HARRY S. DELUGACH

PROFESSIONAL INTERESTS

Software engineering, software requirements, object-oriented modeling, knowledge-based systems, intelligent software agents, conceptual graphs, database integration, metadata standards, logic-based systems, team mental models

SUMMARY

- 40 years of experience teaching at the university level (over 20 different courses, many online sections)
- Co-founded and President of Teamwork Evaluation and Modeling (TEaM), a UAH-licensed startup company
- Extensive scholarly and professional publication record (17 refereed journal articles, over 40 refereed conference and meeting articles)
- Experienced researcher (Pi or Co-PI with over $700K awarded for sponsored research)
- Experienced academic administrator (5 years as a program director)
- Experienced consultant for legal and commercial organizations
- Extensive experience in university governance and administrative committees
- Accomplished speaker (20 invited talks in six countries)
- Software developer (three substantial packages) including CharGer, which has been used in over 70 countries for over fifteen years, and Knowledge Capture Pro
- Editor of an international standard (ISO/IEC 24707:2007 – Common Logic)

PROFESSIONAL

1996 – present	**Associate Professor** (with tenure), Dept. of Computer Science, University of Alabama in Huntsville, Huntsville, Alabama.
2015 – 2019	**President** and Co-Founder, Teamwork Evaluation and Modeling, Inc. (TEaM, Inc.), engaged in helping professional teams understand and improve shared mental models of their work activities and processes.
2009 – 2014	**Director**, Honors College (formerly University Honors Program), University of Alabama in Huntsville, Huntsville, Alabama.
1990 – 1996	**Assistant Professor**, Dept. of Computer Science, University of Alabama in Huntsville, Huntsville, Alabama.
1989 – 1990	**Visiting Assistant Professor** in Computer Science, Dept. of Mathematical Sciences, University of Memphis, (formerly Memphis State Univ.), Memphis, Tennessee.
1984 – 1989	**Graduate Research Assistant**, Dept. of Computer Science, University of Virginia, Charlottesville, Virginia.
1983 – 1984	**Computing Analyst**, Martin Marietta Energy Systems (for the U.S. Department of Energy), Oak Ridge, Tennessee.
1980 – 1983	**Computer Programmer**, Center for Business and Economic Research, College of Business Administration, University of Tennessee, Knoxville.
1981 – 1983	**Instructor**, Department of Computer Science, University of Tennessee, Knoxville (Part-time).
1979 – 1980	**Computer Operator**, Thomas Cate, CPA, Knoxville, Tennessee (Part-time).

1976 – 1978   **Mathematics Teacher**, Riverview Middle School, Memphis City Schools, Memphis, Tennessee.

EDUCATION

1991   Ph.D. in Computer Science, University of Virginia (Charlottesville, Virginia). Dissertation Title: "A Multiple Viewed Approach to Software Requirements."

1982   M.S. in Computer Science, University of Tennessee (Knoxville, Tennessee).

1976   B.A. in Chemistry, Carleton College (Northfield, Minnesota).

SELECTED PUBLICATIONS

REFEREED JOURNAL PUBLICATIONS

Wei, Bingyang and **Harry S. Delugach**, "From State Diagrams to Sequence Diagrams: A Requirements Acquisition Approach," *Intl. Jour. of Computers and Applications*, DOI: 10.1080/1206212X.2017.1408982, 2019.

Caralee Kassos and **Harry S. Delugach**, "Specifying Constraints for Detecting Inconsistencies In A Conceptual Graph Knowledge Base," *Intl. Jour. of Conceptual Structures and Smart Applications*, vol. 5, no. 2, 2017.

Harry Delugach, Letha H. Etzkorn, Sandra Carpenter, Dawn Utley, "A Knowledge Capture Approach for Directly Acquiring Team Mental Models," *Intl. Jour. of Human-Computer Studies*, vol. 96, Dec. 2016, pp. 12-21, DOI: 10.1016/j.ijhcs.2016.07.001.

G. S. Reed, M. D. Petty, N. J. Jones, A. W. Morris, J. P. Ballenger, and **H. S. Delugach**, "A Principles-based Model of Ethical Considerations in Military Decision Making", *Journal of Defense Modeling and Simulation*, Apr. 2016, vol. 13, no. 2, pp. 195-211.

Harry S. Delugach, "Implementation and Visualization of Conceptual Graphs in Charger," *Intl. Jour. of Conceptual Structures and Smart Applications*, vol. 2, no. 2, pp. 1-19, 2014.

William T. Sabados and **Harry S. Delugach**, "Understanding And Modeling Context In Data Integration." *Intl. Jour. of Conceptual Structures and Smart Applications*, vol. 2, no. 1, 2014, pp. 1-17.

Sandra Carpenter, **Harry Delugach**, Letha Etzkorn, Julie Fortune, and Dawn Utley, "How Instructional Format (Voice and Modality) Influences Subsequent Performance: An Empirical Study," *Intl. Jour. of Teaching and Learning in Higher Education*, vol. 25, no. 1, 2013, pp. 59-65.

Sandra Carpenter, **Harry Delugach**, Letha Etzkorn, Shamsnaz Virani, Dawn Utley and Julie Fortune, "Reflections and Evolution of an Interdisciplinary Research Team", *Intl. Jour. of Interdisciplinary Studies in Computer Science and Engineering*, vol. 1, no. 1, pp. 65-72, June 2011.

Danielle L. DeBraccio and **Harry S. Delugach**, "From Requirements to Software Architectural Style Focusing On Connector Properties", *Intl. Jour. of Interdisciplinary Studies in Computer Science and Engineering*, vol. 1, no. 1, pp. 1-35, Jan. 2010.

Delugach, Harry S., "Representing metadata constraints in Common Logic", *Int. J. Metadata, Semantics and Ontology*, vol. 4, no. 4, pp. 277-286, 2009.

Hector M. Olague, Letha H. Etzkorn, Sherri L. Messimer, **Harry S. Delugach**, "An Empirical Validation of Object-Oriented Class Complexity Metrics and Their Ability to Predict Error-Prone Classes in Highly Iterative, or Agile, Software: A Case Study," *Jour. Software Maintenance and Evolution*, vol. 20, no. 3, May/June 2008, pp.171-197.

