Elizabeth Bradley
Department of Computer Science
University of Colorado
Boulder CO 80309-0430
(303) 492-5355
email: lizb@cs.colorado.edu

Research Interests

Nonlinear dynamics and nonlinear time-series analysis

Degrees Awarded

Ph.D. Electrical Engineering and Computer Science

Massachusetts Institute of Technology September 1992

Thesis research under Professors G. J. Sussman and H. Abelson combining ideas from nonlinear dynamics, artificial intelligence, and control theory in order to exploit chaotic behavior. Minor in mathematical physics: general relativity, galactic dynamics, etc.

S.M. Computer Science

Massachusetts Institute of Technology June 1986

Thesis research under Professor R. H. Halstead on multiprocessor applications. Advanced training in digital signal processing, VLSI, network theory and circuit design, and simulation.

S.B. Electrical Engineering

Massachusetts Institute of Technology December 1983

Broad curriculum in electrical engineering, with emphasis on analog and digital circuit design. Secondary focuses on ancient history and a variety of foreign languages.

Professional History

Professor

University of Colorado

Chair May 2003 to February 2006

Associate Professor May 1999 to May 2004

Assistant Professor January 1993 to May 1999

Department of Computer Science. Joint appointments/affiliations: Department of Electrical, Computer, and Energy Engineering; Department of Applied Mathematics. Currently supervising or co-supervising dissertation work for four Ph.D. students, and a BS student.

Radcliffe Fellow

Radcliffe Institute for Advanced Study AY2006-2007

Visiting Scholar

Harvard University Spring 1997

Division of Engineering and Applied Sciences AY1999-2000, AY2013-2014

Doctoral Candidate/Research Assistant

Massachusetts Institute of Technology 1986 to 1992

Researched and implemented computer control algorithms that exploit chaos. Designed and built physical devices to demonstrate these tools.

Honors

President's Teaching Scholar 2017–present
The University of Colorado system's highest recognition of excellence in and active commitment to learning, scholarly teaching and research, and creative work

CU GOLD Faculty Integrity Award 2011
The yearly student-voted CU-wide award for "dedication to the virtues of academic integrity"

Women of Excellence, MIT Crew 2010
35th Anniversary, MIT Alumni Association

CRA-W Distinguished Professor 2008
CAPP-R (Cohort of Associate Professors Project)

Radcliffe Fellow 2006-2007

Subaru CU Educator Spotlight Award 2002

Member of the External Faculty, Santa Fe Institute 1999-present

John & Mercedes Peebles Innovation in Teaching Award 1999
The yearly student-voted College of Engineering award

Packard Fellowship in Science and Engineering 1995-2000

NSF National Young Investigator Award 1993-1998

AAUW Dissertation Fellowship 1991/92 Academic Year

IEEE Senior Member

1988 Olympic Games 5th Place, Rowing, Women's Four With Coxswain

Publications

I. Journal Papers

- V. Deshmukh, S. Bhaskar, T. Berger, E. Bradley, and J. D. Meiss, "Comparing Feature Sets and Machine-Learning Models for Prediction of Solar Flares: Topology, Physics, and Model Complexity," *Astronomy & Astrophysics* **674**:A159 (2023).
- V. Deshmukh, R. Meikle, E. Bradley, J. D. Meiss, and J. Garland, "Using Scaling-Region Distributions to Select Embedding Parameters," *Physica D*:**446**:133674 (2023).
- D. Du, A. Subramanian, W. Han, W. Chapman, E. Bradley and J. Weiss, "Increase in MJO Predictability Under Global Warming," *Nature Climate Change* DOI: 10.1038/s41558-023-01885-0 (2023)
- V. Deshmukh, E. Bradley, J. Garland, and J. D. Meiss, "Toward Automated Extraction and Characterization of Scaling Regions in Dynamical Systems," *Chaos* **31**:123102 (2021)
- S. Molnar, E. Bradley, and K. Gruchalla, "Oscillatory Spreading and Inertia in Power Grids," *Chaos* **31**:123103 (2021)
- M. Neuder, E. Bradley, E. Dlugokencky, J. White, and J. Garland, "Detection of Local Mixing in Time-Series Data Using Permutation Entropy," *Physical Review E* **103**:022217 (2021).
- V. Deshmukh, E. Bradley, J. Garland, and J. D. Meiss, "Using Curvature to Select the Time Lag for Delay Reconstruction," *Chaos* **30**:053108 (2020).
- V. Deshmukh, T. Berger, E. Bradley, and J. D. Meiss, "Leveraging the Mathematics of Shape for Solar Magnetic Eruption Prediction," *Journal of Space Weather and Space Climate* **10**:13 (2020).
- J. Garland, T. R. Jones, E. Bradley, M. Neuder, J. W. C. White, "Climate Entropy Production Recorded in a Deep Antarctic Ice Core," *Chaos* **29**:101105 (2019).

