

## RODNEY D. NIELSEN

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### EDUCATION

Ph.D., Computer Science and Cognitive Science, University of Colorado at Boulder, 2008  
M.S., Computer Science, University of Colorado at Boulder, 2005  
M.S. (ABD), EEE, Computer Engineering, North Dakota State University, 1988  
B.A., Mathematics, Minot State University, 1986  
B.S., Computer Science, Minot State University, 1986

### PROFESSIONAL EXPERIENCE

Assistant Professor Adjunct, Dept. of Computer Science, CU Boulder, 2009 – present  
Research Assistant Professor, Dept. of Elec. & Comp. Engr., University of Denver, 2009 – present  
Research Associate, The Institute of Cognitive Science, CU Boulder, 2009 – present  
Research Scientist, Boulder Language Technologies, Boulder, CO, 2008 – present  
Research Assistant, Department of Computer Science, University of Colorado at Boulder, 2007  
Research Assistant, Institute of Cognitive Science, University of Colorado at Boulder, 2006  
Technology Research and Strategy, Jefferson County, CO, 1997 – 2000  
Chief Technology Officer, Athena Systems, Broomfield, CO, 1995 – 2005  
Manager, Knowledge Technologies Group, Andersen Consulting, Chicago, IL, 1992 – 1995  
Senior Consultant, Artificial Intelligence, Andersen Consulting, Chicago, IL, 1990 – 1992  
Consultant, Artificial Intelligence Group, Andersen Consulting, Chicago, IL, 1988 – 1990  
Teaching Assistant, North Dakota State University, Fargo, ND, 1987 – 1988  
Laboratory Assistant, North Dakota State University, Fargo, ND, 1986 – 1987

### RESEARCH INTERESTS

Machine Learning, Natural Language Processing, Computational Semantics, and Cognitive Science in the context of Educational Technology, End-User Development, Game Development, and Clinical Informatics Question Answering

# PUBLICATIONS

## JOURNAL ARTICLES AND BOOK CHAPTERS

Rodney D. Nielsen, Wayne Ward and James H. Martin. (2009). Recognizing entailment in intelligent tutoring systems. In Ido Dagan, Bill Dolan, Bernardo Magnini and Dan Roth (Eds.): *The Journal of Natural Language Engineering Special Issue on Textual Entailment*, (JNLE). Cambridge University Press, Cambridge, United Kingdom.

Rodney D. Nielsen, Kristy Boyer, Michael Heilman, Chin-Yew Lin, Juan Pino, and Amanda Stent. (2009). Evaluating question generation: Methodologies and performance metrics. In Vasile Rus and Art Graesser (Eds.) *The Question Generation Shared Task and Evaluation Challenge*. ISBN: 978-0-615-27428-7.

Rodney D. Nielsen, Wayne Ward and James H. Martin. (2008). Soft computing in intelligent tutoring systems and educational assessment. In Bhanu Prasad (Ed.): *Soft Computing Applications in Business*, pp 201-230. Published by Springer-Verlag, Heidelberg, Germany.

## CONFERENCE AND WORKSHOP PROCEEDINGS

Lee Becker, Rodney D. Nielsen, and Wayne Ward. (2009). What a pilot study says about running a question generation challenge. In *Proceedings of the Second Workshop on Question Generation, at the 14th International Conference on Artificial Intelligence in Education*, Brighton, United Kingdom, July 6-10, 2009. IOS Press.

Sikos, Les, Rodney D. Nielsen, Travis Rood, Laura A. Michaelis, Martha Palmer and Albert D. Kim. 2009. On the Road to Conventionalization: Analyses of Nominal Coercion. Poster presented at *The Twenty-Second Annual Meeting of the CUNY Conference on Human Sentence Processing*. Davis, CA. March 2009.

Rodney D. Nielsen, Lee Becker, and Wayne Ward. (2008). TAC 2008 CLEAR RTE system report: Facet-based entailment. In *Proceedings of the Text Analysis Conference*, Gaithersburg, Maryland, November 17-19, 2008. National Institute of Standards and Technology.

Rodney D. Nielsen. (2008). Question generation: Proposed challenge tasks and their evaluation. In Vasile Rus and Art Graesser (Eds.): *Proceedings of the Workshop on the Question Generation Shared Task and Evaluation Challenge*, Arlington, Virginia, September 25-26, 2008.

Rodney D. Nielsen. (accepted). Identifying key concepts for question generation. Accepted to the *Workshop on the Question Generation Shared Task and Evaluation Challenge* (combined with another accepted paper into the preceding paper), Arlington, Virginia, September 25-26, 2008.

Rodney D. Nielsen, Jason Buckingham, Gary Knoll, Ben Marsh and Leysia Palen. (2008). A Taxonomy of questions for question generation. In Vasile Rus and Art Graesser (Eds.): *Proceedings of the Workshop on the Question Generation Shared Task and Evaluation Challenge*, Arlington, Virginia, September 25-26, 2008.

