

## RODNEY D. NIELSEN

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### EDUCATION

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

### PROFESSIONAL EXPERIENCE

Research Scientist, The Institute of Cognitive Science, CU Boulder, 2009 – present  
Assistant Professor Adjunct, Dept. of Computer Science, CU Boulder, 2009 – present  
Research Scientist, Boulder Language Technologies, Boulder, CO, 2008 – present  
Research Collaborator, Mayo Clinic Rochester, Arizona, and Florida, 2011 – 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  
Chief Technology Officer, Athena Systems, Broomfield, CO, 1995 – 2005  
Technology Research and Strategy, Jefferson, Golden, CO, 1997 – 2000  
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, NDSU, 1987 – 1988

### RESEARCH INTERESTS

Natural Language Processing, Machine Learning, Computational Semantics, and Cognitive Science in the context of Clinical Informatics, Spoken-Dialogue Health and Wellbeing Companion Robots, Educational Technology, and End-User Development

## PUBLICATIONS

### JOURNAL ARTICLES AND BOOK CHAPTERS

Daniel Albright, et al. (In submission) Annotating a clinical narrative corpus. In submission to *Journal of the American Medical Informatics Association (JAMIA)*. BMJ.

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, (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

Myroslava Dzikovska, Rodney D. Nielsen, and Chris Brew. (Submitted) [Anonymous submission]. Submitted to *The 2012 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies, (NAACL HLT 2012)*, Montreal, Québec, Canada, June 3-8, 2012. The Association for Computational Linguistics, (ACL), Stroudsburg, Pennsylvania.

Brian L. Cairns, Rodney D. Nielsen, James J. Masanz, James H. Martin, Martha S. Palmer, Wayne H. Ward, and Guergana K. Savova. (2011). The MiPACQ Clinical Question Answering System. *American Medical Informatics Association Annual Symposium (AMIA 2011)*. October 22-26, 2011. Washington D.C.

Rodney D. Nielsen. (2011) The Multi-source Integrated Platform for Answering Clinical Questions (MiPACQ). Abstract and presentation at *Advances in Clinical Question Answering: Watson meets Healthcare, John Hurdle and Guergana Savova moderators, at American Medical Informatics Association Annual Symposium (AMIA 2011)*. October 22-26, 2011. Washington D.C.

Rodney D. Nielsen, James J. Masanz, James H. Martin, Martha S. Palmer, Wayne H. Ward, and Guergana K. Savova. (Submitted). Beyond QA: Collaborative Dialogue for Clinical Research Discovery. *American Medical Informatics Association Annual Symposium (AMIA 2011)*. October 22-26, 2011. Washington D.C.

Heather D. Anderson, Wilson D. Pace, Elias Brandt, Rodney D. Nielsen, David R. West, Richard R. Allen, Anne M. Libby, and Robert J. Valuck. (2011). Methods for enhanced identification and detection of suicidality outcomes in observational comparative effectiveness and safety research. In the *Third Symposium on Comparative Effectiveness Research Methods (Methods for Developing and Analyzing Clinically Rich Data for Patient-Centered Outcomes Research)*. Rockville, Maryland, June 6-7, 2011.

- Heather Anderson, Wilson D. Pace, Elias Brandt, Rodney D. Nielsen, David R. West, and Robert J. Valuck. (2011). Methods for detecting suicidality outcomes in observational comparative effectiveness and safety studies. At the *annual meeting of the New Clinical Drug Evaluation Unit (NCDEU)*, (National Institute of Mental Health). Boca Raton, Florida, June 13-16, 2011. American Society of Clinical Psychopharmacology.
- Rodney D. Nielsen, Richard Voyles, Daniel Bolanos, Mohammad Mahoor, Wilson Pace, Katie Siek, and Wayne Ward. (2010). A Platform for Human-Robot dialog Systems Research. In *Proceedings of AAAI Fall Symposium, Dialog with Robots*, pp 161-162, Arlington, Virginia, November 11-13, 2010. AAAI Press.
- Rodney D. Nielsen, James Masanz, Philip V. Ogren, Wayne Ward, James Martin, and Guergana K. Savova. (2010). An architecture for complex clinical question answering. In *Proceedings of the First Annual ACM International Health Informatics Symposium (IHI 2010)*, pp 395-399, Arlington, VA, November 11-12, 2010. ACM, New York, NY.
- Lee Becker, Rodney D. Nielsen, Ifeyinwa Okoye, Tamara Sumner, Wayne H. Ward. (2010). What's next? Target Concept Identification and Sequencing. In *Proceedings of the Third Workshop on Question Generation, at the Tenth International Conference on Intelligent Tutoring Systems, (ITS 2010)*, pp 35-44, Pittsburgh, Pennsylvania, June 14-18, 2010.
- Dmitriy Dligach, Rodney Nielsen, Martha Palmer. (2010). To Annotate More Accurately or to Annotate More. In *Proceedings of the Fourth Linguistics Annotation Workshop, at the Forty-Eighth annual meeting of the Association for Computational Linguistics, (ACL-10)*, Uppsala, Sweden, July 11-16, 2010. Published by the Association for Computational Linguistics, (ACL), Stroudsburg, Pennsylvania.
- Jena D. Hwang, Rodney D. Nielsen, and Martha Palmer. (2010). Towards a Domain Independent Semantics: Enhancing Semantic Representation with Construction Grammar. In *Proceedings of the North American Association for Computational Linguistics – Human Language Technologies, Workshop on Extracting and Using Constructions in Computational Linguistics, (NAACL HLT 2010)*, pp 1-8, Los Angeles, California, June 1-6, 2010. Published by the Association for Computational Linguistics, (ACL), Stroudsburg, Pennsylvania.
- 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.
- Les Sikos, 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.

