

MATTHEW W. CROCKER

CURRICULUM VITAE

I. Personal Details:

Date of Birth:	August 4, 1964	Contact address:	Talstraße 24
Place of Birth:	Moncton, Canada		66119 Saarbrücken, Germany
Nationality:	Canadian		Tel: +49 681 584 7575
Residency:	German		Email: crocker@coli.uni-sb.de
Family status:	Married, one child		Web: www.coli.uni-sb.de/~crocker

II. Academic Qualifications:

<u>Degree</u>	<u>Institution</u>	<u>Awarded</u>
PhD	Dept. of Artificial Intelligence University of Edinburgh, Edinburgh, U.K.	July 1992
MSc	Dept. of Computer Science University of British Columbia, Vancouver, Canada	November 1988
BSc(CS)	School of Computer Science University of New Brunswick, Fredericton, Canada	May 1986
High School Diploma	Fredericton High School Fredericton, Canada	June 1982

III. Scientific Career

Since August 2008	Principal Investigator: Excellence Cluster <i>Multi-Modal Computing and Interaction</i>
Since August 2008	Full Professor of Psycholinguistics (W3), Department of Computational Linguistics, Saarland University
March 2008	Offer: Full Professorship of Psycholinguistics (W3), Bielefeld University: declined
June 2005	Short-listed: Director of MPI for Psycholinguistics, Nijmegen, NL
Mar 2005 – Dec 2007	Deputy Director (Stellvertretender Sprecher) of Collaborative Research Centre (SFB 378): <i>Resource Adaptive Cognitive Processes</i>
Since April 2001	Director (Sprecher) of the International Research Training Group: <i>Language Technology and Cognitive Systems</i> (partner: Edinburgh University)
Jan 2000 – July 2008	Professor of Psycholinguistics (C3), Department of Computational Linguistics, Saarland University
Jan 1999 – Dec 1999	Research Scientist (Wissenschaftlicher Mitarbeiter 1b) Department of Computational Linguistics, Saarland University
May 1998	Offer: Assoc. Professorship (tenured), Computer Science, Brock University, Canada: declined
Oct 1994 – Dec 1998	ESRC Senior Research Fellow (AR2), Centre for Cognitive Science, University of Edinburgh
Oct 1991 – Sept 1994	Joint Lecturer, Artificial Intelligence and Cognitive Science, University of Edinburgh
May 1989 – Sept 1991	Research Associate: “ <i>Principle-Based Human Sentence Processing</i> ” Human Communication Research Centre (HCRC), Edinburgh
June 1987 – June 1988	Research Assistant: “ <i>Expert system for compiler development</i> ”, Department of Computer Science, University of British Columbia
Nov 1984 – Aug 1986	Research Assistant: “ <i>A French text-to-speech system</i> ” University of New Brunswick

IV. Summary of Research Interests:

My research is concerned with the experimental investigation and computational modelling of (situated) human language understanding, with a particular emphasis in the following areas:

- The interaction of language and vision in situated language understanding
- Connectionist models of language comprehension and visual attention
- Utterance-mediated gaze and joint attention in real and virtual environments
- Psycholinguistics in embodied cognition, and human-robot interaction
- Eye-tracking investigations of sentence processing, focusing on the role of long-term and recent experience
- Probabilistic computational models of lexical, syntactic and semantic processing

The overarching goal of my research is to bring together sophisticated psycholinguistic investigation of real-time language processing, with more general accounts of situated cognition, in developing computational cognitive models.

