, Alexandre Klementiev, Sigrid Klerke, Christoph Kling, Julien Kloetzer, Alistair Knott, Tomáš Kočiský, Philipp Koehn, Oskar Kohonen, Prasanth Kolachina, Alexander Koller, Mamoru Komachi, Kazunori Komatani, Rik Koncel-Kedziorski, Lingpeng Kong, Ioannis Konstas, Hahn Koo, Stefan Kopp, Moshe Koppel, Valia Kordoni, Anna Korhonen, Bhushan Kotnis, Zornitsa Kozareva, Julia Kreutzer, Jayant Krishnamurthy, Mark Kroell, Kriste Krstovski, Canasai Kruengkrai, Germán Kruszewski, Lun-Wei Ku, Sicong Kuang, Marco Kuhlmann, Jonas Kuhn, Wu Kui, Shankar Kumar, Nate Kushman, Ilia Kuznetsov, Polina Kuznetsova, Tom Kwiatkowski, Sandra Kübler,

Man Lan, Guy Lapalme, Mirella Lapata, Shalom Lappin, Birger Larsen, Alex Lascarides, Alon Lavie, Angeliki Lazaridou, Phong Le, Joseph Le Roux, Kenton Lee, Moontae Lee, Sungjin Lee, Yoong Keok Lee, Tao Lei, Oliver Lemon, Alessandro Lenci, Lori Levin, Gina-Anne Levow, Omer Levy, Mike Lewis, Chen Li, Fangtao Li, Hang Li, Jing Li, Jiwei Li, Junhui Li, Shoushan Li, Sujian Li, Wenjie Li, Xiaolong Li, Zhenghua Li, Kexin Liao, Xiangwen Liao, Chin-Yew Lin, Hui Lin, Victoria Lin, Wang Ling, Xiao Ling, Christina Lioma, Pierre Lison, Diane Litman, Marina Litvak, Biao Liu, Fei Liu, Jiangming Liu, Jing Liu, Kang Liu, Qun Liu, Yang Liu, Varvara Logacheva, Lucelene Lopes, Adam Lopez, Oier Lopez de Lacalle, Aurelio Lopez-Lopez, Annie Louis, Bin Lu, Jing Lu, Wei Lu, Andy Luecking, Michal Lukasik, Jiaming Luo, Minh-Thang Luong, Franco M. Luque,

Shaoping Ma, Qingsong Ma, Shuming Ma, Wolfgang Macherey, Nitin Madnani, Wolfgang Maier, Prodromos Malakasiotis, Suresh Manandhar, Gideon Mann, Christopher D. Manning, Diego Marcheggiani, Daniel Marcu, Marco Marelli, Eugenio Martínez Cámara, Toni Marti, Patricio Martinez-Barco, Héctor Martínez Alonso, Eugenio Martínez Cámara, Fernando Martínez Santiago, Eugenio Martínez-Cámara, Fernando Javier Martínez Santiago, André F. T. Martins, Vivien Mast, Yuichiro Matsubayashi, Takuya Matsuzaki, Jonathan May, Diana Maynard, Diana McCarthy, David McClosky, Ryan McDonald, Tara McIntosh, Kathy McKeown, Louise McNally, Beata Megyesi, Yashar Mehdad, Oren Melamud, Arul Menezes, Fandong Meng, Helen Meng, Florian Metze, Haitao Mi, Yishu Miao, Tsvetomila Mihaylova, Tomas Mikolov, Timothy Miller, Tristan Miller, David Mimno, Meg Mitchell, Teruhisa Misu, Yusuke Miyao, Ryosuke Miyazaki, Daichi Mochihashi, Ashutosh Modi, Marie-Francine Moens, Samaneh Moghaddam, Saif Mohammad, Karo Moilanen, Luis Gerardo Mojica de la Vega, M. Dolores Molina-González, Manuel Montes, Andres Montoyo, Christof Monz, Taesun Moon, Roser Morante, Silvio Moreira, Alessandro Moschitti, Arjun Mukherjee, Philippe Muller, Yugo Murawaki, Gabriel Murray, Lluís Márquez, Thomas Müller,

Masaaki Nagata, Satoshi Nakamura, Mikio Nakano, Yukiko Nakano, Preslav Nakov, Courtney Napoles, Jason Naradowsky, Karthik Narasimhan, Vivi Nastase, Borja Navarro, Roberto Navigli, Silvia Necsulescu, Mark-Jan Nederhof, Sapna Negi, Matteo Negri, Aida Nematzadeh, Graham Neubig, Jun-Ping Ng, Vincent Ng, Dong Nguyen, Garrett Nicolai, Vlad Niculae, Luis Nieto Piña, Alexandr Nikitin, Zhou Nina, Joakim Nivre,

Brendan O'Connor, Timothy O'Donnell, Stephan Oepen, Kemal Oflazer, Alice Oh, Jong-Hoon Oh, Naoaki Okazaki, Hiroshi G. Okuno, Constantin Orasan, Vicente Ordonez, Miles Osborne, Diarmuid Ó Séaghdha, Mari Ostendorf, Ekaterina Ovchinnikova, Gozde Ozbal,

Sebastian Padó, John Paisley, Alexis Palmer, Martha Palmer, Sinno Jialin Pan, Denis Paperno, Ankur P. Parikh, Cecile Paris, Tommaso Pasini, Peyman Passban, Panupong Pasupat, Siddharth Patwardhan, Michael J. Paul, Adam Pauls, Ellie Pavlick, Bolette Pedersen, Hao Peng, Nanyun Peng, Gerald Penn, Casper Petersen, Slav Petrov, Miriam R. L. Petruck, Hieu Pham, Nghia The Pham, Olivier Pietquin, Mohammad Taher Pilehvar, Manfred Pinkal, Emily Pitler, Paul Piwek, Barbara Plank, Simone Ponzetto, Maja Popović, Fred Popowich, Matt Post, Christopher Potts, Vinod Prabhakaran, Vinodkumar Prabhakaran, Sameer Pradhan, Daniel Preoţiuc-Pietro, Laurent Prévot, Stephen Pulman, Matthew Purver, Sampo Pyysalo,

Xian Qian, Xiuming Qiao, Bing Qin, Guang Qiu, Xipeng Qiu, Chris Quirk,

Alessandro Raganato, Preethi Raghavan, Afshin Rahimi, Altaf Rahman, Jonathan Raiman, Gabriela Ramírez-de-la-Rosa, Ari Rappoport, Mohammad Sadegh Rasooli, Antoine Raux, Sujith Ravi, Marta Recasens, Sravana Reddy, Ines Rehbein, Roi Reichart, Drew Reisinger, David Reitter, Yafeng Ren, Zhaochun Ren, Steve Renals, Evelina Rennes, Corentin Ribeyre, Matthew Richardson, Sebastian Riedel, Jason Riesa, Verena Rieser, Stefan Riezler, German Rigau, Laura Rimell, Alan Ritter, Brian Roark, Molly Roberts, Tim Rocktäschel, Horacio Rodriguez, Stephen Roller, Laurent Romary, Carolyn Rose, Andrew Rosenberg, Sara Rosenthal, Paolo Rosso, Michael Roth, Sascha Rothe, Alexander Rudnicky, Josef Ruppenhofer, Alexander M. Rush,