## 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

- Wilson Pace, Rodney D. Nielsen, Heather Anderson, Robert Valuck, Elias Brandt, and David R. West. (2010). Data Additions Related to Depression Care through Natural Language Processing. A report to *Agency for Healthcare Research and Quality: Developing Evidence to Inform Decisions about Effectiveness (DEcIDE) Program*. November, 2010.
- 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.

## CONTRIBUTIONS

Heather Orton Anderson, Anne Libby, and Robert Valuck. (2010). Methods for detecting suicidality outcomes in observational comparative effectiveness research. Presented at *the American Public Health Association's 138<sup>th</sup> Annual Meeting and Expo*, Denver, Colorado, November 6-10, 2010.

Dmitriy Dligach and Martha Palmer. (2008). Novel Semantic Features for Verb Sense Disambiguation. In *Proceedings of ACL-08: HLT*, pp 29–32, Columbus, Ohio, USA, June 2008. Association for Computational Linguistics, (ACL), Stroudsburg, Pennsylvania.

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. (Designed the knowledge-based system and implemented its architectural code.)

## OTHER INVITED TALKS

Rodney D. Nielsen. (2009). *Combining Statistical and Knowledge-Based Approaches to Improve Information Extraction*. At Computational Bioscience Program, Denver Health Sciences Center / Anschutz Medical Campus, Denver, Colorado, April 27, 2009.

Rodney D. Nielsen. (2006). *Learner answer assessment in intelligent tutoring systems*. At The Institute of Cognitive Science, University of Colorado at Boulder, 2006.

Rodney D. Nielsen. (1991-1994). *Gave invited talks to clients of Accenture / Andersen Consulting (e.g., AT&T Credit Card Services, Disney, etc.) describing methods in Machine Learning and Artificial Intelligence and how they could be applied to improve the client's processes*.

## GRANTS AND AWARDS

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

United States Patent Number 5791652: (Mathematics educational game)

(Active) National Science Foundation, “Collaborative Research: Companionbots for Proactive Therapeutic Dialog on Depression”, ~\$2M total, 2011-2015, **Rodney D. Nielsen (PI)** with Co-PIs Daniel Bolanos and Wayne Ward, Boulder Language Technologies; Mohammad Mahoor, DU; and Wilson Pace M.D., CU Anschutz Medical Campus.

(Active) Institute of Education Sciences, Department of Education, “Comprehension SEEDING: Comprehension through Self-Explanation, Enriched Discussion, and Inquiry Generation”, **\$1,829,471, 2011-2014, Rodney D. Nielsen (PI)** with Co-PIs Michelene Chi, Arizona State University, and Robert Talbot, CU-Denver.

(Active) National Institutes of Health, American Recovery and Reinvestment Act grant, “MiPACQ: Multi-source Integrated Platform for Answering Clinical Questions”, \$1M, 2009-2011, Co-Investigator with: Guergana Savova (lead PI, Harvard), Christopher Chute (PI, Mayo Clinic Rochester), James Martin (PI, CU-Boulder), M. Palmer and W. Ward (Co-PIs).

Agency for Healthcare Research and Quality, “Expanding DARTNet to Conduct a Comparative Effectiveness Study on Major Depression”, \$45,142 subcontract to CU-Boulder for computational semantics to detect mentions and severity of depression and suicide, Rodney D. Nielsen (PI), 2010-2011.

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

Dade County, Florida, *Judicial Case Scheduling AI*, ~\$2.5M. (Wrote the proposal’s AI R&D; did not participate in the implementation due to other commitments), 1993–.

Newell Corp, *Custom Sales, Configuration, Shop-floor Scheduling, Routing & Packaging AI*. ~\$2M. (PD/PI of AI R&D), 1992–1994.