- D. Khider *et al.*, "PaCTS 1.0: A Crowdsourced Reporting Standard for Paleoclimate Data," *Paleoceanography and Paleoclimatology* **34**:1570 (2019).
- J. Garland, T. R. Jones, V. Morris, M. Neuder, J. W. C. White, E. Bradley, "Anomaly Detection in Paleoclimate Records using Information Theory," *Entropy* **20**:931 (2018).
- E. Bradley, T. Nelson, and L. Rassbach de Vesine, "CSciBox: Artificial Intelligence for Age-Depth Modeling," *PAGES* **26**:72 (2018).
- J. Emile-Geay, D. Khider, D. Garijo, N. P McKay, Y. Gil, V. Ratnakar, E. Bradley, "The Linked Earth Ontology: A Modular, Extensible Representation of Open Paleoclimate Data," *Earth Science Informatics* (2018).
- J. Garland, E. Bradley, and J. Meiss, "Exploring the Topology of Dynamical Reconstructions," *Physica D* **334**:49–59 (2016).
- J. Garland, R. James and E. Bradley, "Leveraging Information Storage to Select Forecast-Optimal Parameters for Delay-Coordinate Reconstructions," *Physical Review E* **93**:022221 (2016).
- J. Garland and E. Bradley, "Prediction in Projection," *Chaos* **25**:123108 (2015).
- Z. Alexander, E. Bradley, J. D. Meiss, and N. Sanderson, "Simplicial Multivalued Maps and the Witness Complex for Dynamical Analysis of Time Series," *SIAM Journal on Applied Dynamical Systems* **14**:1278-1307 (2015).
- E. Bradley and H. Kantz, "Nonlinear Time-Series Analysis Revisited," *Chaos* **25**:097610 (2015). 6th most cited article in *Chaos* in 2017.
- E. Bradley, L. Pecora, and A. Motter, "Introduction to Focus Issue: The 25th Anniversary of Chaos: Perspectives on Nonlinear Science—Past, Present, and Future," *Chaos* **25**:097501 (2015).
- E. Komendera, J. Garland, D. Scheeres, and E. Bradley, "Efficiently Evaluating Reachable Sets in the Circular Restricted 3-Body-Problem," *IEEE Transactions on Aerospace and Electronic Systems* **51**:454–467 (2015).
- J. Garland, R. James, and E. Bradley, "Quantifying Time-Series Predictability through Structural Complexity," *Physical Review E* **90**:052910 (2014).
- K. Anderson, E. Bradley, L. Rassbach de Vesine, M. Zreda, and C. Zweck, "Forensic Reasoning and Paleoclimatology: Creating a System That Works," *Advances in Cognitive Systems*, **3**: 221-240 (2014).
- N. Look, C. Arellano, A. Grabowski, W. McDermott, R. Kram, and E. Bradley, "Dynamic Stability of Running: The Effects of Speed and Leg Amputations on the Maximal Lyapunov Exponent," *Chaos* **23**:043131 (2013). Featured in the "Editor's Picks" section of *Chaos* and spotlighted in the "Physics Update" section of *Physics Today*, 6 December 2013.
- Z. Alexander, E. Bradley, J. Garland and J. Meiss, "Iterated Function System Models in Data Analysis: Detection and Separation," *Chaos* **22**:023103 (2012).
- C. Phillips, L. Becker, and E. Bradley, "Strange Beta: An Assistance System for Indoor Rock Climbing Route Setting Using Chaotic Variations and Machine Learning," *Chaos* **22**:013130 (2012).
- C. Zweck, M. Zreda, K. Anderson, and E. Bradley, "The Theoretical Basis for ACE, an Age Calculation Engine for Cosmogenic Nuclides," *Chemical Geology* **291**:199–205 (2012)
- R. Hoenigman, A. Lim, and E. Bradley, "Cooperation in Bike Racing: When to Work Together and When to Go It Alone," *Complexity* **17**:39–44 (2011).
- L. Rassbach, K. Anderson, and E. Bradley, "Providing Decision Support for Cosmogenic Isotope Dating," *AI Magazine* **32**:69–78 (2011)

- E. Bradley, D. Capps, J. Luftig, and J. Stuart, "Towards Stylistic Consonance in Human Movement Synthesis," *Open AI Journal* **4**:1–19 (2010)
- N. Ross, J. Hertzberg, and E. Bradley, "Discretization of the Vorticity Field of a Planar Jet," *Experiments in Fluids* **49**:1161–1175 (2010)
- T. Mytkowicz, E. Bradley, and A. Diwan, "Computers Are Dynamical Systems," *Chaos* **19**:033124 (2009).
- T. Peacock and E. Bradley, "Going with (or Against) the Flow," *Science* **320**:1302-1303 (2008)
- J. Giardino, J. Hertzberg, and E. Bradley, "A Calibration Procedure for Millimeter-Scale Stereomicroscopic Particle Image Velocimetry," *Experiments in Fluids* **45**:1037–1045. (2008).
- R. Stolle, A. Hogan, and E. Bradley, "Agenda Control for Heterogeneous Reasoners," *Journal of Logic and Algebraic Programming* **62**:41–69 (2005)
- D. Gorman, P. Gruenwald, P. Hanlon, I. Mezic, L. Waller, C. Castilla-Chavez, E. Bradley, and J. Mezic, "Implications of Systems Dynamic Models and Control Theory for Environmental Approaches to the Prevention of Alcohol- and Other Drug-Related Problems," *Substance Use and Misuse* **39**:1713–1750 (2004)
- V. Robins, J. Abernethy, N. Rooney, and E. Bradley, "Topology and Intelligent Data Analysis," *Intelligent Data Analysis* **8**:505–515 (2004)
- T. Peacock, J. Hertzberg, Y-C. Lee, and E. Bradley, "Forcing a Planar Jet Flow with MEMS," *Experiments in Fluids* **37**:22–28 (2004)
- V. Robins, N. Rooney, and E. Bradley, "Topology-Based Signal Separation," *Chaos* **14**:305–316 (2004)
- Z. Ma, E. Bradley, T. Peacock, J. Hertzberg, and Y-C. Lee, "Solder-Assembled Large MEMS Flaps for Fluid Mixing," *IEEE Transactions on Advanced Packaging* **26**:268–276 (2003)
- E. Bradley and R. Mantilla, "Recurrence Plots and Unstable Periodic Orbits," *Chaos* **12**:596–600 (2002)
- E. Bradley, M. Easley, and R. Stolle, "Reasoning About Nonlinear System Identification," *Artificial Intelligence* **133**:139–188 (2001)
- V. Robins, J. Meiss, and E. Bradley, "Computing Connectedness: Disconnectedness and Discreteness," *Physica D* **139**:276–300 (2000)
- E. Bradley, A. O'Gallagher, and J. Rogers, "Global Solutions for Nonlinear Systems using Qualitative Reasoning," *Annals of Mathematics and Artificial Intelligence*, **23**:211–228 (1998)
- J. Iwanski and E. Bradley, "Recurrence Plot Analysis: To Embed or not to Embed?," *Chaos*, **8**:861–871 (1998)
- E. Bradley and J. Stuart, "Using Chaos to Generate Variations on Movement Sequences," *Chaos*, **8**:800–807 (1998)
- V. Robins, J. Meiss, and E. Bradley, "Computing Connectedness: An Exercise in Computational Topology," *Nonlinearity*, **11**:913–922 (1998)
- E. Bradley and M. Easley, "Reasoning About Sensor Data for Automated System Identification," *Intelligent Data Analysis* **2**:123–138 (1998)
- J. Dixon, E. Bradley, and Z. Popović, "Nonlinear Time-Domain Analysis of Injection-Locked Microwave MESFET Oscillators," *IEEE Transactions on Microwave Theory and Technique*, **45:**1050–1057 (1997)
- E. Bradley and R. Stolle, "Automatic Construction of Accurate Models of Physical Systems," *Annals of Mathematics and Artificial Intelligence*, **17**:1–28 (1996)

