

**MARK J. STEEDMAN FBA FRSE**  
**Curriculum Vitae (November 6, 2023)**

**PRESENT POST:** Professor of Cognitive Science  
School of Informatics, University of Edinburgh

**DATE OF BIRTH:** Sept. 18th 1946

**NATIONALITY:** British

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**DEGREES:**

1968 B.Sc. (hons.) in Experimental Psychology, University of Sussex.  
1973 Ph.D. in Artificial Intelligence, University of Edinburgh, (Dissertation: *The Formal Description of Musical Perception*. Advisor: Prof. H.C. Longuet-Higgins FRS).

**CAREER:**

1969 – 1972 University of Edinburgh: Research Associate, School of Artificial Intelligence, under Professor H.C. Longuet-Higgins FRS.  
1972 – 1973 University of Edinburgh: Research Fellow, School of Artificial Intelligence, with Professor H.C. Longuet-Higgins FRS.  
1973 – 1976 University of Sussex: Research Fellow, Centre for Research into Perception and Cognition, Department of Experimental Psychology, with Prof. P.N. Johnson-Laird.  
1976 – 1983 University of Warwick: Lecturer, Dept. of Psychology.  
1983 – 1988 University of Edinburgh: Lecturer then Reader in Computational Linguistics, Dept. of Artificial Intelligence and Centre for Cognitive Science  
1988 – 1998 University of Pennsylvania, Associate then Full Professor, Dept. of Computer and Information Science.  
1998 – University of Edinburgh, Professor of Cognitive Science, School of Informatics; also Adjunct Professor, Department of Computer and Information Science, University of Pennsylvania.  
1998 – 2010 Director, Institute for Language, Cognition, and Computation (ILCC, formerly ICCS)  
2000 – 2003 Acting Director, Center for Speech Technology Research, School of Informatics/Dept. of Linguistics, Edinburgh.

**VISITING POSITIONS:**

1980 – 1981 University of Texas at Austin: Alfred P. Sloan Research Fellow, Centre for Cognitive Science.  
1982 Max Planck Institute for Psycholinguistics, Nijmegen: Visiting Fellow, summer, 1982.  
1986 – 1987 University of Pennsylvania, Philadelphia: Visiting Professor, Department of Computer and Information Science.  
1996 IMS University of Stuttgart: Visiting Researcher, Summer, 1996.  
2006 – 2007 IRCS University of Pennsylvania, Sabbatical Visiting Professor.  
2016 Ian Gordon Fellow, Victoria University, Wellington New Zealand, October.

## HONORS:

- 1993 Fellow of the Association for the Advancement of Artificial Intelligence (AAAI).
- 2002 Fellow of the Royal Society of Edinburgh (FRSE).
- 2002 Fellow of the British Academy (FBA).
- 2006 Member of the Academia Europæa.
- 2005 – 2007 Vice-President-elect, Vice-President, then President of the Association for Computational Linguistics (ACL).
- 2008 Fellow of the Society for the Study of Artificial Intelligence and Simulation of Behaviour (SSAISB).
- 2012 Fellow of the Association for Computational Linguistics (ACL).
- 2013 Fellow of the Cognitive Science Society (CSS).
- 2014 – 2016 Vice-President elect, Vice-President, then President, ACL SIGDAT special interest group.
- 2018 Lifetime Achievement Award of the Association for Computational Linguistics (ACL).
- 2021 Fellow of the Asia-Pacific Artificial Intelligence Association (AAIA).
- 2021 Fellow of the European Laboratory for Learning and Intelligent Systems (ELLIS).

## GRANTS HELD:

- SSRC: HR 4251, “The Semantics of Temporal Description in English”, approx £10,000, 1977-1981 (PI, Univ. of Warwick).
- EEC ESPRIT: project no. 393 “Construction and Interrogation of Knowledge Bases using Natural Language and Graphics”, approx. 500,000 UK pounds, 1984-1989, (a collaborative project with the Fraunhofer Gesellschaft and University, Stuttgart; the Laboratoire de Marcoussis, Compagnie Générale de l’Electricité; Triumph-Adler AG. co-PI with Drs. E. B. Richards and E. Klein at the University of Edinburgh).
- EEC ESPRIT: project BR 3175. In 1987/88 I was the coordinator and a principal investigator on a proposal to the ESPRIT Basic Research Action for a grant of 500,000 UK pounds over two and a half years to the Cognitive Science departments at Edinburgh (as part of a collaborative project with the universities of Amsterdam, Stuttgart, and Tübingen), entitled “Dynamic Interpretation of Natural Language”. Although I had to withdraw my name as a PI in the final stages, due to my imminent move to Penn, this grant was awarded 1989.
- DARPA: N00014-90-J-1863 “Research in Natural Language Processing” for \$2.2M over three years, from July 1990, co-PI with Drs. Joshi, Marcus, Webber, U. Penn.
- NSF: BNS-9021223 “Grammatical Foundations of Prosody and Discourse”, a workshop and conference grant, \$34,225, for one year from 1991. Co-PI with Drs. Polanyi (Rice University) and Ladusaw (UC, Santa Cruz).
- NSF: IRI90-18513 “Computer Synthesis of Contextually Appropriate Intonation for Spoken Language”, for \$155,082 over two years from Sept 1991, PI, U.Penn.
- NSF: IRI91-17110 “Communication, Coarticulation and Dialogue Gesture in Facial Animation” for \$290,000 over three years from Sept 1992, co-PI with Dr. N. Badler, U Penn.
- ARPA: N66001-94-C6043, “Lexical Grammar, Automatic Grammar Acquisition and Multisentence Understanding”, \$2.25M subject to adjustment from Sept 1994. co-PI with Drs. Marcus, Joshi, Webber, U. Penn.
- ARO: DAAH04-94-G0426, “Research in AI”, \$700K subject to adjustment from Sept 1994. co-PI with Drs. Joshi, Marcus, Webber, U. Penn.
- NSF: IRI-9504372, “Synthesising Conversation between Human-like Cooperative Agents”, \$540K (revised) three years from Sept 95, co-PI with Dr. N. Badler, U.Penn.

DOE: P200A70304, “Computer and Information Science”, Graduate Assistance in Areas of National Need Program, \$367K, 3 years from Sept 1997 (PI, U.Penn).

UK EPSRC: GR/M96889, “Wide Coverage Parsing and Grammar Induction Using CCG”, £159K, 3 years from Oct 2000 (PI, Univ. Edinburgh).

UK EPSRC: GR/R02450, “Using Discourse Information to Control Intonation and Ellipsis for Automatic Speech Production”, £60K, 3 years from Oct 2000 (Co-PI with Dr. J. Moore, Univ. Edinburgh).

EU (FET) “Magicster: Embodied Believable Agents,” 406K Euros (Edinburgh Component), 3 years from Dec 2000 (Coordinator and PI, Univ. Edinburgh).

UK EPSRC: GR/R82838, “Visiting Fellowship in Computational Aspects of Categorical Grammar”, for Prof. Nissim Francez, Technion. £40K, 6 months from Apr 2002 (PI, Univ. Edinburgh).

NSF/DARPA “Weakly Supervised Learning For Wide-Coverage Parsing”, one of four projects selected for Fred Jelinek’s CLSP summer workshop, 6 weeks May-June 2002, Edinburgh component \$75K.

EPSRC: GR/S19134, “Visiting Fellowship in Computational Linguistics”, for Dr. Cem Bozsahin, Middle East Technical University Ankara, £10K, 5 months from Jan 2003 (PI, Univ. Edinburgh).

UK EPSRC: GR/S22509, “Visiting Fellowship in Computational Linguistics”, for Dr. Ian Pratt-Hartmann, University of Manchester £7K, 5 months from Feb 2003 (PI, Univ. Edinburgh).

Royal Society of Edinburgh International Exchange Programme “Visiting Fellowship in Computational Linguistics”, for Dr. Cem Bozsahin, Middle East Technical University Ankara, £1K, 1 month from July 2005 (PI, Univ. Edinburgh).

UK ESRC: PTA-026-27-0944, “Syntax, Probability, Prediction, and Memory in Human Sentence Processing,” (Visiting Fellowship for Dr. R. Levy), £32K, 6 months from Sept 2005, (Co-PI with Frank Keller, Univ. Edinburgh).

NSF IIS-041628 (R39058) “IRC in Human Communication”, £21K, 3 yrs from Sept 01 2004, Co-PI.

EU IST Cognitive Systems IP FP6-2004-IST-4-27657 “Paco-Plus: Perception, Action and Cognition through Learning of Object-Action Complexes,” 760K Euros (Edinburgh Component), 4 years from Feb. 2006 extended to May 31 2010 (PI, Univ. Edinburgh).

UK EPSRC: EP/F028938, “Visiting Fellowship”, for Dr. Sumru Ozsoy, Bosphorus University £14K, 3 months from Nov 2007 (PI, Univ. Edinburgh).

EU ERC Advanced Fellowship 249520 GRAMPLUS: Grammar-Based Robust Natural Language Processing. 1.9M Euro, 5 years from 1 June 2010 (PI, Univ. Edinburgh).

EU IST Cognitive Systems IP EC-FP7-270273 Xperience: Robots Bootstrapped through Learning from Experience. 1.35M Euro (Edinburgh Component), 5 years from 1 Jan 2011 (Co-PI with Chris Geib and Ron Petrick, Univ. Edinburgh).

ARC Discovery grant DP 110102506 “Incremental Parsing and Coreference Resolution”. 22K AUD (Edinburgh Component), 3 years from 1 Jan 2011 (Co-PI with Mark Johnson, Macquarie University, Sydney Australia).

Google Faculty Award: “Learning Hidden Semantics for QA by Machine Reading,” 1 year from 1 Feb 2016, \$61.5K

ARC Discovery grant DP160102156 “Improved Syntactic Parsing and Semantic Analysis for Natural Language Processing”. 25K AUD (Edinburgh Component), 3 years from 1 Jan 2016 (Co-PI with Mark Johnson, Macquarie University, Sydney Australia).

EU ERC H2020 Advanced Fellowship GA 742137 SEMANTAX: “Form-Independent Semantics for Natural Language Understanding.” 2.0M Euro, 5 years from 1 June 2017 (PI).

University of Edinburgh and Huawei Technologies Award, “Building and Interrogating Knowledge Graphs from Text,” £162,659, 3 yrs, 1 Sept 2017–31 August 2020. (PI)

Bloomberg L.P. Gift Award “Learning Hidden Semantics by Machine Reading using Entailment Graphs”, \$55,384, 1 year , May 1 2017–Apr 31 2018 (PI).

University of Edinburgh and Huawei Technologies Research Center, “Semantic Parsing and Dialog for Knowledge-Graph Query,” (Co-PIs: Simon King; Mirella Lapata; Ivan Titov; Bonnie Webber) £917,465, 4 yrs, 1 Sept 2020–31 August 2024 (PI).

### **TEACHING and ACADEMIC SERVICE:**

Graduate and undergraduate courses and graduate seminars on Computational Linguistics, Artificial Intelligence, Programming, Programming Language Concepts, Psychology of Language, Introductory Linguistics, Introductory Psychology, at the Universities of Sussex, Warwick, Edinburgh, Texas at Austin, Pennsylvania, Stuttgart, and the Summer Institutes of LSA and ESLLI. I have also taught a number of short courses in speech and text processing for industry and other non-university groups, such as ARO. I was chair of the IRCS committee to organise and expand undergraduate Cognitive Science Teaching at Penn.

At Edinburgh I have taught AI2, (two sections), Natural Language Software System Design (NLSSD), and the AI Large Practical. Until 2010, I taught Introduction to Cognitive Science (ICS) and Advanced Natural Language Processing (ANLP). I also served on the committee to redesign the Informatics First and Second Year courses, and the Undergraduate Cognitive Science Programs.

Chairman and coordinator for the undergraduate joint honours degree in Computer Science and AI, University of Edinburgh, from 1987 to 1988.

Director of the Graduate Program in Cognitive Science, University of Edinburgh, from 1987 to 1988.

External Examiner, M.Sc. in Cognitive Science, University of Essex, from 1985 to 1988.

Chair of Graduate Admissions, CIS, U.Penn, 1990–1998

Graduate Chair, CIS U.Penn, 1993–1998.

