

## CURRICULUM VITAE

**Katie A. Evans, Ph.D.**

**Walter Koss Associate Professor of Mathematics and Statistics**

### CONTACT INFORMATION

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### EDUCATION

Postdoctoral, Mechanical Engr.	Oregon State University, Corvallis, OR	2004-05
Ph.D., Mathematics	Advisor: Dr. Mark F. Costello Virginia Tech, Blacksburg, VA	December 2003
	Advisor: Dr. Belinda Batten King Dissertation: Reduced Order Controllers for Distributed Parameter Systems	
M.S., Mathematics	Virginia Tech, Blacksburg, VA	May 2001
	Advisor: Dr. Belinda Batten King Thesis: The Search for a Reduced Order Controller: Comparison of Balanced Reduction Techniques	
B.S., Mathematics	Morehead State University, Morehead, KY	May 1999
	Statistics Minor, Summa Cum Laude	

### PROFESSIONAL EXPERIENCE

2014-present	Interim Director, Mathematics and Statistics and Industrial Engineering, Director, Integrated STEM Education Research Center, Director, Louisiana Tech Grand Challenge Scholars Program Walter Koss Associate Professor of Mathematics and Statistics, Louisiana Tech University, Ruston, LA
2013-2014	Director, Louisiana Tech Grand Challenge Scholars Program Walter Koss Associate Professor of Mathematics and Statistics, Louisiana Tech University, Ruston, LA
2011-2013	Walter Koss Associate Professor of Mathematics and Statistics, Louisiana Tech University, Ruston, LA
2009-2011	Walter Koss Assistant Professor of Mathematics and Statistics, Louisiana Tech University, Ruston, LA
2005-2009	Assistant Professor of Mathematics and Statistics, Louisiana Tech University, Ruston, LA
2004-2005	Research Associate, Mechanical Engineering, Oregon State University, Corvallis, OR

2002, 2003	Graduate Research Assistant, Mathematics, Interdisciplinary Center for Applied Mathematics, Virginia Tech, Blacksburg, VA
1999-2003	Graduate Teaching Assistant, Mathematics, Virginia Tech, Blacksburg, VA
1999	Graduate Researcher, Los Alamos National Laboratory, Los Alamos, NM

## HONORS AND AWARDS

- Louisiana Tech NSBE Role Model, AY 2014-15
- Best paper presentation in session, American Control Conference, Portland, OR, June 2014.
- Nominee for the Louisiana Tech University Senate *F. Jay Taylor Undergraduate Teaching Award*.
- College of Engineering and Science nominee for Louisiana Tech's *University Senate Chair Award*, Louisiana Tech University, 2013.
- Louisiana Tech University College of Engineering and Science Leadership Award for outstanding leadership in the development of the college strategic plan, 2012.
- *Virgil Orr Junior Faculty Award*, Louisiana Tech University, September 2011. The purpose of the award is to recognize junior faculty who have made significant contributions to the mission and purpose of the university.
- Best paper presentation in session, American Control Conference, Baltimore, MD, July 2010.
- United States Air Force Summer Faculty Fellow, Summer 2009 and Summer 2010.
- *Walter Koss Professorship* in Mathematics and Statistics, held since September 2009.
- LATechSTEP Program Award, Louisiana Tech Engineering and Science Foundation Board of Directors, January 2008.
- College of Engineering and Science nominee for Louisiana Tech's *Virgil Orr Junior Faculty Award*, Louisiana Tech University, 2008.
- Travel Award, Society for Industrial and Applied Mathematics, July 2007.
- Featured on Career Profiles Website, Mathematical Association of America, May 2007.
- Selected as a Mathematical Association of America Project NExT Fellow, 2006-2007.
- Best paper presentation in session, American Control Conference, Denver, CO, June 2003.
- Invited keynote speaker at the Morehead State University Annual Phi Kappa Phi Banquet, Morehead, KY, March 2000.
- Phi Kappa Phi Award of Excellence, scholarship to attend Virginia Tech, 1999.