- E. Bradley and D. Straub, "Using Chaos to Improve the Capture Range of a Phase-Locked Loop: Experimental Verification," *IEEE Transactions on Circuits and Systems*, **43**:914–922 (1996)
- E. Bradley, "Autonomous Exploration and Control of Chaotic Systems," *Cybernetics and Systems*, **26**:299–319 (1995)
- E. Bradley, "Causes and Effects of Chaos," *Computers and Graphics*, **19**:755–778 (1995)
- E. Bradley, "Using Chaos to Improve the Capture Range of a Phase-Locked Loop," *IEEE Transactions on Circuits and Systems*, **40**:808–818 (1993)
- E. Bradley and F. Zhao, "Phase Space Control System Design," *IEEE Control Systems Magazine*, **13**:39–46 (1993)
- E. Bradley and R. Halstead, "Simulating Logic Circuits: A Multiprocessor Application," *International Journal of Parallel Programming*, **16**:305–338 (1987)

II. Books, Book Chapters, and Theses

- J. Gama, E. Bradley, and J. Hollmén, eds., *Advances in Intelligent Data Analysis X*, Springer, *Lecture Notes in Computer Science* volume 7014, 2011 (30064 chapter downloads as of June 2019)
- R. Stolle and E. Bradley, "Communicable Knowledge in Automated System Identification," in *The Computational Discovery of Communicable Knowledge*, L. Todorovski and S. Dzeroski, eds., Springer, 2004
- M. Easley and E. Bradley, "Incorporating Engineering Formalisms into Automated Model Builders," in *The Computational Discovery of Communicable Knowledge*, L. Todorovski and S. Dzeroski, eds. Springer, 2004
- E. Bradley, "Kirchhoff's Laws," in A. Scott, editor, *Encyclopedia of Nonlinear Science*, Routledge, 2004
- M. Berthold, H.-J. Lenz, E. Bradley, and R. Kruse, eds., *Advances in Intelligent Data Analysis V*, Springer, *Lecture Notes in Computer Science* volume 2810, 2003
- R. Stolle, M. Easley, and E. Bradley, "Reasoning about Models of Nonlinear Systems," in *Logical and Computational Aspects of Model-Based Reasoning*, L. Magnani *et al.*, eds. Kluwer, 2002
- M. Easley and E. Bradley, "Information Granulation in Automated Modeling," in W. Pedrycz, editor, *Granular Computing: An Emerging Paradigm*, Physica-Verlag, 2001
- E. Bradley, "Time-Series Analysis," in M. Berthold and D. Hand, editors, *Intelligent Data Analysis: An Introduction*, Springer-Verlag, 2000; second edition, 2003
- E. Bradley, *Taming Chaotic Circuits*. Ph.D. Dissertation, 1992
- E. Bradley, *Logic Simulation on a Multiprocessor*, S.M. Dissertation, 1986

III. Refereed Conference Papers

- V. Deshmukh, T. Berger, J. D. Meiss and E. Bradley, "Shape-Based Feature Engineering for Solar Flare Prediction," *IAAI (Proceedings of the 33rd Conference on Innovative Applications of Artificial Intelligence)*, Virtual, February 2021.
- G. Gharooni Fard, E. Bradley, and O. Peleg, "Data-Driven Modeling of Resource Distribution in Honeybee Swarms," *ALife (Proceedings of the 2020 Conference on Artificial Life)*, Montreal ($\rightarrow$ virtual), July 2020.
- N. Sanderson, E. Shugerman, S. Molnar, J. Meiss, and E. Bradley, "Computational Topology Techniques for Characterizing Time-Series Data", *IDA-17 (Proceedings of the 13th International Symposium on Intelligent Data Analysis)*, London, October 2017.

- J. Garland, T. Jones, E. Bradley, R. James and J. W. C. White, "A First Step Toward Quantifying the Climate's Information Production Over the Last 68,000 Years," *IDA-16 (Proceedings of the 12th International Symposium on Intelligent Data Analysis)*, Stockholm, October 2016. Springer, *Lecture Notes in Computer Science* volume 9897, 2016.
- L. Rassbach de Vesine, K. Anderson, M. Zreda, C. Zweck, and E. Bradley, "Forensic Reasoning about Paleoclimatology," *AAAI Fall Symposium on Discovery Informatics*, Arlington VA, November 2013.
- J. Garland and E. Bradley, "On the Importance of Nonlinear Modeling in Computer Performance Prediction," **Best paper award**, *IDA-13 (Proceedings of the 12th International Symposium on Intelligent Data Analysis)*, London, October 2013. Springer *Lecture Notes in Computer Science* volume 8207.
- E. Komendera, D. Scheeres, and E. Bradley, "Intelligent Computation of Reachability Sets for Space Missions," *IAAI-12 (Proceedings of the 24th Conference on Innovative Applications of Artificial Intelligence)*, Toronto; July 2012.
- E. Bradley, E. Komendera, and D. Scheeres, "Efficiently Locating Impact and Escape Scenarios in Spacecraft Reachability Sets," *AIAA/AAS Astrodynamics Specialist Conference*, Minneapolis, August 2012.
- R. Hoenigman, E. Bradley, N. Barger, "Water Conservation Through Facilitation on Residential Landscapes," *AAAI-11 (Proceedings of the 25th National Conference on Artificial Intelligence)*, San Francisco; August 2011.
- J. Garland and E. Bradley, "Predicting Computer Performance Dynamics," *IDA-11 (Proceedings of the 10th International Symposium on Intelligent Data Analysis)*, Porto, October 2011. Springer *Lecture Notes in Computer Science* volume 7014.
- K. Gruchalla, M. Rast, E. Bradley, P. Minnini, "Segmentation and Visualization of Multivariate Features using Feature-Local Distributions," *ISVC (Proceedings of the 7th International Symposium on Visual Computing)*, Las Vegas; July 2011. Springer *Lecture Notes in Computer Science* volume 6938.
- L. Rassbach, K. Anderson, and E. Bradley, "Providing Decision Support for Cosmogenic Isotope Dating," *IAAI-10 (Proceedings of the 22nd Conference on Innovative Applications of Artificial Intelligence)*, Atlanta; July 2010.
- R. Hoenigman, E. Bradley and N. Barger, "AgentScapes — Designing Water Efficient Landscapes Using Distributed Agent-based Optimization," *GECCO-10 (Proceedings of the Genetic and Evolutionary Computation Conference)*, Portland OR; July 2010.
- C. Phillips and E. Bradley, "Strange Beta: Chaotic Variations for Indoor Rock Climbing Route Setting," *ICAND-10 (Proceedings of the International Conference on Applications in Nonlinear Dynamics)*, Lake Louise; September 2010.
- Z. Alexander, T. Mytkowicz, A. Diwan and E. Bradley, "Measurement and Dynamical Analysis of Computer Performance Data," *IDA-10 (Proceedings of the 9th International Symposium on Intelligent Data Analysis)*, Tucson; May 2010; Springer *Lecture Notes in Computer Science* volume 6065.
- L. Rassbach, K. Anderson, E. Bradley, C. Zweck and M. Zreda, "End-to-End Support for Dating Paleolandforms," *IDA-10 (Proceedings of the 8th International Symposium on Intelligent Data Analysis)*, Tucson; May 2010; Springer *Lecture Notes in Computer Science* volume 6065.
- A. Rubin, D. Capps, and E. Bradley, "Constructionism and Creative Movement: A Manifesto," *Constructionism (Proceedings of the 12th European Logo Conference)*, Paris; August 2010.