Director, Institute for Language, Cognition, and Computation (ILCC, formerly ICCS), School of Informatics, University of Edinburgh, 1998–2010

Acting Director, Centre for Speech Technology Research, School of Informatics, University of Edinburgh, 2000–2003

### **SERVICE:**

Founding Editor (joint): *Language and Cognitive Processes*, 1984-1992; Senior Editor, *Cognitive Science*, 1997–1999.

Advisory Editor: *Cognition*, 1980–2002; *Linguistics*, 1979-1992; *Journal of Semantics*, from 1985; *Language and Cognitive Processes* renamed *Language, Cognition, and Neuroscience*, from 1992; *Language and Speech*, 1994–2000, *Cognitive Science*, from 1996; *Journal of Comparative Germanic Linguistics*, 1996–2000; *Lingua*, 1999-2004; *Computational Linguistics*, from 2005-2008; *Semantics and Pragmatics*, from 2007; *Linguistics in Language Technology*, from 2007; *Syntax*, from 2010; *Journal of Language Modeling*, from 2013; *Transactions of the Association for Computational Linguistics*, from 2012.

Reviewer: *Perception*; *Cognitive Psychology*; *Linguistics and Philosophy*; *Cognitive Science*; *Synthèse*; *Natural Language and Linguistic Theory*; *Language*; *Computational Linguistics*; *Behaviour and Brain Sciences*; *Artificial Intelligence*, *Linguistic Inquiry*, *Journal of Applied Linguistics*, etc. etc. Also referee for numerous publishers and book series (Kluwer, Academic Press, MIT Press, Cambridge UP, Oxford UP, Wiley-Blackwell, etc.).

Program Committee for 27th Annual Conference of the Association for Computational Linguistics, Vancouver, June 1989.

Area Chair for Natural Language Processing, International Joint Conference on Artificial Intelligence, Sidney, Australia. August 1991.

NIMH Advisory Panel for Cognitive Science, May 1993

Program Committee for 33rd Annual Conference of the Association for Computational Linguistics, Boston, June 1995.

Program Committee for the Student Session of the 33rd Annual Conference of the Association for Computational Linguistics, Boston, June 1995.

Member, Review Committee for Annual International Workshop on Parsing Technology, 1995–1999.

Member, Review Committee, 9th Amsterdam Colloquium, ILLC Univ. Amsterdam 1993.

Member, Review Committee, European Conference on Artificial Intelligence 1994–1996

Member, Program Committee for 35rd Annual Conference of the Association for Computational Linguistics, Madrid, June 1997.

Member, NIMH Advisory Panel for Cognitive Science, May 1993, June 1997.

Member, NSF Review Panels March April 1994.

Member, ESRC/MRC/SERC JCI External Review Committee: Joint Council Initiative in Cognitive Science and Human Computer Interaction (UK) 1996.

Member, Review Committee, 12th Amsterdam Colloquium, ILLC Univ. Amsterdam 1998.

Member, NIMH Perception and Cognition Study Section (PEC), Fall 1997–summer 1999.

Member, NIMH Biobehavioral and Behavioral Processes Study Section 3 (BBBP-3), Fall 1999—Summer 2001.

Member, NIH Biobehavioral and Behavioral Processes Advisory Panel (BBBP-3), November 2004

Member, Standing Committee for the Annual European Summer School in Logic, Language, and Information (ESSLLI) from 1999–2002

Member, Program Committee for 40th Annual Conference of the Association for Computational Linguistics, Philadelphia, June 2002.

Member, Program Committee for 18th National Conference on Artificial Intelligence, Edmonton, July 2002, Canada.

Member, Programme Committee, International Conference of Music in Artificial Intelligence, Edinburgh Sept 2002

Member, review panel, Formal Grammar Conference, Trento August 2002

Member, review panel, TIME 2002, Manchester August 2002

Member, review panel, International Conference on Spoken Language Processing (ICSLP) 2000.

Member, review panel, TAG+ Conference, Venice, June, 2002.

Member, INRIA External Review Committee for Theme 2A: Paris, October 2002.

Member EPSRC Review College, 2003–present

Member, Review Panel, Conference on Semantics and Linguistic Theory (SALT 13), 2003

Member, Review Panel, 4th Conference of the North American Chapter of the Association for Computational Linguistics (HLT-NAACL 2003), Edmonton.

Member, Review Panel, International Workshop on Parsing Technology, (IWPT-03),

Member, Review Panel, EUROGRAPHICS 2003.

Co-Chair, SIGDAT International Conference on Empirical Methods in Natural Language Processing (EMNLP), Sapporo Japan, July 2003.

Member, External Review Committee Onderzoeksschool Logika (Dutch Graduate School in Logic) for Dutch Royal Academy for the Sciences (KNAW) February 2004

Member, Review Panel, International Workshop on Parsing Technology, (IWPT-04),

Member, Review Panel, 42nd Annual Meeting of the Association for Computational Linguistics (ACL), Barcelona 2004

Member, Review Panel, Conference on Semantics and Linguistic Theory (SALT 14), 2004

Member, Review Panel, International Workshop on Parsing Technology, (IWPT-04),  
Member of the Executive Committee, Association for Computational Linguistics, 2005-2008  
Member, Review Panel, 43rd Annual Meeting of the Association for Computational Linguistics (ACL),  
Ann Arbor MI 2005  
Member, Review Panel, SIGDAT International Conference on Empirical Methods in Natural Language  
Processing (EMNLP) 2005  
Member, Review Panel, International Workshop on Parsing Technology, (IWPT-05),  
Member, EPSRC Review Panel, People and Interactivity. 2004.  
Member, EU FP6 Cognitive Systems Program Review Board for the project COSY, November 2005  
Member, Review Panel, 5th Conference of the North American Chapter of the Association for Computa-  
tional Linguistics (HLT-NAACL 2006)  
Member, Review Panel, International Workshop on Parsing Technology, (IWPT-06),  
Member, Review Panel, 46th Annual Meeting of the Association for Computational Linguistics (ACL),  
Prague 2006  
Member, NIH Biobehavioral and Behavioral Processes Advisory Panel (BBBP-D(04)), February 2006  
Member, EU Advisory Panel for the FP7 Call Computational Cognitive Systems, Luxembourg, March  
2006  
Member Advisory Board of the MCRI on Asymmetry at the Interface and the Cognitive System, SSHRC,  
Canada (2004-2009)  
Member, EU FP6 Cognitive Systems Program Review Board for the project COSY, November 2006.  
Chair Evaluation Committee of the Institute for Logic, Language, and Information (ILLC), Universiteit  
van Amsterdam, October-November 2006.  
Member, Evaluation Committee for INRIA/LORIA Nancy, July 2008  
Chair Midterm Evaluation Committee of the Institute for Logic, Language, and Information, Universiteit  
van Amsterdam, May 2010.  
Member, EPSRC Review Panel, ICT Responsive Mode Panel, Sept. 2012.  
Advisor for the Renewal Evaluation of the Institute for Logic, Language, and Information, Universiteit van  
Amsterdam, October 2012.  
Chair, Mature Centre Review Panel for Centre for Language Sciences (CLaS), Macquarie University, Syd-  
ney Australia, November. 2012.  
Co-chair, Comité d'expertise pour l'Évaluation du Bachelor et du Master en Informatique pour les sciences  
humaines, Université de Genève (avec Prof. Bertrand Meyer, ETH Zürich), June 2013.  
Chair, Midterm Evaluation Committee of the Institute for Logic, Language, and Information (ILLC), Uni-  
versiteit van Amsterdam, May 2015 (with Prof. Angelika Kratzer, UMass Amherst, and Prof. Wolf-  
gang Thomas, U. Aachen).  
Expert delegate, OECD meeting to compare computer and human skills, Russell Sage Foundation New  
York, May 2016.  
Member, Review Panel for Deutsche Forschungsgemeinschaft (DFG, German Research Foundation) "Clus-  
ters of Excellence in the area of Computer Science" Bonn, May 2017  
Member, Scientific Advisory Council for the Institute for Logic, Language, and Information (ILLC), Uni-  
versiteit van Amsterdam, November 2019 (with Prof. Valeria de Paiva (Nuance), Prof. Hannes Leit-  
geb (Ludwig Maximilian University of Munich) and Prof. Moshe Vardi (Rice U.).  
Member, Nominations Committee of the ACL, 2019-2021.  
Chair for Fellowships for the Nominations Committee of ACL, 2020  
General Chair, 9th CCF International Conference on Natural Language Processing and Chinese Computing  
(NLPCC), Zhengzhou, October 2020.  
Chair, EPSRC ICT Prioritization panel, December 2020.

## RESEARCH STATEMENT:

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. He is ranked among the top 100 Computer Scientists in the UK by Guide2Research (2020).

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.

## PH.D. THESES & POSTDOCS SUPERVISED:

- Gerry Altmann. (PhD, AI and CCS, Edinburgh). Reference and the resolution of local syntactic ambiguity: the effect of context during human sentence processing. Awarded 1986. Professor, University of Connecticut CT.
- Marc Moens. (PhD, CCS, Edinburgh) Tense, Aspect and Time Reference. Awarded 1988. Venture Capitalist, Edinburgh.
- Remo Pareschi (PhD, AI and CCS, Edinburgh). Algorithmic Processing of Unification-based Implementations of Extended Categorical Grammars. Awarded 1989. Associate Professor, University of Molise, Italy.
- Nick Haddock. (PhD, AI and CCS, Edinburgh). Incremental Semantic Interpretation and Interactive Syntactic Processing. Awarded 1989. Senior Research Officer Hewlett Packard, Palo Alto CA.
- Einar Jowsey. (PhD, AI, Edinburgh) Constraining Formal Grammar for Computational Applications. Awarded 1991. Post-doctoral Research Fellow in Computer Science at the University of Essex, UK.
- Mark Hepple (PhD, CCS, Edinburgh, with E. Engdahl) Word order and Processing in English and Germanic Languages. Awarded 1991. Senior Faculty, University of Sheffield UK.
- Cathérine Pelachaud (PhD, CIS, U. Penn, with N. Badler), Communication and Coarticulation in Facial Animation. Awarded 1991. Senior Researcher, INRIA Paris.
- Michael Niv (PhD, CIS, U. Penn) Processors for Combinatory Grammars. Awarded 1993. Postdoctoral Research Fellow, Dept of Computer Science, Technion, Tel Aviv Israel. SRA Arlington VA.
- Michael White (PhD, CIS, U. Penn) Temporal Semantics and Temporal Reference. Awarded August 1994. Senior Computational Linguist, Cogentex, Ithaca NY. Faculty, Linguistics, The Ohio State University.
- Beryl Hoffman (PhD, CIS U. Penn) Syntax, Semantics and Discourse Information in Turkish, Awarded Aug 1995. NATO Post-doctoral Fellow, University of Edinburgh. Faculty, Marymount College, Arlington VA.
- Scott Prevost (PhD, CIS U. Penn) Intonation, Context and Contrastiveness in Spoken Language Generation. Awarded December 1995. Post-doctoral Fellow, MIT Media Lab. Research Scientist, Fuji Xerox. CSO Headpedal Inc. CEO BING, Microsoft.