Mrinmaya Sachan, Mehrnoosh Sadrzadeh, Markus Saers, Kenji Sagae, Horacio Saggion, Benoît Sagot, Magnus Sahlgren, Patrick Saint-Dizier, Avneesh Saluja, Marc Franco Salvador, Felipe Sánchez-Martínez, Germán Sanchis-Trilles, Urko Sanchez Sanz, Anoop Sarkar, Asad Sayeed, Carolina Scarton, David Schlangen,

Allen Schmaltz, Helmut Schmid, Nathan Schneider, Alexandra Schofield, William Schuler, Sabine Schulte im Walde, Sebastian Schuster, Hinrich Schütze, Lane Schwartz, Roy Schwartz, Chun Wei Seah, Djamé Seddah, Wolfgang Seeker, Yohei Seki, Rico Sennrich, Minjoon Seo, Hendra Setiawan, Izhak Shafran, Apurva Shah, Kashif Shah, Shiqi Shen, Chaitanya Shivade, Milad Shokouhi, Szymon Sidor, Avirup Sil, Carina Silberer, Mario J. Silva, Fabrizio Silvestri, Khalil Sima'an, Patrick Simianer, Serra Sinem Tekiroglu, Sameer Singh, Gabriel Skantze, Kevin Small, Noah Smith, Jan Šnajder, Jasper Snoek, Richard Socher, Anders Søgaard, Artem Sokolov, Thamar Solorio, Yan Song, Radu Soricut, Aitor Soroa, Lucia Specia, Caroline Sporleder, Vivek Srikumar, Edward Stabler, Gabriel Stanovsky, Manfred Stede, Mark Steedman, Amanda Stent, Brandon Stewart, Matthew Stone, Svetlana Stoyanchev, Veselin Stoyanov, Carlo Strapparava, Kristina Striegnitz, Markus Strohmaier, Patrick Sturt, Rajen Subba, Katsuhito Sudoh, Weiwei Sun, Xu Sun, Mihai Surdeanu, Jun Suzuki, John Sylak-Glassman, Gabriel Synnaeve, Stan Szpakowicz, Idan Szpektor,

Hiroya Takamura, Partha Talukdar, Akihiro Tamura, Duyu Tang, Jian Tang, Jiliang Tang, Mariona Taulé, Christoph Teichmann, Irina Temnikova, Joel Tetreault, Kapil Thadani, Ran Tian, Jörg Tiedemann, Ivan Titov, Takenobu Tokunaga, Katrin Tomanek, Kentaro Torisawa, David Vilar Torres, Kristina Toutanova, Isabel Trancoso, Harald Trost, Richard Tzong-Han Tsai, Reut Tsarfaty, Kostas Tsioutsiouliklis, Oren Tsur, Yoshimasa Tsuruoka, Yulia Tsvetkov, Gokhan Tur, Marco Turchi, Oscar Täckström,

L. Alfonso Urena Lopez, Olga Uryupina, Masao Utiyama,

Alessandro Valitutti, Lonneke van der Plas, Lucy Vanderwende, David Vandyke, Marten van Schijndel, Paola Velardi, Yannick Versley, Renata Vieira, Esaú Villatoro, Sami Virpioja, Andreas Vlachos, Rob Voigt, Svitlana Volkova, Titus von der Malsburg, Ngoc Thang Vu,

Marilyn Walker, Byron C. Wallace, Stephen Wan, Xiaojun Wan, Chong Wang, Hsin-Min Wang, Lu Wang, Mingxuan Wang, Pidong Wang, Quan Wang, Shaojun Wang, Tong Wang, Wen Wang, Wenya Wang, Yu-Chun Wang, Nigel Ward, Taro Watanabe, Andy Way, Bonnie Webber, Ingmar Weber, Furu Wei, Albert Weichselbraun, Keenon Werling, Michael White, Jason D. Williams, Shuly Wintner, Sam Wiseman, Guillaume Wisniewski, Kam-Fai Wong, Dekai Wu, Hua Wu, Ji Wu, Shumin Wu, Joern Wuebker,

Fei Xia, Rui Xia, Pengtao Xie, Shasha Xie, Wayne Xin Zhao, Chenyan Xiong, Deyi Xiong, Ruifeng Xu, Wang Xuancong, Nianwen Xue,

Yadollah Yaghoobzadeh, Grace Yang, Yi Yang, Zi Yang, Mark Yatskar, Wen-tau Yih, Wenpeng Yin, Anssi Yli-Jyrä, Dani Yogatama, Steve Young, Kai Yu, Xiaotian Yu,

Fabio Massimo Zanzotto, Alessandra Zarcone, Daniel Zeman, Xiaodong Zeng, Luke Zettlemoyer, Deniz Zeyrek, Ke Zhai, Aston Zhang, Chunyue Zhang, Congle Zhang, Hongyi Zhang, Lei Zhang, Meishan Zhang, Min Zhang, Qi Zhang, Sicong Zhang, Yuan Zhang, Yue Zhang, Zhihua Zhang, Chunyue Zhang, Bing Zhao, Kai Zhao, Shenglin Zhao, Tiejun Zhao, Tong Zhao, Guodong Zhou, Qiang Zhou, Xiaodan Zhu, Xiaoning Zhu, Patrick Ziering, Heike Zinsmeister, Willem Zuidema

Invited Talk I: Same Policy Issue, Different Portrayal: The Importance of Tone and Framing in Language

Amber E. Boydstun, University of California at Davis

Many policy issues at the center of politics are relatively fixed; they tend to involve the same basic questions that do not vary over time (e.g., should abortion be legal? should we execute people convicted of horrific crimes?). Political candidates, too, are (like the rest of us) the same people year after year (e.g., Hillary Clinton in 2016 is just an older version of Hillary Clinton in 2015). Yet when citizens consider a given political item (be it a policy issue, a candidate, or something else), they tend not to perceive that item in a fixed way over time. Rather, peoples perceptions of the item tend to depend on how that item is portrayed at that moment. Policy issues and political candidates alike can be portrayed differently through the use of different visual imagery but even more pervasively through variance in the text used to describe them. In this talk, I give a general overview of the importance of issue and candidate portrayals in political communication. I outline the extensive research that has already been done trying to identify different portrayals in text. And I discuss the many opportunities available today to researchers interested in tracking issue and candidate portrayals in text and in examining the effects of issue and candidate portrayals on public attitudes and voting behavior.