- K. Gruchalla, M. Rast, E. Bradley, J. Clyne, and P. Minnini, "Visualization-Driven Structural and Statistical Analysis of Turbulent Flows," *IDA-09 (Proceedings of the 8th International Symposium on Intelligent Data Analysis)*, Lyon; September 2009; Springer *Lecture Notes in Computer Science* volume 5572.
- J. Abernethy, R. Sharman, and E. Bradley, "An Artificial Intelligence Approach to Operational Aviation Turbulence Forecasting," *Proceedings of the 3rd International Conference on Research in Air Transportation*, Fairfax VA; June 2008.
- L. Rassbach and E. Bradley, "Challenges in Presenting Argumentation Results," *QR-08 (Proceedings of the 22nd International Workshop on Qualitative Reasoning about Physical Systems)*, Boulder; June 2008.
- K. Gruchalla, M. Dubin, J. Marbach, and E. Bradley, "Immersive Examination of the Qualitative Structure of Biomolecules," *QR-08 (Proceedings of the 22nd International Workshop on Qualitative Reasoning about Physical Systems)*, Boulder; June 2008.
- K. Anderson, E. Bradley, M. Zreda, L. Rassbach, C. Zweck, and E. Sheehan. "ACE: Age Calculation Engine: A Design Environment for Cosmogenic Dating Techniques." In *ADVCOMP (Proceedings of the International Conference on Advanced Engineering Computing and Applications in Sciences)*, November 2007.
- L. Rassbach, E. Bradley, K. Anderson, M. Zreda, and C. Zweck, "Arguing about Radioisotope Dating," *QR-07 (Proceedings of the 21st International Workshop on Qualitative Reasoning about Physical Systems)*, Aberystwyth UK; June 2007.
- J. Abernethy, E. Bradley, and R. Sharman, "Qualitative Reasoning About Small-Scale Turbulence in an Operational Setting," *QR-06 (Proceedings of the 20th International Workshop on Qualitative Reasoning about Physical Systems)*, Hanover NH; July 2006.
- N. Ross, E. Bradley, and J. Hertzberg, "Dynamics-Informed Data Assimilation in a Qualitative Fluids Model," *QR-06 (Proceedings of the 20th International Workshop on Qualitative Reasoning about Physical Systems)*, Hanover NH; July 2006.
- V. Robins, J. Abernethy, N. Rooney, and E. Bradley, "Topology and Intelligent Data Analysis," *IDA-03 (Proceedings of the 5th International Symposium on Intelligent Data Analysis)*, Berlin; August 2003; Springer *Lecture Notes in Computer Science* volume 2810.
- Z. Ma, T. Peacock, E. Bradley, and Y.C. Lee, "Solder-assembled MEMS flaps to enhance fluid mixing," *ASME IMECE (Proceedings of the International Mechanical Engineering Congress and Exposition)*, New York; November 2001.
- E. Bradley, N. Collins, and W. Kegelmeyer, "Feature Characterization in Scientific Data," *IDA-01 (Proceedings of the 4th International Symposium on Intelligent Data Analysis)*, Lisbon; September 2001; Springer *Lecture Notes in Computer Science* volume 2189.
- M. Easley and E. Bradley, "Intelligent Sensor Analysis and Actuator Control," *IDA-01 (Proceedings of the 4th International Symposium on Intelligent Data Analysis)*, Lisbon; September 2001; Springer *Lecture Notes in Computer Science* volume 2189.
- M. Easley and E. Bradley, "Meta-domains for Automated System Identification," *ANNIE-00 (Proceedings of the Conference on Smart Engineering System Design)*, St. Louis; November 2000.
- M. Easley and E. Bradley, "Generalized Physical Networks for Automated Model Building," *IJCAI-99 (Proceedings of the 16th International Joint Conference on Artificial Intelligence)*, Stockholm; August 1999.
- M. Easley and E. Bradley, "Reasoning About Input-Output Modeling of Dynamical Systems," *IDA-99 (Proceedings of the 3rd International Symposium on Intelligent Data Analysis)*, Amsterdam; August 1999; Springer *Lecture Notes in Computer Science* volume 1642.