Sandra L. Carpenter, **Harry S. Delugach**, Letha H. Etzkorn, Phillip A. Farrington, Julie L. Fortune, Dawn R. Utley, Shamsnaz S. Virani, "A Knowledge Modeling Approach to Evaluating Student Essays in Engineering Courses," *Jour. of Engr. Education*, vol. 96, no. 3, July 2007, pp. 227-239.

Marsha A. Dowell, Billie Rozell, David Roth, **Harry Delugach**, Patricia Chaloux, Jennifer Dowell, "Economics and Disparities in Hospitalized Patients with Type 2 Diabetes." *Jour. of Nursing Scholarship*, vol. 36, no. 1, pp. 66-72, 2004.

Hinke, Thomas H., and **Delugach, Harry S**., and Randall P. Wolf, "Protecting Databases From Inference Attacks," *Computers and Security*, 1997, vol. 16, no. 8, pp. 687-708.

Delugach, Harry S. and Hinke, Thomas H., "Wizard: A Database Inference Analysis And Detection System," *IEEE Trans. Knowledge and Data Engr.*, vol. 8, no. 1, pp. 56-66, Special Issue on Secure Database Systems Technology, Feb. 1996.

Hinke, Thomas H. and **Delugach, Harry S.** and Chandrasekhar, Asha, "A Fast Algorithm For Finding Second Paths in Database Inference Analysis," *Jour. Computer Security*, vol. 3, no. 2/3, pp. 147-168, 1995/1996.

Delugach, Harry S. and Hinke, Thomas H., "Using Conceptual Graphs To Represent Database Inference Security Analysis," *Jour. Computing and Info. Tech*., vol. 2, no. 4, pp. 291-307, 1994.

Delugach, Harry S., "Specifying Multiple-Viewed Software Requirements With Conceptual Graphs," *Jour. Systems and Software*, vol. 19, pp. 207-224, 1992.

REFEREED CONFERENCE PUBLICATIONS

Bingyang Wei, **Harry Delugach**, "Transforming UML Models to and from Conceptual Graphs to Identify Missing Requirements," *Graph-Based Representation and Reasoning, Lecture Notes in Artificial Intelligence*, vol. 9717, Springer-Verlag, Annecy, France, pp. 72-79, July, 2016.

Bingyang Wei, **Harry Delugach**, "A Framework for Requirements Knowledge Acquisition Using UML and Conceptual Graphs," *14th Intl. Conf. on Software Engineering Research, Management and Applications (SERA)*, June 2016, Towson, MD, U.S.A

Bingyang Wei, **Harry Delugach**, Eduardo Colmenares and Catherine Stringfellow , "A Conceptual Graphs Framework for Teaching UML Model-Based Requirements Acquisition," *29th IEEE Conf. on Software Engineering Education and Training*, April 2016, Dallas, TX U.S.A.

Delugach, Harry; Carpenter, Sandra; Utley, Dawn; Etzkorn, Letha; "Freely Available Software for Eliciting and Comparing Team Mental Models: The Team Mental Model Acquisition Tool (MMAT)," 9th Annual INGRoup Conference, Raleigh, NC, July, 2014.

Bryan J. Smith, **Harry S. Delugach**, "Another Reason Why Conceptual Graphs Need Actors," *Conceptual Structures: Leveraging Semantic Technologies, Proc. 17th Intl. Conf. on Conceptual Structures*, Moscow, Russia, *Lecture Notes in Artificial Intelligence*, vol. 5662, pp. 293-306, Springer-Verlag, Berlin, 2009.

Sandra Carpenter, **Harry S. Delugach**, Letha H. Etzkorn, Julie L. Fortune, Dawn R. Utley, Phillip A. Farrington, Shamsnaz Virani, "Studying Team Shared Mental Models", *Proc. 3rd Intl. Conf. on the Pragmatic Web*, Uppsala, Sweden, Sep. 28-30, 2008, ACM Press, pp. 41-48.

Harry S. Delugach and Daniel M. Rochowiak, "Grounded conceptual graph models," *Conceptual Structures: Knowledge Visualization and Reasoning, Proc. 16th Intl. Conf. on Conceptual Structures*, *Lecture Notes in Artificial Intelligence*, vol. 5113, Springer-Verlag, Toulouse, France, pp. 269-281, 2008.

Harry S. Delugach, "Towards Conceptual Structures Interoperability Using Common Logic," *CS-TIW 2008 Conceptual Structures Tools and the Web, Proc. 3rd Conceptual Structures Tool Interoperability Workshop*, CEUR Vol-352, Madalina Croitoru, Matthias Jaeschke, Sebastian Rudolph, eds., pp. 13-21, 2008.

Harry S. Delugach, "An evaluation of the pragmatics of web-based bug tracking tools," *Proc. 2nd Intl. Pragmatic Web Conf.*, Buckingham Shum, S., Lind, M. and Weigand, H. (2007), (Eds). 22-23 Oct. 2007, Tilburg, Netherlands. ISBN 1-59593-859-1 & 978-1-59593-859-6. ePrint Archive: http://oro.open.ac.uk/9275, pp. 49-55.

Randall C. Bachmeyer and **Harry S. Delugach**, "A conceptual approach to feature modeling," *Proc. 15th Intl. Conf. on Conceptual Structures: Knowledge Architectures for Smart Applications*, Sheffield, U.K., *Lecture Notes in Artificial Intelligence*, vol. 4604, July 2007, pp. 179-191.

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B.J. Smith and **Harry Delugach**, "A Framework for Analyzing and Testing Requirements with Actors in Conceptual Graphs," *Proc. 14th Intl. Conf. on Conceptual Structures: Inspiration and Application*, Aalborg, Denmark, *Lecture Notes in Artificial Intelligence,* LNAI 4068, July 2006.

David Skipper and **Harry Delugach**, "OpenCG: An Open Source Conceptual Graph Representation," *Proc. First Conceptual Structures Tool Interoperability Workshop* (CS-TIW 2006), Aldo de Moor, Simon Polovina, Harry Delugach, eds. Aalborg Univ. Press, July, 2006, ISBN 87-7307-769-0, pp. 48-57.

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Harper, Lois W., and **Delugach, Harry S.,** "Using Conceptual Graphs to Represent Agent Semantic Constituents", in *Conceptual Structures at Work: Proc. 12th Intl. Conf. on Conceptual Structures (ICCS 2004),* Lecture Notes in Artificial Intelligence, LNAI vol. 3127, Springer-Verlag, Heidelberg, K. E. Wolff, H. D. Pfeiffer and H.S. Delugach, eds., July 2004, pp. 325-338.