Bio: Amber Boydstun is an Associate Professor of Political Science at the University of California, Davis. Her work bridges multiple disciplines, including psychology, journalism, and computer science. Her core research examines the interaction between media and politics, with a focus on how different media portrayals of the same policy issue can prompt citizens and policymakers to respond to that issue in different ways. She uses lab experiments, large-scale media studies, and manual and computational text analysis to study how issues make the news; how issues are "framed" in the news; the dynamics of "media storms"; and how media coverage can shape public opinion and public policy on issues like immigration, gun control, same-sex marriage, and capital punishment. She is author of *Making the News* (Chicago) and co-author of *The Decline of the Death Penalty and the Discovery of Innocence* (Cambridge), as well as many journal articles. Boydstun works with scholars across the globe as a member of the Comparative Agendas Project,[1] a collaborative enterprise by political science and policy scholars to measure international government outputs. She serves on the editorial boards for the journal Political Communication, the Text as Data Association, and the Women Also Know Stuff[2] initiative. Most recently, she co-chaired the 2016 Visions in Methodology Conference. [3]

[1] http://www.comparativeagendas.info/

[2] http://womenalsoknowstuff.com/

[3] http://visionsinmethodology.org/conferences/2016-conference/

Invited Talk II: On Distributional Semantics
Mark Steedman, University of Edinburgh

The central problem in open domain-question answering from text is the problem of *entailment*. Given enough text, the answer is almost certain to be there, but is likely to be expressed differently than in the question—either in a paraphrase, or in a sentence that entails or implies the answer. We cannot afford to bridge this gap by open-ended theorem-proving search. Instead we need a semantics for natural language that directly supports common-sense inference, such as that *arriving somewhere* implies subsequently *being there*, and *invading* a country implies *attacking* it. We would like this semantics to be compatible with traditional logical operator semantics including quantification, negation and tense, so that *not being there* implies *not having arrived*, and *not attacking* implies *not invading*.

There have been many attempts to build such a semantics of content words by hand, from the generative semantics of the '60s to WordNet and other resources of the present. The '60s saw attempts based on generative semantics, while more recently, they have exploited WordNet and other computational resources. However, such systems have been incomplete and language-specific in comparison to the vastness of human common-sense reasoning. One consequence has been renewed interest in the idea of treating the semantics as "hidden", to be discovered through machine learning, an idea that has its origins in the "semantic differential" of Osgood, Suci, and Tannenbaum in the '50s.

There are two distinct modern approaches to the problem of data-driven or "distributional" semantics. The first, which I will call "collocational", is the direct descendant of the semantic differential. In its most basic form, the meaning of a word is taken to be a vector in a space whose dimensions are defined by the lexicon of the language, and whose magnitude is defined by counts of those lexical items within a fixed window on the string (although in practice the dimensionality is reduced and the relation to frequency less direct). Crucially, semantic composition is defined in terms of linear algebraic operations such as vector addition.

The second approach, which I will call "denotational", defines the meaning of a word in terms of the entities (or rather their designators) that it is predicated over and the ensembles of predications over entities of the same types, obtained by machine-reading with wide coverage parsers. Semantic composition is can then be defined as an applicative system, as in traditional formal semantics.

The talk reviews recent work in both collocation- and denotation- based distributional semantics, including some hybrid approaches that interpolate grammatical features with collocational representations, or use probabilistic logics over relations whose arguments denote vectors, and asks for each what dimensions of meaning are actually being represented. It argues that the two approaches are largely orthogonal on these dimensions. Collocational representations are good for representing ambiguity, with linear algebraic composition most effective at disambiguation and representing distributional similarity. Denotational representations represent something more like a traditional compositional semantics, but one in which the primitive relations correspond to those of a hidden language of logical form representing paraphrase and common-sense entailment directly.

To make this point, I will discuss recent work in which collocational distributional representations such as embeddings have been used as proxies for semantic features in models such as LSTM, to guide disambiguation during parsing, while a lexicalized denotation-based distributional semantics is used to support inference of entailment. I will show that this hybrid approach can be applied with a number of parsing mod-

els, including transition-based and supertagging, to support entailment-based QA with denotation-based distributional representations. I will discuss work at Edinburgh and elsewhere in which the semantics of paraphrases is represented by a single cluster identifier and common-sense inference (derived from a learned entailment graph) is built into the lexicon and projected by syntactic derivation, rather than delegated to a later stage of inference. The method can be applied cross-linguistically, in support of machine translation. Ongoing work extends the method to extract multi-word items, light-verb constructions, and an aspect-based semantics for temporal/causal entailment, and to the creation and interrogation of Knowledge Graphs and Semantic Nets via natural language.

Bio: Mark Steedman is Professor of Cognitive Science in the School of Informatics at the University of Edinburgh. Previously, he taught as Professor in the Department of Computer and Information Science at the University of Pennsylvania, which he joined as Associate Professor in 1988, after teaching at the Universities of Warwick and Edinburgh. His PhD is in Artificial Intelligence from the University of Edinburgh. He was a Alfred P. Sloan Fellow at the University of Texas at Austin in 1980/81, and a Visiting Professor at Penn in 1986/87. He is a Fellow of the American Association for Artificial Intelligence, the British Academy, the Royal Society of Edinburgh, the Association for Computational Linguistics, and the Cognitive Science Society, and a Member of the European Academy.

His research interests cover issues in computational linguistics, artificial intelligence, computer science and cognitive science, including syntax and semantics of natural language, wide-coverage parsing and question-answering, comprehension of natural language discourse by humans and by machine, grammar-based language modeling, natural language generation, and the semantics of intonation in spoken discourse. Much of his current NLP research is addressed to probabilistic parsing and robust semantics for question-answering using the CCG grammar formalism, including the acquisition of language from paired sentences and meanings by child and machine. He sometimes works with colleagues in computer animation using these theories to guide the graphical animation of speaking virtual or simulated autonomous human agents. Some of his research concerns the analysis of music by humans and machines.

Table of Contents

Conference Program

Monday, August 8, 2016

8:45–9:00 ***Opening session***

9:00–10:10 ***Invited talk I: Amber Boydstun***

10:10–10:40 ***Coffee break***

Session 1A: Semantic parsing I

10:40–11:00 *Noise reduction and targeted exploration in imitation learning for Abstract Meaning Representation parsing*
James Goodman, Andreas Vlachos and Jason Naradowsky

11:00–11:20 *Data Recombination for Neural Semantic Parsing*
Robin Jia and Percy Liang

11:20–11:40 *Inferring Logical Forms From Denotations*
Panupong Pasupat and Percy Liang

11:40–12:00 *Language to Logical Form with Neural Attention*
Li Dong and Mirella Lapata

Session 1B: Information extraction

10:40–11:00 *Unsupervised Person Slot Filling based on Graph Mining*
Dian Yu and Heng Ji

11:20–11:40 *A Multi-media Approach to Cross-lingual Entity Knowledge Transfer*
Di Lu, Xiaoman Pan, Nima Pourdamghani, Shih-Fu Chang, Heng Ji and Kevin Knight

Session 1C: Machine translation I

10:40–11:00 *Models and Inference for Prefix-Constrained Machine Translation*
Joern Wuebker, Spence Green, John DeNero, Sasa Hasan and Minh-Thang Luong

11:00–11:20 *Modeling Coverage for Neural Machine Translation*
Zhaopeng Tu, Zhengdong Lu, Yang Liu, Xiaohua Liu and Hang Li

11:20–11:40 *Improving Neural Machine Translation Models with Monolingual Data*
Rico Sennrich, Barry Haddow and Alexandra Birch

11:40–12:00 *Graph-Based Translation Via Graph Segmentation*
Liangyou Li, Andy Way and Qun Liu

