ERIC J. BRAUDE

Last updated: July 10, 2023; ebraude@bu.edu

Education

Ph.D.	Columbia University	Mathematics	1971
M.S.	University of Miami	Computer Science	1980
M.S.	University of Illinois	Mathematics	1967
B. Sc. (hons)	University of Natal	Mathematics	1966

Employment

1990-present: Boston University Metropolitan College
Associate Professor of Computer Science
Chair, Computer Science Department, 1990-1995
Acting Associate Dean for Academic Affairs, 1992-1993
Director of Digital Learning, 2019 - date

1987-90: MITRE Corporation, Advanced Technology Department, Bedford MA
Associate Department Head
Part time:
Boston University College of Arts and Sciences
Computer Science Adjunct Faculty (CAS)

1982-87: RCA/GE Advanced Technology Labs
Manager, software laboratories
Staff Engineer To Vice President.
Manager, Intelligent Systems Programs
Part Time:
University Of Pennsylvania
Penn State University
Adjunct Professor Of Computer Science

1979-82: Naval Surface Warfare Center, Department of Defense
Computer Scientist
Part time: N. J. Institute of Technology
Adjunct Professor Of Computer Science

1976-79: Penn State University, Behrend College
Acting head, science and engineering division
mathematics coordinator; associate professor of mathematics

Publications

Books and Book Chapters

“Software Engineering: Modern Approaches,” Eric Braude and Michael Bernstein, Waveland Press 782 pages (2016) (formerly published by Wiley in 2010)

"Components and Frameworks in the Cloud Era," Dino Konstantopoulos, Mike Pinkerton, and Eric Braude. Chapter in "Software Reuse in the Emerging Cloud Computing Era," Hongji Yang and Xiaodong Liu (eds.), IGI (2012)

"Software Design: From Programming to Architecture” Wiley, ISBN 0-471-20459-5, Cloth, 550 pages (2003), cross-listed by IEEE
-- also in Portuguese and Korean

“Software Engineering: an Object-Oriented Perspective” Wiley, ISBN 0-471-32208-3, Cloth, 575 pages (2001)
-- also in Russian, Spanish, Korean, Chinese and Japanese.

“Software Engineering: Selected Readings” (editor) IEEE, ISBN 0780348176, 340 pages (2000)

"Object Oriented Analysis, Design and Testing: Selected Readings" (editor) IEEE, ISBN: 0780323416, 269 pages (1998)

"Analyzing and Designing Object-Oriented Systems", IEEE, ISBN: 0-7803-2324-60-7803-2324-6, Self-study course and workbook of exercises (1997)

"The Algebra of Calculus", DC Heath / Houghton Mifflin, ISBN 0-669-21885-5 (1990); Online version, 2003.

Refereed Journal Articles

Braude, E., & Abdyldayev, S. (n.d.). Generalizing Morley’s and Other Theorems with Automated Realization. Journal of Automated Reasoning volume 60, pp 503–526 (2018) doi:10.1007/s10817-017-9435-3

"Evaluation of Knowla: An Online Assessment and Learning Tool" by Meredith Myra Thompson and Eric John Braude, Journal of Educational Computing Research 54 (4), January 2016

“Weakest Preconditions and Cumulative Subgoal Fulfillment,” Science of Computer Programming Volume 89, Part C, 1 September 2014, Pages 223–234

"Best Principles in the Design of Shared Software," Dino Konstantopoulos, Mike Pinkerton, Eric Braude; 3rd IEEE International Workshop Quality-Oriented Reuse of Software (IEEE QUORS'09), July 2009.

"Software-as-a-Service and Offshoring," International Journal of Business Transformations, March-April 2009.

“Facilitating Security Education in an Online Environment,” with Adam Arakelian; Journal of Security Education, Volume 2, Number 3, 33-40 (2007)

"Obtaining Sample Path Derivatives by Source Code Instrumentation", Discrete Event Dynamic System: Theory and Applications, 6, 371-378 (1996)

"Optimization Using Simulation", Simulation Digest (1991)

"Cocontinuity I: a Urysohn's Lemma for Partially Ordered Sets", Journal London Math. Society, (2), 18, pp365-373 (1978)

"Semilattice Theory with Applications to Point Set Topology", Fundamenta Mathematicae, 94, pp95-108 (1977)

"G-Souslin Diagonals and a Theorem of Lorch and Tong", General Topology and its Applications, 5, pp181-194 (1975)

"Compact G-Souslin Sets are G-delta's", Proc. of the American Math. Society, 40, pp250-252 (1973)

"Perfect Open and Distinguishable Multivalued Maps", Trans. of the American Math. Society, 182, pp431-441 (1971)

"Descriptive Baire and Descriptive Z-analytic Sets", Proc. of the London Math. Society, (3) 23, p409-427 (1971)

Other Scholarly Papers and Refereed Conference Proceedings

"Value-added Grading of AI-assisted Papers," 19th Annual International Conference on Computer Science and Education in Computer Science, June 2023, Boston, MA, to appear.
"Plagiarism Abatement with Templates," 18th Annual International Conference on Computer Science and Education in Computer Science, June 2022, Sofia, Bulgaria, to appear.