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Harper, Lois and **Delugach, Harry S.,** "Using Conceptual Graphs to Capture Semantics of Agent Communication," in *Conceptual Structures for Knowledge Creation and Communication: Proc. 11ᵗʰ Intl. Conf. on Conceptual Structures (ICCS 2003)*, Lecture Notes in Artificial Intelligence, LNAI 2746, Springer-Verlag, Heidelberg, A. de Moor, Wilfried Lex, and Bernhard Ganter, eds., July 2003, pp. 392-404.

Evans, Debra C., **Delugach, Harry S.,** and Skipper, David J., "Application of Conceptual Graph Structures in the Design of an Adaptive System: An Initial Concept and Exploration." *Proc. Human Factors and Ergonomics Soc. 45th Annual Meeting*, Minneapolis, MN, October, 2001.

Cox, Lisa and **Delugach, Harry S.** and Skipper, David, "Dependency Analysis Using Conceptual Graphs," *Suppl. Proc. 9ᵗʰ Intl. Conf. on Conceptual Structures*, July 30 - Aug 4, 2001, Palo Alto, CA, U.S.A. http://sunsite.informatik.rwth-aachen.de/Publications/CEUR-WS/Vol-41/Cox.pdf.

Delugach, Harry and Skipper, David, "Knowledge Re-Use in Simulated Entities," *10ᵗʰ Conf. On Computer Generated Forces and Behavior Representation*, Norfolk, VA, May 15-17, 2001, 10TH-CGF-065, http://www.sisostds.org/cgf-br/10th/index.htm.

Etzkorn, Letha and **Delugach, Harry,** "Towards a Semantic Metrics Suite for Object-Oriented Design," *Proc.. 34th Intl. Conf. on Technology of Object-Oriented Languages and Systems, TOOLS 34 (TOOLS USA),* July 30-Aug. 4, 2000, IEEE Computer Society Press, Los Alamitos, CA, 2000, pp. 71-80.

H. Delugach and B. Lampkin, "Troika: Using Grids, Lattices and Graphs in Knowledge Acquisition," in *Working with Conceptual Structures: Contributions to ICCS 2000*, G. Stumme, Ed. Aachen, Germany: Shaker Verlag, 2000, pp. 201-214.

Delugach, Harry S., "Repertory Grid Graphs: A Merging of Conceptual Graphs and Repertory Grids," *11ᵗʰ Workshop on Knowledge Acquisition*, Banff, Alberta, Canada, Apr. 18-23, 1998.

Ryszard Raban and **Harry S. Delugach**, "Animating Conceptual Graphs," in *Conceptual Structures: Fulfilling Peirce's Dream*, vol. 1257, *Lecture Notes in Artificial Intelligence*, Dickson Lukose, Harry S. Delugach, Mary Keeler, Leroy Searle, and John F. Sowa, eds., Springer-Verlag, 1997, pp. 431-445.

Randy P. Wolf and **Harry S. Delugach**, "PCCG: An Operational Tracked Grid For Creating Conceptual Graphs," in *Conceptual Structures: Fulfilling Peirce's Dream*, vol. 1257, *Lecture Notes in Artificial Intelligence*, Dickson Lukose, Harry S. Delugach, Mary Keeler, Leroy Searle, and John F. Sowa, eds., Springer-Verlag, 1997, pp. 617-620.

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Hinke, Thomas H., **Delugach, Harry S.,** and Wolf, Randall P., "A Framework For Inference Directed Data Mining," *Database Security Volume X: Status and Prospects*, Pierangela Samarati and Ravi S. Sandhu, eds., Chapman & Hall for the International Federation of Information Processing (IFIP), pp. 229-239, 1997.

Wolf, Randall P. and **Delugach, Harry S.,** "Knowledge Acquisition via the Integration of Repertory Grids and Conceptual Graphs," *Auxiliary Proceedings, 4th Intl. Conf. on Conceptual Structures*, P.W. Eklund, G. Ellis and G. Mann, eds., University of New South Wales, Sydney, Australia, Aug. 19-23, 1996, ISBN 0-7334-1387-0, pp. 108-120.

Delugach, Harry S. and Hinke, Thomas H., "Microanalysis: Acquiring Database Semantics In Conceptual Graphs," in *Conceptual Structures: Knowledge Representation as Interlingua*, P.W. Eklund, G. Ellis and G. Mann, eds., *Lecture Notes on Artificial Intelligence* LNAI 1115, Springer Verlag, Berlin, 1996, ISBN 3-540-61534-2, presented at ICCS '96, 4th Intl. Conf. on Conceptual Structures, University of New South Wales, Sydney, Australia, Aug. 19-23, 1996. pp. 218-228.

Hinke, Thomas H., **Delugach, Harry S.,** and Wolf, Randall P., "ILIAD: An Integrated Laboratory for Inference Analysis and Detection," *Proc. Ninth IFIP WG 11.3 Working Conference on Database Security*, Rensellaer Polytechnic Institute, New York, August 13-16, 1995, pp. 359-376.

Hinke, Thomas H., and **Delugach, Harry S.,** "Security-Oriented Database Inference Detection," *Proc. 17th Natl. Comp. Security Conf.*, National Institute of Standards and Technology, Baltimore, MD, Oct. 11-14, 1994, pp. 510–513.

Delugach, Harry S. and Hinke, Thomas H., "Constrained Lines Of Identity: An Approach To Conditional Joins," *Proc. ICCS '94, 2nd Intl. Conf. on Conceptual Structures*, University of Maryland, College Park, MD, Aug. 16-19, 1994, pp. 31–44.

Delugach, Harry S. and Hinke, Thomas H. and Chandrasekhar, Asha, "Applying Conceptual Graphs for Inference Detection Using Second Path Analysis," *Proc. ICCS93, First Intl. Conf. on Conceptual Structures*, pp. 188-197, Laval University, Quebec City, Canada, Aug. 4-7, 1993.

Polovina, Simon and **Delugach, Harry S.,** "The Economics of Supply and Demand: An Important Challenge For Conceptual Graphs," *Proc. ICCS93, Intl. Conf. on Conceptual Structures*, pp. 98-108, Laval University, Quebec City, Canada, Aug. 4-7, 1993.

Hinke, Thomas H. and **Delugach, Harry S.** and Chandrasekhar, Asha. "Layered Knowledge Chunks For Database Inference Detection," *Proc. 7th IFIP WG 11.3 Working Conference on Database Security*, Huntsville, Alabama, Sept. 12-15, 1993, pp. 276-297.