Session 1D: Word meaning I

10:40–11:00 *Incremental Acquisition of Verb Hypothesis Space towards Physical World Interaction*
Lanbo She and Joyce Chai

11:00–11:20 *Language Transfer Learning for Supervised Lexical Substitution*
Gerold Hintz and Chris Biemann

11:20–11:40 *Learning the Curriculum with Bayesian Optimization for Task-Specific Word Representation Learning*
Yulia Tsvetkov, Manaal Faruqui, Wang Ling, Brian MacWhinney and Chris Dyer

11:40–12:00 *Pointing the Unknown Words*
Caglar Gulcehre, Sungjin Ahn, Ramesh Nallapati, Bowen Zhou and Yoshua Bengio

Monday, August 8, 2016 (continued)

Session 1E: Parsing I

11:00–11:20 *Generalized Transition-based Dependency Parsing via Control Parameters*
Bernd Bohnet, Ryan McDonald, Emily Pitler and Ji Ma

11:20–11:40 *A Transition-Based System for Joint Lexical and Syntactic Analysis*
Matthieu Constant and Joakim Nivre

11:40–12:00 *Neural Greedy Constituent Parsing with Dynamic Oracles*
Maximin Coavoux and Benoit Crabbé

Session 1F: Noncompositionality

10:40–11:00 *Literal and Metaphorical Senses in Compositional Distributional Semantic Models*
E.Dario Gutierrez, Ekaterina Shutova, Tyler Marghetis and Benjamin Bergen

11:00–11:20 *Idiom Token Classification using Sentential Distributed Semantics*
Giancarlo Salton, Robert Ross and John Kelleher

11:20–11:40 *Adaptive Joint Learning of Compositional and Non-Compositional Phrase Embeddings*
Kazuma Hashimoto and Yoshimasa Tsuruoka

11:40–12:00 *Metaphor Detection with Topic Transition, Emotion and Cognition in Context*
Hyeju Jang, Yohan Jo, Qinlan Shen, Michael Miller, Seungwhan Moon and Carolyn Rose

12:00–13:40 ***Lunch break***

Session 2A: Word vectors I

14:00–14:20 *Compressing Neural Language Models by Sparse Word Representations*
Yunchuan Chen, Lili Mou, Yan Xu, Ge Li and Zhi Jin

14:20–14:40 *Intrinsic Subspace Evaluation of Word Embedding Representations*
Yadollah Yaghoobzadeh and Hinrich Schütze

14:40–15:00 *On the Role of Seed Lexicons in Learning Bilingual Word Embeddings*
Ivan Vulić and Anna Korhonen

Session 2B: Events and schemas

13:40–14:00 *Liberal Event Extraction and Event Schema Induction*
Lifu Huang, Taylor Cassidy, Xiaocheng Feng, Heng Ji, Clare R. Voss, Jiawei Han and Avirup Sil

14:00–14:20 *Jointly Event Extraction and Visualization on Twitter via Probabilistic Modelling*
Deyu Zhou, Tianmeng Gao and Yulan He

14:20–14:40 *Using Sentence-Level LSTM Language Models for Script Inference*
Karl Pichotta and Raymond J. Mooney

14:40–15:00 *Two Discourse Driven Language Models for Semantics*
Haoruo Peng and Dan Roth

Session 2C: Sentiment analysis

13:40–14:00 *Sentiment Domain Adaptation with Multiple Sources*
Fangzhao Wu and Yongfeng Huang

14:00–14:20 *Connotation Frames: A Data-Driven Investigation*
Hannah Rashkin, Sameer Singh and Yejin Choi

14:20–14:40 *Bi-Transferring Deep Neural Networks for Domain Adaptation*
Guangyou Zhou, Zhiwen Xie, Jimmy Xiangji Huang and Tingting He

14:40–15:00 *Document-level Sentiment Inference with Social, Faction, and Discourse Context*
Eunsol Choi, Hannah Rashkin, Luke Zettlemoyer and Yejin Choi

Session 2D: Parsing II

13:40–14:00 *Active Learning for Dependency Parsing with Partial Annotation*
Zhenghua Li, Min Zhang, Yue Zhang, Zhanyi Liu, Wenliang Chen, Hua Wu and Haifeng Wang

14:20–14:40 *Dependency Parsing with Bounded Block Degree and Well-nestedness via Lagrangian Relaxation and Branch-and-Bound*
Caio Corro, Joseph Le Roux, Mathieu Lacroix, Antoine Rozenknop and Roberto Wolfler Calvo

Session 2E: Information retrieval

13:40–14:00 *Query Expansion with Locally-Trained Word Embeddings*
Fernando Diaz, Bhaskar Mitra and Nick Craswell

14:00–14:20 *Together we stand: Siamese Networks for Similar Question Retrieval*
Arpita Das, Harish Yenala, Manoj Chinnakotla and Manish Shrivastava

14:20–14:40 *News Citation Recommendation with Implicit and Explicit Semantics*
Hao Peng, Jing Liu and Chin-Yew Lin

Monday, August 8, 2016 (continued)

Session 2F: Phonology and morphology

13:40–14:00 *Grapheme-to-Phoneme Models for (Almost) Any Language*
Aliya Deri and Kevin Knight

14:20–14:40 *Neural Word Segmentation Learning for Chinese*
Deng Cai and Hai Zhao

14:40–15:00 *Transition-Based Neural Word Segmentation*
Meishan Zhang, Yue Zhang and Guohong Fu

15:00–15:30 ***Coffee break***

Session 3A: Question answering I

15:30–15:50 *A Parallel-Hierarchical Model for Machine Comprehension on Sparse Data*
Adam Trischler, Zheng Ye, Xingdi Yuan, Jing He and Philip Bachman

15:50–16:10 *Combining Natural Logic and Shallow Reasoning for Question Answering*
Gabor Angeli, Neha Nayak and Christopher D. Manning

16:10–16:30 *Easy Questions First? A Case Study on Curriculum Learning for Question Answering*
Mrinmaya Sachan and Eric Xing

16:30–16:50 *Improved Representation Learning for Question Answer Matching*
Ming Tan, Cicero dos Santos, Bing Xiang and Bowen Zhou

16:50–17:10 *Tables as Semi-structured Knowledge for Question Answering*
Sujay Kumar Jauhar, Peter Turney and Eduard Hovy

Session 3B: Sentence vectors

15:30–15:50 *Neural Summarization by Extracting Sentences and Words*
Jianpeng Cheng and Mirella Lapata

16:10–16:30 *Neural Networks For Negation Scope Detection*
Federico Fancellu, Adam Lopez and Bonnie Webber

16:30–16:50 *CSE: Conceptual Sentence Embeddings based on Attention Model*
Yashen Wang, Heyan Huang, Chong Feng, Qiang Zhou, Jiahui Gu and Xiong Gao

Session 3C: Parsing III

Session 3D: Dialog

15:30–15:50 *DocChat: An Information Retrieval Approach for Chatbot Engines Using Unstructured Documents*
Zhao Yan, Nan Duan, Junwei Bao, Peng Chen, Ming Zhou, Zhoujun Li and Jianshe Zhou