“De-Fragmenting Code-Embedded UML: A Design,” 13th Annual International Conference on Computer Science and Education in Computer Science, June 30th to July 3th 2017, Albena, Bulgaria

"Incremental UML for Agile Development: Embedding UML Class Models in Source Code," RCoSE '17 Proceedings of the 3rd International Workshop on Rapid Continuous Software Engineering, Pages 27-31

"Students Learn by Doing; or Do They?", 15th Annual International Conference on Computer Science and Education in Computer Science, June 2016

"Using The Knowla Knowledge Assembly System To Teach Programming", 11th Annual International Conference on Computer Science and Education in Computer Science, Boston MA, June 2015

"Assessment of KNOWLA: Knowledge Assembly for Learning and Assessment" by Thompson, M., Braude, E., Canfield, C., Halfond, J., & Sengupta, A., Learning at Scale. 2015, ACM: Vancouver, BC.

“Using the Dafny Verification System in an "Introduction to Algorithms" Class: A Preliminary Report” 10th International Workshop on Computer Science and Education in Computer Science, June 2014

“Cumulative Software Architecture Development,” 2014 Working IFIP/IEEE Conference on Software Architecture

"Dijkstra’s Counting Arguments, Puzzles, and Cumulative Subgoal Fulfillment" Proceedings of the 9th International Workshop on Computer Science and Education in Computer Science, (June 2013)

"Programming with Discipline: Cumulative Subgoal Fulfillment" Proceedings of the 8th International Workshop on Computer Science and Education in Computer Science, (July 2012)

“A Mashup Framework for Composable Resources in the Presence of Unreliability,” International Journal of Advances in Computing and Management, with Dino Konstantopuolos, 1-6 (2012)

"Applications of Cumulative Subgoal Fulfillment to Linear Programming," Proceedings of the 7 Annual International Conference on Computer Science and Education in Computer Science (2011), 43-52

Review of "Hot, Flat and Crowded" by Thomas Friedman (Farrar, Straus and Giroux, 2008), International Journal of Business Insights and Transformations 2, 2, 2009

“Cumulative Subgoal Fulfillment in Software Development,” Proceedings of the 11th IASTED International Conference on Software Engineering and Applications, 480-485 (2007)

With K. Bodi, E. Braude, T. Prokaeva, and D. Seldin. "Neural Networks as Classifiers for Amyloidogenic Light Chain Sequences;” Evans Day Symposium, Boston University Medical School (2007)

With V. Kanabar, S. Zlateva, and R. Stainov. “Integrating Distance Learning with Traditional Delivery in a Graduate Certificate Program for IT Professionals” *Proceedings of the 2002 American Society for Engineering Education Annual Conference & Exposition, American Society for Engineering Education*, Montreal, June 2002.

With V. Kanabar, S. Zlateva, and R. Stainov. “Blending Web Based and Traditional Delivery in a Graduate Certificate for Information Technology Professionals, *Proceedings of the 2002 ASEE/SEFI/TUB, American Society for Engineering Education*, Berlin, October 2002.

"Towards a Standard Class Framework for Discrete Event Simulation" Proceedings, 31st Annual Simulation Symposium IEEE, ISBN 0-8186-8418-6 (1998), 4-8.

"Single-run Simulations: Experimental Results" with Bernard Leipzig, SCSC '97, M. Obiadat et al , eds. Society for Computer Simulation, San Diego, ISBN 1-56555-123-0 (1997)

"Simulating with Entire Piecewise Linear Distributions" SCSC '96, A Saylor et al , eds. Society for Computer Simulation, San Diego, ISBN 1-56555-098-6, 47-51 (1996)

"A General Method for Determining the Sensitivity of Simulations" SCSC '95, Tuncer Oren and Louis Berta, eds. Society for Computer Simulation, San Diego, (1995).