Hinke, Thomas H., and **Delugach, Harry S.,** "AERIE: An Inference Modeling and Detection Approach For Databases," *Database Security, VI: Status and Prospects*, IFIP Transactions, no. A-21, pp. 179-194, B. W. Thuraisingham and C. E. Landwehr, eds., Elsevier Science Publ (North-Holland), Amsterdam, 1993. (reprinted from *Proc. 6th IFIP WG 11.3 Working Conference on Database Security*, Vancouver, British Columbia, Canada, Aug. 19-21, 1992)

Delugach, Harry S., and Hinke, Thomas H., "AERIE: Database Inference Modeling and Detection Using Conceptual Graphs," *Lecture Notes in Artificial Intelligence*, no. 754, Chapter 16, Springer-Verlag, Berlin, 1993. (reprinted from *Proc. Seventh Annual Workshop 0n Conceptual Graphs*, pp. 183-192, New Mexico State University, Las Cruces, New Mexico, July 8-10, 1992)

Delugach, Harry S., "An Exploration Into Semantic Distance," *Lecture Notes in Artificial Intelligence*, no. 754, Chapter 9, Springer-Verlag, Berlin, 1993. (reprinted from Proc. *Seventh Annual Workshop 0n Conceptual Graphs*, pp. 29-37, New Mexico State University, Las Cruces, New Mexico, July 8-10, 1992)

Delugach, Harry S., "Dynamic Assertion and Retraction of Conceptual Graphs," *Proc. Sixth Annual Wkshop on Conceptual Graphs*, Eileen Way, ed., SUNY Binghamton, New York, July 11-13, 1991, pp. 15-26.

Delugach, Harry S., "Multiple Viewed Software Requirements Using Conceptual Graphs," *Proc. Fourth Annual Wkshop on Conceptual Graphs*, IJCAI-89, Timothy Nagle and Jan Nagle, eds., Aug. 1989, Detroit, Michigan, sec. 4.03.

BOOK CHAPTERS

Harry S. Delugach, "Active Knowledge Systems," in *Conceptual Structures in Practice*, Henrik Schärfe and Pascal Hitzler, eds., Chap. 14, pp. 349-369, Chapman and Hall, CRC Press, Boca Raton, FL, USA, 2009 (invited book chapter).

Harry S. Delugach, "Formal Analysis of Workflows in Software Development," in *Handbook of Research on Socio-Technical Design and Social Networking Systems*, Brian Whitworth and Aldo de Moor, editors, Information Science Reference Publ., Hershey, PA (invited book chapter), 2008, ISBN 978-1-60566-264-0, Chapter 20, pp. 280-297.

Delugach, Harry S., "Analyzing Multiple Views Of Software Requirements" in *Conceptual Structures: Current Research and Practice*, P. Eklund, T. Nagle, J. Nagle and L. Gerholz, eds., Ellis Horwood, New York, pp. 391-410, 1992. (reprinted from *Proc. Fifth Annual Wkshop on Conceptual Structures*, AAAI-90, Peter Eklund and Laurie Gerholz,, eds., pp. 17-22, Linköping University, Boston and Stockholm, 1990)

OTHER PUBLICATIONS

Delugach, Harry S. (2014). *Charger - A Conceptual Graph Editor - User's Guide*. Retrieved from http://concept.cs.uah.edu/downloads/CharGer%20Manual.pdf

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Delugach, Harry S. and Skipper, David S., "Knowledge Techniques for Advanced Conceptual Modeling," *9th Conf. On Computer Generated Forces and Behavior Representation*, Orlando, FL, May 16-18, 2000.

Delugach, Harry S., "STDS: PEIRCE Software Requirements and Development Standards," *Proc. 2nd Intl. Workshop on PEIRCE*: A Conceptual Graphs Workbench, pp. 3-15, Laval University, Quebec, Canada, Aug. 7, 1993.

Delugach, Harry S., "STDS: Software Development Standards," *Proc. Intl. Conference on PEIRCE: A Conceptual Graphs Workbench*, pp. 13-18, New Mexico State University, Las Cruces, New Mexico, July 10, 1992.

32559, Research Institute, Univ. Alabama in Huntsville, Sept. 1991.

OTHER PUBLICATION CREDITS

Editor, ISO/IEC 24707:2007 – *Common Logic - Common Logic (CL): a framework for a family of logic-based languages*, Intl. Organization of Standards, Geneva, Switzerland, 2007.

Aldo de Moor, Simon Polovina, **Harry Delugach** (editors) *Proc. 1st Conceptual Structures Tool Interoperability Wkshop* (CS-TIW 2006), Aalborg Univ. Press, Aalborg, Denmark, July 2006. ISBN 87-7307-769-0.

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Dickson Lukose, **Harry Delugach**, Mary Keeler, Leroy Searle, and John F. Sowa, (Eds.) (1997), "Conceptual Structures: Fulfilling Peirce's Dream", *Proc. Fifth Intl. Conf. on Conceptual Structures (ICCS'97),* August 3-8, Univ. of Washington, Seattle, USA, Lecture Notes in Artificial Intelligence, Springer-Verlag, No. 1257, Berlin. ISBN: 3-540-63308-1.

Leroy Searle, Mary Keeler, John Sowa, **Harry Delugach**, and John Sowa, "Fulfilling Peirce's Dream: Conceptual Structures and Communities of Inquiry," in *Conceptual Structures: Fulfilling Peirce's Dream*, vol. 1257, *Lecture Notes in Artificial Intelligence*, Dickson Lukose, Harry S. Delugach, Mary Keeler, Leroy Searle, and John F. Sowa, eds., Springer-Verlag, 1997, pp. 1-11.

SOFTWARE PACKAGES

- Knowledge Capture Pro (formally referred to as the Mental Model Acquisition Tool (MMAT),) platform-independent client-server Web application, (copyright 2014-2019, Univ. of Alabama Board of Trustees), principal author, approx. 100,000 lines in Java, javascript, jsp (2012-2019).

- CharGer, a conceptual graph visual editor, platform-independent 57,000 lines in Java (1998-present), http://concept.cs.uah.edu/charger-download.jsp/.

- Automated Testing Language Compiler for Numerical Controllers, 12,000 lines in C (1985-1986).