- Jong Park (PhD, CIS, U. Penn) Semantics for Combinatory Grammars. Awarded May 1996. Faculty, KAIST Korea.
- Charles Ortiz (PhD, CIS, U. Penn) Worlds of Change: Counterfactual Reasoning and Causation. Awarded December 1996. Post Doctoral Fellow, Harvard. Senior Research Scientist SRI Menlo Park; Director, Nuance Laboratory for Research in Artificial Intelligence and Natural Language.
- Matthew Stone (PhD, CIS, U. Penn) Modality in Dialogue: Planning, Pragmatics and Computation. awarded Dec 1998. **FoLLI Prize for Outstanding Dissertation in Language, Logic and Computation for 1999**. Associate Professor, Rutgers U.
- Nobo Komagata (PhD, CIS, U. Penn), Information Structure in Texts: A Computational Analysis of Contextual Appropriateness in English and Japanese. Dec 1999. Assistant Professor, UNJ Trenton
- Frank Keller (PhD, Informatics, Edinburgh, with A. Sorace) Gradience in Grammar: Experimental and Computational Aspects of Degrees of Grammaticality, June 2000. Faculty, University of the Saarlandes Saabrücken. Faculty, University of Edinburgh.
- Jane Neumann (PhD, Informatics, Edinburgh, with D. Willshaw), Holistic Processing of Hierarchical Structures in Connectionist Networks. June 2001. Postdoc, Max Planck Institut for Cognitive Neuroscience, Leipzig
- Jason Baldridge (PhD, Informatics, Edinburgh), Lexically Specified Derivational Control in Combinatory Categorical Grammar, Dec 2002. **Beth Prize for Outstanding Dissertation in Language, Logic and Computation for 2002**. Associate Professor, Linguistics, University of Texas at Austin; Senior Scientist Google Mountain View CA.
- Julia Hockenmaier (PhD, Informatics, Edinburgh), Data and Models for Statistical Parsing with Combinatory Categorical Grammar. June 2003. **Pub. BCS Distinguish Dissertations Collection, shortlisted for BCS Distinguished Dissertation 2003**. Associate Professor, Computer Science, University of Illinois Urbana-Champaign.
- Dr. Stephen Clark (Postdoc 2000-2004, Informatics Edinburgh) on EPSRC grant GR/M96889. Faculty, Computer Science, University of Oxford; Computing Laboratory, University of Cambridge, Cambridge Quantum Computing Ltd.
- Dr. Johan Bos (Postdoc 2003-2005, Informatics Edinburgh) on EU FP5 grant MAGICSTER. Senior Researcher, University La Sapienza, Rome; Associate Professor, University of Groningen.
- Maarika Traat (PhD, Informatics, Edinburgh), Information Structure in Discourse Representation, June 2006, Postdoc U. Tartu, Estonia.
- Mark McConville (PhD, Informatics, Edinburgh), An Inheritance-Based Theory of the Lexicon in Combinatory Categorical Grammar Dec. 2006, Soillse Research Fellow, University of Glasgow
- Sasha Calhoun (PhD, Informatics, Edinburgh, with Bob Ladd ), Intonation and Information Structure in English, 2007. Faculty, University of Wellington, NZ.
- Ruken Cakıcı (PhD, Informatics, Edinburgh), Wide Coverage Parsing for Turkish, May 2009, Lecturer, Middle East Technical University.
- Dr. Ron Petrick (Postdoc, Informatics, Edinburgh 2006-present), EU IST IPs Paco+, Xperience
- Dr. Chris Geib (Postdoc, Informatics, Edinburgh 2006-2013), Paco+, Xperience; Associate Prof. Drexel University.
- Dr. Luke Zettlemoyer (Postdoc 2010-2011, Informatics Edinburgh), Assistant Prof, University of Washington, Seattle. NSF
- Thomas Kwiatkowski (PhD, Informatics, Edinburgh), Probabilistic Grammar Induction from Sentences and Structured Meanings, May 2012, Postdoc., University of Washington, Seattle; Allen Institute, Seattle; Google New York.
- Kira Mourão (PhD, Informatics, Edinburgh), Learning Action Models using Kernel Perceptrons, May 2012, Postdoc., University of Edinburgh, EU IST Xperience.



Emily Thomforde (PhD, Informatics, Edinburgh), Semi-supervised Lexical Acquisition for Wide Coverage Parsing, May 2013. Freelance Game Developer, Edinburgh **Scottish BAFTA award 2013**.

Dr. Alexandra Birch-Mayne (Postdoc 2010-2013, Informatics Edinburgh), ERC grant GRAMPLUS.

Dr. Tejaswini Deoskar (Postdoc 2011-2015, Informatics Edinburgh), ERC grant GRAMPLUS.

Dr. Nathaniel Smith (Postdoc 2012-2015, Informatics, Edinburgh), EU IST IPs Xperience

Dr. Omri Abend (Postdoc 2013-2015, Informatics Edinburgh), ERC grant GRAMPLUS.

Dr. Jeff Mitchell (Postdoc 2013-2015, Informatics Edinburgh), ERC grant GRAMPLUS.

Mark Granroth-Wilding, (PhD, Informatics, Edinburgh), Harmonic Analysis of Music using Combinatory Categorical Grammar. June 2013. Postdoc Computing Laboratory, University of Cambridge.

Chris Christodoulopoulos, (PhD, Informatics, Edinburgh), Unsupervised Syntactic Category Induction using Multi-level Linguistic Features, December 2013. Postdoc, Computer Science, University of Illinois Urbana-Champaign.

Prachya Boonkwan, (PhD, Informatics, Edinburgh), Scalable Semi-Supervised Grammar Induction using Cross-Linguistically Parameterized Syntactic Prototypes, June 2014. Researcher, National Electronic and Computer Technology Center (NECTEC) Pathumthani, Thailand

Aciei Eshky, (PhD, Informatics, Edinburgh), Generative Probabilistic Models of Goal-Directed Users in Task Oriented Dialogs, Dec 2014. Postdoc, Informatics Edinburgh. Researcher Quantics, Edinburgh

Mike Lewis, (PhD, Informatics, Edinburgh), Combined Distributional and Logical Semantics, May 2015. Postdoc., University of Washington, Seattle; Allen Institute, Seattle. Researcher, Facebook.

Greg Coppola, (PhD, Informatics, Edinburgh), Iterative Parameter Mixing for Distributed Large-Margin Training of Structured Predictors for Natural Language Processing, Dec 2014. Google, New York.

Loukou, Felicia (Masters by Research, Informatics, Edinburgh), Typed Entailment Graphs with Light Verb Constructions, May 2016. Data Scientist, UK Government Digital Service.

Siva Reddy (PhD, Informatics, Edinburgh, with M. Lapata) Syntax-Mediated Semantic Parsing, May 2017. Stanford University, Post-doc in Computer Science.

Bharat Ram Ambati (PhD, Informatics, Edinburgh) Transition-based Combinatory Categorical Grammar Parsing for English and Hindi, May 2016. Apple, Cupertino, CA.

Andrew McLeod (PhD, Informatics, Edinburgh), The Language of Music: A Computational Model of Music Interpretation, June 2018. researcher in the Semantic Music Technologies group at Fraunhofer IDMT.

John Torr (PhD, Informatics, Edinburgh), Wide-coverage Statistical Parsing with Minimalist Grammars, May 2019) Research scientist, Wluper Ltd.; Apple Cambridge.

Javad Hosseini (PhD, Informatics, Edinburgh), Learning Typed Entailment Graphs from Text, December 2020. Google London.

Sabine Weber (PhD, Informatics, Edinburgh), Unsupervised German Predicate Entailment Using The Distributional Inclusion Hypothesis, May 2022.

Sander Bijl de Vroe (PhD, Informatics, Edinburgh), Temporality and Modality in Entailment Graph Induction, December 2022.

Ida Szubert (PhD, Informatics, Edinburgh), Work In Progress (from Sept 2017).

Li, Tianyi (PhD, Informatics, Edinburgh), Work In Progress

Nick McKenna (PhD, Informatics, Edinburgh), Work In Progress

Cheng, Liang (PhD, Informatics, Edinburgh), Work In Progress

Liu, Tianyang (PhD, Informatics, Edinburgh), Work In Progress

Matt Grenander (PhD, Informatics, Edinburgh), Work In Progress

Dr. Liane Guillou (Postdoc), June 2017-August 2023, Senior Researcher, Research Institutes of Sweden.

Dr. Miloš Stanojević (Postdoc), Nov 2017-Oct. 2021. Research Scientist, DeepMind, London;

Dr. Thomas Kober (Postdoc), Jan 2018-Dec 2019. Research Scientist Zalando

Dr. Mohammed Javad Hosseini (Postdoc), Jan 2021-Sept 2021. Research Scientist Google, London;

Dr. Ratish Puduppully (PostDoc), Oct 2021-Aug 2022. Research Scientist, A-star Singapore;

Dr. Louis Mahon (PostDoc) September 2022-July 2023

## PUBLICATIONS:

### Books

- (1996a) *Surface Structure and Interpretation*, Linguistic Inquiry Monograph **30**, MIT Press.  
(2000a) *The Syntactic Process*, MIT Press.  
(2001a) *The Syntactic Process*, MIT Press. (paperback edition, revised)  
(2012a) *Taking Scope: The Natural Semantics of Quantifiers*, MIT Press.

### Corpora

- (2005a) *CCGbank*, (with Julia Hockenmaier), Linguistic Data Consortium, LDC2005T13 (ISBN 1-58563-340-2), Philadelphia, PA.  
(2009a) *NXT-format Switchboard Corpus* (with Sasha Calhoun, Jean Carletta, et. al.), Linguistic Data Consortium, LDC2009T26 (ISBN: 1-58563-526-X), Philadelphia, PA.  
(2015a) *XML Massively Parallel Bible Corpus* (with Chris Christodoulopoulos), ILCC Informatics, Edinburgh <http://groups.inf.ed.ac.uk/ccg/corpora.html>.  
(2016f) *Hindi CCGbank* (with Bharat Ambati and Tejaswini Deoskar), ILCC Informatics, Edinburgh <http://groups.inf.ed.ac.uk/ccg/corpora.html>

### Refereed Journal Articles

- (1977a) “The Perception of Musical Rhythm and Metre”, *Perception*, **6**, 555-569.  
(1977b) “Verbs, Time and Modality”, *Cognitive Science*, **2**, 216-234.  
(1978a) “The Psychology of Syllogisms”, (with Philip Johnson-Laird), *Cognitive Psychology*, **10**, 64-99.  
(1982a) “On the Order of Words”, (with Tony Ades) *Linguistics and Philosophy*, **4**, 517-558.  
(1983a) “On the Generality of the Nested Dependency Constraint and the Reason for an Exception in Dutch”, *Linguistics*, **21.1**, 35-66.  
(1984a) “A Generative Grammar for Jazz Chord Sequences”, *Music Perception*, **2.1**, 52-77.  
(1985a) “LFG and Psychological Explanation”, *Linguistics and Philosophy*, **8.3**, 359-385.  
(1985b) “Dependency and Coordination in the Grammar of Dutch and English”, *Language*, **61.3**, 523-568.  
(1987a) “Combinatory Grammars and Parasitic Gaps”, *Natural Language and Linguistic Theory*, **5**, 403-439.  
(1988a) “Temporal Ontology and Temporal Reference”, (with Marc Moens), *Computational Linguistics*, **14**, 15-28. (Reprinted as 2005u.)  
(1988b) “Interaction with Context During Human Sentence Processing”, (with Gerry Altmann), *Cognition*, **30**, 191-238  
(1989a) “Ambiguity in Context: a reply”, (with Gerry Altmann), *Language and Cognitive Processes*, **4**, 105-122.  
(1990a) “Gapping as Constituent Coordination”, *Linguistics and Philosophy*, **13**, 207-264.  
(1991a) “Structure and Intonation”, *Language*, **68.2**, 260-296.  
(1993a) “Categorical Grammar”, *Lingua*, **90**, 221-258.  
(1994a) “Acquisition of Verb Categories”, *Lingua*, **92**, 471-480.  
(1994b) “Specifying Intonation from Context for Speech Synthesis”, (with Scott Prevost), *Speech Communication*, **15**, 139-153.  
(1994c) “The Well-tempered Computer”, *Philosophical Transactions of the Royal Society, A*, **349**, 115-130.  
(1996b) “Generating Facial Expressions for Speech” (with Catherine Pelachaud and Norman Badler), *Cognitive Science*, **20**, 1-46.