- M. Easley and E. Bradley, "Hybrid phase-portrait analysis in automated system identification," *AAAI Spring Symposium on Hybrid Systems in AI*, Stanford; March 1999. AAAI Technical Report SS-99-05.
- E. Bradley, D. Capps, and A. Rubin, "Can Computers Learn to Dance?," *IDAT-99 (Proceedings of the Conference on International Dance and Technology)*, Tempe AZ; February 1999.
- R. Stolle and E. Bradley, "Multimodal Reasoning for Automatic Model Construction," *AAAI-98 (Proceedings of the 15th National Conference on Artificial Intelligence)*, Madison WI; July 1998.
- J. Stuart and E. Bradley, "Learning the Grammar of Dance," *ICML-98 (Proceedings of the 15th International Conference on Machine Learning)*, Madison WI; July 1998.
- R. Stolle and E. Bradley, "Multimodal Reasoning about Physical Systems," *AAAI Spring Symposium on Multimodal Reasoning*; Stanford CA; March 1998. AAAI Technical Report SS-98-04.
- R. Stolle and E. Bradley, "Opportunistic modeling," *IJCAI Workshop on Engineering Problems in Qualitative Reasoning*, Nagoya Japan; August 1997.
- E. Bradley and M. Easley, "Reasoning About Sensor Data for Automated System Identification," *IDA-97 (Proceedings of the 2nd International Symposium on Intelligent Data Analysis)*, London UK; August 1997; Springer *Lecture Notes in Computer Science* 1280.
- E. Bradley, A. O'Gallagher, and J. Rogers, "Global Solutions for Nonlinear Systems using Qualitative Reasoning," *QR-97 (Proceedings of the International Workshop on Qualitative Reasoning about Physical Systems)*, Cortona Italy; May 1997.
- R. Stolle and E. Bradley, "A Customized Logic Paradigm for Reasoning about Models," *QR-96 (Proceedings of the International Workshop on Qualitative Reasoning about Physical Systems)*, Stanford Sierra Camp CA; May 1996.
- E. Bradley, "Autonomous Exploration and Control of Chaotic Systems," *AAAI Fall Workshop on Control of the Physical World by Intelligent Agents*, New Orleans LA; November 1994.
- E. Bradley, "Automatic Construction of Accurate Models of Physical Systems," *QR-94 (Proceedings of the International Workshop on Qualitative Reasoning about Physical Systems)*, Nara Japan; June 1994.
- E. Bradley and F. Zhao, "Phase Space Control System Design," *CACSD-92 (Proceedings of the IEEE Symposium on Computer-Aided Control System Design)*, Napa CA; March 1992.
- E. Bradley, "Control Algorithms for Chaotic Systems," *Proceedings of the European Conference on Algebraic Computing in Control*, Paris France; March 1991; Springer *Lecture Notes in Control and Information Sciences* volume 165.

IV. Other Publications (Selected)

- N. Bliss, E. Bradley, and C. Krintz (2023), "Building Resilience to Climate Driven Extreme Events with Computing Innovations: A Convergence Accelerator Report," `arxiv.org/abs/2301.10087`.
- G. Gharooni Fard, V. Deshmukh, E. Bradley, C. Topaz, and O. Peleg, "A Persistent Homology Approach for Characterizing Honeybee Behavior during Food Exchange," SIAM News, December 2021.
- N. Bliss, E. Bradley, and C. Monteleoni (2021), "Computing Research for the Climate Crisis," a white paper prepared for the Computing Community Consortium of the Computing Research Association `arXiv:2108.05926`.
- N. Bliss, E. Bradley, J. Garland, F. Menczer, S. Ruston, K. Starbird, and C. Williams (2020) "An Agenda for Disinformation Research," a white paper prepared for the Computing Community Consortium of the Computing Research Association `arXiv:2012.08572`.

- E. Bradley, M. Marathe, M. Moses, W. Gropp, D. LoPresti (2020) "Pandemic Informatics: Preparation, Robustness and Resilience," a white paper prepared for the Computing Community Consortium of the Computing Research Association `arXiv:2012.09300`.
- Chair of Steering Committee, "A 20-Year Roadmap for AI," Computing Community Consortium and Association for the Advancement of Artificial Intelligence, August 2019.
- J. Garland and E. Bradley, "Information Theory in Earth and Space Science," SIAM News, October 2018.
- J. Garnett and E. Bradley,"Unix Memory Allocations are Not Poisson" `arxiv.org/abs/-1803.08981` (2018)
- S. Barocas, E. Bradley, V. Honavar, and F. Provost (2017) "Big Data, Data Science, and Civil Rights," a white paper prepared for the Computing Community Consortium committee of the Computing Research Association
- V. Honavar, K. Yelick, K. Nahrstedt, H. Rushmeier, J. Rexford, M. Hill, E. Bradley, and E. Mynatt. (2017) "Advanced Cyberinfrastructure for Science, Engineering, and Public Policy," a white paper prepared for the Computing Community Consortium committee of the Computing Research Association
- J. Giardino, J. Hertzberg, and E. Bradley, "A Stereo-Microscopic Particle Image Velocimetry System," Paper NC-001. American Physical Society, *57th Annual Meeting of the Division of Fluid Dynamics*, November 21-23, 2004 Seattle, Washington.
- E. Bradley, *Taylor Series: Notes for CSCI3656*, Research Report on Curricula and Teaching CT005-02 (Department of Computer Science), 2002.
- E. Bradley, *Error in Numerical Methods: Notes for CSCI3656*, Research Report on Curricula and Teaching CT004-02 (Department of Computer Science), 2002.
- E. Bradley and J. Stuart, "Optimization and Human Movement," *Newsletter of the SIAM Activity Group on Optimization* **12(1)** (2001)
- E. Bradley, review of *The Computational Beauty of Nature* by Gary Flake, *AI Magazine* **21**:89-91 (Summer 2000)
- E. Bradley, *Classical Mechanics: Notes for CSCI4446/6446*, Research Report on Curricula and Teaching CT007-00 (Department of Computer Science), 1999
- E. Bradley, *Numerical Solution of Differential Equations: Notes for CSCI3656*, Research Report on Curricula and Teaching CT003-98 (Department of Computer Science), 1998
- E. Bradley and J. Stuart, "Using Chaos to Generate Choreographic Variations," *Fourth Experimental Chaos Conference*, Boca Raton FL; August 1997
- E. Bradley, "Hugh Herr: Spring-Loaded Entrepreneur," *Technology Review*, May 1993
- E. Bradley, "A Control Algorithm for Chaotic Physical Systems," *First Experimental Chaos Conference*, Washington D.C.; October 1991. Proceedings published by World Scientific

Invited Presentations (last five years)

- "A Brief Tour of Nonlinear Dynamics," Physics Department Colloquium, Boston College, November 2023.
- "A Brief Tour of Nonlinear Dynamics," Computer Science Department Colloquium, Tufts University, December 2022.
- "Chaos and Control," *ATCO Spacelab Distinguished Lecture Series*, virtual, December 2022.
- "Analysis of Paleoclimate Temperature Dynamics," Max Planck Institute for the Physics of Complex Systems, Dresden, October 2022.