Rodney D. Nielsen, Wayne Ward and James H. Martin. (2008). Automatic generation of fine-grained representations of learner response semantics. In Beverly Park Woolf, Esma Aimeur, Roger Nkambou and Susanne P. Lajoie (Eds.): *Proceedings of the Ninth International*

*Conference on Intelligent Tutoring Systems, (ITS 2008)*, pp 173-183, Montreal, Canada, June 23-27, 2008. Published by Springer, Heidelberg, Germany.

- Rodney D. Nielsen, Wayne Ward, James H. Martin and Martha Palmer. (2008). Extracting a representation from text for semantic analysis. In *Proceedings of the Forty-Sixth annual meeting of the Association for Computational Linguistics and the Human Language Technologies Conference, (ACL-08:HLT)*, pp 241-244, Columbus, Ohio, June 15-20, 2008. Published by the Association for Computational Linguistics, (ACL), Stroudsburg, Pennsylvania.
- Rodney D. Nielsen, Wayne Ward and James H. Martin. (2008). Classification errors in a domain-independent assessment system. In *Proceedings of the Third Workshop on Innovative Use of Natural Language Processing for Building Educational Applications, at the Forty-Sixth annual meeting of the Association for Computational Linguistics, (ACL-08:HLT)*, pp 10-18, Columbus, Ohio, June 15-20, 2008. Published by the Association for Computational Linguistics, (ACL), Stroudsburg, Pennsylvania.
- Rodney D. Nielsen, Wayne Ward, James H. Martin and Martha Palmer. (2008). Annotating students' understanding of science concepts. In *Proceedings of the Sixth International Language Resources and Evaluation Conference, (LREC:08)*, Marrakech, Morocco, May 28-30, 2008. Published by the European Language Resources Association, (ELRA), Paris, France.
- Rodney D. Nielsen, Wayne Ward and James H. Martin. (2008). Learning to assess low-level conceptual understanding. In David Wilson and H. Chad Lane (Eds.): *Proceedings of the Twenty-First International Artificial Intelligence Researchers Society Conference, (FLAIRS-08)*, pp 427-432, Coconut Grove, Florida, May 15-17, 2008. Published by the Association for the Advancement of Artificial Intelligence, (AAAI Press), Menlo Park, California.
- Rodney D. Nielsen and Wayne Ward. (2007). A corpus of fine-grained entailment relations. In *Proceedings of the Pattern Analysis, Statistical Modelling and Computational Learning Workshop on Textual Entailment and Paraphrasing, at the Forty-Fifth annual meeting of the Association for Computational Linguistics, (ACL-PASCAL-07)*, pp 28-35, Prague, Czech Republic, June 23-30, 2007. Published by the Association for Computational Linguistics, (ACL), Stroudsburg, Pennsylvania.
- Steven Bethard, Rodney D. Nielsen, James H. Martin, Wayne Ward, and Martha Palmer. (2007). Semantic integration in learning from text. In *Proceedings of the Association for the Advancement of Artificial Intelligence Spring Symposium Series on Machine Reading, (AAAI SSS-07)*, Stanford University, Palo Alto, California, March 26-28, 2007. Published by the Association for the Advancement of Artificial Intelligence, (AAAI Press), Menlo Park, California.
- Rodney D. Nielsen, Wayne Ward and James H. Martin. (2006). Toward dependency path based entailment. In Bernardo Magnini and Ido Dagan (Eds.): *Proceedings of the Second PASCAL Recognising Textual Entailment Challenge Workshop, (PASCAL RTE 2006)*, pp 44-49, Venice, Italy, April 10, 2006. Published by the Pattern Analysis, Statistical Modelling and Computational Learning Network of Excellence, (PASCAL).
- Rodney D. Nielsen and Sameer Pradhan. (2004). Mixing weak learners in semantic parsing. In Dekang Lin and Dekai Wu (Eds.): *Proceedings of the Conference on Empirical Methods in*

*Natural Language Processing, (EMNLP 2004)*, pp 80-87, Barcelona, Spain, July 25-26, 2004. Published by the Association for Computational Linguistics, (ACL), Stroudsburg, Pennsylvania.

Rodney D. Nielsen. (2004). MOB-ESP and other improvements in probability estimation. In Max Chickering and Joseph Halpern (Eds.): *Proceedings of the Twentieth Conference on Uncertainty in Artificial Intelligence, (UAI-2004)*, pp 418-425, Banff, Canada, July 7-11, 2004. Published by the Association for Computing Machinery, (ACM), New York, New York.

David Reynolds and Tim Beck. (1993). Tennessee offender management information system. In *Proceedings of the Fifth Conference on Innovative Applications of Artificial Intelligence, (IAAI-93)*, Washington, DC, July 11-15, 1993. Published by the Association for the Advancement of Artificial Intelligence, (AAAI Press), Menlo Park, California. (Rodney designed the knowledge-based system and implemented its architectural code.)

## PH.D. THESIS

Rodney D. Nielsen. (2008). *Learner answer assessment in intelligent tutoring systems*. Ph.D. thesis, Wayne Ward and James H. Martin, Co-Advisors, the University of Colorado at Boulder, January 4, 2008.