- (1999a) “Connectionist Sentence Processing in Perspective”, *Cognitive Science*, **23**, 615-634.
- (2000b) “Information Structure and the Syntax-Phonology Interface”, *Linguistic Inquiry*, **31**, 649-689.
- (2002a) “Plans, Affordances, and Combinatory Grammar,” *Linguistics and Philosophy*, **25**, 723-753.
- (2003a) “Discourse and Information Structure” (With Ivana Kruijff-Korbayová), *Journal of Logic, Language and Information*, **12**, 249-259.
- (2006a) “Is Semantics Computational?” (With Matthew Stone), *Theoretical Linguistics* **32**, 73-89.
- (2006b) “Categorial Grammar and the Semantics of Contextual Prepositional Phrases,” (with Nissim Francez) *Linguistics and Philosophy*, **29**, 381-417.
- (2007a) “CCGbank: A Corpus of CCG Derivations and Dependency Structures Extracted from the Penn Treebank,” (with Julia Hockenmaier) *Computational Linguistics*, **33**, 355-396.
- (2008a) “On Becoming a Discipline” (2007 ACL Presidential Address to the 45th Annual Conference) *Computational Linguistics*, **34**, 137-144
- (2010a) “The NXT-Format Switchboard Corpus: A Rich Resource for Investigating the Syntax, Semantics, Pragmatics, and Prosody of Dialog,” (With Sasha Calhoun, Jean Carletta, Jason Brenier, Neil Mayo, Dan Jurafsky, and David Beaver), *Language Resources and Evaluation*, **44**, 387-419.
- (2011b) “Object-Action Complexes: Grounded Abstractions of Sensorimotor Processes”, (with Norbert Krüger, Christopher Geib, Justus Piater, Ronald Petrick, et al., *Robotics and Autonomous Systems*, **59**, 740-757.
- (2011c) “Romantics and Revolutionaries: What Theoretical and Computational Linguists Need to Know about Each Other\* (\*But were Afraid to Ask)”, *Linguistic Issues in Language Technology* , **6**.
- (2013a) (with Mike Lewis) “Combined Distributional and Logical Semantics,” *Transactions of the Association for Computational Linguistics*, **1**, 179-192.
- (2014a) “The Surface Compositional Semantics of English Intonation,” *Language*, **90**, 2-57.
- (2014b) (with Mark Granroth-Wilding) “A Robust Parser-Interpreter for Jazz Chord Sequences,” *Journal of New Music Research*, **43**, 355-374.
- (2014c) (with Mike Lewis) “Improved CCG Parsing with Semi-supervised Supertagging” *Transactions of the Association for Computational Linguistics*, **2**, 327-338.
- (2014d) (with Siva Reddy and Mirella Lapata) “Large-scale Semantic Parsing without Question-Answer Pairs.” *Transactions of the Association for Computational Linguistics*, **2**, 377-392.
- (2014e) “Evolutionary Basis for Human Language: Comment on ”Toward a Computational Framework for Cognitive Biology: Unifying Approaches from Cognitive Neuroscience and Comparative Cognition” by Tecumseh Fitch,” *Physics of Life Reviews*, **11**, 382-388.
- (2015b) (with Christos Christodoulopoulos) “A Massively Parallel Corpus: ç The Bible in 100 Languages” *Language Resources and Evaluation*, **49**, 375-395.
- (2016a) (with Andrew McLeod) “HMM-Based Voice Separation of MIDI Performance” *Journal of New Music Research*, **45**, 17-26.
- (2016b) (with Siva Reddy, Oscar Täckström, Michael Collins, Tom Kwiatkowski, Dipanjan Das, and Mirella Lapata), “Transforming Dependency Structures to Logical Forms for Semantic Parsing”, *Transactions of the Association for Computational Linguistics*, **4**, 127-140.
- (2017a) (with Bharat Ambati and Tejaswini Deoskar), “Hindi CCGbank: A CCG Treebank from the Hindi Dependency Treebank” *Language Resources and Evaluation*, **51**, 1-34.
- (2017b) (with Omri Abend, Tom Kwiatkowski, Nathaniel Smith, and Sharon Goldwater), “Bootstrapping Language Acquisition”, *Cognition* **136**, 116-143.
- (2017c) (with Andrew McLeod, Rodrigo Schramm, and Emmanouil Benetos), “Automatic Transcription of Polyphonic Vocal Music”, *Applied Sciences* **7**, #1285
- (2018a) “The Lost Combinator” (ACL Lifetime Achievement Award address), *Computational Linguistics*, **44**, 613-629.

- (2018b) (with Javad Hosseini, Nathanael Chambers, Siva Reddy, Xavier R Holt, Shay B Cohen, and Mark Johnson), “Learning Typed Entailment Graphs with Global Soft Constraints”, *Transactions of the Association for Computational Linguistics*, **6**, 703-718.
- (2020a) “A Formal Universal of Natural Language Grammar”, *Language*, **96**, 618-660.
- (2021a) (with Miloš Stanojević), “Formal Basis of a Language Universal”, *Computational Linguistics*, **47**, 9-42.
- (2023a) “Modeling Structure-Building in the Brain with CCG Parsing and Large Language Models”, *Cognitive Science*, **47**, 1-39.
- (2023b) “On Internal Merge”, *Linguistic Inquiry*, (to appear).
- (2023c) (with Ida Szubert, Omri Abend, Nathan Schneider, Samuel Gibbon, Louis Mahon, and Sharon Goldwater), “Cross-linguistically Consistent Semantic and Syntactic Annotation of Child-directed Speech”, *Language Resources and Evaluation*, (submitted).

### Refereed Conference Papers

Refereed conference papers delivered at meetings which only publish abstracts, and papers appearing in unrefereed collections of working papers, appear under “Recent Invited Addresses” and “Some Recent Talks,” below.

- (1971) “On interpreting Bach”, with H.C. Longuet-Higgins, 6th Annual Machine Intelligence Workshop, Edinburgh, in proceedings published as Meltzer, B. and Michie, D. (Eds.) *Machine Intelligence 6*. Edinburgh: Edinburgh University Press, 221-241. (reprinted as 1987d)
- (1978b) “A programmatic theory of linguistic performance”, with P.N. Johnson-Laird, NATO Conference on Psycholinguistics, Stirling, June 1976, in proceedings published as Smith, P. and Campbell, R. (Eds.) *Recent Advances in the Psychology of Language*. New York: Plenum, 171-192.
- (1980a) “An algorithmic approach to main clause constructions in English”, with A.E. Ades, 2nd Conference of the Society for Artificial Intelligence and the Simulation of Behaviour, Amsterdam, March 1980, in: Hardy, S. et al, (Eds.) *Proceedings of AISB80*, A.I.S.B., University of Sussex, 1-10.
- (1984b) “Natural and Unnatural Language Processing”, SERC Workshop on Natural Language Parsing, University of Essex, Colchester, April 1982. In proceedings published as K. Sparck-Jones and Y. Wilks (Eds.), *Automatic Natural Language Parsing*. Ellis Horwood, 132-140.
- (1984c) “A Categorical Theory of Intersecting Dependencies in Dutch Infinitival Complements”, International Conference on Complementation, Universitaire Faculteiten Sint Aloysius, Brussels, June 1983. In proceedings published as de Geest, W., and Putseys, Y., (eds.), *Sentential Complementation*, Foris, Dordrecht, 215-226.
- (1987b) “A Lazy Way to Chart-parse with Categorical Grammars”, (with Remo Pareschi), Proceedings of the 25th Annual Conference of the Association for Computational Linguistics, Stanford CA, July 1987, 81-88.
- (1987c) “Temporal Ontology in Natural Language”, (with Marc Moens), Proceedings of the 25th Annual Conference of the Association for Computational Linguistics, Stanford CA, July 1987, 1-7. (Reprinted as 2003e)
- (1988c) “Syntax and Intonational Structure in a Categorical Grammar”, Workshop on Human Speech Perception and Natural Language Understanding, Sperlonga Italy, May 1988. In proceedings published as Gerry Altmann (ed.), *Cognitive Models of Speech Processing*, MIT Press: Cambridge MA. 457-482.
- (1989b) “Intonation and Syntax in Spoken Language Systems”, *DARPA Speech and Natural Language Workshop*, Philadelphia PA, February 1989, see Working Papers of the conference, Morgan Kauffman, 222-227

- (1989c) “Syntax and Intonation in Spoken Language Systems,” AAI Workshop on Spoken Language Systems, Stanford, CA, April 1989, see Working Papers of the conference;
- (1989d) “Parsing Spoken Language Using Combinatory Grammars,” *Proceedings of International Workshop on Parsing Technologies*, CMU, Pittsburg August 1989, 162-171.
- (1990b) “Structure and Intonation in Spoken Language Understanding”, *Proceedings of the 28th Annual Conference of the Association for Computational Linguistics*, Pittsburgh, PA, June 1990, 9-17.
- (1991b) “Linguistic Issues in Facial Animation”, ( with C. Pelachaud and N.I. Badler), *Proceedings of the Conference on Computer Animation*, 15-30, Geneva, Switzerland, May 1991.
- (1991c) “Type-raising and Directionality in Combinatory Grammar”, 29th Annual conference of the Association for Computational Linguistics, Berkeley CA, June 1991, 71-78.
- (1993c) “Generating Contextually Appropriate Intonation”, (with Scott Prevost), *Proceedings of the Sixth Conference of the European Chapter of the Association for Computational Linguistics*, Utrecht, April 1993, 332-340.
- (1993d) “Using Context to Specify Appropriate Intonation in Speech Synthesis”, (with Scott Prevost), *Proceedings of EUROSPEECH Conference*, Berlin, September 1993, 2103-2106.
- (1993e) “The Grammar of Intonation and Focus”, *Proceedings of the 9th Amsterdam Colloquium*, ILLI, Amsterdam, December 1993, 17-34.
- (1994b) “Animated Conversation: Rule-based Generation of Facial Expression, Gesture and Spoken Intonation for Multiple Conversational Agents,” (with Justine Cassell, Catherine Pelachaud, Norm Badler, Brett Achorn, Tripp Becket, Brett Douville, Scott Prevost, and Matthew Stone), *Proceedings of the ACM SIGGRAPH '94 Conference*, Orlando FL. 413-420, (reprinted as 1997c, 1998b). **2017 recipient of Influential Paper Award from the International Foundation for Autonomous Agents and Multi-Agent Systems (IFAAMAS)**
- (1994c) “Modeling the Interaction between Speech and Gesture”, (with Justine Cassell, Matthew Stone, Brett Douville, Scott Prevost, Brett Achorn, Norm Badler and Catherine Pelachaud), *Proceedings of the Sixteenth Annual Meeting of the Cognitive Science Society*, 153-2158, Atlanta GA, August 1994.
- (1995a) “Dynamic Semantics for Tense and Aspect”, *Proceedings of the International Joint Conference on Artificial Intelligence*, Montreal, Quebec, Aug. 1995, 1292-1298.
- (1996c) “Representing Discourse Information for Spoken Dialogue Generation”, *Proceedings of International Symposium on Spoken Dialogue, International Conference on Spoken Language Processing (held in conjunction with ICSLP-96)*, Philadelphia Sept 1996, 89-92.
- (1999b) “Alternating Quantifier Scope in CCG”, *Proceedings of 37th Annual conference of the Association for Computational Linguistics*, College Park, June 1999, 301-308
- (2002b) “Formalizing Affordance”, *Proceedings of the 24th Annual Meeting of the Cognitive Science Society*, GMU, Fairfax VA, Erlbaum, 834-839.
- (2002c) (with Julia Hockenmaier and Stephen Clark) “Building Deep Dependency Structures using a Wide-Coverage CCG Parser,” *Proceedings of the 40th Meeting of the ACL*, Philadelphia July 2002, 327-334.
- (2002d) (with Julia Hockenmaier) “Generative Models for Statistical Parsing with Combinatory Grammars,” *Proceedings of the 40th Meeting of the ACL*, Philadelphia July 2002, 335-342.
- (2002e) (with Julia Hockenmaier) “Acquiring Compact Lexicalized Grammars from a Cleaner Treebank,” *Proceedings of Third International Conference on Language Resources and Evaluation (LREC)*, Las Palmas, 2002, 1974-1981.
- (2003b) (with Miles Osborne, Anoop Sarkar, Stephen Clark, Rebecca Hwa, Julia Hockenmaier, Paul Ruhlén, Steven Baker and Jeremiah Crim), “Bootstrapping Statistical Parsers from Small Datasets”, *Proceedings of the Annual Meeting of the European Chapter of the ACL*, Budapest, Hungary, 331-338