Illinois State Chamber of Commerce, *Workforce Matchmaking and Training Recommendation AI*, ~\$750K. (PD/PI of AI R&D), 1992–1993.

Baltimore Gas & Electric, *Service Scheduling and Routing AI*, ~\$1M. (PD/PI of AI R&D), 1991–1992.

Tennessee Department of Corrections, *Offender Sentencing AI*, ~\$1.5M. (PD/PI of AI R&D; won AAAI Innovative Applications of AI award), 1991–1992.

CU Boulder Department of Computer Science, Institute of Cognitive Science, and the Graduate School, four travel grants. Around \$1,500. 2004.

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

## 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

## STUDENTS ADVISED

Master's Thesis Supervisor/Chair: Matt Pico, Computer Science, CU Boulder, (exp: May 2012)  
Ph.D. Thesis Committee: Philip Ogren (Oracle), Computer Science, CU Boulder, Dec. 2010  
Master's Thesis Committee: Gregory Brown, Computer Science, CU Boulder, May 2011  
Ph.D. Advising/Mentoring: Lee Becker and Dmitriy Dligach (Harvard), Computer Science; Jena Hwang, Linguistics; and Les Sikos (Swarthmore), Cognitive Science, CU Boulder  
Master's Advising/Mentoring: Brian Cairns (Google), Nirav Desai (Potomac Fusion), Jason Buckingham (Microsoft), Computer Science, CU Boulder  
Research Experience for Undergraduates Advising: Amy LeMessurier, Massachusetts Institute of Technology; and Alan Mishler, University of Michigan  
Undergraduate Advising: Johanna Blumenthal, Cognitive Science / Psychology; Gary Knoll and Ben Marsh, Computer Science; and Aaron VanBerg, Linguistics, CU Boulder

## COURSES TAUGHT

Machine Learned Ranking, I.S. (CSCI 5900, CU-Boulder, Spring 2011)  
Subjectivity Analysis, M.E.P. (CSCI 6800, CU-Boulder, Spring 2011)  
Information Retrieval, Guest Lecture (CSCI 5417, CU-Boulder, Fall 2010)  
Question Answering, I.S. (CSCI 6900, CU-Boulder, Spring 2010)  
Machine Learning (CSCI 5622, CU-Boulder, Fall 2009)  
Artificial Intelligence (1989-1994, redesigned course taught to 1000s of consultants)  
Knowledge Technologies (1989-1994)  
Object-Oriented Analysis and Design (1990-2001)  
Software Engineering & Process Analysis and Modeling (1990-2001)  
Calculus (NDSU, Fall 1987, Winter & Spring 1988)



## SERVICE

Co-organizer (with Myroslava Dzikovska, University of Edinburgh and Chris Brew, Educational Testing Service): Semeval 2013 Task 4: Textual entailment and paraphrasing for student input assessment. Summer 2013, Co-located with ACL or NAACL (TBD).

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

Board of Advisors: *NSF DR K-12 research and development proposal, "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.*

Steering Committee: *The Workshop on Question Generation* (2009-10).

Journal Review: *Journal of Dialog and Discourse* (2011).

Journal Review: *Journal of Natural Language Engineering* (2009, 2010).

Program Committee: *ACL 2012: The 50th Conference of the Association of Computational Linguistics*. July 8-14, Jeju, Republic of Korea.

Program Committee: *EACL-12: The Fifteenth Conference of the European Chapter of the Association for Computational Linguistics*, (semantics track), April 23-27, Avignon, France.

Program Committee: *The 7th Workshop on Innovative Use of NLP for Building Educational Applications, NAACL 2012*, June 3-8, Montreal, CA.

Program Committee: *ACL 2011: The 49th Conference of the Association of Computational Linguistics*, in the area of Natural Language Processing Applications. June 19-24, 2011. Portland, Oregon.

Program Committee: *FLAIRS: The 24th International Artificial Intelligence Researchers Society*, in the area of Natural Language Processing. May 18-20, 2011. Palm Beach, Florida.

Program Committee: *The Fourth Question Generation*. June 2011. Portland, Oregon.

Program Committee: *CoLING 2010: The 23rd International Conference on Computational Linguistics*, in the area of Semantics. August 23-27, 2010. Beijing, China.

Program Committee: *The Tenth International Conference on Intelligent Tutoring Systems, Workshop on Question Generation*. June 14-18, 2010. Pittsburg, Pennsylvania.

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 Fourteenth International Conference on Artificial Intelligence in Education (AIED 2009), Workshop on Question Generation*. July 5-10. Brighton, UK.

Program Committee: *The Twelfth Conference of the European Chapter of the Association for Computational Linguistics (EACL-09)*, logic track (computational 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)

American Medical Informatics Association

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