"Enhanced Execution: Getting more out of programs", MITRE Corporation, (1990)

"Knowledge: The New Commodity and its Impacts on Society", by invitation, ASME Winter Ann. Mtg. and 86-WA/TS-3 (1986)

"Computer Languages: A View from the Top", RCA Engineer (1984)

"AI Applications to ATE Support", co-author, Tech. Report, NAEC (1983)

"The HPL Language and Compiler: a Floyd-Evans Implementation", Tech. Report 81-446, NSWC (1982)

Patent

US patent number 5,282,128, issued January 25, 1994: "Apparatus and Method for Determining Process Gradients"

In Preparation

Book: “Cumulative Subgoal Fulfillment” (research monograph; tentative title)

Teaching

MOST RECENT NEW PROGRAMS AND COURSES DEVELOPED

- Graduate Certificate in Machine Learning (2018)
- Master of Science in Software Development (proposal leader; 2016)
- Information Systems in Python course (2015)
- Graduate Certificate Program in Multimedia and Videogame Engineering (2007)
- CS 633 "Distributed Software Development" (2007)
- Two BU certificate programs for Kronos Inc.: One new and one tailored (2006)

COMPUTER SCIENCE COURSES TAUGHT

- Advanced Object-Oriented programming with Design Patterns
- Agile and Advanced Software Engineering
- Algorithm Design
- Artificial Intelligence
- Compiler Construction
- C++
- Data Structures
- Decision Support Systems
- Design Patterns and Components
- Development with Security
- Distributed Software Development
- Fuzzy, Expert and Neural Systems
- Information Systems in Python
- IT Security Policies and Procedures
- Intelligent Systems
- Internet-based Application Development
- Introduction to Computer Science
- IT Strategy and Management
- Machine Learning
- Mobile Application Development
- Object-Oriented Analysis and Design
- Object-Oriented Simulation
- Development with Security
- Software Engineering
- Software Testing and Quality Assurance
- System Analysis
- Web Services

MATHEMATICS

Algebra, Analysis, Calculus, Topology

Awards and Honors

- Jonah Speaker, Temple Emanuel, Andover, MA 2017

- Grant: "KNOWLA: Machine-Gradable Essay-Style Assessment and Self-Learning with Knowledge Assembly" from Boston University Digital Learning Initiative, $66,000, 2014
- "Best Principles in the Design of Shared Software" by Konstantopoulos, Pinkerton, and Braude, selected as among "some best papers from ... workshop and recommend(ed) ... to be published in a research handbook..."
- Designated alumnus donation, 2005
- Boston University grants for technology use in education, and distance education methods, 2000-2005
- RCA management award
- Graduate Fellow, Columbia University
- International Institute of Education appointee
- CSIR fellowship for graduate study
- Rhodes scholarship finalist

Technical Experience

Mentored corporate teams to introduce software engineering, security, and object-oriented technology. Direct and indirect clients include the following.

SmartCurrent-2017; The Chief Executives Organization – 2013; Philips Medical – 2005, 2006; Aventis – 2004; Mercury Computer Systems – 2001, 2002; Tridium Inc. -- 2001; Andover Controls – 2000; State Street Bank – 2000; CISCO --- 1999; Ariel Technology – 1998 - 1999; Dynamics Research Corporation -- 1995 - 1998; Lucent Technology – 1998; GTE – 1997; Vectis – 1997; Foxboro Corporation -- 1996; Desktop Data inc. -- 1996; Lockheed Sanders – 1991-96; PRI Automation – 1994; MITRE Corporation-- 1990-92

- Audited designs for security
- Mentored numerous software development groups
- Reviewed software designs
- Developed method for determining sensitivity of simulation outputs to parameter inputs.
- Introduced code inspection techniques corporation-wide.
- Consulted on methods for large-scale software development
- Performed research at the intersection of Applied Mathematics, Artificial Intelligence, Operations Research and Simulation. Supervised work in Neural Nets.
- Introduced Neural Net technology to GE/RCA at Advanced Technology Laboratories
- Reviewer and responsible RCA release authority for numerous technical reports to U.S. government on AI, robotics and image processing
- Defined technical areas for R&D projects in software including:
    - Neural Nets
    - Expert systems tools and applications to maintenance, ATE
    - AI applied to decision making and command and control
    - Natural language /voice control

    - Formal verification of software
    - Compiler R&D
    - Projects in robotics, image and speech processing
- Supervised technical and project management in expert systems for maintenance of Navy radars
- Designed and implemented expert systems for SDI and USW decision-making
- Robot imaging and control for mail handling
- Designed and implemented formally verifiable code for the US Navy
- Performed research and wrote papers on AI, Expert systems and mathematics
- Designed and implemented compiler for use by US Navy