V. Research Funding:

- Excellence Cluster *Multimodal Computing and Interaction*. PIs: Backes, Crocker, Druschel, Lengauer, Mehlhorn, Pinkal, H-P Seidel (Director), R Seidel, Slusallek, Uszkoreit, Wahlster, Weickert, Weikum. Nov 2007 – Nov 2012, Total value: €25M, (my responsibility: €300K equipment, €600K research personnel, approx.)
- DFG International Research Training Group (joint with University of Edinburgh): *Language Technology and Cognitive Systems*. October 2005 – April 2010 (phase 3), PIs: Barry, Crocker (Director), Klakow, Pinkal, Uszkoreit, Wahlster, value: €3.7M (approx.)
- DFG Project: *Adaptive Human Language Processing (Alpha: Phase 3)*, within SFB 378: *Resource Adaptive Cognitive Processes*. Jan 2005 – Dec 2007, value: €450 000 (approx.)
- DFG Research Project: *Parallelism in Human Parsing*, Sept 2004 – Sept 2006, value: €150 000 (approx.)
- Saarland University Grant (with A. Melinger): *Assoziationsnormen für Wörter und Bilder im Fernsehen*, April 2004 – June 2005, value: €12 960
- DFG International Research Training Group (joint with University of Edinburgh): *Language Technology and Cognitive Systems*. April 2004 – Sept 2005 (phase 2), Vorstand: Barry, Crocker (Director/Sprecher), Klakow, Pinkal, Uszkoreit, Wahlster, value: €618 254
- DFG International Research Training Group (joint with University of Edinburgh): *Language Technology and Cognitive Systems*. April 2001 – Mar 2004 (phase 1), Vorstand: W. Barry, M. Crocker (Director/Sprecher), M. Pinkal, J. Siekmann, G. Smolka, H. Uszkoreit, W. Wahlster, value: DM 1 784 000
- DFG Project: *Adaptive Human Language Processing (Alpha: Phase 2)*, within SFB 378: *Resource Adaptive Cognitive Processes*. Jan 2002 – Dec 2004, value: DM 838 044
- DFG Project: *Adaptive Human Language Processing (Alpha: Phase 1)*, within SFB 378: *Resource Adaptive Cognitive Processes*. Jan 2001 – Dec 2001, value: DM 147 200
- DFG Conference Grant to host: *The 7th conference on Architectures and Mechanisms for Language Processing (AMLaP-2001)*, Saarbrücken, 20–22 Sept 2001, value: DM 15 900
- ESRC Research Fellowship (award # H52427000394), Oct 1994 – Sept 1998. A senior four year personal research fellowship. ESRC evaluation of performance: Very good.
- ESRC grant: *Reanalysis: Computational theory and online investigations*, jointly held with Dr. M. Pickering (Glasgow), July 1997 – Sept 1998, value: GBP 42 429 (~DM 123 000). ESRC evaluation of performance: Excellent.
- British Council/DAAD (Germany) Initiative: *Data-intensive Computational Psycholinguistics*, held with Dr. L. Konieczny (Saarbrücken), July 1998 – July 2000, value: GBP 3 600 (~DM 10 400)
- British Council/Swiss National Foundation Initiative: *Lexical Statistics: Measures for Effective NLP*, held with Dr. P. Merlo (Geneva), Oct 1995 – Mar 1997, value: GBP 2 000 (~DM 6 000)
- Awarded five ESRC Competitive PhD Studentships for Thacker, Corley, Keller, Sturt, Tugwell. Value: full tuition and PhD level salary for three years, per student.

VI. Teaching and Doctoral Supervision:

Department of Computational Linguistics, Saarland University [2000-present]:

- *Introduction to Psycholinguistics*: This course introduces the aims, current issues, theories, and experimental methods of modern psycholinguistics, focusing on lexical and sentence level processing. It introduces the basic concepts of experimental design and statistical analysis, present core experimental paradigms, and discusses prevalent theories and computational models.
- *Computational Psycholinguistics*: Senior course covering foundations of symbolic, probabilistic and connectionist models of human language processing, case studies of advanced models, and experimental methods.
- *Mathematical Foundations of Computational Linguistics III: Statistical Methods*: Introduction to basic probability theory, information theory, and language modeling: Markov models, part-of-speech tagging, and statistical parsing.
- *Machine Learning of Natural Language*: Senior course on connectionist and probabilistic machine learning techniques for natural language such as decision trees, Bayesian classifiers, clustering, neural networks. Weekly practicals use tlearn (neural network) and weka (machine learning) software to run simulations.
- *Human Semantic Processing*: Senior seminar course examining major psycholinguistic findings related to semantic processing. (with M. Pinkal).
- *Language Processing in Visual Worlds*: Senior seminar course which introduces the visual worlds eye-tracking paradigm, and discussed seminars articles. (with P. Knoeferle, A. Weber).