- "Identifying and Evangelizing Emerging Technical Directions," the *Symposium on the Future of Computing Research*, Boston MA, September 2022. Video available at `fcr-2022.net/videos`.
- "Nonlinear Time-Series Analysis," *Evolution of Collective Computational Abilities of (Pre)Historic Societies*, Santa Fe Institute, Santa Fe NM (→ virtual), November 2020.
- "Climate Dynamics Captured in Ice-Core Data," **Invited plenary**, *Australia and New Zealand Industrial and Applied Mathematics Conference (ANZIAM)*, February 2020.
- "Computational Topology Techniques for Characterizing Time-Series Data," *Joint Mathematics Meetings*, Denver, Colorado, January 2020.
- "Nonlinear Time-Series Analysis of a Paleoclimate Temperature Record from Antarctica," *International Workshop on Dynamical Methods in Data-based Exploration of Complex Systems*, Dresden, October 2019.
- "Leveraging Topological Data Analysis and Deep Learning for Solar Flare Prediction," *Machine learning in Heliophysics*, Amsterdam, September 2019.
- "CSciBox: An Artificial Intelligence Tool for Complex Age-Depth Models," IS-GEO webinar (NSF RCN on geosciences and intelligent systems; `is-geo.org`), August 2018.

Funding History

co-I CIRES Innovative Research Proposal, University of Colorado, "Machine Learning Applied to Volcanic Eruption Forecasting," $50K; 2021-2022. PI: Anne Sheehan, CU Geosciences.

PI National Science Foundation award #2127309, "Computing Innovation Fellows Project 2021," $19.999M; 2021-2024. Co-PIs: E Zegura, GA Tech; K. Calvert, Univ. of Kentucky; R. Bryant, CMU; A. Schwartz; Computing Research Association.

PI National Science Foundation award #1734706, "Computing Community Consortium III," $8.376M; 2018-2023. Co-PIs: M. Hill, Microsoft; D. LoPresti, Lehigh University; A. Drobnis, Computing Research Association.

co-PI National Science Foundation award #2030859, "Computing Innovation Fellows 2020 Project," $15.937M; 2020-2023. PI: E. Zegura, GA Tech. Co-PIs: M. Hill, Microsoft; A. Bernat, Computing Research Association; A. Schwartz; Computing Research Association.

Collab National Aeronautics and Space Administration grant #80NSSC20K1404, "Application of Topological Data Analysis and Computational Geometry to Recurrent Deep Learning Algorithms for Solar Eruption Prediction," $496K; 2020-2022. PI: T Berger, SWx-TREC. ("Collaborator" is NASA's term for co-PIs who do not draw salary from the grant.)

PI National Science Foundation contract #AGS 2001670, "Harnessing the Data Revolution in Space Physics: Topological Data Analysis and Deep Learning for Improved Solar Eruption Prediction," $676K; 2020-2024. Co-PIs: J. Meiss, Department of Applied Mathematics; T. Berger, SWx-TREC.

PI National Renewable Energy Lab subcontract UGA-0-41026-90, "Power System Visualization and Analysis for Clean Energy Design" $326K, 2016-2020.

PI National Science Foundation contract #CMMI 1537460, "The Shape of Data: A New Way to Detect Critical Shifts in System Performance." $430K; plus $5K Research Experience for Undergraduates (REU) supplement, 2012-2015. Co-PI: J. Meiss, Department of Applied Mathematics.

PI National Science Foundation contract #CMMI 1447440, "EAGER: Computational Topology Techniques for Characterizing Time-Series Data." $61490; 2014-2015. Co-PI: J. Meiss, Department of Applied Mathematics.

PI National Science Foundation contract #CMMI-1162440, "DynSyst_Special_Topics: Reduced-Order Dynamical Models for Effective Power Management in Computer Systems." $366K plus $12K Research Experience for Undergraduates (REU) supplement #CMMI 1162440; 2012-2016.

PI National Science Foundation contract #1245947 "CREATIV/INSPIRE: Automating Reasoning in Interpreting Climate Records of the Past." $577K plus $16K Research Experience for Undergraduates (REU) supplement #IIS 1245947 and $50K software sustainability supplement; 2012-2016. Co-PIs: K. Anderson, Department of Computer Science; Thomas Marchitto, INSTAAR; James White, INSTAAR.

PI Innovative Seed Grant Program (IGP), University of Colorado, Office of the Vice Chancellor for Research, "Applications of Artificial Intelligence Techniques to the Computation of Reachability Sets." $44K; 2011-2014.

PI University of Colorado Council on Research and Creative Work, Conference Award for grad-student travel grants to attend the *International Workshop on Qualitative Reasoning*. $2K; 2008.

co-PI National Science Foundation contract #SMA-0720692, "CSR—SMA: Validating Architectural Simulators Using Non-Linear Dynamics Techniques." $577K plus $12K Research Experience for Undergraduates (REU) supplement; 2007–2011. Co-PI: A. Diwan, Department of Computer Science.

PI Dean's Seed Grant. $3700K; 2005.

co-PI Equipment gift from Agilent. $18K; 2005. Co-PI: J. Hertzberg, University of Colorado.

co-PI National Science Foundation contract #ATM-0325812, "ITR: Collaborative Research: Software for Interpretation of Cosmogenic Isotope Inventories – A Combination of Geology, Modeling, Software Engineering and Artificial Intelligence." $922K plus $30K Research Experience for Undergraduates (REU) supplement; 2003–2008. Co-PIs: K. Anderson, Department of Computer Science, M. Zreda, University of Arizona.

PI Council on Research and Creative Work, University of Colorado, Grant in Aid "Feature Extraction from Oceanographic Datasets." $7K; 2002–2003

co-PI National Science Foundation Equipment Grant #CTS-0114109, "Acquisition of a Particle Image Velocimetry System." $83K plus $30K Research Experience for Undergraduates (REU) supplement; 2001–2002. Co-PIs: J. Hertzberg, R. Shandas, and V. Bright, Department of Mechanical Engineering.

lead PI National Science Foundation #ACI-0083004, "An Interactive Experimental/Numerical Simulation System with Applications in MEMS Design." $497K; 2000–2003. Co-PIs: J. Hertzberg and Y-C. Lee, Department of Mechanical Engineering.

PI Sandia National Laboratories # 0100.12.0033B, "Feature Extraction from Large Scientific Datasets." $167K; 2000–2002.

PI Office of Naval Research #N00014-96-1-0720, "Automatic Construction of Accurate Models of Physical Systems." $304K; 1996–1999.

PI Packard Fellowship in Science and Engineering, David and Lucile Packard Foundation. $550K; 1995–2000.

PI National Science Foundation #MIP-9403223, "Automatic Construction of Accurate Models of Physical Systems." $65K; 1994–1995.

PI National Science Foundation National Young Investigator Award #CCR-9357740, "New Approaches to Engineering Design: Controlled Chaos and Computer Automation." $287K; 1993–1998.