- (2003c) (with Rebecca Hwa, Stephen Clark, Miles Osborne, Anoop Sarkar, Julia Hockenmaier, Paul Ruhlen, Steven Baker and Jeremiah Crim), “Example Selection for Bootstrapping Statistical Parsers”, *Proceedings of the Joint Conference of Human Language Technologies and the Annual Meeting of the North American Chapter of the ACL*, Edmonton, Canada, 236-243.
- (2003d) (with Rebecca Hwa, Miles Osborne and Anoop Sarkar), “Corrected Co-training for Statistical Parsers”, *Proceedings of the International Conference on Machine Learning (ICML) Workshop “The Continuum from Labeled to Unlabeled Data”*, Washington, USA, 2003., 95-102, Washington DC.
- (2004a) (with Johan Bos, Stephen Clark, James R. Curran and Julia Hockenmaier), “Wide-Coverage Semantic Representations from a CCG Parser,” *Proceedings of the 20th International Conference on Computational Linguistics (COLING '04)*, Geneva, 1240-1246.
- (2004b) (with Malvina Nissim, Shipra Dingare, and Jean Carletta), “An Annotation Scheme for Information Status in Dialog,” *Proceedings of the 4th Languages Resources and Evaluation Conference (LREC '04)*, Lisbon, May, 1023-1026.
- (2004c) (with Stephen Clark and James Curran) “Object-Extraction and Question-Parsing using CCG,” *Proceedings of the Conference on Empirical Methods in Natural Language Processing (EMNLP)*, Barcelona, 111 - 118.
- (2005b) (with Sasha Calhoun, Malvina Nissim, and Jason Brenier), “A Framework for Annotating Information Structure in Discourse”, *Proceedings of the ACL Workshop: Frontiers in Corpus Annotation II: Pie in the Sky*, Ann Arbor MI, 45-52.
- (2006c) (with Geib et al.) “Object Action Complexes as an Interface for Planning and Robot Control,” *Proceedings of the HUMANOIDS-06 Workshop: Toward Cognitive Humanoid Robots*.
- (2007c) (with Chris Geib) “On Natural Language Processing and Plan Recognition,” *Proceedings of the 20th International Joint Conference on AI (IJCAI)*, Hyderabad, 1612-1617.
- (2007d) (with Ron Petrick) “Planning Dialog Actions”, *Proceedings of the 8th SIGdial Workshop on Discourse and Dialogue*, Antwerp, Sept. 2007, 265-272.
- (2007e) (with Akira Ohtani) “Case, Coordination, and Information Structure in Japanese”, *Proceedings of the 21st Pacific Asia Conference on Language, Information and Computation (PACLIC)*, Seoul, Korea, November 2007, 365-374.
- (2008b) (with Petrick et al.) “Representation and Integration: Combining Robot Control, High-Level Planning, and Action Learning,” *Proceedings of the International Cognitive Robotics Workshop (CogRob 2008)* at ECAI 2008.
- (2008b) (with Akira Ohtani) “On Japanese Desiderative Constructions”, *Proceedings of the 22nd Pacific Asia Conference on Language, Information and Computation (PACLIC)*, Cebu City, Philippines, November 2008, 290-301. (Nominated for Best Paper).
- (2009b) (with Laura Rimell and Stephen Clark) “Unbounded Dependency Recovery for Parser Evaluation,” *Proceedings of the Conference on Empirical Methods in Natural Language Processing (EMNLP)*, Singapore, 813-821.
- (2010c) (with Krüger et al.) “Object-Action Complexes: Grounded Abstractions of Sensorimotor Processes,” *Proceedings of the 4th International Conference on Cognitive Systems*, Zurich, January 2010.
- (2010d) (with Morgan et al.) “A Bottom-Up Parsing Model of Local Coherence Effects”, *Proceedings of the 32nd Annual Meeting of the Cognitive Science Society*, Portland OR, 1559-1564.
- (2010e) (with Kwiatkowski et al.) “Inducing Probabilistic CCG Grammars from Logical Form with Higher-Order Unification”, *Proceedings of the 2010 Conference on Empirical Methods in Natural Language Processing*, Cambridge MA, 1223-1233.

- (2010f) (with Christodoulopoulos et al.) “Two Decades of Unsupervised POS tagging—How Far Have We Come?”, Proceedings of the 2010 Conference on Empirical Methods in Natural Language Processing, Cambridge MA, 575-584.
- (2010g) (with Mourão et al.) “Learning Action Effects in Partially Observable Domains”, Proceedings of the 19th European Conference on Artificial Intelligence, Lisbon, 973-974.
- (2011d) (with Kwiatkowski et al.) “Lexical Generalization in CCG Grammar Induction for Semantic Parsing”, Proceedings of the 2011 Conference on Empirical Methods in Natural Language Processing, Edinburgh, 1512-1523.
- (2011e) (with Christodoulopoulos et al.) “A Bayesian Mixture Model for PoS Induction Using Multiple Features”, Proceedings of the 2011 Conference on Empirical Methods in Natural Language Processing, Edinburgh, 638-647.
- (2011f) (with Thomforde) “Semi-supervised CCG Lexicon Extensions”, Proceedings of the 2011 Conference on Empirical Methods in Natural Language Processing, Edinburgh, 1246-1256.
- (2011g) (with Boonkwan) “Grammar Induction from Text Using Small Syntactic Prototypes”, Proceedings of the 5th International Joint Conference on Natural Language Processing, Chiang Mai, Thailand, 438-446.
- (2012b) (with Kwiatkowski et al.) “A Probabilistic Model of Syntactic and Semantic Acquisition from Child-Directed Utterances and their Meanings”, Proc. 13th Conference of the European Chapter of the Association for Computational Linguistics, Avignon, 234-244.
- (2012c) (with Eshky et al.) “Generative Goal-Driven User Simulation for Dialog Management “ Proceedings of the 2012 Joint Conference on Empirical Methods in Natural Language Processing and Computational Natural Language Learning, Jeju Island, Korea, 71-81.
- (2012d) (with Mourão et al.) “Learning STRIPS operators from noisy and incomplete observations”, Proceedings of the 28th Conference on Uncertainty in Artificial Intelligence, Catalina Island CA. 614-623.
- (2012e) (with Granroth-Wilding) “Statistical Parsing for Harmonic Analysis of Jazz Chord Sequences”, In Proceedings of the International Computer Music Conference (ICMC), Ljubljana. 478-485.
- (2013b) (with Ambati and Deoskar) “Using CCG categories to improve Hindi dependency parsing”, In Proceedings of the 51st Annual Meeting of the Association for Computational Linguistics (ACL), Sofia, 604-609.
- (2013c) (with Coppola) “The Effect of Higher-Order Dependency Features in Discriminative Phrase-Structure Parsing”, In Proceedings of the 51st Annual Meeting of the Association for Computational Linguistics (ACL), Sofia, 610-616.
- (2013d) (with Lewis) “Unsupervised Induction of Cross-Lingual Semantic Relations”, In Proceedings of the Conference on Empirical Methods in Natural Language Processing (EMNLP), Seattle, 681-692.
- (2013e) (with Aksoy et al.) “Structural Bootstrapping at the Sensorimotor Level for the Fast Acquisition of Action Knowledge for Cognitive Robots”, in Proceedings of the 3rd Joint International Conference on Development and Learning and Epigenetic Robotics (ICDL), 1-8.
- (2014f) (with Deoskar, Christodoulopoulos, and Birch) “Generalizing a Strongly Lexicalized Parser using Unlabeled Data”, In Proceedings of the 14th Conference of the European Chapter of the Association for Computational Linguistics (EACL), Gothenburg, 126-134.
- (2014g) (with Ambati and Deoskar) “Improving Dependency Parsers using Combinatory Categorical Grammar”, In Proceedings of the 14th Conference of the European Chapter of the Association for Computational Linguistics (EACL), Gothenburg, 159-163.
- (2014h) (with Eshky and Allison) “A Generative Model for User Simulation in a Spatial Navigation Domain”, In Proceedings of the 14th Conference of the European Chapter of the Association for Computational Linguistics (EACL), Gothenburg, 626-635



- (2014i) (with Abend and Cohen) “Lexical Inference over Multi-Word Predicates: A Distributional Approach”, In Proceedings of the 52nd Annual Meeting of the Association for Computational Linguistics (ACL), Baltimore MD, 644-654.
- (2014j) (with Lewis) “A\* CCG Parsing with a Supertag-factored Model”, In Proceedings of the Conference on Empirical Methods in Natural Language Processing (EMNLP), Doha, 990-1000.
- (2014k) (with Kaiser, Lewis, Petrick, and Asfour) “Extracting Common Sense Knowledge from Text for Robot Planning”, In Proceedings of the IEEE International Conference on Robotics and Automation (ICRA), Hong Kong, 3749-3756.
- (2015c) (with Ambati, Deoskar, Johnson) “An Incremental Algorithm for Transition-based CCG Parsing” Proceedings of the 2015 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies, Denver CO, 53-63.
- (2015d) (with Abend, Cohen) “Lexical Event Ordering with an Edge-Factored Model”, Proceedings of the 2015 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies, Denver CO, 1161-1171.
- (2015e) (with Mitchell) “Orthogonality of Syntax and Semantics within Distributional Spaces” In Proceedings of the 53rd Annual Meeting of the Association for Computational Linguistics (ACL), Beijing, 1301-1310.
- (2016c) (with Ambati and Deoskar) “Shift Reduce CCG Parsing using Neural Network Models”. In Proceedings of the 2016 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies, San Diego CA, 447-453.
- (2016d) (with Ambati and Reddy) “Assessing Relative Sentence Complexity using an Incremental CCG Parser.”. In Proceedings of the 2016 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies, San Diego CA, 1051-1057.
- (2016e) (with Bisk, Reddy, Blitzer, and Hockenmaier) “Evaluating Induced CCG Parsers on Grounded Semantic Parsing”. In Proceedings of the Conference on Empirical Methods in Natural Language Processing (EMNLP), Austin TX, 2022-2027.
- (2017d) (with Siva Reddy, Oscar Täckström, Slav Petrov, and Mirella Lapata) “Universal Semantic Parsing”, In Proceedings of the Conference on Empirical Methods in Natural Language Processing (EMNLP), Copenhagen, 113-119.
- (2017e) (with Rodrigo Schramm, Andrew McLeod, and Emmanouil Benetos) “Multi-pitch Detection and Voice Assignment for *a cappella* Recordings of Multiple Singers”, in Proceedings of the 18th Conference of the International Society for Music Information Retrieval (ISMIR), 552-559.
- (2017f) (with Andrew McLeod), “Meter Detection in Symbolic Music Using a Lexicalized PCFG”. In Proceedings of the 14th Sound and Music Computing Conference, 373-379.
- (2018c) (with Gözde Gül Şahin), “Character-Level Models versus Morphology in Semantic Role Labeling”. In Proceedings of the 56th Annual Meeting of the Association for Computational Linguistics”, 386-396.
- (2018d) (with Andrew McLeod), “Evaluating automatic polyphonic music transcription”. In Proceedings of the 19th Conference of the International Society for Music Information Retrieval (ISMIR), 42-49.
- (2018e) (with Andrew McLeod), “Meter detection and alignment of MIDI performance”. In Proceedings of the 19th Conference of the International Society for Music Information Retrieval (ISMIR), 113-119.
- (2018f) (with Gözde Gül Şahin), “Data Augmentation via Dependency Tree Morphing for Low Resource Languages”. In Proceedings of the Conference on Empirical Methods in Natural Language Processing”, 5004-5009.
- (2019c) (with Miloš Stanojević), “CCG Parsing Algorithm with Incremental Tree Rotation”. In Proceedings of the Conference of the North American Chapter of the Association for Computational Linguistics”, 228-239.