Cognitive Science, University of Edinburgh [1991-1998]:

- *Computational Linguistics 1*: Computational linguistics for the MSc in Cognitive Science. Formal language theory, DCGs, parsing algorithms, human language processing, statistical NLP, unification-based and typed feature systems (ALE). [1994-1998]
- *Computational Linguistics 2*: Second term computational linguistics for the MSc in Cognitive Science. Semantic representation and interpretation in natural language processing, a large group project for understanding instructional texts. [1991-1993]

Department of Artificial Intelligence, University of Edinburgh [1991-1994]:

- *AI-1 Natural Language*: First-year AI undergraduate module on natural language processing. Overview of NLP applications, SHRDLU, basic syntax, parsing (DCGs). [1991-1994]
- *Advanced Topics in NLP*: Senior AI undergraduate and MSc module. Seminar course covering selected current topics in natural language processing (with Chris Mellish). [1993-1994]
- *Computational Semantics*: A senior AI undergraduate and MSc module, covering semantic representation and interpretation in NLP. Includes predicate logic, lambda-calculus, quantifier scoping, DRT, and NL techniques for reference resolution. [1991-1993]

European Summer School in Logic, Language, and Information:

- *Human Language Comprehension*: Two-week course taught jointly with Martin Pickering, ESSLI-97, Aix-en-Provence, France, August 1997.
- *Computational Linguistics and Cognition*: Two-week course taught jointly with Massimo Poesio, ESSLI-98, Saarbrücken, Germany, August 1998.

Primary supervisor of the following ongoing PhD dissertations at Saarland University:

<u>Student</u>	<u>Begin</u>	<u>Topic of Dissertation</u>
E. Ellsiepen	10/07	<i>The Use of Scene Memory in Situated Spoken Language Comprehension</i>
J. Köhne	10/07	<i>The Time-course of Cross-situational (Artificial) Language Learning</i>
J. Steinberg	05/05	<i>A Linking Hypothesis for Utterance-mediated Visual Attention</i>
G. Paris	09/04	<i>Gender in Lexical Processing: A Connectionist Model of Eye-tracking Evidence</i>
K. Hadelich	11/01	<i>Alignment: Simultaneous Eye-tracking of Interlocutors in Dialog</i> (paused studies)

Primary supervisor of the following completed PhD dissertations:

<u>Student</u>	<u>Awarded</u>	<u>Title of Dissertation</u>	<u>Current Position</u>
<i>Saarland University</i>			
M. Staudte	07/10	<i>Joint Attention in Spoken Human Robot Interaction</i>	Excellence Cluster MMCI, Saarland University
U. Pado	05/07	<i>The Integration of Syntax and Semantic Plausibility in a Wide-Coverage Model of Human Sentence Processing</i>	Ordinate.com & CSLI Stanford, USA
A. Dubey	02/05	<i>Statistical Parsing for German: Modelling Syntactic Properties and Annotation Differences</i>	Research Scientist, Edinburgh University, UK
P. Knoeferle	02/05	<i>The Role of Visual Scenes in Spoken Language Comprehension: Evidence from Eye-Tracking</i>	Assist. Professor, Bielefeld University, DE
<i>Edinburgh University</i>			
S. Rezaei	02/99	<i>Linguistic and Computational Analysis of Scrambling in Persian</i>	Faculty, Univ. of Northern British Columbia, CA
D. Tugwell	12/98	<i>Dynamic Syntax</i>	Research Scientist, St. Andrews, UK
D. Lee	01/98	<i>An HPSG-based Model of Korean Dialog</i>	Faculty member, Sejong University, Korea
S. Corley	07/97	<i>A Statistical Model of Human Lexical Category Disambiguation</i>	Sharp Labs of Europe, Cambridge, UK
P. Sturt	06/97	<i>Syntactic Reanalysis in Human Language Processing</i>	Reader, Edinburgh University, UK
Z. Gungordu	06/97	<i>Incremental Constraint-based Parsing: An Efficient Approach for Head-final Languages</i>	Cyc Corp, Austin, USA
M. Ishizaki	02/97	<i>Mixed Initiative Natural Language Dialogue with Variable Communicative Modes</i>	Assoc. Professor University of Tokyo, JP

Additional supervision and examination activities:

- Habilitation examiner (Saarland): Markus Egg, Lars Konieczny, Bertram Opitz, Berthold Crysmann, Sabine Schulte im Walde
- Habilitation committee (Saarland): Patrick Blackburn, Stefan Müller, Ralf Rummer, Martine Grice, Valia Kordoni, Günther Neumann, Manfred Putzer, Andrea Weber
- PhD committee (Saarland): Andrea Kowalski, Elena Karagjosova, Kristina Striegnitz, Juliana Hofman, Stefan Thater, Fei Yu
- MSc/Diplom supervisor (Saarland): G. Paris, S. Mohr, E. Auer, J. Apel, M. Sanchez, E. Ellsiepen
- External PhD examiner: M. Osborne, (Computer Science, York, UK), M. Mani (Phonology, Oxford), E. Salillas (Universidad de La Laguna, Tenerife, Spain), Gaurav Malhotra (Psychology, Edinburgh)
- Internal PhD examiner for B. Jones, H. Branigan, C. Rhys. (Edinburgh, UK)
- Secondary PhD supervisor for: A. Schöter, G. Evans, M. Pake. (Edinburgh, UK)
- Supervisor of Msc (Edinburgh) dissertations for: M. Smith, A. Fordham, S. Rezaei, and R. Thacker.