GRANTS AND CONTRACTS

Principal Investigator (PI) for 10 awarded contracts/grants (total $302,107), Co-PI for 5 more (total $565,513).

- Mentor, "Creating and Deploying Automated Software Test Procedures with Regression Testing," Austen Seidler, Research and Creative Experience for Undergraduates (RCEU), May-Aug. 2020, $3,750.

- Co-Principal Investigator (with H. Chung), "Supporting the Social Media Vetting through Machine Learning and Visual Analytics,", Social Media 23, Anniston, AL. Jan. 2019 – Dec. 2019. $26,446.

- Co-Principal Investigator (with H. Chung), "Social Media Vetting Software,", Social Media 23, Anniston, AL. July 2017 – Dec. 2018. $138,768.
- Principal Investigator, "Apollo Simulator: A Multidisciplinary System Development Project," National Collegiate Honors Council, Dec. 2010 – Dec. 2011, $500.
- Distinguished Speaker Series grant for Dr. Aldo de Moor's visit, 2008-09, $1,500.
- Co-Principal Investigator, "Parts Marking Decision Environment," MICOM Close Combat Support Program, May 2009 – Dec. 2009, $180,012.
- Principal Investigator, "A usability-validated tool for acquiring mental models," University Research Infrastructure Investment (URII) Grant URII 08-331, Office of the Vice President for Research, UAH $13,874, 2008-2009.
- Principal Investigator, "Cognitive Battle Damage Assessment (CBDA) Tools For the Joint Military Community," Bevilacqua Research Corp., Huntsville, AL, $34,000, Aug. 2004-July 2006.
- Principal Investigator, "Intelligent Scenario Generation Tool," Bevilacqua Research Corp., Huntsville, AL, $74,973, May 2005-Oct. 2005.
- Principal Investigator, "Dependency Language Representation Using Conceptual Graphs," contract with Bevilacqua Research Corp. through the Air Force Research Laboratory's (AFRL) Advanced Technologies for Information Assurance and Survivability (ATIAS) at Wright-Patterson Air Force Base, 2000 – 2001, $71,225.
- Principal Investigator, "Adaptive Instructional Systems," contract with Bevilacqua Research Corp., Huntsville, AL, through SBIR Phase I with Army Research Institute's Rotary Wing Applied Research Unit, Ft. Rucker, AL, 2000, $11,800.
- Principal Investigator, "Intelligent Battle Damage Assessment Station," contract with Bevilacqua Research Corp., Huntsville, AL, through U.S. Army Threat Simulation Management Office (TSMO), Ft. Huachuca, AZ, 2000, $41,500.
- Harry S. Delugach (PI), Mary Ellen Weisskopf, Carl Davis, Developing Laboratory Materials for Introductory Java Courses, Provost's instructional mini-grant, Summer, Fall 1998, $2,700.
- Principal Investigator, "Conceptual Modeling For Software Development in Moving Target Indication (MTI)," contract with Bevilacqua Research Corp., Huntsville, AL, under SBIR Phase II through Hanscom Air Force Base, MA, 1998 – 2001, $50,235.
- Co-Principal Investigator (with T. Hinke), "AERIE: A Database Inference Exploration Laboratory", University Research Program, Office of INFOSEC Computer Science, National Security Agency, contract no. MDA904-94-C-6120, 1994 – 1996, $110,738.
- Co-Principal Investigator (with T. Hinke), "AERIE: An Inference Modeling and Detection Approach," University Research Program, Office of INFOSEC Computer Science, National Security Agency, contract no. MDA904-92-C-5146, 1992 – 1995, $117,549.
- Investigator, "Automated Payload Experiment Tool Feasibility Study," through Microgravity Science and Application Division, Payload Projects Office, NASA Marshall Space Flight Center, 1990 – 1991.

CONSULTING ACTIVITIES

- Center for Space Plasma and Aeronomic Research (CSPAR), UAH, 2019
- The Implementation Group, Washington, D.C., 2019.
- Burr & Forman LLP, Birmingham, AL, 2007-2008.
- Concurrent Technologies Corporation, Johnstown, PA, 2005-2006.
- Bevilacqua Research Corporation, Huntsville, AL, 2002-2004, 2001, 1997-1998.
- U.S. Army Aviation and Missile Command (AMCOM) Corporate Information Center, 2004.
- U.S. District Court, Alabama Northern District, Hon. Sam Pointer, 1999.
- Micro Analysis & Design, Boulder, Colorado, to assist in contract proposal to NAWC-TSD Naval Training Research Center, Orlando, FL, 1997.

- Bradley, Arant, Rose and White, P.C., Attorneys, Huntsville, AL, 1996-1997.
- ADS Environmental Services, Inc., Huntsville, AL, 1996.

PROFESSIONAL ORGANIZATIONS

- Association for Computing Machinery (ACM)
- IEEE Computer Society
- Tau Beta Pi, national engineering honor society, life member, inducted Virginia Alpha, 1987
- Sigma Xi, national science honor society, inducted 2001
- Phi Kappa Phi, national honor society, inducted 2001
  - President, UAH chapter 149, 2004-2006
- National Collegiate Honors Council, 2009-2014
- Participating member, International Committee for Information Technology Standards, Metadata Standards Technical Committee DM32.8 (formerly INCITS/L8), ANSI-designated U.S. Technical Advisory Group to ISO/IEC JTC1/SC32 Working Group 2 (Metadata Standards). 2003-2009.

TEACHING AND STUDENT SUPERVISION

PH.D. STUDENTS SUPERVISED

9. Caralee Kassos, Ph.D. awarded May, 2018. Dissertation Title: "A Method For Quantifying Inconsistency In a Conceptual Graph Knowledge Base"

8. Bingyang Wei, Ph.D. awarded August 2015. Dissertation Title "A Comparison of Two Frameworks For Multiple-Viewed Software Requirements Acquisition"

7. William T. Sabados, Ph.D., awarded May 2015. Dissertation Title: "Knowledge Spaces: A Context-Driven Concept System Framework For Data Integration"

6. Bryan J. Smith, Ph.D., awarded May 2011. Dissertation Title: "Using A Visual Programming Language To Bridge The Cognitive Gap Between A Novice's Mental Model And Program Code"

5. Lisa D. Cox, Ph.D. awarded December 2008. Dissertation Title: "Characterization Of Dependencies As Building Blocks For Semantic Relations Using The Mutuo Semantic Capture Framework And Conceptual Graphs"

4. Randall C. Bachmeyer, Ph.D. awarded August 2008. Dissertation Title: "A conceptual graph feature model for use in developing software product-lines".