- (2019d) (with Javad Hosseini, Shay Cohen, and Mark Johnson), “Duality of Link Prediction and Entailment Graph Induction”. In Proceedings of the 57th Annual Meeting of the Association for Computational Linguistics”, Florence, 4736-4746.
- (2019e) (with John Torr, Miloš Stanojević, and Shay Cohen), “Wide-Coverage Neural A\* Parsing for Minimalist Grammars”. In Proceedings of the Annual Conference of the Association for Computational Linguistics”, Florence, 2486-2505.
- (2019f) (with Ida Szubert), “Node Embeddings for Graph Merging: Case of Knowledge Graph Construction”. In Proceedings of the 13th Workshop on Graph-Based Methods for Natural Language Processing (TextGraphs-13), 172–176. Hong Kong.
- (2020b) (with Miloš Stanojević), “CCG Parsing with a Fully Incremental Neural Model”. In Proceedings of the 58th Annual Meeting of the Association for Computational Linguistics”, 4111-4122. Virtual Seattle.
- (2020c) (with Miloš Stanojević, “CCG Span-Based LCFRS-2 Parsing”. In Proceedings of the 16th International Conference on Parsing Technologies, 111-121. Virtual Seattle.
- (2020d) (with Thomas Kober, Malihe Alikhani, and Matthew Stone), “Aspectuality Across Genre: A Distributional Semantics Approach”. In Proceedings of the 28th International Conference on Computational Linguistics, 4546-4562.
- (2020e) (with Elizabeth Nielsen and Sharon Goldwater), “The Role of Context in Neural Pitch Accent Detection in English”. In Proceedings of the 59th Annual Meeting of the Association for Computational Linguistics, 7994-8000.
- (2021b) (with Milos Stanojevic, Shohini Bhattachali, Donald Dunagan, Luca Campanelli, Jonathan Brennan, and John Hale), “Modeling incremental language comprehension in the brain with Combinatory Categorical Grammar”. In Proceedings of the 11th Workshop on Cognitive Modeling and Computational Linguistics, 23-38.
- (2021d) (with Tianyi Li and Sujian Li), “Semi-Automatic Construction of Text-to-SQL Data for Domain Transfer”. In Proceedings of the 17th International Conference on Parsing Technology. 38-49.
- (2021e) (with Milos Stanojevic), “Computing All Quantifier Scopes with CCG”. In Proceedings of the 14th International Conference on Computational Semantics. 33-37.
- (2021f) (with Nick McKenna, Liane Guillou, Javad Hosseini, Sander Bijl de Vroe, and Mark Johnson), “Multivalent Entailment Graphs for Question Answering”, in Proceedings of the Conference on Empirical Methods in Natural Language Processing, 10758-10768.
- (2021g) (with Nikita Moghe and Alexandra Birch-Mayne), “Cross-lingual Intermediate Fine-tuning Improves Dialogue State Tracking”, in Proceedings of the Conference on Empirical Methods in Natural Language Processing, 1137-1150.
- (2021h) (with Javad Hosseini, Shay Cohen, and Mark Johnson), “Open-Domain Contextual Link Prediction and its Complementarity with Entailment Graphs”, Findings of the Association for Computational Linguistics: EMNLP, 1137-1150.
- (2022a) (with Tianyi Li, Sabine Webber, Javad Hosseini and Liane Guillou), “Cross-lingual Inference with a Chinese Entailment Graph”, Findings of the Association for Computational Linguistics: ACL, 1214-1233.
- (2022b) (with Tianyi Li, Javad Hosseini, and Sabine Webber), “Language Models are Poor Learners of Directional Inference”, Findings of the Conference on Empirical Methods in Natural Language Processing, ACL, 903-921.
- (2022c) (with Matt Grenander and Shay Cohen), “Sentence-Incremental Neural Coreference Resolution”, Proceedings of the Conference on Empirical Methods in Natural Language Processing, ACL, 427-443.

- (2023d) (with Elizabeth Nielsen and Sharon Goldwater), “Prosodic features improve sentence segmentation and parsing in English”, Proceedings of the Interspeech Conference, 2633-2637.
- (2023e) (with Nikita Moghe, Tom Sherborne, and Alexandra Birch), “Extrinsic Evaluation of Machine Translation Metrics”, Proceedings of the Annual Meeting of the Association for Computational Linguistics, 13060-13078. **Best Paper Award.**
- (2023e) (with Ratish Puduppully, Parag Jain, and Nancy Chen), “Multi-Document Summarization with Centroid-Based Pretraining”, Proceedings of the Annual Meeting of the Association for Computational Linguistics, 128-138.
- (2023f) (with, Yuting Wu, Yutong Hu, Yansong Feng, Tianyi Li, and Zhao, Dongyan), “Align-then-Enhance: Entailment Graph Enhancement with Soft Predicate Alignment”, Findings of the Association for Computational Linguistics: ACL, 881-894.
- (2023g) (with Nick McKenna, Tianyi Li, and Mark Johnson), “Smoothing Entailment Graphs with Language Models”, Proceedings of the 3rd Conference of the Asia-Pacific Chapter of the Association for Computational Linguistics (AACL/IJCNLP), 551-563. **The Best Paper Award.**
- (2023h) (with Nick McKenna, Tianyi Li, Liang Cheng, Mohammed Javad Hosseini, and Mark Johnson), “Sources of Hallucination by Large Language Models on Inference Tasks”, Findings of the ACL, Proceedings of the Conference on Empirical Methods in Natural Language Processing, (to appear).
- (2023i) (with Liang Cheng, and Mohammed Javad Hosseini), “Complementary Roles of Inference and Language Models in Question Answering”, Proceedings of the EMNLP Workshop on Pattern-based Approaches to NLP in the Age of Deep Learning, (to appear).

#### **Abstracts, Reviewed Conference Papers, Book Chapters, and Review Papers in Journals**

- (1978c) “A procedural model of presupposition”, Conference on Foundations of Semantic Theories, Nijmegen, March 1977, in Seuren, P. (Ed) *A Symposium on Semantic Theory. Grammatik 9*, Katholieke Universiteit, Nijmegen, 118-148.
- (1980b) “The production of sentences, utterances and speech-acts: Have computers anything to say?”, with P.N. Johnson-Laird, in B. Butterworth. (Ed.) *Language Production*, Academic Press: New York, 111-141.
- (1982b) “Reference to past time”, Max Planck Institute Conference on Deixis, Nijmegen, March 1978, and Alfred P. Sloan Foundation Conference on Events, Situations and Actions, Austin TX October 1980. In: Jarvella, R. and Klein, W. (Eds.) *Speech, Place and Action: Studies of Language in Context*, Wiley: London, 1982, 125-157.
- (1984d) “On the Generality of the Nested Dependency Constraint and the Reason for an Exception in Dutch” in Butterworth, B., Comrie, B., and Dahl, O. (eds.), *Explanations for Language Universals*, Mouton, 35-66. (Reprint of (1983a))
- (1985c) “On not being led up the garden path: the use of context by the psychological parser”, with S. Crain, Alfred P. Sloan Foundation Conference on Human Parsing Mechanisms, University of Texas, Austin TX, March 1981. In Dowty, D., Karttunen, L. and Zwicky, A., (eds.), *Natural Language Parsing: Psychological, Computational and Theoretical Perspectives*, ACL Studies in Natural Language Processing, Cambridge University Press, 320-358.
- (1987d) “On Interpreting Bach”, with H.C. Longuet-Higgins, H.C. Longuet-Higgins, (ed.), *Mental Processes*, MIT Press:Cambridge MA, 82-104. (Reprint of (1971)).
- (1987d) “Combinatory Grammars and Human Language Processing”, Conference on Modularity in Knowledge Representation and Natural Language Processing, Amherst MA, June 1985. In: Garfield, J. (ed.), *Modularity in Knowledge Representation and Natural Language Processing*, Cambridge Mass.: MIT Press/Bradford Books, 187-205.

- (1988d) “Combinators and Grammars”, Conference on Categorical Grammar, Tucson AZ, May 1985. In proceedings published as Bach, E., Oehrle, R.T., and Wheeler, D. (eds.), *Categorical Grammars and Natural Language Structures*, Dordrecht: Riedel. 417-442.
- (1989e) “Coordination and Constituency in a Combinatory Grammar”, In Mark Baltin and Tony Kroch, (eds.), *Alternative Conceptions of Phrase Structure*, University of Chicago Press: Chicago, 201-231.
- (1989f) “Grammar, Interpretation and Processing from the Lexicon”, Max Planck Institute Conference on Processing and the Lexicon, Nijmegen, June 1986. In William Marslen-Wilson (ed.), *Lexical Representation and Process*, MIT Press: Cambridge MA, 463-504.
- (1991d) “Parsing Spoken Language Using Combinatory Grammars,” in M. Tomita, (ed.), *Current Issues in Parsing Technology*, Kluwer:Dordrecht. 113-126. (Reprint of 1989d).
- (1991e) “Syntax, Intonation and ‘Focus’”, in E. Klein and F. Veltmann, (eds.) *Natural Language and Speech: Proceedings of the Symposium, ESPRIT Conference, Brussels, Nov. 1991*, Springer Verlag, Berlin. 21-38.
- (1992c) “Grammars and Processors”, supposedly to appear in H. Kamp and C. Rohrer, (eds.), *Current Theories in Natural Language Understanding* (working title), Reidel:Dordrecht. (Appears as MS-CIS-92-52).
- (1992d) “Acquisition of Verb Categories”, Conference on Acquisition of the Mental Lexicon, IRCS, University of Pennsylvania, January 1992, to appear in L. Gleitman, (ed.) *Acquisition of the Mental Lexicon* (reprint of 1992a), Cambridge MA: MIT Press/Bradford Books.
- (1992f) “Integrating Grammar and Intonation”, G. Görz (ed.), *Proceedings of KONVENS 92*, Berlin, Springer Verlag. 21-28.
- (1993f) “Surface Structure, Intonation, and Discourse Meaning”, in M. Bates and R. Weischedel, (eds.), *Challenges in Natural Language Processing* CUP:Cambridge. 228-253.
- (1994d) “Information-Based Intonation Synthesis”, (with Scott Prevost), *Proceedings of the ARPA Human Language Technology Workshop*, Plainsboro NJ, March 1994, Morgan-Kaufman, Palo Alto CA. 193-198.
- (1994e) “Implications of Binding for Lexicalized Grammars”, *Proceedings of the 3rd Workshop on Tree-Adjoining Grammar and Related Formalisms*, Université de Paris VII, September 1994, in Anne Abeillé and Owen Rambow, (eds.), *Tree Adjoining Grammars: Formalisms, Linguistic Analysis, and Processing*, CSLI Publications, Stanford CA., (2000), 283-301.
- (1994f) “Automatically Generating Conversational Behaviour in Animated Agents”, with (Justine Cassell, Catherine Pelachaud and Norm Badler) *Abstracts for the Conference on Lifelike Computer Characters '94*, Snowbird, Utah, October 1994, 20-21.
- (1994g) “Categorical Grammar,” in R.E. Asher (ed.), *Encyclopedia of Language and Linguistics*, Pergamon Press, Oxford, 467-477. Reprinted with variations as 1996i, 1997d.
- (1995b) “Synthesizing Cooperative Conversation,” (with Pelachaud et al.) *First International Conference on Cooperative Multimodal Communication*, Eindhoven, May 1995. (Proceedings appear as 1998c), 68-88.
- (1996d) “Natural Language Processing” in M.Boden (ed.), *Handbook of Perception and Cognition, 14: Computational Psychology and Artificial Intelligence*, Academic Press. 229-266.
- (1996e) “Computational Aspects of the Theory of Grammar”, in L. Gleitman and M. Liberman (eds.), *Invitation to Cognitive Science, vol 1: Language*, MIT Press, 247-281.
- (1996f) “The Role of Prosody and Semantics in the Acquisition of Syntax”, Conference on Signals to Syntax, Brown University, January 1993. in Morgan, James and Katherine Demuth (eds.), *Signal to Syntax*, Erlbaum, NJ., 331-342.
- (1996h) “The Blues and the Abstract Truth: Music and Mental Models”, in J. Oakhill and A. Garnham, (eds.), *Mental Models in Cognitive Science*, Erlbaum. 305-318.