15:50–16:10 *Investigating the Sources of Linguistic Alignment in Conversation*
Gabriel Doyle and Michael C. Frank

16:10–16:30 *Entropy Converges Between Dialogue Participants: Explanations from an Information-Theoretic Perspective*
Yang Xu and David Reitter

16:30–16:50 *Finding the Middle Ground - A Model for Planning Satisficing Answers*
Sabine Janzen, Wolfgang Maaß and Tobias Kowatsch

16:50–17:10 *A Sentence Interaction Network for Modeling Dependence between Sentences*
Biao Liu and Minlie Huang

Session 3E: Generation

15:30–15:50 *Towards more variation in text generation: Developing and evaluating variation models for choice of referential form*
Thiago Castro Ferreira, Emiel Krahmer and Sander Wubben

15:50–16:10 *How Much is 131 Million Dollars? Putting Numbers in Perspective with Compositional Descriptions*
Arun Chaganty and Percy Liang

16:10–16:30 *Generating Factoid Questions With Recurrent Neural Networks: The 30M Factoid Question-Answer Corpus*
Iulian Vlad Serban, Alberto García-Durán, Caglar Gulcehre, Sungjin Ahn, Sarath Chandar, Aaron Courville and Yoshua Bengio

16:30–16:50 *Latent Predictor Networks for Code Generation*
Wang Ling, Phil Blunsom, Edward Grefenstette, Karl Moritz Hermann, Tomáš Kočiský, Fumin Wang and Andrew Senior

16:50–17:10 *Easy Things First: Installments Improve Referring Expression Generation for Objects in Photographs*
Sina Zarrieß and David Schlangen

Session 3F: Entities and coreference

15:30–15:50 *Collective Entity Resolution with Multi-Focal Attention*
Amir Globerson, Nevena Lazic, Soumen Chakrabarti, Amarnag Subramanya, Michael Ringaard and Fernando Pereira

16:30–16:50 *Which Coreference Evaluation Metric Do You Trust? A Proposal for a Link-based Entity Aware Metric*
Nafise Sadat Moosavi and Michael Strube

16:50–17:10 *Improving Coreference Resolution by Learning Entity-Level Distributed Representations*
Kevin Clark and Christopher D. Manning

Session 3G: Topics

15:30–15:50 *Effects of Creativity and Cluster Tightness on Short Text Clustering Performance*
Catherine Finegan-Dollak, Reed Coke, Rui Zhang, Xiangyi Ye and Dragomir Radev

15:50–16:10 *Generative Topic Embedding: a Continuous Representation of Documents*
Shaohua Li, Tat-Seng Chua, Jun Zhu and Chunyan Miao

16:30–16:50 *Detecting Common Discussion Topics Across Culture From News Reader Comments*
Bei Shi, Wai Lam, Lidong Bing and Yinqing Xu

16:50–17:10 *A Discriminative Topic Model using Document Network Structure*
Weiwei Yang, Jordan Boyd-Graber and Philip Resnik

18:00–21:00 ***Poster and dinner session I (includes SRW)***

AraSenTi: Large-Scale Twitter-Specific Arabic Sentiment Lexicons
Nora Al-Twairesh, Hend Al-Khalifa and Abdulmalik AlSalman

Unsupervised Multi-Author Document Decomposition Based on Hidden Markov Model
Khaled Aldebei, Xiangjian He, Wenjing Jia and Jie Yang

Automatic Text Scoring Using Neural Networks
Dimitrios Alikaniotis, Helen Yannakoudakis and Marek Rei

Improved Semantic Parsers For If-Then Statements
I. Beltagy and Chris Quirk

Universal Dependencies for Learner English
Yevgeni Berzak, Jessica Kenney, Carolyn Spadine, Jing Xian Wang, Lucia Lam, Keiko Sophie Mori, Sebastian Garza and Boris Katz

Extracting token-level signals of syntactic processing from fMRI - with an application to PoS induction
Joachim Bingel, Maria Barrett and Anders Søgaard

Bidirectional Recurrent Convolutional Neural Network for Relation Classification
Rui Cai, Xiaodong Zhang and Houfeng Wang

Sentence Rewriting for Semantic Parsing
Bo Chen, Le Sun, Xianpei Han and Bo An

Chinese Zero Pronoun Resolution with Deep Neural Networks
Chen Chen and Vincent Ng

Constrained Multi-Task Learning for Automated Essay Scoring
Ronan Cummins, Meng Zhang and Ted Briscoe

CFO: Conditional Focused Neural Question Answering with Large-scale Knowledge Bases
Zihang Dai, Lei Li and Wei Xu

Verbs Taking Clausal and Non-Finite Arguments as Signals of Modality – Revisiting the Issue of Meaning Grounded in Syntax
Judith Eckle-Kohler

Tree-to-Sequence Attentional Neural Machine Translation
Akiko Eriguchi, Kazuma Hashimoto and Yoshimasa Tsuruoka

Coordination Annotation Extension in the Penn Tree Bank
Jessica Ficler and Yoav Goldberg

Analyzing Biases in Human Perception of User Age and Gender from Text
Lucie Flekova, Jordan Carpenter, Salvatore Giorgi, Lyle Ungar and Daniel Preoţiuc-Pietro

Modeling Social Norms Evolution for Personalized Sentiment Classification
Lin Gong, Mohammad Al Boni and Hongning Wang

Modeling Concept Dependencies in a Scientific Corpus
Jonathan Gordon, Linhong Zhu, Aram Galstyan, Prem Natarajan and Gully Burns

Normalized Log-Linear Interpolation of Backoff Language Models is Efficient
Kenneth Heafield, Chase Geigle, Sean Massung and Lane Schwartz

How well do Computers Solve Math Word Problems? Large-Scale Dataset Construction and Evaluation
Danqing Huang, Shuming Shi, Chin-Yew Lin, Jian Yin and Wei-Ying Ma

Embeddings for Word Sense Disambiguation: An Evaluation Study
Ignacio Iacobacci, Mohammad Taher Pilehvar and Roberto Navigli

Understanding Discourse on Work and Job-Related Well-Being in Public Social Media
Tong Liu, Christopher Homan, Cecilia Ovesdotter Alm, Megan Lytle, Ann Marie White and Henry Kautz

Achieving Open Vocabulary Neural Machine Translation with Hybrid Word-Character Models
Minh-Thang Luong and Christopher D. Manning

End-to-end Sequence Labeling via Bi-directional LSTM-CNNs-CRF
Xuezhe Ma and Eduard Hovy

Off-topic Response Detection for Spontaneous Spoken English Assessment
Andrey Malinin, Rogier van Dalen, Kate Knill, Yu Wang and Mark Gales

Synthesizing Compound Words for Machine Translation
Austin Matthews, Eva Schlinger, Alon Lavie and Chris Dyer

Harnessing Cognitive Features for Sarcasm Detection
Abhijit Mishra, Diptesh Kanojia, Seema Nagar, Kuntal Dey and Pushpak Bhattacharyya

End-to-End Relation Extraction using LSTMs on Sequences and Tree Structures
Makoto Miwa and Mohit Bansal