3. Lois Harper, Ph.D. awarded May 2006. Dissertation Title: "A Composite Semantic Communication Framework for Representation of Agent Communication Language Semantics"

2. Malcolm Morrison, Ph.D. awarded May 1999. Dissertation Title: "Extraction Of Ontological Information From Software Engineering Diagrams"

1. Randall P. Wolf, Ph.D. awarded May 1998. Dissertation Title: "Knowledge Acquisition Via Integration of Personal Constructs and Conceptual Graphs"

MASTER'S THESIS STUDENTS SUPERVISED

8. Michael Grenon, M.S. awarded Aug. 2018. Thesis Title: "Contextualized Queries Over Heterogeneous Data With A Property-Graph-Based Knowledge Space"

7. Thomas C. Taylor, M.S. awarded May 2016. Thesis Title: "Semi-Automatic Identification of Synonyms in Structured Knowledge Representations"

6. Caralee Kassos, M.S. awarded May 2011. Thesis Title: "Automatic Detection Of Inconsistencies In A Conceptual Knowledge Base"

5. William Sabados, M.S. awarded May 2010. Thesis Title: "Comparing Semantic Matching Results of Schema Matchers and Metadata Registry Enabled Systems"

4. Danielle DeBraccio, M.S. awarded May 2007. Thesis Title: "Towards Automating Software Architectural Style Selection From Requirements"

3. Bryan J. Smith, M.S.S.E. awarded May 2006. Thesis Title: "A Framework For Analyzing And Testing Requirements With Actors In Conceptual Graphs"

2. Greg Glaze, M.S.S.E. awarded Aug. 2004. Thesis Title: "Automating Software Architecture Selection And Generation"

1. Brian Lampkin, M.S. awarded Aug. 1999. Thesis Title: "Troika: A Hybrid Approach To Knowledge Acquisition And Representation Using Graphs, Grids And Lattices"

CURRICULUM RESPONSIBILITIES

I am (or have been) course coordinator for the following courses. Coordinator duties include: textbook selection, curriculum content, and supervision of instructors.

CS 307	Object-Oriented Programming in C++
CS 321	Introduction to Object-Oriented Programming in Java
CS 390	Unix Programming
CS 424/524	Programming Languages
CS 499	Senior Team Project in Software Engineering
CS 590	Programming Environments With UNIX
CS 551	Object-Oriented Software Development (discontinued)
CS 650	Software Engineering Process
CS 652	Object-Oriented Analysis and Design

COURSES AND SECTIONS TAUGHT

University of Alabama in Huntsville – Computer Science courses

CS 104 **Introduction to Computer Science with JavaCS 107 Computer Science I with CCS 108   Computer Science I with PascalCS 208   Data Structures with PascalCS 221 Data Structures in C++CS 307 Object-Oriented Programming in C++CS 495   Special Topics (Independent Study)**

CS 499 **Senior Team Development Project CS 551   Object-Oriented Software DevelopmentCS 624/524/424 Programming Languages CS 630   Artificial Intelligence I**

CS 635/796 Computational Models of Cognition CS 650 Software Engineering CS 696 Special topics: Advanced Object-Oriented Development Using UML

CS 652 **Systems and Software RequirementsCS 652 Object-Oriented Analysis and DesignCS 656Software TestingCS 696   Special Topics: Software Requirements Using Conceptual Graphs CS 696   Special Topics: Logic Models in Computer Science**

CS 730 **Artificial Intelligence II**

University of Alabama in Huntsville – Honors courses

HON 100 **Honors Lecture Series (formerly Honors Forum)HON 120   Honors InquiryHON 399   Ethics and the Internet** (Interdisciplinary seminar with Profs. Deborah Heikes and Don Bowyer)**HON 399   Machine Intelligence in Movies/TV*Univ. of Alabama in Huntsville, Professional and Continuing Studies***

Principles of UML Modeling*University of Memphis (formerly Memphis State Univ.)*

COMP 1900 Computer Programming I (Pascal) COMP 3420   Computer OrganizationCOMP 4003   Computer Organization and Assembly LanguageCOMP 4081 Software DevelopmentHONORS, AWARDS, AND RECOGNITION

- Featured in *Charger Times* article, "Teacher Profile: Harry Delugach," by Cydney Nichols, Aug. 27, 2015.
- Featured in *Charger Times* article, "Group of UAH professors develops innovative software that will help coordinate teamwork," by Sarah Bastos, April 21, 2015.
- Recipient of College of Science **Dean's Service Award** for Teaching, Service and Scholarship, 2007.
- Featured in news articles for assisting in Bevilacqua Research Corporation OpenCG software donation, 2005.
- Featured in news articles about CharGer conceptual graph software, 2005.
- **NASA Faculty Fellowship**, NASA Marshall Space Flight Center, 2003.
- Resolution for service from the **University of Alabama System Board of Trustees**, June 25, 1999.
- **NASA Graduate Student Fellowship**, NASA Langley Research Center, 1986-1989.

INVITED TALKS

- Tutorial, "Introduction to Python Programming", Huntsville chapter, Society of Reliability Engineers (SRE) RAM Training Summit, 2017, 2018, Defense Acquisition University, Huntsville, AL.
- Honors Lecture, "Solar Sidewalks," UAH, March 12, 2015.
- International Standards Organization (ISO) JTC1/SC32, 2007 Open Forum on Metadata Technology Standardization, "Common Logic - A standard for exchanging logical semantic data," July 10, 2007, New York, NY USA. Hosted by Farance, Inc.
- 6th Annual University of Alabama System Honors Research Day, Keynote Address: "Can Computers Think?" April 20, 2007, Huntsville, AL, USA
- Honors Forum, Univ. of Alabama in Huntsville, "Machine intelligence on the big screen," March 27, 2007, Huntsville, AL, USA
- PhD course on Conceptual Structures, in conjunction with the 14th Intl. Conf. on Conceptual Structures (ICCS 2006), July 2006, Aalborg, Denmark, hosted by Aalborg University's Doctoral School in Human Centered Informatics.
- Honors Forum, Univ. of Alabama in Huntsville, "Building Active Knowledge Systems Using Conceptual Graphs," Oct. 4, 2005, Huntsville, AL, USA
- International Standards Organization (ISO) JTC1/SC32, 2005 Open Forum on Metadata Technology Standardization, "Common Logic in Support of Ontologies," April 14, 2005, Berlin, Germany.
- STARLab, Department of Informatics (Computer Science), Vrije Universiteit Brussel, "Knowledge Systems Using Common Logic," April 10, 2005, Brussels, Belgium.
- Dept. of Information Systems and Management, Tilburg University, "Building Active Knowledge Systems Using Formalisms," Nov. 25, 2004, Tilburg, The Netherlands.
- International Standards Organization (ISO) JTC1/SC32, 2004 Open Forum for eBusiness and Metadata Technology Standardization, "Introduction to Common Logic and Conceptual Graphs," May 17, 2004, Xi'an, China.
- Rhodes College, Department of Mathematics and Computer Science, "Using Conceptual Graphs in Knowledge-Based Systems," Jan. 22, 2004, Memphis, Tennessee.
- NASA Marshall Space Flight Center Engineering Directorate, Flight Systems Group, "Semi-Automated Acquisition of Flight Software Requirements," July 29, 2003, Huntsville, Alabama.

