

VALERIE B. BARR

Professor and Chair of Computer Science
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Union College
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EDUCATION:

PhD. (Computer Science) May, 1996, Rutgers University, 1989 – 1996.

Title of Dissertation: **Applications of Rule-Based Coverage Measures to Expert System Evaluation**, also published as Rutgers University Technical Report DCS-TR-340.

M.S. (Computer Science), New York University, 1977 – 1979.

B.A. (Applied Mathematics) *cum laude*, Mount Holyoke College, 1973 – 1977.

CURRENT RESEARCH:

Development of verification and validation methodology and tools for natural language processing (NLP) systems. Re-analysis of NSF data on degree production in science and engineering disciplines – 1966 – 2001. Curricular changes to support broadening computing education.

RESEARCH INTERESTS:

Software testing, with applications to AI and NLP systems; women and computer science.

TEACHING AND RESEARCH EXPERIENCE:

Union College. Department Chair and Professor of Computer Science, September 2004 to present.

Courses Taught: Computers and Computing, Creative Computing, Introduction to Computational Science, Artificial Intelligence, Compiler Construction, Programming Languages, Large Scale Software Development, Introduction to Women's and Gender Studies, Scholars Research Seminar “Brilliant Mind, Embattled Soul”

Hofstra University. Associate Department Chair, January 2001 – August 2004; Associate Professor of Computer Science, September 2000 to August 2004; Assistant Professor of Computer Science, September 1996 to August 2000; Instructor in Computer Science, September 1995 – August 1996.

Courses Taught: Overview of Computer Science (non-majors); Fundamentals of Computer Science 1 and 2; Discrete Mathematics 1; Data Structures and Algorithms; Software Engineering; Programming Languages; Compiler Construction; Artificial Intelligence; Computers, Ethics, and Society; Introduction to Women's Studies; Gender and Science.

Columbia University, Visiting Research Scholar, Computer Science Dept. and Center for Research on Information Access, September 1999 – February 2001 (funded by NSF POWRE grant).

Polytechnic University of New York. Visiting Assistant Professor of Computer Science, September 1994 to May 1995.

Courses Taught: Introduction to Programming Methodology; Compilers; C, UNIX, and Software Development.

Mount Holyoke College. Visiting Instructor in Computer Science, September 1991 to December 1992.

Courses Taught: Introduction to Computer Science; C and UNIX; Data Structures; Compilers; Analysis of Algorithms

Rutgers University. Teaching Assistant and Lecturer, September 1989 to May 1991.

Pratt Institute. Assistant Professor of Computer Science, January 1987 to August 1989.

Courant Institute of Mathematical Sciences, New York University. Research Assistant, Summer 1987; Research and Teaching Assistant, September 1977 to May 1979.

INDUSTRY EXPERIENCE:

SUPAC and Supreme Equipment Corporation, Micro-software Manager, 1982 – 1985; Dubner Computer Systems, Staff Consultant, 1980 – 1982; Exxon Corporation, Systems Analyst, 1979 – 1980; independent consultant, 1985-2001.

JOURNAL PUBLICATIONS:

“Validation and verification of intelligent systems – what are they and how are they different?” with Avelino Gonzalez, *Journal of Experimental and Theoretical Artificial Intelligence*, Volume 12, Number 4 October 2000.

“Applications of rule-base coverage measures to expert system evaluation,” *Journal of Knowledge Based Systems* Volume 12(1999), pp. 27-35.

“Application of control flow and data flow analysis to rule-based systems,” *Annals of Software Engineering* Volume 4 (1997), pp. 171-189.

“Exploring expert systems,” *IEEE Computer*, November 1988, pp. 68-73.

REFEREED CONFERENCE PAPERS:

“A Proposed Model for Effective Verification of Natural Language Generation Systems”, Florida Artificial Intelligence Research Society Conference (FLAIRS), May 2003, St. Augustine, Florida, pp. 208-212.

“Validation of Human Behavior Representations,” with S.Y. Harmon, C.W.D. Hoffman, A.J. Gonzalez, R. Knauf, Foundations-02, October 2001, Baltimore, MD.

“A Quagmire of Terminology: Verification & Validation, Testing, and Evaluation,” FLAIRS-2001, Key West, May 2001.

“Applying reliability engineering to expert systems,” FLAIRS-99, May, 1999, Orlando, FL,

pp. 494 - 498.

“Software testing across the curriculum,” Eastern Small College Computing Conference, October, 1998, Poughkeepsie, NY.

“Applications of rule-base coverage measures to expert system evaluation,” AAAI-97, August, 1997, Providence, RI, pp. 411 - 416.