VII. Peer Activities:

Professional Activities:

- Rumelhart Prize Selection Committee (2010 –)
- Associate Editor: *Cognition* (2009 –)
- Associate Editor: *Frontiers in Language Sciences* (2010 –)
- Managing Editor: *Dialogue & Discourse* (2010 –)
- Guest Editor: *Brain & Language* (special issue on Embodied Language Processing, to appear Sept. 2009)
- Editorial Board: *Studies in Theoretical Psycholinguistics* (2005–), Springer Verlag
- Editorial Board: *Journal of Language and Translation* (2003–)
- Editorial Board: *Computational Linguistics* (1995 – 1997), active alumni board member

Ad hoc reviewing for the following journals:

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| • <i>ACM Trans. on Interactive and Intelligent Systems</i> | • <i>Cognitive Science</i> | • <i>Memory & Cognition</i> |
| • <i>Acta Psychologica</i> | • <i>Computational Linguistics</i> | • <i>Psychological Review</i> |
| • <i>Applied Psycholinguistics</i> | • <i>Journal of Memory and Language</i> | • <i>Psychonomic Bulletin and Review</i> |
| • <i>Brain & Language</i> | • <i>Journal of Psycholinguistic Research</i> | • <i>Quarterly Journal of Experimental Psychology</i> |
| • <i>Cognition</i> | • <i>Lingua</i> | • <i>Trends in Cognitive Science</i> |
| • <i>Cognitive Psychology</i> | | |

Review of research proposals for:

- *National Science Foundation (NSF, USA)*
- *German National Science Foundation (DFG):* reviewing of collaborative research centers (SFB), research training groups(GK), and research grants (Normalverfahren).
- *Economic and Social Research Council (ESRC, UK)*
- *Engineering and Physical Sciences Research Council (EPSRC, UK)*
- *European Science Foundation (ESF)*
- *Swiss National Science Foundation (SNCF)*
- *Netherlands Organisation for Scientific Research (NWO, NL)*
- *Science Foundation Ireland (SFI)*
- *MacArthur Foundation (USA)*

Visiting positions:

- Short-term visiting researcher at the Institute for Research in Cognitive Science (IRCS), University of Pennsylvania, February – March 1997.
- Visiting researcher, Rutgers University Centre for Cognitive Science, March – April 1997.

Involvement in international conferences:

- Co-founder in 1995 (with Prof. Martin Pickering) of the annual conference *on Architectures and Mechanisms for Language Processing* (AMLaP, see: <http://www.amlap.org/>): An annual international conference attracting over 200 delegates. The conference is based in Europe and has established itself as a premier venue for interdisciplinary research in theoretical, computational, and experimental psycholinguistics.
- Co-organizer and co-chair (with Pia Knoeferle) of the *Workshop on Embodied Sentence Processing*, August, 2007 (ESP, see: <http://www.embodiedlanguage.org/>)
- Organised and co-chaired *AMLaP-95* and *AMLaP-97* in Edinburgh, and *AMLaP-2001* in Saarbrücken.
- Co-chair of the *ACL Workshop Incremental Parsing: Bringing Engineering and Cognition Together*, with Frank Keller, Steve Clark and Mark Steedman, Barcelona, Spain, July, 2004.
- Member of the programme committee for: *Annual Meeting of the Cognitive Science Society (CogSci 2001, Edinburgh and CogSci 2009, Amsterdam)*, *NeMLaP* (Bilkent, 1996) and *AMLaP* (1995-2009), *QITL-2* (Osnabrück, 2006). Member of tutorial and workshops programme committee for *CogSci* since 2005.
- AD-hoc reviewing for numerous conferences, including: Cognitive Science Society, AMLaP, CUNY, ICCM, ECAI, IJCAI, ACL, PACLING, ILPS and various ACL workshops.