- (1996i) “Categorial Grammar,” in Keith Brown and Jim Miller (eds.), *Concise Encyclopedia of Syntactic Theories*, Pergamon Press, Oxford, 31-43. (Revision of 1994g).
- (1996j) “Does Grammar Make Use of Bound Variables?” International Workshop on Variable Free Semantics, Osnabrück Germany September 1996, in M. Böttner and W. Thümmel (eds.), 2000, *Variable Free Semantics*, Secolo, Osnabrück, 200-209.
- (1997a) “Temporality”, in J. van Benthem and A. ter Meulen (ed.) *Handbook of Logic and Linguistics*, North Holland. 895-938.
- (1997b) “Cognitive Algorithms”, in S. Sternberg and D. Scarborough, (eds.), *Invitation to Cognitive Science, vol 4: Conceptual Foundations*, MIT Press, 171-210.
- (1997c) “Animated Conversation: Rule-based generation of facial expressions, gesture, and spoken intonation for multiple conversational agents”, (with Cassell et al.) in Michael Huhns and Munindar Singh, (eds.) *Readings in Agents*, Morgan Kaufmann, San Francisco CA. 148-155. (Reprint of 1994b *Proceedings of ACM SIGGRAPH '94 Conference*, 413-420).
- (1997d) “Categorial Grammar,” in Peter Lamarque, (ed.), *Concise Encyclopedia of the Philosophy of Language*, Pergamon Press, Oxford, (revision of 1994g, in press).
- (1998a) “Connectionist and Symbolist Sentence Processing”, 11th Annual CUNY Conference on Sentence Processing, Rutgers, March 1998, 33 (abstract).
- (1998b) “Animated Conversation: Rule-based generation of facial expressions, gesture, and spoken intonation for multiple conversational agents”, (with Cassell et al.) in Mark Maybury and Wolfgang Wahlster, (eds.) *Readings in Intelligent User Interfaces*, Morgan Kaufmann, San Francisco CA. 582-591. (Reprint of 1994b *Proceedings of ACM SIGGRAPH '94 Conference*, 413-420).
- (1998c) “Synthesizing Cooperative Conversation,” (with Pelachaud et al.) in Harry Bunt, Robbert-Jan Beun and Tijn Borghuis, (Eds.), *Multimodal Human-Computer Interaction*, Lecture Notes in Computer Science 1374, Springer Berlin, 68-88.
- (2002f) “Connectionist and Symbolic Representations of Language,” to appear in *Encyclopedia of Cognitive Science*, Nature Publishing Group, Macmillan.
- (2003c) “Wide Coverage Parsing and Incrementation in CCG,” in Raffaella Bernardi and Michael Moortgat (eds.), *Linguistic Corpora and Logic Based Grammar Formalisms*, Institute of Linguistics, Universiteit Utrecht, 115-133.
- (2003e) “Temporal Ontology and Natural Language” (with Marc Moens), in Javier Gutieérrez-Rexach (ed.), *Semantics: Critical Concepts in Linguistics* Vol. IV: The Semantics of Predicates and Inflection, 290-305, Routledge. (Reprint of 1987c.)
- (2004w) “Where does Compositionality Come From?”, papers from the 2004 AAAI Fall Symposium on *Compositional Connectionism in Cognitive Science*, Technical Report FS-04-03, AAAI Press, 59-62.
- (2004y) “APML, a Mark-up Language for Believable Behavior Generation”, (with Berardina de Carolis, Catherine Pelachaud, and Isabella Poggi), in H. Prendinger, (ed.) *Life-like Characters. Tools, Affective Functions and Applications*, 65-85, Springer, Berlin.
- (2004z) “How to use APML to Specify Intonation,” Tech Report, School of Informatics.
- (2005u) “Temporal Ontology and Temporal Reference”, (with Marc Moens), in Inderjeet Mani, James Pustejovsky, and Robert Gaizauskas (eds.) *The Language of Time: A Reader*. Oxford University Press, 93-114. (Reprint of 1988a.)
- (2005v) “Interfaces and the Grammar”, in *Proceedings of the 24th West Coast Conference on Formal Linguistics*, (WCCFL 24), Cascadilla Proceedings Project, Somerville, MA, USA, 19-33.
- (2006c) “Syntactic Variables and Variable-free Syntax,” *Encyclopædia of Language and Linguistics*, 2nd edn., Ed. Keith Brown, v.12:394-402.
- (2006d) “Combinatory Categorial Grammar,” *Encyclopædia of Language and Linguistics*, 2nd edn., Ed. Keith Brown, v.2:610-622.

- (2006e) “Semantics in Categorical Grammar,” *Encyclopædia of Language and Linguistics*, 2nd edn., Ed. Keith Brown, v11:143-142.
- (2007f) “Information-Structural Semantics for English Intonation”, in Chungmin Lee, Matthew Gordon, and Daniel Büring (eds.) *Topic and Focus: Cross-linguistic Perspectives on Meaning and Intonation*, Kluwer: Dordrecht.
- (2007g) “On ‘The Computation’,” in Gillian Ramchand and Charles Reiss, (eds.), *The Oxford Handbook of Linguistic Interfaces*, Oxford University Press, Oxford, 575-611
- (2009c) “Welsh Syntactic Soft Mutation”, in *Abstracts of the 6th Old World Conference on Phonology*, Edinburgh, February 22-24, 23..
- (2009d) “Foundations of Universal Grammar in Planned Action” in Morten Christiansen, Chris Collins, and Shimon Edelman (eds.), *Language Universals*, Oxford University Press Oxford, 174-199.
- (2009e) (with Kwiatkowski et al.) “Computational Grammar Acquisition from CHILDES data using a Probabilistic Parsing Model”, Workshop on Psycho-Computational Models of Human Language Acquisition, at the 31st Annual Meeting of the Cognitive Science Society (Poster).
- (2010b) “Embodied Compositionality” (Comment on ‘Embodied Language, Best-Fit Analysis, and Formal Compositionality’ by J. Feldman), *Physics of Life Reviews*, 7, 418-420.
- (2011g) (with Jason Baldridge) “Combinatory Categorical Grammar,” in Kirsti Börjars and Bob Borsley, (eds.), *Non-Transformational Theories of Grammar*, Blackwell Oxford, 181-224.
- (2011h) (with Granroth-Wilding) “Analysis of Jazz Chord Sequences with Combinatory Categorical Grammar”, *The Neurosciences and Music IV: Learning and Memory*, Edinburgh (Poster)
- (2012f) (with Christodoulopoulos et al.) “Turning the Pipeline into a Loop: Iterated Unsupervised Dependency Parsing and PoS Induction”, *Proceedings of the NAACL-HLT Workshop on the Induction of Linguistic Structure*, Montreal, 96-99.
- (2012g) (with Granroth-Wilding) “Harmonic Analysis of Jazz MIDI Files Using Statistical Parsing”, in *Proceedings of the 5th International Workshop on Machine Learning and Music (MML12)* Edinburgh (abstract).
- (2012h) “Computational Linguistic Approaches to Temporality”, in Robert Binnick (ed.) *The Oxford Handbook of Tense and Aspect*, Oxford University Press, 102-120.
- (2014l) “Categorical Grammar”, in Andrew Carnie, Yosuke Sato, and Daniel Siddiqui (eds.) *The Routledge Handbook of Syntax*, Routledge, 670-701.
- (2014m) (with Lewis) ‘Combining Formal and Distributional Models of Temporal and Intensional Semantics’, In *Proceedings of the ACL Workshop on Semantic Parsing*, Baltimore, MD., 28-32 (**Google Best Paper Award**).
- (2015f) (with Jeff Mitchell, “Parser Adaptation to the Biomedical Domain without Re-Training”, in *Proceedings of the 6th International Workshop on Health Text Mining and Information Analysis (LOUHI)*, 79-89.
- (2017g) “The Emergence of Language”, *Mind and Language*, 32, 579-590.
- (2019g) “Form-Independent Meaning-Representation for Eventualities” in Truswell, Robert (ed.) *The Oxford Handbook of Event Structure*. Oxford University Press, 605-623.
- (2019h) “Combinatory Categorical Grammar” in András Kertész, Edith Moravcsik, and Csilla Rákosi (ed.) *Current Approaches to Syntax—a Comparative Handbook*. de Gruyter Mouton: Berlin, (to appear).
- (2019i) (with Sabine Weber), “Construction and Alignment of Multilingual Entailment Graphs for Semantic Inference”, In *Proceedings of the ACL Workshop on Widening NLP*, Florence, 77-79.
- (2020f) (with Liane Guillou, Sander Bijl de Vroe, Javad Hosseini, and Mark Johnson), “Incorporating Temporal Information in Entailment Graph Mining”. In *Proceedings of the 14th Workshop on Graph-Based Natural Language Processing*, 60-71.

- (2021i) (with Sander Bijl de Vroe, Liane Guillou, Milos Stanojevic, and Nick McKenna), “Modality and Negation in Event Extraction”. In Proceedings of Challenges and Applications of Automated Extraction of Socio-political Events (CASE) workshop. 31-42.
- (2021j) (with Liane Guillou, Sander Bijl de Vroe, and Mark Johnson), “Blindness to Modality Helps Entailment Graph Mining”, in Proceedings of the Second Workshop on Insights from Negative Results in NLP, 110-116.
- (2021k) (with Sabine Weber), “Zero-Shot Cross-Lingual Transfer is a Hard Baseline to Beat in German Fine-Grained Entity Typing”, in Proceedings of the Second Workshop on Insights from Negative Results in NLP, 42-48.
- (2022d) (with Malihe Alikhani, Thomas Kober, Bashar Alhafni, Yue Chen, Mert Inan, Elizabeth Nielsen, Shahab Raji, and Matthew Stone), “Zero-shot Cross-Linguistic Learning of Event Semantics”, Proceedings of the 15th International Conference on Natural Language Generation, ACL, 427-443.
- (2022e) (with Ida Szubert, Omri Abend, Nathan Schneider, Samuel Gibbon, and Sharon Goldwater), “Universal Dependencies and Semantics for English and Hebrew Child-directed Speech”, Proceedings of the Society for Computation in Linguistics, ACL, 235-240.

### Recent Keynote Addresses and Invited Lectures

- “On Becoming a Discipline”, 2007 ACL. Presidential Address to the 45th Annual Conference) published as [2008a] *Computational Linguistics*, **34**, 137-144.
- “Grounding Language in Action Representation”, Keynote Address to the Third International Conference on Cognitive Systems, Karlsruhe, April 2008.
- “The Intonational Interface”, invited talk to the Conference on Experimental and Theoretical Advances in Prosody, Cornell April 2008
- “The Grammar of Scope”, invited talk to the Workshop on Logic, Language and Information (WOLLIC 2008), Edinburgh, July 2008.
- “The Intonational Interface”, invited talk to the Workshop on Prosodic Interface Relations, Stuttgart, November 2008.
- “Combinatory Categorical Grammar for Robust Natural Language Processing”, referee selected tutorial at the 12th Conference of the European Chapter of ACL (EACL) 2009, Athens. (Two lectures).
- “The Statistical Problem of Language Acquisition” keynote address to the 2nd Workshop on Semantic Processes, Logic, & Cognition, Tübingen, April 2009.
- “From Mirror-Neurons and FOXP2 to Language”, Keynote address to the Morris Symposium on Language, Cognition, and Motor Control, Stony Brook NY, May 2009.
- “Dialog as Planning with Knowledge and Sensing” (with Ron Petrick) ARO Workshop on Situated Understanding of Intention, IRCS, University of Pennsylvania, Philadelphia PA, July 2009.
- “Grounding Language in Object-Centered Affordance (OACs)” invited paper, Workshop on Object-Action Complexes (OACs), Humanoids Conference, 7th December 2009.
- “Computational Grammar Acquisition from CHILDES data using a Probabilistic Parsing Model” (with Kwiatkowski et al.), Workshop on Psycho-Computational Models of Human Language Acquisition, at the 31st Annual Meeting of the Cognitive Science Society.
- “Comments on Topics” (with Calhoun), invited paper, Workshop “Towards a Linguistically-Motivated Annotation Scheme for Information Status”, LSA Conference, Baltimore MD, January 2010.
- “Combinatory Categorical Grammar for Robust Natural Language Processing” invited tutorial, University of Geneva Doctoral School, Leysin, March 2010
- “Combinatory Categorical Grammar as a Framework for Linguistics” invited tutorial, University of York Frameworks, York, April 2010

- “Formal Grammars for Computational Musical Analysis” Music, Pattern, and Math Workshop, Herstmonceux Castle, Sussex, August 2010.
- “Formal Foundation of Grammar in Collaborative Action” 18th ESPP Conference, Bochum, August 2010.
- “Plans and the Structure of Meaning” Dynamics in Semantics, Stuttgart, September 2010.
- “Some Important Problems in Natural Language Processing” Hamming Lecture, University of Edinburgh, September 2010.
- “Intonation, Conversation, and Melody” Invited Lecture, Radcliffe Seminar on Prosody and Dialog in Language and Music, Radcliffe Institute, November, 2010.
- “Learning Cognitive Symbolic Systems” Invited Address, Symposium “Defining Cognitive Informatics”, University of Vienna, January, 2011.
- “Compositionality in Language and Collaborative Planning” Keynote, The Annual Conference of the Association for Artificial Intelligence and the Simulation of Behaviour, York, April, 2011.
- “Computing Scope in a Natural Logic” invited address, Tübingen Conference on Semantic Processing, July 2011.
- “Computing Scope in a Natural Logic.” Keynote, International Conference on Parsing Technology, Dublin, October 2011.
- “The Statistical Problem of Language Acquisition” invited address, Harvard/Australia Workshop, Macquarie University, August 2011
- “The Statistical Problem of Language Acquisition” keynote, CUNY Conference New York March 2012
- “The Statistical Problem of Language Acquisition” keynote, EACL Conference Workshop on Computational Models of Language Acquisition and Loss, Avignon, April 2012
- “Combinatory Categorical Grammar for Robust Natural Language Processing”, Invited Course at the North American Summer School on Logic, Language, and Information (NASSLLI), Austin TX., June 2012. (Five lectures).
- “The Statistical Problem of Language Acquisition,” invited address, Conference on Logical Aspects of Computational Linguistics, Nantes, July, 2012.
- “Parsing with Case, Coordination, and Free Word Order,” keynote, ACL Workshop on Parsing and Semantic Processing of Morphologically Rich Languages, Jeju, Korea, July, 2012.
- “Parsing with Case, Coordination, and Free Word Order,” keynote, 19th HPSG Conference, Daejeon Korea, July 2012.
- “Mild Context Sensitivity and Near-Context Freedom”, invited talk, Festschrift for Aravind Joshi, Philadelphia PA, October 2012.
- “Using Linguistic Knowledge in Natural Language Processing”, Invited address, The Amsterdam SMART Cognitive Science Colloquium, November 2012.
- “Treebanking in the Language of Thought”, keynote, 11th International Workshop on Treebanks and Linguistic Theories (TLT), Lisbon, November 2012.
- “Structurally Bootstrapping Grounded Language for Robots”, keynote, Workshop on Bootstrapping Structural Knowledge from Sensory-Motor Experience, ICRA, Karlsruhe, May 2013.
- “Robust Compositional Semantics” Keynote, 18th Australasian Document Computing Symposium (ADCS) and 11th Annual Workshop of the Australian Language Technology Association (ALTA), 4-6 December 2013, Brisbane.
- “Planning and Language: A New Synthesis”. Keynote, 31st Workshop of the UK Planning and Scheduling Special Interest Group, Edinburgh 29th-30th January 2014
- “Computation, Probability, and Temporal Ontology” Invited paper, Conference on Tense in Semantics and Philosophy of Language, 5-6th June 2014, St. Andrews.
- “Generalized Categorical Grammars and Logical Form”, Invited paper, Festschrift for Emmon Bach, 20-21st June 2014, Frankfurt.