- 11th Int. Conf. On Conceptual Structures (ICCS 2003), "Towards Building Active Knowledge Systems With Conceptual Graphs," July 2003, Dresden, Germany.
- Huntsville Section, IEEE Computer Society, May 13, 2003, "Modern Techniques in Software Engineering."
- International Standards Organization (ISO) JTC1/SC32 Sixth International Open Forum on Metadata Registries, "Formal knowledge representation for metadata registries," Jan 23, 2003, Santa Fe, NM.
- UAH Computer Science Department Seminar Series, "Beyond Databases: Representing Knowledge With Conceptual Graphs," October 21, 2000.
- Department of Defense Human Factors Engineering Technical Advisory Group (DoD HFE TAG), Human and Modeling and Simulation SubTAG., "Using Sowa's Conceptual Graphs for Representing Mental Models of Students", El Paso, TX, Nov. 6, 2000.
- Threat Systems Management Office, Huntsville, AL, March 15, 2000, "Introduction to Conceptual Graphs."
- American Society of Engineers From India (ASEI), Huntsville Chapter, Sept. 14, 1994, "Object-Oriented Technology in Software Development."
- Huntsville Section, IEEE Computer Society, Feb. 17, 1993, "Object-Oriented Software Development."
- Seventh Annual Workshop on Conceptual Graphs, New Mexico State University, July 10, 1992. "Software Development Standards For PEIRCE - A Joint Conceptual Graph Workbench."
- Computational Logic Seminar, Memphis State University, Feb. 2, 1990. "Issues in Parsing Algebraic Expressions in Prolog." Memphis, Tennessee
- Cognitive Science Research Seminar, Memphis State University, Sept. 26, 1989. "Multiple Views of Software Requirements Using Conceptual Graphs." Memphis, Tennessee

PROFESSIONAL SERVICE

Serving the State

- Member, Articulation and General Studies Committee, Interdisciplinary/Honors/Innovative Committee, 2010-2014.
- Member, University of Alabama System Strategic Planning Task Force, 1999-2000.
- Member, University of Alabama System Strategic Planning Group, 1998-1999.
- Faculty Representative, University of Alabama System Board of Trustees, 1998-1999.
- Faculty Representative, Alabama Conference of College and University Faculty Presidents (ACCUFP), 1997-1998.

Serving the Community

- Presented "Guitar Mathematics: From Pythagoras to Les Paul", *MuSTEM* Summer Residential Camp 2018, June 25, 2018
- Judge for INSPIRESS High School Engineering / NASA engineering competition, 2011-present
- Judge for Louis Stokes Alliance for Minority Participation (LSAMP) state competition, 2014
- Member of Higher Education Advisory Board, New Century Technology High School, 2010-2012.
- Speaker at Liberty Middle School Career Day, Dec. 2007.
- Prresented on artificial intelligence at Buckhorn High School, 1997-1998.
- Reviewer for scholarship applicants, Alabama K-12 teachers for the Success Through Academic Research (STAR) program, 2010-2013.

Serving the University

- University Review Board (promotion and tenure committee), chair, 2002-2004, member 2018-2020.

- Faculty reappointment/tenure/promotion committees, member, College of Nursing, 1997-present.
- Member, Five Year Review Committee for the Dean of the Graduate School and Director of International Services, 2018.
- Member, English Department self-study committee, 2015.
- Member, Enrollment Management Committee, 2012-2014.
- Member, Web Re-design Coordinating Committee, 2013-2014.
- Member and coordinator, Strategic Planning Task Force regarding increasing university event visibility and participation among stakeholders, 2012.
- Member, Strategic Planning Task Force regarding increased recruitment, retention and graduation rates, 2012.
- UAH Faculty Senate:
    - Elected representative, UAH Faculty Senate (for the Computer Science Department), 1994-1998, 2005-2007, 2016-2018. Member, Finance and Resources Committee
    - Chair, Finance and Resources Committee, UAH Faculty Senate, 2006-2007.
    - Responsible for selection and oversight of the Research Experience for Undergraduates program, 2006-07 academic year.
    - Chair, Faculty and Student Development Committee, UAH Faculty Senate, 2005-2006.
    - Past-President and Executive Board member (ex officio), UAH Faculty Senate, 1999-2001.
    - President, UAH Faculty Senate, 1998-1999.
    - President-elect, UAH Faculty Senate, 1997-98.
    - Vice-President, UAH Faculty Senate, 1996-97.
    - Chair, Admissions and Scholastic Affairs Committee, UAH Faculty Senate, 1994-1995.
- Member (ex officio) Financial Aid Committee, 2009-2014.
- Member, Dean's Leadership Scholarship Committee, 2011-2014.
- Reader, Commencement Ceremony, 2009-2013.
- Honors Council, member, 2003-2009.
    - Chair (ex officio) University Honors Council, 2009-2014.
- Institutional Review Board (Human Subjects Committee), 2008-2009.
- Faculty Appeals Committee, member, 2005-2009, 2013-2014, 2019-2021; chair, 2013, chair of Hearing Committee, 2009.
- Governance Chair (Audit Subcommittee) during university-wide Southern Association of College and Schools (SACS) Accreditation process, 2004-2006.
- Dean's evaluation team for Communication Arts Department in the College of Liberal Arts, member, March, 2004.
- Student Affairs Advisory Board, member, 2004-2008.
- University Judicial Board, member, 2002-2004; chair of Hearing Committee, 2004.
- Graduate Council representative from the College of Science, 1992-1996, 2000-2004.
- Graduate observer, representing the Graduate School at various Master's and Ph.D. defenses and examinations, 1991-present.
- Educational Technology and Distance Education Committee, member, 1999-2001.
- Honorary Degrees and Naming Committee, member (ex-officio), 1998-1999.
- Information Services Users' Advisory Group, member, 1995-1997, 2000-2001.
- University Commencement Committee, member (ex-officio), 1999.
- Deans and Directors Council, member, 2009-2014, member (ex-officio), 1998-1999.
- Administrative Council, member (ex-officio), 1998-1999.