Leadership

- Chair, MET Academic Conduct Committee, Boston University, MET College, 2020
- Chair, Promotion and Tenure Committee in 20/21, Boston University, MET College, 2020
- Chairman, Search Committee for Director of Arts Administration at Boston University Metropolitan College, 2014-15
- Chairman, Committee on Doctoral Programs, 2013-14
- Chairman, Academic Conduct Committee, 2014-20
- Redesigned and combined CS 665 and CS 770 into "Software Patterns and Analysis"
- Responsible for Software Engineering and Artificial Intelligence areas
- Organizing opportunities to deliver classes in India 2008
- Managed Areas within Computer Science Department
    - Software Engineering 2000 to present
    - Artificial Intelligence 2000 to present
    - Multimedia and Video Game Engineering 2007 to present
- Initiated and contributed heavily to a collective handbook of online teaching experience, 2006-2007
- Academic Conduct Committee, 2004-2006, Chairman
- Search Committee for Bachelor's Program in Liberal Arts, 2004-2005, Chairman
- College R&D Committee, 2002-03, Chairman
- Chair, Search Committee for Director of the Science and Engineering Program, 2003-2004
- Co chair, ad hoc committee on faculty evaluation guidelines, 2001
- Chair Academic Policy Committee at the Metropolitan College, 1996-1998
- Directed program in Computer Science at the Metropolitan College, 1990-1995.
- Acted as Associate Dean for Academic Affairs, Metropolitan College of Boston University (faculty, existing programs, new programs, courses, undergraduate and graduate admissions and appeals, office staff, curriculum, overseas programs)
- Coordinated mathematics department at Behrend College of Penn State.
- Organized new division of Science and Engineering within the Behrend College of Penn State University
- Founded Software Laboratories for RCA Government Systems Division
- Managed unit managers at MITRE Corporation

Committee Membership

- Nominating Committee 2017 – date
- Arts Administration Search Committees 2017 - date
- Executive Committee 2011- 2013
- Promotion Committee 2012-date
- Academic Conduct Committee 1998-2000, 2007-2008, 2009-date
- Merit Review Committee 2007-2008
- Search Committee for Outreach Director 2007-2008
- Academic Conduct Committee -1998-2000, 2007-2008
- Research and Development Committee 2006-2072005
- Search Committee for Degree Continuation Program, Chairman
- Center for Excellence in Teaching, 2003-2005
- Search Committee for Science and Engineering Program, 2002-03, Chairman
- Summer School Committee, 2001-2003
- Long-range Planning Committee, 2001, 2002
- Academic Policy Committee 1996-2000, 2001-2002, 2003-2007
- Ad Hoc Faculty Evaluation Committee 2001
- Executive Committee 1991-95, 2000, 2001
- Joint University/Faculty Council Planning Committee,1995-1998
- Working Group On Software Engineering Degree Guidelines

Invited Presentations and Conferences

- "In-class Common-reporting Workshops in Computer Science," Computer Science and Education in Computer Science (2019), 1, 31-33.
- "Guided-KNOWLA," (2019) with Ye Liu, Sixth ACM Conference on Learning @ Scale - L@S '19.
- “Incremental UML for agile development with PREXEL” (2018) with J. Van Schooneveld, 40th International Conference on Software Engineering Companion Proceeedings - ICSE '18, Buenos Aires, Argentina
- "A Framework for Modeling in Scale: An Introduction” (2018), 14th Annual International Conference on Computer Science and Education in Computer Science. Boston, MA
- "The Dijkstra/Gries Loop Invariant Process Formalized and Extended" at Microsoft Research, Redmond, WA, Feb 18, 2013
- Keynote address: "Cumulative Subgoal Fulfillment," International Conference on Advances in Computing and Management, Pune, India, January 6, 2012
- Editorial Board member International Journal of Business Insights and Transformation. 2009 to present
- Invited lecture: "Cumulative Subgoal Fulfillment," University of Warwick, UK, November 2010
- Panel participant at Boston video game developer's meeting: "Education for Video Gaming," 2008
- Panel on Higher Education, Hyderabad, India; January. Reported in Economic times of India, 2008