- “Semantics for Semantic Parsers” Keynote, ACL Conference Workshop on Semantic Parsing, 26th June 2014, Baltimore.
- “Towards Wide Coverage Parsing for Construction Grammar”. Invited talk to the Workshop on Computational Construction Grammar, 8th International Conference on Construction Grammar (ICCG8), September 2014, Osnabrück.
- “Robust Semantics for Natural Language Processing” Keynote, 9th International Conference on Natural Language Processing (PolTAL), September 2014, Warsaw.
- “Robust Semantics for Semantic Parsing” Keynote, 28th Pacific Asia Conference on Language, Information and Computing (PACLIC). December 2014, Phuket, Thailand
- “Transitivity and Scope of Null Indefinites”, Keynote talk, Conference on Interactions between Syntax and Semantics across Frameworks, January 2015, Cambridge.
- “A Theory of Content”, keynote talk, ISBCS, May 2015, Ankara, Turkey.
- “A Theory of Content”, keynote talk, Israeli Seminar on Computational Linguistics, June 2015, Tel Aviv.
- “A Distributional Theory of Content for NLP” keynote talk, Cognitive Computation Workshop, Imperial College, September 2015.
- “Combinatory Categorical Grammar for Robust Natural Language Processing: Lectures on Wide-Coverage Parsing, Semantic Parsing, Question Answering and Text Entailment and Computational Semantics”, Samsung Electronics Polska, Warsaw, December 2015 (Four lectures).
- “Combinatory Categorical Grammar for Linguists” Course at the LOT Winter School, Tilburg, January 2016 (five lectures).
- “A Distributional Theory of Content for NLP” Keynote address to 22nd International Conference on Computational Linguistics and Intellectual Technologie, RSUH Moscow June 2016.
- Commentator, University of Stuttgart Computational Linguistics summer retreat, Kleinwalsertal, Austria.
- “On Distributional Semantics”, Keynote address to the 54th Annual Meeting of the Association for Computational Linguistics, Berlin, August 2016.
- “Introduction to Combinatory Categorical Grammar”, course at the ESSLLI Summer School, Bolzano, August 2016 (five lectures)
- “A Distributional Theory of Content for NLP”, invited talk, ESSLLI Workshop RefSemPlus, Bolzano, August 2016.
- “Linguistics, computation, and modeling human language”, invited talk CCD/CLaS Workshop on Modelling Human Language, Macquarie University, Sydney NSW, Dec 1 2016.
- “On Distributional Semantics”, keynote, 14th Annual Workshop of the Australian Language Technology Association, Monash University Melbourne Victoria, 6 Dec 2016.
- “CCG for Natural Language Processing”, course at the 2017 Interdisziplinäre Kolleg, Mohnesee-Günne, 13-216 March 2017 (four lectures).
- “Introduction to Combinatory Categorical Grammar”, course at the LSA Summer Institute, Lexington KY, July 2017 (eight lectures).
- “Combinators and Minimalism: Putting Syntax Back Together Again”, invited Forum Lecture, LSA Summer Institute, Lexington KY, 11 July 2017.
- Ian Gordon Fellowship Lectures, Victoria University, Wellington NZ. Three public popular lectures on Language Evolution, Language Acquisition, and the Theory of Grammar, October 2017.
- “The Lost Combinator”, 2018 ACL Lifetime Achievement award address, 56th Annual Meeting of the Association for Computational Linguistics, Melbourne, July 2018.
- “A Formal Universal of Natural Language Grammar”, invited address to the Symposium on the Syntax of the Bantu Noun Phrase, Queen Mary University of London, September 2018.
- “The Lost Combinator”, keynote address to the Annual Conference of the Chinese Information Processing Society of China (CIPS), Beijing, November 2018.

- “A Formal Universal of Natural Language Grammar”, invited address to the Symposium on the Syntax of the Bantu Noun Phrase, Queen Mary University of London, September 2018.
- “A Formal Universal of Natural Language Grammar”, keynote address to the Categorical Grammar Summit, Xiangtan University, Hunan Province, China, April 2019.
- “Linguistic Semantics and Contemporary NLI”, keynote address to the workshop Natural Logic Meets Machine Learning (NaLoMA), held in conjunction with NASSLLI at Virtual Brandeis, July 2020,
- “Unsupervised Induction of Explainable Meaning Representations”, keynote address to the 2nd Workshop on Designing Meaning Representations, held in conjunction with CoLing in Virtual Barcelona, December 2020.
- “Building and Interrogating Knowledge Graphs in Natural Language,” keynote address to the 6th CIPS Language and Intelligence Summit, Chinese Academy of Sciences, virtual Beijing, August 2021.
- “Semantic Parsing for Conversational Question-Answering” keynote address to the Huawei Strategy and Technology Workshop, October 2021.
- “Projecting Dependency: CCG and Minimalism” keynote address to the 46th Penn Linguistics Colloquium, virtual Philadelphia PA, March 2022
- “Combinatory Categorical Grammar: An Introduction”, five lectures to the North American Summer School for Logic Language and Information, University of Southern California, Los Angeles CA, June 2022.
- “Inference in Open-Domain Question-Answering” keynote address to the Huawei Strategy and Technology Workshop, July 2022.
- “Inference in Open-Domain Question-Answering” keynote address to the 16th China Conference on Knowledge Graph and Semantic Computing, virtual Qinhuangdao, August 2022
- “Combined Logical and Language-model -Based Inference”, keynote to the AI Quorum Inaugural NLP Symposium, Mohamed bin Zayed University of Artificial Intelligence, Abu Dhabi, December 2022.
- “Inference in the Time of GPT”, keynote to the Huawei Strategy and Technology Summit, June 2023.
- “Inference in the Time of GPT”, keynote to the Conference on Computability in Europe, Batumi Georgia, July 2023.

## Some Recent Talks

### **Scope Alternation and the Syntax-Semantics Interface,**

Linguistics Department, NYU, New York, March 2012

### **Semantics and Implicature in the Meaning of English Intonation**

Linguistics Department, Cornell University, Ithaca NY, Apr 2007

Linguistics Department, Northwestern University, Evanston IL, Apr 2007

### **The Statistical Problem of Language Acquisition**

Linguistics Department, University of Edinburgh, November 2010.

Linguistics Department, University of Texas at Austin, February 2011.

Dublin Computational Linguistics Research Group, April, 2011.

Department of Computer Science, Carnegie Mellon University, April, 2011.

Department of Computer Science, La Sapienza, Rome, June 2012.

Department of Computer Science, KAIST University, Korea, July, 2012.

### **The Future of Semantic Parser Induction**

Department of Computer Science, University of Sheffield, UK, November, 2012.

Department of Computer Science, University of Bath, UK, December, 2012.

### **Taking Scope**

Dept of Computer Science, Macquarie University, Sydney NSW January 2012.

### **Combined Compositional and Distributional Semantics**

CLaS/CCD, Macquarie University, Sydney NSW December 2013.

**Formal Grammars for Computational Musical Analysis** LANGUAGE Seminar, Ecole Normale Supérieure, Paris March 2015.

**A Distributional Theory of Content for NLP**

Workshop on Semantic Theory and Empirical Evidence, University of Osnabrück, Sept 2009.

Linguæ Seminar, Ecole Normale Supérieure, Paris March 2015.

IBM Thomas Watson Research Lab, Yorktown Heights NY March 2015.

Computer Science Dept Columbia University New York March 2015

Dept of Computer and Information Science, University of Pennsylvania October 2015.

Dept of Computer Science University of Trento October 2015.

Dept. of Computer Science, Queen Mary University of London, February 2016.

Google, London May 2016

Computational Linguistics Institute, University of the Saarland, Saarbrücken, May 2016

Philosophy Department, Victoria University, Wellington NZ, October 2017.

Computer Science Department, University of Otago, Dunedin, NZ, October 2017.

Linguistics and Cognitive Science Program, University of Geneva May 2018

Invited talk, Institute of Software, Chinese Academy of Sciences, Beijing, November 2018.

Invited talk, Department of Computer Science, Peking University, Beijing, November 2018.

Invited talk, Huawei Noah's Ark, Hong Kong, December 2018.

Invited talk ILCC University of Amsterdam, November 2019

**Bootstrapping Language Acquisition**

Institute for Research in Cognitive Science, Otago University of Pennsylvania, March 2016.

Child Language Acquisition Group, University of Otago, Dunedin, NZ, October 2017.

Child Language Acquisition Group, University of Manchester, April 2018

**Combinatory Categorical Grammar as a Linguistic Theory,**

invited talk CCD/CS, Macquarie University, Sydney NSW, Nov. 23, 2016.

**Combinatory Categorical Grammar for Natural Language Processing,**

invited talk CCD/CS, Macquarie University, Sydney NSW, Nov. 30, 2016.

**Form-Independent Semantic Representation for Eventualities**

invited talk, Département de Linguistique, Université de Genève, May 2018.

Keynote address, 2nd Sydney NLP/ALTA Mini-Conference, University of Sydney NSW, July 2018

Invited talk, DeepMind London, Jan. 2019.

invited talk, Natural Language Processing Group, University of California at Irvine, March 2019.

**Present and Future Research in NLP**

Invited talk, Huawei Noah's Ark, London, March 2019.

**A Formal Universal of Natural Language Grammar**

Invited talk CCD/CS, Macquarie University, Sydney NSW, July 2018.

**The Combinatory Cognitive Science of Language,**

Invited talk, Cognitive Science Group, University of California at Irvine, March 2019.

**Grounding Natural Language Processing in Action Planning**

Invited talk, DeepMind London, May 2019.

**Why we still need Grammars for NLP**

Invited talk, CLASP, Gothenburg University, April 2021.

**Combinatory Minimalism: Projecting Dependency without Movement**

Invited talk, IGRA Leipzig University, May 2021.

**Building and Interrogating Knowledge Graphs in Natural Language**

Invited talk, Alan Turing Institute Special Interest Group in Knowledge Graphs, July, 2021.

**Projecting Dependency: CCG and Minimalism**

Invited talk to the CNRS/gdrLIFT Seminar on Interactions between Formal and Computational Linguistics (IFCL), Paris, March 2022.

**Inference in Open-Domain Question-Answering,**

Invited talk to the Workshop on 10 Years of BabelNet, La Sapienza University Rome, July 2022.

**Inference in the Time of GPT,**

Invited talk to the Edinburgh Huawei Joint Laboratory Workshop, June 2023.

Invited talk to the Meeting to Honour Phil Johnson-Laird, UCL London, July 2023.

**Deriving Value from Large Datasets, Chatbots and NLP**

SydBank Board, Edinburgh, September 2023.

**Impact of Large Datasets, Chatbots and NLP,**

Meeting of the International Science Council (ISC) Cttee. for Science Planning, Online, September 2023.