A short proof that O_2 is an MCFL
Mark-Jan Nederhof

Context-aware Argumentative Relation Mining
Huy Nguyen and Diane Litman

Leveraging Inflection Tables for Stemming and Lemmatization.
Garrett Nicolai and Grzegorz Kondrak

Scaling a Natural Language Generation System
Jonathan Pfeil and Soumya Ray

ALTO: Active Learning with Topic Overviews for Speeding Label Induction and Document Labeling
Forough Poursabzi-Sangdeh, Jordan Boyd-Graber, Leah Findlater and Kevin Seppi

Predicting the Rise and Fall of Scientific Topics from Trends in their Rhetorical Framing
Vinodkumar Prabhakaran, William L. Hamilton, Dan McFarland and Dan Jurafsky

Compositional Sequence Labeling Models for Error Detection in Learner Writing
Marek Rei and Helen Yannakoudakis

Neural Semantic Role Labeling with Dependency Path Embeddings
Michael Roth and Mirella Lapata

Prediction of Prospective User Engagement with Intelligent Assistants
Shumpei Sano, Nobuhiro Kaji and Manabu Sassano

Resolving References to Objects in Photographs using the Words-As-Classifiers Model
David Schlangen, Sina Zarrieß and Casey Kennington

RBPB: Regularization-Based Pattern Balancing Method for Event Extraction
Lei Sha, Jing Liu, Chin-Yew Lin, Sujian Li, Baobao Chang and Zhifang Sui

Neural Network-Based Model for Japanese Predicate Argument Structure Analysis
Tomohide Shibata, Daisuke Kawahara and Sadao Kurohashi

Addressing Limited Data for Textual Entailment Across Domains
Chaitanya Shivade, Preethi Raghavan and Siddharth Patwardhan

Annotating and Predicting Non-Restrictive Noun Phrase Modifications
Gabriel Stanovsky and Ido Dagan

Bilingual Segmented Topic Model
Akihiro Tamura and Eiichiro Sumita

Learning Semantically and Additively Compositional Distributional Representations
Ran Tian, Naoaki Okazaki and Kentaro Inui

Inner Attention based Recurrent Neural Networks for Answer Selection
Bingning Wang, Kang Liu and Jun Zhao

Relation Classification via Multi-Level Attention CNNs
Linlin Wang, Zhu Cao, Gerard de Melo and Zhiyuan Liu

Knowledge Base Completion via Coupled Path Ranking
Quan Wang, Jing Liu, Yuanfei Luo, Bin Wang and Chin-Yew Lin

Larger-Context Language Modelling with Recurrent Neural Network
Tian Wang and Kyunghyun Cho

The Creation and Analysis of a Website Privacy Policy Corpus
Shomir Wilson, Florian Schaub, Aswarth Abhilash Dara, Frederick Liu, Sushain Cherivirala, Pedro Giovanni Leon, Mads Schaarup Andersen, Sebastian Zimmeck, Kanthashree Mysore Sathyendra, N. Cameron Russell, Thomas B. Norton, Eduard Hovy, Joel Reidenberg and Norman Sadeh

Sequence-based Structured Prediction for Semantic Parsing
Chunyang Xiao, Marc Dymetman and Claire Gardent

Learning Word Meta-Embeddings
Wenpeng Yin and Hinrich Schütze

Towards Constructing Sports News from Live Text Commentary
Jianmin Zhang, Jin-ge Yao and Xiaojun Wan

A Continuous Space Rule Selection Model for Syntax-based Statistical Machine Translation
Jingyi Zhang, Masao Utiyama, Eiichro Sumita, Graham Neubig and Satoshi Nakamura

Probabilistic Graph-based Dependency Parsing with Convolutional Neural Network
Zhisong Zhang, Hai Zhao and Lianhui Qin

A Search-Based Dynamic Reranking Model for Dependency Parsing
Hao Zhou, Yue Zhang, Shujian Huang, Junsheng Zhou, Xin-Yu Dai and Jiajun Chen

Cross-Lingual Sentiment Classification with Bilingual Document Representation Learning
Xinjie Zhou, Xiaojun Wan and Jianguo Xiao

Segment-Level Sequence Modeling using Gated Recursive Semi-Markov Conditional Random Fields
Jingwei Zhuo, Yong Cao, Jun Zhu, Bo Zhang and Zaiqing Nie

Tuesday, August 9, 2016

9:00–10:10 ***Invited talk II: Mark Steedman***

10:10–10:40 ***Coffee break***

Session 4A: Relations and knowledge bases

10:40–11:00 *Identifying Causal Relations Using Parallel Wikipedia Articles*
Christopher Hidey and Kathy McKeown

11:00–11:20 *Compositional Learning of Embeddings for Relation Paths in Knowledge Base and Text*
Kristina Toutanova, Victoria Lin, Wen-tau Yih, Hoifung Poon and Chris Quirk

11:20–11:40 *Commonsense Knowledge Base Completion*
Xiang Li, Aynaz Taheri, Lifu Tu and Kevin Gimpel

Session 4B: Semantic parsing II

10:40–11:00 *Simpler Context-Dependent Logical Forms via Model Projections*
Reginald Long, Panupong Pasupat and Percy Liang

11:20–11:40 *A Fast Unified Model for Parsing and Sentence Understanding*
Samuel R. Bowman, Jon Gauthier, Abhinav Rastogi, Raghav Gupta, Christopher D. Manning and Christopher Potts

Session 4C: Word meaning II

11:20–11:40 *Investigating Language Universal and Specific Properties in Word Embeddings*
Peng Qian, Xipeng Qiu and Xuanjing Huang

11:40–12:00 *Diachronic Word Embeddings Reveal Statistical Laws of Semantic Change*
William L. Hamilton, Jure Leskovec and Dan Jurafsky

Session 4D: Tasks and datasets

10:40–11:00 *Beyond Plain Spatial Knowledge: Determining Where Entities Are and Are Not Located, and For How Long*
Alakananda Vempala and Eduardo Blanco

11:00–11:20 *LexSemTm: A Semantic Dataset Based on All-words Unsupervised Sense Distribution Learning*
Andrew Bennett, Timothy Baldwin, Jey Han Lau, Diana McCarthy and Francis Bond

11:20–11:40 *The LAMBADA dataset: Word prediction requiring a broad discourse context*
Denis Paperno, Germán Kruszewski, Angeliki Lazaridou, Ngoc Quan Pham, Raffaella Bernardi, Sandro Pezzelle, Marco Baroni, Gemma Boleda and Raquel Fernandez

11:40–12:00 *WikiReading: A Novel Large-scale Language Understanding Task over Wikipedia*
Daniel Hewlett, Alexandre Lacoste, Llion Jones, Illia Polosukhin, Andrew Fandrianto, Jay Han, Matthew Kelcey and David Berthelot

Session 4E: Parsing IV

11:00–11:20 *Optimizing Spectral Learning for Parsing*
Shashi Narayan and Shay B. Cohen

11:20–11:40 *Stack-propagation: Improved Representation Learning for Syntax*
Yuan Zhang and David Weiss

Session 4F: Document analysis

10:40–11:00 *Inferring Perceived Demographics from User Emotional Tone and User-Environment Emotional Contrast*
Svitlana Volkova and Yoram Bachrach