- Invited lecture: "Cumulative Subgoal Fulfillment in Software Development," UMass Dartmouth Computer Science Department, 2008
- “International Software Development," Institute of Technology and Management, Chennai, India, January 2008.
- Panel participant at Founder's Day for Asian School of Business; Hyderabad, India; January 2008
- With Jay Halfond: “Manipulating History,” Conference on Constructing the New Humanist in Undergraduate Education, Boston University, April 2008
- International Association of Science and Technology: Session Chair; Software Engineering and Applications; "Methodological Advances" session; November 2007
- MET CS Graduation Speaker at Kronos Inc. graduation ceremony; June 2007
- Charles River Associates and MET CS, “Cumulative Subgoal Fulfillment in Software Engineering” 2007
- Invited lecture: UMass Boston “Software Engineering Techniques” 2006
- Business Analyst World, “Quality Assurance for Business Analysts,” Burlington, MA, October 2005
- Investor’s Bank and Trust, 2005 “Object-Oriented Analysis and Design”
- Summer School grant, 2004-2005: New course in advanced Software Engineering and Agile Methods
- Investor’s Bank and Trust, Feb 2004,; DST Corp., August 2004; CitiStreet Corp., August 2004: “Computing in the Next Decade,”
- CrossPoint, Chelmsford, MA, September 2004 “Web Services in Your Future”
- Demonstration of collaboration application, Technology in Education Exhibition, BU, April 2002
- Demonstration of software engineering case study, CS Education conference, March 2001
- Short course on Java, Design Patterns, and Object-Oriented Analysis and Design, Greater Boston Chapter of the IEEE, 1997, 1998, 1999, 2000
- Talk on Design Patterns, Lockheed Sanders Corporation, May 1999
- Talk on CORBA, University of Natal (South Africa) March 1999
- Volunteer with Greater Boston Chapter of the Association for Computer Machinery. 1996
- Invited colloquium talk, New Jersey Institute of Technology, March 9, 1994 "The Gradient of a Program."
- Co-organizer, Summer Computer Simulation Conference, Boston, 1993
- Presentations on my research to various Boston-area companies (1992-93)
- Lecture to Local chapter of Society for Computer Simulation on object-oriented simulation (1992)
- IEEE D.C. conference on Neural Nets, 1989 - co-chairman
- American Society of Mechanical Engineers - on AI (1986)
- Data Processing Management Association - on AI (1985)
- Software Cost Estimation Group: SCAGG - on AI (1985)
- IEEE Expert Systems in Government (1985) - Conference Vice-chairman
- IEEE Philadelphia Chapter - on AI (1984)

Grants and Special Programs

- KNOWLA: Machine-Gradable Essay-Style Assessment and Self-Learning with Knowledge Assembly, Boston University Digital Learning Initiative, Principal Investigator
- Travel Grant for two to Pune, India; January 2012
- "Accountability on Demand for Composable Capabilities on Demand," MITRE Corporation; $12,000 award amount, 2010
- "Advanced Software Engineering Course" awarded by Summer School, 2004-2005
- "Blended Distance Face-face version of Web Services Course" awarded by Summer School, 2002-2003
- "Longitudinal Learning Communities via Course Sites" awarded by the University Instructional Technology Grant Program, 2000-2001
- Co-wrote and participated in departmental distance education grant, 1999
- Introduced certificates in Software Development and Software Engineering, 1996
- Initiated distance education at the Metropolitan College, 1995, 1996
- Established on-site MS degrees at Boston area companies, 1994, 1996
- Conducted Undergraduate Research Participation grants from NSF and the Cottrell Foundation, 1972-1974

Other

Poetry
"What on Earth", Midway Journal, to Appear
"The Education of a Lover", Panoplyzine, May 2023
"The Amanzimtoti," Book of Matches, May 2023
"Looking From America", I-70 Review 2023
"A Study of My Own" nominated for The Pushcart Prize
"Holding On", Frost Meadow Review v11
"Bolzano, Northern Italy", South Florida Poetry Journal 2023
"Johannesburg, 1955", J Journal, Spring 2023
"A Study of my Own" to appear in Apple Valley Review
"Heard, When I Called Your Group Home" to appear in Constellations
"Great-uncle Sets a Tone" and "Looking for the Place," 2018 Mizmor Anthology eCollection, December 2018
"A Boy's Desserts", Poetica, Fall 2016
Composition for Flute with Poetry based on my poems, by Jeffrey Brody, 2015
"Poet Meet" (Preface), "Wintry Mix", and "World Class Windows", *Songs from the Castle's Remains*, 2013 Winner, 27th annual Eagle-Tribune/Robert Frost Foundation Spring Poetry Contest, 2009

Other
Founder, Boston Public Library Shakespeare Reading Group
Cofounder, White Mountain Flute Conservatory