- Speaker and organizer, Faculty Survival Skills session for new faculty orientation, 1998-2002.
- Advisor to Honors Forum students for their "Campus as Text" project, 2002-2005.
- Faculty representative and occasional moderator, COMPASS (new student orientation), 2000-2006.
- Search committees:
  - Instructional Technology Administrator (chair), 2007.
  - Provost and V.P. of Academic Affairs, 2000.
  - College of Science Dean, 1998.
  - Dean of Graduate Studies, 1998.
  - Asst. V.P. for Information Systems, 1998.

Serving the Department

- Coordinator for ABET (Accreditation Board for Engineering and Technology) information gathering, 2016-present
- Member, Student Outcomes Assessment Committee, 2006-present.
- Coordinator of departmental seminar series, 2006-2008.
- Faculty advisor, student chapter of the Association for Computing Machinery (Charger ACM), 2006-2009.
- Coordinator for undergraduate recruiting, 2005-2009.
- Chair, Software Engineering Curriculum Development committee, 2003-2004.
- Webmaster, software engineering web site, 2000-2005.
- Editor, Technical Report series, 1997-2002.
- Faculty search committee, 2003.
- Course coordinator for introductory Java courses, and software engineering
- Coordinator, Master's comprehensive exam, 1998, 2002, 2007.
- Served as System Administrator (1993) for all CS department computing systems, supervising one full-time and three part-time persons

Serving the College of Science

- Conducted computer competition during the Science Olympiad, Feb. 2010.
- Hosted prospective students and their parents at recruitment event, Nov. 2007.
- Frontiers in Science, PH 110 lecture, "No Such Thing: Modeling the Real World," Univ. of Alabama in Huntsville, given in 2007, 2008, 2010, 2016, and 201.
- Member of Mathematical Sciences Departmental Review Committee, 2006.
- Member and Chair, Promotion and Tenure Advisory Committee (PTAC), 2004-2005
- Judge for Regional Science Fair, March 2004.
- Judge for Science Olympiad, computer competition, 2003, 2010.
- UAH Public Affairs Office, spokesman on the Year 2000 (Y2K) problem, 1998-2000.
- Presenter at Days of Discovery high school recruitment activities, 1992-1996.

Service to Computing and Research Disciplines

- **Conceptual Structures Research**
  - Associate Editor, Intl. Jour. of Conceptual Structures and Smart Applications, July 2017-present.
  - Editorial Review Board, *Intl. Jour. of Conceptual Structures and Smart Applications*, 2014-2017.

- Program Committee, IJCAI Intl. Wkshop. On Graph Structures For Knowledge Representation And Reasoning, July 2009.
- Program co-chair, First Conceptual Structures Tool Interoperability Workshop, in conjunction with the 14th Intl. Conf. on Conceptual Structures (ICCS'2004), Aalborg, Denmark, July, 2006.
- General Chair, 12th Intl. Conf. on Conceptual Structures (ICCS'2004), Huntsville, AL, July 19-23, 2004.
- General Chair, 5th Intl. Conf. on Conceptual Structures (ICCS'97), Seattle, Washington, August 4-8, 1997.
- Program Chair (with Gerd Stumme), 9th Intl. Conf. on Conceptual Structures (ICCS'2001), Palo Alto, California, July 30-Aug. 3, 2001.
- Program Committee member, Intl. Conf. On Conceptual Structures (ICCS), 1993-present.
- Editorial Board member, Intl. Conf. On Conceptual Structures (ICCS), 1996-present.

- **International Standards Development**
  - Editor of ISO/IEC 24707:2007, a published international standard based on the Common Logic project
  - Representative of UAH to the DM32.8 (formerly INCITS/L8) committee, the national body representing the U.S. (ANSI) on standards for metadata and knowledge interchange for the International Standards Organization (ISO), 2003-2009.
  - Hosted ISO/IEC JTC1/SC 32/WG 2 interim meeting in Huntsville, AL, Oct. 16-20, 2006.

- **Pragmatics and Collaborative Systems**
  - Program Co-chair, 3rd Intl. Pragmatic Web Conference, Uppsala, Sweden, 2008.
  - Program Committee member, 1st and 2nd Intl. Pragmatic Web Conference, 2006-2007.
  - Program Committee member, 5th Intl. Conf. on Action in Language, Organizations and Information Systems (ALOIS 2008)

- **Technical Reviewer**
  - Reviewer, *Computational Intelligence*, 2017-present.
  - Reviewer, *Simulation: Trans. of the Society for Modeling and Simulation Intl.*, 2010 - present.
  - Reviewer, *Applied Intelligence Journal*, 2007-present.
  - Reviewer, *Intl Journal of Software Engineering and Knowledge Engineering*, 2015
  - Reviewer, *Software Testing, Verification and Reliability*, 2014-2015
  - Reviewer, *Minds and Machines*, 2012.
  - Reviewer, *Journal of Software: Evolution and Process*, 2012.
  - Reviewer, *IEEE Trans. on Knowledge and Data Engineering*, 2004.
  - Reviewer, *The Handbook of Information Security*, published by Wiley, 2004.
  - Reviewer, *The Handbook of Technology Management*, published by Wiley, 2008.
  - Book Reviewer, *Software Engineering: A Practitioner's Approach*, by Roger S. Pressman, 6th edition.
  - Reviewer, *IEEE Software*, 2001.
  - Reviewer, *Crossroads*, national ACM student publication, 2001.
  - National Science Foundation Review Panel, IIS (Information And Intelligent Systems) Division, Information Integration and Informatics Cluster, 2007.

- Letter to the Editor (published), *Scientific American*, Sept. 2005
- External Ph.D. Thesis Reviewer, Dept. of Computer Science, Univ. of Queensland, Australia, 2003.