11:00–11:20 *Prototype Synthesis for Model Laws*
Matthew Burgess, Eugenia Giraudy and Eytan Adar

11:20–11:40 *Which argument is more convincing? Analyzing and predicting convincingness of Web arguments using bidirectional LSTM*
Ivan Habernal and Iryna Gurevych

11:40–12:00 *Discovery of Treatments from Text Corpora*
Christian Fong and Justin Grimmer

12:00–13:40 ***Lunch break***

Session 5A: Deep learning (short papers)

Session 5B: Semantics and generation (short papers)

Session 5C: Machine translation II (short papers)

Tuesday, August 9, 2016 (continued)

Session 5D: Text classification (short papers)

Session 5E: Potpourri I (short papers)

15:00–15:30 ***Coffee break***

Session 6A: Machine learning

15:30–15:50 *Learning Structured Predictors from Bandit Feedback for Interactive NLP*
Artem Sokolov, Julia Kreutzer, Christopher Lo and Stefan Riezler

16:10–16:30 *Deep Reinforcement Learning with a Natural Language Action Space*
Ji He, Jianshu Chen, Xiaodong He, Jianfeng Gao, Lihong Li, Li Deng and Mari Ostendorf

16:30–16:50 *Incorporating Copying Mechanism in Sequence-to-Sequence Learning*
Jiatao Gu, Zhengdong Lu, Hang Li and Victor O.K. Li

16:50–17:10 *Cross-domain Text Classification with Multiple Domains and Disparate Label Sets*
Himanshu Sharad Bhatt, Manjira Sinha and Shourya Roy

Session 6B: Word vectors II

15:50–16:10 *Morphological Smoothing and Extrapolation of Word Embeddings*
Ryan Cotterell, Hinrich Schütze and Jason Eisner

16:10–16:30 *Cross-lingual Models of Word Embeddings: An Empirical Comparison*
Shyam Upadhyay, Manaal Faruqui, Chris Dyer and Dan Roth

16:30–16:50 *Take and Took, Gaggle and Goose, Book and Read: Evaluating the Utility of Vector Differences for Lexical Relation Learning*
Ekaterina Vylomova, Laura Rimell, Trevor Cohn and Timothy Baldwin

Tuesday, August 9, 2016 (continued)

Session 6C: Machine translation III

15:30–15:50 *Minimum Risk Training for Neural Machine Translation*
Shiqi Shen, Yong Cheng, Zhongjun He, Wei He, Hua Wu, Maosong Sun and Yang Liu

16:10–16:30 *A Character-level Decoder without Explicit Segmentation for Neural Machine Translation*
Junyoung Chung, Kyunghyun Cho and Yoshua Bengio

16:30–16:50 *Target-Side Context for Discriminative Models in Statistical Machine Translation*
Aleš Tamchyna, Alexander Fraser, Ondřej Bojar and Marcin Junczys-Dowmunt

16:50–17:10 *Neural Machine Translation of Rare Words with Subword Units*
Rico Sennrich, Barry Haddow and Alexandra Birch

Session 6D: Discourse

15:30–15:50 *Implicit Discourse Relation Detection via a Deep Architecture with Gated Relevance Network*
Jifan Chen, Qi Zhang, Pengfei Liu, Xipeng Qiu and Xuanjing Huang

15:50–16:10 *Model Architectures for Quotation Detection*
Christian Scheible, Roman Klinger and Sebastian Padó

16:10–16:30 *Speech Act Modeling of Written Asynchronous Conversations with Task-Specific Embeddings and Conditional Structured Models*
Shafiq Joty and Enamul Hoque

16:30–16:50 *Situation entity types: automatic classification of clause-level aspect*
Annemarie Friedrich, Alexis Palmer and Manfred Pinkal

Session 6E: Language and vision

15:30–15:50 *Learning Prototypical Event Structure from Photo Albums*
Antoine Bosselut, Jianfu Chen, David Warren, Hannaneh Hajishirzi and Yejin Choi

15:50–16:10 *Cross-Lingual Image Caption Generation*
Takashi Miyazaki and Nobuyuki Shimizu

16:10–16:30 *Learning Concept Taxonomies from Multi-modal Data*
Hao Zhang, Zhiting Hu, Yuntian Deng, Mrinmaya Sachan, Zhicheng Yan and Eric Xing

16:30–16:50 *Generating Natural Questions About an Image*
Nasrin Mostafazadeh, Ishan Misra, Jacob Devlin, Margaret Mitchell, Xiaodong He and Lucy Vanderwende

16:50–17:10 *Physical Causality of Action Verbs in Grounded Language Understanding*
Qiaozi Gao, Malcolm Doering, Shaohua Yang and Joyce Chai

Session 6F: Summarization

16:30–16:50 *Optimizing an Approximation of ROUGE - a Problem-Reduction Approach to Extractive Multi-Document Summarization*
Maxime Peyrard and Judith Eckle-Kohler

Session 6G: Learner language

15:30–15:50 *Phrase Structure Annotation and Parsing for Learner English*
Ryo Nagata and Keisuke Sakaguchi

15:50–16:10 *A Trainable Spaced Repetition Model for Language Learning*
Burr Settles and Brendan Meeder

16:30–16:50 *User Modeling in Language Learning with Macaronic Texts*
Adithya Renduchintala, Rebecca Knowles, Philipp Koehn and Jason Eisner

16:50–17:10 *On the Similarities Between Native, Non-native and Translated Texts*
Ella Rabinovich, Sergiu Nisioi, Noam Ordan and Shuly Wintner

Tuesday, August 9, 2016 (continued)

17:30–19:00 ***Poster and dinner session II***

Learning Text Pair Similarity with Context-sensitive Autoencoders
Hadi Amiri, Philip Resnik, Jordan Boyd-Graber and Hal Daumé III

Linguistic Benchmarks of Online News Article Quality
Ioannis Arapakis, Filipa Peleja, Barla Berkant and Joao Magalhaes

Alleviating Poor Context with Background Knowledge for Named Entity Disambiguation
Ander Barrena, Aitor Soroa and Eneko Agirre

Mining Paraphrasal Typed Templates from a Plain Text Corpus
Or Biran, Terra Blevins and Kathleen McKeown

How to Train Dependency Parsers with Inexact Search for Joint Sentence Boundary Detection and Parsing of Entire Documents
Anders Björkelund, Agnieszka Faleńska, Wolfgang Seeker and Jonas Kuhn

MUTT: Metric Unit TesTing for Language Generation Tasks
William Boag, Renan Campos, Kate Saenko and Anna Rumshisky

N-gram language models for massively parallel devices
Nikolay Bogoychev and Adam Lopez

Cross-Lingual Morphological Tagging for Low-Resource Languages
Jan Buys and Jan A. Botha

Semi-Supervised Learning for Neural Machine Translation
Yong Cheng, Wei Xu, Zhongjun He, Wei He, Hua Wu, Maosong Sun and Yang Liu

Strategies for Training Large Vocabulary Neural Language Models
Wenlin Chen, David Grangier and Michael Auli