PI National Science Foundation Research Initiation Grant #CCR-9309556, "Automatic Construction and Refinement of Dynamic Systems Models." Proposal accepted in 1993, but withdrawn because of NYI award.

Research Mentoring

Unless otherwise noted, all are in the Department of Computer Science. ECE = Electrical and Computer Engineering.

- Postdocs
  - Thomas Peacock: fluid flow control in micromachined systems *[1/98 – 12/99; now a full professor in the Mechanical Engineering Department at MIT]*
  - Ryan James: information-theoretic metrics for time series *[9/13–6/14; now a research scientist at UC Davis]*
  - Laura de Vesine: automated reasoning about ice cores *[11/12–6/17]*
  - Thomas Nelson: software engineering and optimization for ice-core processing *[5/16–9/17]*
  - Tyler Jones: ice-core data analysis (with James White) *[5/16–8/19]*
- Ph.D. students
  - Jennifer Abernethy: forecast system for clear-air turbulence *[Degree awarded 12/08; went on to a postdoc at CSIRO in Australia]*
  - Zach Alexander: topology of computer dynamics *[Degree awarded 5/12; took position at Microsoft Research]*
  - Lily Cothren: model reduction in dynamical systems *[joined group in fall of 2023]*
  - Morgan Byers: topological data analysis *[began Ph.D. 1/23]*
  - Varad Deshmukh: topological data analysis and machine learning for solar flare prediction *[Degree awarded 5/22; now at Meta]*
  - Matthew Easley: automated input-output modeling of dynamical systems *[Degree awarded 12/00; now leading the cybersecurity effort for the Army Futures command in DC]*
  - Joshua Garland: prediction of computer dynamics *[Degree awarded 5/16; went on to a Fellow position at the Santa Fe Institute]*
  - James Garnett: modeling and control of computer networks *[Degree awarded 12/04; took a position at Secure64]*
  - Golnar Gharooni Fard *[Began Ph.D. 1/18; co-advised with Orit Peleg]*
  - Kenny Gruchalla: visualization of data from dynamical systems *[Degree awarded 12/09; now leading the scientific visualization group at NREL]*
  - Rhonda Hoenigman: agent-based modeling of landscape ecology *[Degree awarded 8/12; moved to an instructorship and then the Dean's office at CU-Boulder]*
  - Joseph Iwanski: recurrence-plot analysis of time series from dynamical systems *[ABD, Applied Mathematics; now chair of Mathematics and Computer Science at the Dwight Englewood School.]*
  - Samantha Molnar: power-grid dynamics *[Degree awarded 5/22; co-advised with Kenny Gruchalla; now at NREL.]*
  - Corey Murphey: information-theoretic analysis of paleorecords *[Began Ph.D. 5/21; co-advised with Jed Brown and Allison Hilger (SLHS)]*
  - Todd Mytkowicz: nonlinear dynamics of computer performance *[Degree awarded 12/09; co-advised with Amer Diwan; took a position at Microsoft Research]*
  - Laura Rassbach: artificial intelligence tools for paleoclimate dating *[Degree awarded 12/09; took a position at Google Research]*

- Vanessa Robins: computational topology *[Degree awarded 6/00; co-advised with James Meiss (Applied Mathematics); now on the faculty at the Australian National University]*
- Natalie Ross (nee Rooney): data assimilation *[Degree awarded 5/08; now a technical manager at Infoprint]*
- Nikki Sanderson: computational topology *[Degree awarded 5/19; co-advised with James Meiss (Applied Mathematics); took a postdoc at Berkeley]*
- Tyler Scott: machine learning *[Degree awarded 1/23; co-advised with Mike Mozer; took a position at Google Research]*
- Reinhard Stolle: automated modeling of dynamical systems *[Degree awarded 8/98; now leading the autonomous vehicles division at Audi]*
- Elizabeth White: automatic detection of conflict & support statements in the medical literature *[Degree awarded 5/10; co-advised with Larry Hunter; moved to instructor position at CU-Boulder]*

- B.S. thesis students
  - Tommaso Buvoli, "Rogue waves in optics and water," 2011-2012. Co-advisor with Mark Ablowitz in the Department of Applied Mathematics.
  - Matthew Culbreth, "Extracting vortices from PIV data," 2004-2005.
  - Mark Eret, "n-body simulations of Saturn's rings using a geometric decomposition strategy of parallelizing the Barnes-Hut algorithm," 2005-2006.
  - Maxine Hartnett, "Applying network analysis and feature engineering in machine-learning models for solar forecasting," 2018-2019
  - Charlotte Gorgemans, "Title TBD," 2021-present
  - Rain Lambek, "Numerical analysis and simulation of a shallow-water system on variable topography," 2018-2019. Co-advisor with Mark Hoefer in the Department of Applied Mathematics.
  - Theo Lincke, "Segmentation of solar magnetograms," 2020-2022.
  - Nikki Look, "Analysis of human gait data," 2010-2013. Co-advisor with Rodger Kram in the Department of Physiology.
  - Michael Neuder, "Information theory for ice-core data," 2018-2020. Co-advisor with James White in the Department of Geological Sciences.
  - Greg Robinson, "The electromagnetics of bee navigation," Department of Applied Mathematics, 2012-2013.

- Undergraduate research projects

  Jada Ballantine, Ellenor Brown (at Harvard), Meenakshy Chakravorty (SMART program), Junyu Chen, Patrick Clary (DLC apprentice), Michael Conde, Matt Culbreth, Joe Geisz, John Giardino, Paul Givens, Apollo Hogan, Eric Horacek, Connor Janowiak, David Johnson, Denis Kazakov, Asim Khwaja (now Professor at the Kennedy School of Government, Harvard), Sebastian Kuzminsky, Katie Lang (CRA-W distributed mentor program student), Jessica Landreth, Bryan LeMaster, Theo Lincke, Jeff Lipnick, Nikki Look, Luke Meszar, Jesse Negretti, Mike Neuder (co-author on two journal papers), John Nord, Sven Nuesken, Jonathan Olson (CU College of Engineering outstanding graduate award for research, 2008), Susan Plummer, Joshua Rahm, Jeremy Ralph (DLC apprentice; won yearly best-poster prize for that group), Alex Renger, Amber Roche, Dan Santa Maria, Evan Sheehan (DLC apprentice), Eric Schell, Roscoe Schenk, Stephen Schroeder, Aaron Sheppard, Suyog Soti, Jack Spicer, Josh Stuart (now Professor at UC Santa Cruz), Elliott Shugerman, Jeff Taggart, Robert Tarrall, David Trowbridge, Jamie Tucker-Foltz, Izaak Weiss, Catherine Youngblood.