“Rule-based system testing with control and data flow techniques,” International Software Quality-Week '96, May 1996, San Francisco, CA, Vol. 2, pp. 1 - 15.

“TRUBAC: A tool for testing expert systems with rule-base coverage measures,” 13th Annual Pacific Northwest Software Quality Conference, Sept. 1995, Portland, OR.

EDITED JOURNALS:

International Journal of Artificial Intelligence Tools (IJAIT), Special Issue on Selected Papers from the 17-th International FLAIRS Conference (FLAIRS-2004), Vol 14, No. 1 & 2, February & April 2005, guest editor with Zdravko Markov.

CONFERENCE PANELS:

“Building a campus wide computation initiative”, Consortium for Computing Sciences in Colleges, October, 2008.

“Emerging technologies in language engineering”, Grace Hopper Conference, September 2000.

“Advantages and Limits of Using Formal Methods”, Florida Artificial Intelligence Research Symposium, May 2000.

“Software testing in the CS curriculum”, Consortium for Computing in Small Colleges Northeast Regional Conference, April 2000.

“Does information technology reduce discrimination?”, The Information Technology Revolution: Women, Work, and Social Change. Mount Holyoke College, February 2000.

“CS1 program examples,” Consortium for Computing in Small Colleges Northeast Regional Conference, April 1998.

INVITED PRESENTATIONS:

City University of New York Computer Science Discipline Council Meeting, March, 2008. “A Campus-Wide Computation Initiative”

General Electric Global Research, Niskayuna, NY and IBM Industry Solutions Laboratory, Hawthorne, NY, December 2004. “Verification of Lexicalized Tree Adjoining Grammars”.

University of Edinburgh, November 2000. “Testing and Evaluation of NLP Systems”, Division of Informatics joint AIAI/HCRC/ICCS/ICSA/IRR seminar.

University of Pennsylvania, October 1996. "Applications of rule-based coverage measures," Computer and Information Science Department Colloquium.

REFEREED WORKSHOP PAPERS:

"Can Computers Think? - an introduction to computer science, programming, and artificial intelligence", with Kristina Striegnitz, short paper, AAAI Spring Symposium, March, 2008.

"Verification of LTAGs for Language Generation", with Ellen Siefring, TAG+7 International Workshop on Tree Adjoining Grammars, May 2004, Vancouver.

"Verification and Validation of Language Processing Systems: Is It Evaluation?", with Judith L. Klavans, ACL 2001 Workshop on Evaluation Methodologies for Language and Dialogue Systems, July 2001, Toulouse, pp. 34 – 40.

"Quantitative performance prediction for rule-based expert systems," AAAI-98 Workshop on Verification and Validation of Expert Systems, July, 1998, Madison, WI, pp. 10 - 15.

"Application of clustering analysis to coverage testing for large KBS," with Mala Mehrotra, AAAI-98 Workshop on Verification and Validation of Expert Systems, July, 1998, Madison, WI, pp. 16 - 17.

"Rule-based coverage measures applied to testing rule-bases with uncertainty," IJCAI-95 Workshop on Verification and Validation of Expert Systems, Aug. 1995, Montreal, pp. 70 - 76.

"Rule-based systems testing using rule-based coverage measures," IEEE Conference on AI Applications Workshop on Verification and Validation of Expert Systems, February 1995.

"Incorporating uncertainty in a DAG-based approach to static and dynamic verification of rule-based systems: Extended Abstract," AAAI-93 Workshop on Verification and Validation of Expert Systems, July 1993, Washington, DC, pp. 129-130.

"A DAG-based approach to static and dynamic verification of rule-based systems," AAAI-92 Workshop on Verification and Validation of Expert Systems, July 1992, San Jose, CA.

INVITED WORKSHOPS:

SECANT: Science Education in Computational Thinking 2008 Workshop, October, 2008.

"Campus Wide Computation Initiative - A New Model for Computing Education."

NSF workshop "Beyond LEGOs: Hardware, Software, and Curriculum for the Next Generation Robot Laboratory," August, 2003, Univ. of Massachusetts - Lowell.

NSF workshop "Software Testing in the Undergraduate Curriculum", June 1999, Univ. of Alabama.

AAAI-97 Workshop on Verification and Validation of Expert Systems, August 1997, Providence, RI.

NSF workshop "Undergraduate Artificial Intelligence Education", June 1996, Temple University, Swarthmore College, Bryn Mawr College.

International Software Engineering Education Workshop, International Conference on Software Engineering, May 1997, Boston, MA.

AAAI-94 Workshop on Verification and Validation of Expert Systems, August 1994, Seattle, WA.