Predicting the Compositionality of Nominal Compounds: Giving Word Embeddings a Hard Time
Silvio Cordeiro, Carlos Ramisch, Marco Idiart and Aline Villavicencio

Learning-Based Single-Document Summarization with Compression and Anaphoricity Constraints
Greg Durrett, Taylor Berg-Kirkpatrick and Dan Klein

Set-Theoretic Alignment for Comparable Corpora
Thierry Etchegoyhen and Andoni Azpeitia

Jointly Learning to Embed and Predict with Multiple Languages
Daniel C. Ferreira, André F. T. Martins and Mariana S. C. Almeida

Supersense Embeddings: A Unified Model for Supersense Interpretation, Prediction, and Utilization
Lucie Flekova and Iryna Gurevych

Efficient techniques for parsing with tree automata
Jonas Groschwitz, Alexander Koller and Mark Johnson

A Vector Space for Distributional Semantics for Entailment
James Henderson and Diana Popa

Hidden Softmax Sequence Model for Dialogue Structure Analysis
Zhiyang He, Xien Liu, Ping Lv and Ji Wu

Summarizing Source Code using a Neural Attention Model
Srinivasan Iyer, Ioannis Konstas, Alvin Cheung and Luke Zettlemoyer

Continuous Profile Models in ASL Syntactic Facial Expression Synthesis
Hernisa Kacorri and Matt Huenerfauth

Evaluating Sentiment Analysis in the Context of Securities Trading
Siavash Kazemian, Shunan Zhao and Gerald Penn

Edge-Linear First-Order Dependency Parsing with Undirected Minimum Spanning Tree Inference
Effi Levi, Roi Reichart and Ari Rappoport

Topic Extraction from Microblog Posts Using Conversation Structures
Jing Li, Ming Liao, Wei Gao, Yulan He and Kam-Fai Wong

Neural Relation Extraction with Selective Attention over Instances
Yankai Lin, Shiqi Shen, Zhiyuan Liu, Huanbo Luan and Maosong Sun

Leveraging FrameNet to Improve Automatic Event Detection
Shulin Liu, Yubo Chen, Shizhu He, Kang Liu and Jun Zhao

Learning To Use Formulas To Solve Simple Arithmetic Problems
Arindam Mitra and Chitta Baral

Unravelling Names of Fictional Characters
Katerina Papantoniou and Stasinos Konstantopoulos

Most "babies" are "little" and most "problems" are "huge": Compositional Entailment in Adjective-Nouns
Ellie Pavlick and Chris Callison-Burch

Modeling Stance in Student Essays
Isaac Persing and Vincent Ng

A New Psychometric-inspired Evaluation Metric for Chinese Word Segmentation
Peng Qian, Xipeng Qiu and Xuanjing Huang

Temporal Anchoring of Events for the TimeBank Corpus
Nils Reimers, Nazanin Dehghani and Iryna Gurevych

Grammatical Error Correction: Machine Translation and Classifiers
Alla Rozovskaya and Dan Roth

Recurrent neural network models for disease name recognition using domain invariant features
Sunil Sahu and Ashish Anand

Domain Adaptation for Authorship Attribution: Improved Structural Correspondence Learning
Upendra Sapkota, Thamar Solorio, Manuel Montes and Steven Bethard

A Corpus-Based Analysis of Canonical Word Order of Japanese Double Object Constructions
Ryohei Sasano and Manabu Okumura

Knowledge-Based Semantic Embedding for Machine Translation
Chen Shi, Shujie Liu, Shuo Ren, Shi Feng, Mu Li, Ming Zhou, Xu Sun and Houfeng Wang

One for All: Towards Language Independent Named Entity Linking
Avirup Sil and Radu Florian

On Approximately Searching for Similar Word Embeddings
Kohei Sugawara, Hayato Kobayashi and Masajiro Iwasaki

Composing Distributed Representations of Relational Patterns
Sho Takase, Naoaki Okazaki and Kentaro Inui

The More Antecedents, the Merrier: Resolving Multi-Antecedent Anaphors
Hardik Vala, Andrew Piper and Derek Ruths

Automatic Labeling of Topic Models Using Text Summaries
Xiaojun Wan and Tianming Wang

Graph-based Dependency Parsing with Bidirectional LSTM
Wenhui Wang and Baobao Chang

TransG : A Generative Model for Knowledge Graph Embedding
Han Xiao, Minlie Huang and Xiaoyan Zhu

Question Answering on Freebase via Relation Extraction and Textual Evidence
Kun Xu, Siva Reddy, Yansong Feng, Songfang Huang and Dongyan Zhao

Vector-space topic models for detecting Alzheimer's disease
Maria Yancheva and Frank Rudzicz

Chinese Couplet Generation with Neural Network Structures
Rui Yan, Cheng-Te Li, Xiaohua Hu and Ming Zhang

20:00 ***Social event***

Wednesday, August 10, 2016

9:00–9:40 ***President's talk***

9:40–10:10 ***Coffee break***

Session 7A: Outstanding papers I

10:10–10:30 *A Thorough Examination of the CNN/Daily Mail Reading Comprehension Task*
Danqi Chen, Jason Bolton and Christopher D. Manning

10:30–10:50 *Learning Language Games through Interaction*
Sida I. Wang, Percy Liang and Christopher D. Manning

10:50–11:10 *Finding Non-Arbitrary Form-Meaning Systematicity Using String-Metric Learning for Kernel Regression*
E.Dario Gutierrez, Roger Levy and Benjamin Bergen

11:10–11:30 *Improving Hypernymy Detection with an Integrated Path-based and Distributional Method*
Vered Shwartz, Yoav Goldberg and Ido Dagan

Session 7B: Outstanding papers II

10:10–10:30 *Multimodal Pivots for Image Caption Translation*
Julian Hitschler, Shigehiko Schamoni and Stefan Riezler

10:30–10:50 *Harnessing Deep Neural Networks with Logic Rules*
Zhiting Hu, Xuezhe Ma, Zhengzhong Liu, Eduard Hovy and Eric Xing

10:50–11:10 *Case and Cause in Icelandic: Reconstructing Causal Networks of Cascaded Language Changes*
Fermin Moscoso del Prado Martin and Christian Brendel

11:10–11:30 *On-line Active Reward Learning for Policy Optimisation in Spoken Dialogue Systems*
Pei-Hao Su, Milica Gasic, Nikola Mrkšić, Lina M. Rojas Barahona, Stefan Ultes, David Vandyke, Tsung-Hsien Wen and Steve Young

Wednesday, August 10, 2016 (continued)

11:30–11:50 *Globally Normalized Transition-Based Neural Networks*
Daniel Andor, Chris Alberti, David Weiss, Aliaksei Severyn, Alessandro Presta, Kuzman Ganchev, Slav Petrov and Michael Collins

11:50–13:30 ***Lunch break***

13:30–15:00 ***ACL business meeting (open to all)***

15:00–15:30 ***Coffee break***

Session 8A: Question answering II (short papers)

Session 8B: Word vectors III (short papers)

Session 8C: Topics and discourse (short papers)

Session 8D: Syntax and morphology (short papers)

Session 8E: Potpourri II (short papers)

17:00–19:00 ***Awards and closing session***