Also high-school students Rishabh Yadav, who joined MIT's freshman class in the fall of 2016, and Charlotte Gorgemans, who made the state level in the 2021 science fair based on her work in our lab and joined the Engineering Honors Program at CU-Boulder that fall.

Professional Service

- Editor, *Chaos* (the American Institute of Physics's interdisciplinary journal of nonlinear science), 2004–present.
- Editorial Board, *NPJ (Nature Partner Journal) Complexity*, 2023–present.
- Board of Directors, *Computing Research Association* (`cra.org`), 2020-2022.
- Organizing committee, NITRD 30th Anniversary Commemoration, 2020–2022.
- co-PI and organizer, "Building Resilience to Climate Driven Extreme Events with Computing Innovations: A Convergence Accelerator Workshop Series," Fall 2022.
- *Computing Community Consortium* of the *Computing Research Association* (`cra.org/ccc`): member, 2012–present; vice-chair, 2018-2020; chair 2020-2022; chair emerita 2022-2023; interim director fall 2023.
- Various leadership roles in *CI Fellows 2020* and *CI Fellows 2021*, a program to fund postdoctoral positions for people whose job searches were impacted by COVID-19. These included serving as co-PI and PI, respectively, on the $20M and $16M NSF grants that funded the programs, as well as on the steering and selection committees, and heavy involvement in informational, mentoring, and cohort-building activities.
- Advisory Board, *SIAM Activity Group on Dynamical Systems*, 2019–present.
- *International Symposium on Intelligent Data Analysis*: Senior program committee/program chair advisor, 2012 (Helsinki, Finland), 2013 (London, UK), 2015 (St. Etienne, France), 2016 (Stockholm, Sweden), 2017 (London, UK), 2018 ('s-Hertogenbosch, the Netherlands), 2020 (Konstanz, Germany). Publicity chair, 2010 (Tucson, USA). Frontier Prize chair, 2012 and 2015. Program chair, 2003 (Berlin, Germany) and 2011 (Porto, Portugal).
- Steering committee, *Intelligent Data Analysis*: semiannual journal and biannual symposium, 1999–2003; 2009–present.
- *Dynamics Days*: Program Chair, 2007; Organizing Committee, 2013.
- External Advisory Board, Templeton Foundation "Complexity Explorer" grant at the Santa Fe Insitute (2011-2014).
- Science Board, Santa Fe Institute, Fall 2008–present.
- External Advisory Board, NSF ADVANCE grants at the University of Colorado (2005–2009) and Brown University (2007–2010).
- External Advisory Board, NSF grant "Potential Recruits to Engineering," Margaret Eisenhart, PI (2006–2009).
- Advisory Board, *Chaos*, 1998–2004.
- Mentor, CRA's *CAPP-R (Cohort of Associate Professors Project)*, Fall 2008.
- Program Chair, *International Workshop on Qualitative Reasoning*, June 2008.
- Reviewer, NSF Grad Fellowship Program, December 2004.
- Panelist, NSF EHS ITR review, March 2003; NSF DMS panel, Feb 2006.
- Panelist, National Institute for Alcoholism and Alcohol Abuse (NIAAA) planning workshop, Berkeley, October 2002. (DARPA-esque "future directions for the agency" event. A 2004 journal publication grew out of this meeting).

- Editorial Board, Santa Fe Institute, 2002–2012.
- Panelist, Department of Defense IS&T TARA, Rome N.Y., March 2000.
- Organizing Committee, *Smart Engineering System Design*, St. Louis MO; November 1999.
- Associate Editor of the *Annals of Mathematics of Artificial Intelligence*, special issue on "Reasoning About Functional Models," 1996.
- Program committees for *AAAI (National Conference on Artificial Intelligence)* 1996, 1997, 2010, 2011 (NECTAR track); *QR (International Workshop on Qualitative Reasoning)* 1999, 2000, 2006-present; *Dynamics Days* 2006, 2008, 2013.
- Referee for *Artificial Intelligence*, *Information Processing Letters*, *International Journal of Parallel Programming*, *Consciousness & Cognition*, *Cognitive Science*, *IEEE Control Systems Magazine*, *Chaos*, *Journal of the Franklin Institute*, *IEEE Transactions on Automatic Control*, *DSP Journal*, *Physica D*, the *IEEE American Control Conference*, *IEEE Transactions on Circuits and Systems*, *Computers and Electrical Engineering*, *Physical Review*, *Physical Review Letters*, *Physics Letters A*, *Geophysical Research Letters*, and the International (*IJCAI*), National(*AAAI*), and European (*ECAI)* conferences on Artificial Intelligence, as well as the international workshops on qualitative reasoning (*QR*) and intelligent data analysis (*IDA*). Proposal reviewer for the Radcliffe Institute, the National Science Foundation, the US Geological Survey, the University of Colorado's internal Packard Fellow competition, and the *National Academies of Sciences, Engineering, and Medicine's Computer Science and Telecommunications Board*'s 2022 report entitled "Realizing Responsible Computing Research: Foundations and Practices."
- Athlete Mentor, US Olympic Committee, 1999–present.
- Board Member and Faculty Advisor, CU Crew Team, 1999–2003.
- Consistently involved in research fairs, industrial liason activities, and the planning and execution of other events designed to encourage high-school, women, and minority students in their pursuit of science and engineering, including:
  - Successfully identifying, nominating, and mentoring women and minority students for fellowships, awards, and scholarships: Sheryl Young Scholarship; Francis Stribic Fellowship; Catawba Nation Scholarship; Santa Fe Institute Summer School Fellowship; CU Chancellor's Fellowship, etc.
  - Organizing social/networking gatherings for women graduate students, in the CS department and elsewhere on campus
  - Giving seminars for various graduate student groups on how to find academic jobs, put together good presentations, etc.
  - Participating in Women in Engineering Program (WIEP) events for women students in two Departments (CS and ECE), as well as in the College at large
  - Giving WIEP high-school *Career Days*, Society of Women Engineers (SWE), and Eta Kappa Nu (HKN) presentations
  - Acting as departmental liason for the *Careers for Women in Computing* documentary
  - Participating in women/science events in the Boulder community