## TECHNICAL REPORTS

Markus Breitenbach, Rodney Nielsen and Gregory Grudic. (2003). Probabilistic random forests: Predicting data point specific misclassification probabilities. Technical Report CU-CS-954-03, the University of Colorado at Boulder.

Rodney D. Nielsen. (1995). Automated unit test generation in expert systems. Andersen Consulting Technical Report, Chicago, Illinois.

Rodney D. Nielsen. (1995). End-user code generation in expert systems. Andersen Consulting Technical Report, Chicago, Illinois.

## JOURNAL ARTICLES IN PROGRESS

Rodney D. Nielsen. The state of end-user development: A software engineering perspective, 26 pp.

## CONSULTING CLIENTS (partial list)

Allstate

Andersen's Strategic Services Logistics

AT&T

Baltimore Gas & Electric

Dade County, FA

Disney

Federal Express  
Great West  
Helene Curtis  
Illinois Chamber of Commerce  
An intelligence organization  
Jefferson County, CO  
Levolor / Newell  
Manville  
Meridian Oil  
Nestle'  
Sears  
Tennessee Dept. of Corrections  
McAllen Independent School District, McAllen, Texas  
Xerox

## GRANTS AND AWARDS

Patent Number 5791652: Domino and interchangeable suit cards, games, and methods of play.  
(Mathematics educational game for which I subsequently developed a software application.)

American Association of Artificial Intelligence – Innovative Application of Artificial Intelligence award (Lead AI systems designer)

National Science Foundation, “MRI-R2 Consortium: Development of Cloud of Clinical Research and Home Healthcare Companion-Bots”, \$5,441,921, Rodney D. Nielsen (PI) with Co-PIs Richard Voyles and Mohammad Mahoor, DU; Wilson Pace M.D., CU-AMC; Wayne Ward, BLT; and Katie Siek, CU, *Pending*.

Institute of Education Sciences, Department of Education, “Comprehension SEEDING: Comprehension through Self-Explanation, Enriched Discussion, and INquiry Generation”, \$1,727,927, Rodney D. Nielsen (PI), *Pending*.

Institute of Education Sciences, Department of Education, “Improving Science Learning Through Tutorial Dialogs”, \$3,130,043, Wayne Ward (PI), 2007–2011, (Conceived & wrote experimental design.)

National Science Foundation, Science of Learning Center, Competitive Summer Research sub-Award from the Institute of Cognitive Science, \$3,000, 2007, (Wrote parts of the proposal and supervised the undergraduate student that received the award.)

National Science Foundation, Science of Learning Center, Competitive Summer Research sub-Award from the Institute of Cognitive Science, \$4,500, 2006.

CU Boulder Department of Computer Science, Institute of Cognitive Science, and the Graduate School, a number of travel grants. Around \$1,500.

Graduated Magna cum Laude with B.S. in C.S. and B.A. in Mathematics.

## STUDENTS MENTORED

Massachusetts Institute of Technology: Amy LeMessurier

University of Colorado at Boulder: Lee Becker, Johanna Blumenthal, Jason Buckingham, Dmitriy Dligach, Jena Hwang, Gary Knoll, Ben Marsh, Les Sikos, and Aaron VanBerg

University of Michigan: Alan Mishler

## COURSES TAUGHT

Machine Learning (CSCI5622, CU-Boulder, Fall 2009)

Artificial Intelligence

Object-Oriented Analysis and Design

Software Engineering

Process Analysis and Modeling

Calculus

## SERVICE

Board of Advisors: *NSF DR K-12 research and development grant, "Pathways to Inquiry: Technology-Assisted Science Inquiry Assessments to Support Inquiry-Based Teaching and Learning in Earth, Life and Physical Sciences", Dr. Yiping Lou (PI), Louisiana State University.*

Chair: International workshop of the Artificial Intelligence practice at Andersen Consulting (now Accenture). 1992.

Steering Committee: *The 3rd Workshop on Question Generation*. 2010.

Journal Review: *Journal of Natural Language Engineering* (2009).

Program Committee: *EMNLP 2009: conference on Empirical Methods in Natural Language Processing*, in the area of Summarization and Generation. August 6-7, 2009. Singapore.

Program Committee: *The 14th International Conference on Artificial Intelligence in Education (AIED 2009), Workshop on Question Generation*.

Program Committee: *The 12th Conference of the European Chapter of the Association for Computational Linguistics (EACL-09)*, logic track (compositional semantics and textual entailment).

Evaluation Team Lead: *Workshop on the Question Generation Shared Task and Evaluation Challenge*, NSF: Arlington, VA, 2008.

Director of Education for worldwide Artificial Intelligence practice at Andersen Consulting, 1990-92. Responsibilities: chair annual conference, quality assurance for semiannual AI class,

and redesigned Introduction to AI session taught to 1000s of consultants in systems analysis & design course.

## PROFESSIONAL ORGANIZATION MEMBERSHIPS (past and present)

Association for the Advancement of Artificial Intelligence

Association of Computational Linguistics

Association of Computing Machinery

Association for Information Technology Professionals

Institute of Electrical and Electronics Engineers

International Artificial Intelligence in Education Society