FELLOWSHIPS & GRANTS:

NSF CPATH Grant 0722203 “CPATH EAE: Campus Wide Computation Initiative - A New Model for Computing Education”, Collaborative with Lafayette College, \$1,150,000. August, 2007.

NSF CPATH Grant 0722277 CPATH CB: Social Robotics collaborative with SUNY Albany, Rensselaer Polytechnic Institute, Schenectady Community College, Schenectady Museum. \$326,752. August, 2007

NSF POWRE Grant EIA-9973855 “Software Evaluation: The Application of Software Testing Techniques to Rule-Based Natural Language Processing Components”, \$74,832. August, 1999.

Hofstra University Faculty Research and Development Grant, 1999-2000; 1996-1997; Hofstra University Presidential Research Award, 1996-1997.

University Fellowship for Graduate Study, Rutgers University, 9/93 – 6/94.

Marian Johnson Fellowship for Graduate Study, Rutgers University, 1/93 – 6/93.

The GE Foundation Faculty for the Future Program, Summer 1992.

Class of 1905 Fellowship for Graduate Study, Mount Holyoke College, 9/90 – 6/91.

DEPARTMENT, COLLEGE, AND UNIVERSITY ACTIVITIES:

Union College

Academic Computing Steering Committee, September 2005 – present.

Computer Engineering Advisory Committee, September 2004 – present.

Digital Art Program Committee, January 2005 – present.

Film Studies Program Committee, 2007 – present.

Science and Engineering Facilities Planning Committee, September 2004 – present.

Women and Gender Studies Advisory Board, September 2004 – present.

General Education Board, September 2005 – June 2007.

Web Policy Board, September 2007 – 2008.

Hofstra University

Associate Department Chair, January 2001 – August 2004.

Chair, Department Personnel Committee, January 2001-August 2004.

Faculty Senate Committee on Academic Computing, 1999-2000, 2002-2004.

AAUP Committee on Women and Minorities, 2002-2004.

Member of Task Force to Re-evaluate ROTC at Hofstra, 1999-2000.

Hofstra College Computing Needs Committee, 1998.

Program Chair for Hofstra University Women and Computing Symposium, 1998.
Hofstra University Center for Teaching Excellence, 1997-2000.
Computer Science Club adviser, 1997-1999.
Department Undergraduate Curriculum Committee, 1995-1999, chair 1996-1999.

PROFESSIONAL AFFILIATIONS and ACTIVITIES:

ACM-W (ACM's Committee on Women in Computing), 2006 – present.

Advisory Board, Anita Borg Institute for Women and Technology (2000-2007, chair 2001-2006)

Professional society memberships: Association for Computing Machinery, ACM SIGART, ACM SIGCSE, AAI, Computer Professionals for Social Responsibility, IEEE, IEEE Computer Society.

NSF review panel participant for 7 solicitations between 2000 and 2008.

Conference organizing: Workshop co-chair for Tapia 2009; Program co-chair for FLAIRS-2004; Program committee member, special track on Verification and Validation, FLAIRS 2000-2003; Special tracks coordinator for FLAIRS-1999.

Journal and conference reviewing: *Journal of Knowledge-Based Systems*; *Annals of Software Engineering*; *IEEE Transactions on Knowledge and Data Engineering*; *IEEE Transactions on Education*; *IEEE Transactions on Systems, Man and Cybernetics*; SIGCSE 1999-2008; CCSCNE 1997-2001, 2005-2008; Metrics '97, Tapia 2009..

RELATED SERVICE:

Panelist: "Contemporary and Historical Representations of Women: How do they reflect and impact the culture of their times?", Convent of the Sacred Heart School, January, 2005.

Judge for FIRST Robotics regional competition, 2002 and 2003.

Presentation at the Harker School, San Jose, CA. "Adventures in Verification of Natural Language Processing Software". April, 2002

Presenter for *Nassau Science Explorations*, May 1998.

Panelist for "Career Paths for Women in Software", sponsored by the New York Software Industry Association (NYSIA) and the Society of Women Engineers (SWE), March, 1998.

Judge for *LeRonald Science Fair*, May 1997.

Douglass Science Career Exploration Day, sponsored by Douglass Project for Rutgers Women in Math, Science, and Engineering; Douglass College, October 1996 and November 1995.

Douglass Science Institute, Douglass College, July 1996: Computer Science instructor for 10th and 11th grade girls.

Women in Science, Engineering, and Technology New Jersey State Conference of Community Colleges, April 1993: Panel Participant “Women in Computer Science”

New Jersey Institute of Technology’s Career Day for Women, November 1992: “On Facing College Study in Scientific and Technical Fields:

Mount Holyoke College Conference on Status of Women in Science, November 1992: Panel Participant “Making Career Choices: Advice to Today’s Undergraduates”