## SERVICE

### Service to Profession:

- AP Calculus Reader, 2013, 2014.
- Reviewer for *International Journal of Mathematical Education in Science and Technology*, two papers, 2014.
- Reviewer for *IEEE Transactions on Control Systems Technology*, 1 paper, 2014.
- NSF Ad-hoc Reviewer, 2013, 2014.

- NSF Panel Reviewer, 2013, 2014.
- Associate Editor for *American Control Conference* (2015, 2014, 2013, 2012, 2011).
- Associate Editor for *Conference on Decision and Control* (2012, 2011).
- Reviewer for *International Journal of Mathematical Education in Science and Technology*, two papers, 2011.
- Reviewer for *Conference on Decision and Control* (2010 - two papers, 2004 - one paper).
- Reviewer for *American Control Conference* (2010 - one session proposal and six papers; 2009 - two papers)
- Reviewer for *Institution of Engineering and Technology (IET) Control Theory & Applications*, 2007.
- Co-Coordinator of Project NExT (New Experiences in Teaching) Sessions for final workshop of the 2006-2007 Fellows, February - August 2007.
- Judge for the American Mathematical Society/Mathematical Association of America Joint Meetings Student Poster Competition, January 2007.
- Judge for the Mathematical Association of America Louisiana/Mississippi Section Student Paper Competition, 2006-2009.
- Co-organizer of a mini-symposium for the Society for Industrial and Applied Mathematics Annual Meeting, Portland, OR, July 2004.
- Reviewer for *IEEE Transactions on Control Systems Technology*, 2004.
- Reviewer for *Air Force Office of Scientific Research, Dynamics and Control Program*, 2003.

#### **Service to University:**

- University Senator, College of Engineering and Science Representative, 2008 – 2011.
- Judge for Regional Science Fair (2009, 2013, 2014).
- Judge for the Louisiana Tech University “Hot ‘n’ Spicy Debates,” February 2006.

#### **Service to College:**

- Presentation for Louisiana Tech’s National Society for Black Engineers student chapter regarding career opportunities for mathematicians and the importance of mathematics in other STEM disciplines, 2012, 2013.
- Faculty mentor for two students applying for fellowships (one graduate student-2013, one undergraduate student-2014).
- Faculty participant for the Louisiana Tech College of Engineering and Science NSF Graduate Research Fellowship Program application tips workshop, 2013.
- Director, Louisiana Tech’s National Academy of Engineering Grand Scholars Program Committee, September 2013 – present.
- Presentation of probability activity for E&S Day, in which the Louisiana Tech College of Engineering and Science hosted over 900 high school students and their teachers to visit our college, April 2013.
- Presentation of cryptography activity for Future Engineers Day, in which area elementary school children visited Louisiana Tech and were exposed to engineering and science concepts, hosted by local chapter of Society for Women Engineers, March 2013.

- COES Mentoring program, have mentored four new faculty members (one from Math/Stat, one from Mechanical Engineering, one from Civil Engineering, one from Biomedical Engineering), October 2012 – present.
- Committee Member, National Recognition Strategic Plan Team, October 2012 – May 2013.
- Committee Member, Strategic Planning Team, February 2012 – May 2012.
- Committee Co-Chair, Education Strategic Plan Team, October 2011 – January 2012.
- Committee Member, Math Hours Review Team, May 2010 – August 2010.
- Faculty Mentor for two students, Louisiana Tech’s National Academy of Engineering Grand Scholars Program, May 2010 – present.
- Committee Member, CAM Steering Committee, April 2010 – present.
- Committee Member, Louisiana Tech’s National Academy of Engineering Grand Scholars Program Committee, September 2009 – September 2013.
- WeBWoRK support for Engr 221 development, 2009 – 2010.
- Committee Member, Undergraduate Programs Team, 2008 – 2009.
- Mathematics Representative for the reintegration of topics with the Sophomore Integrated Engineering Curriculum, 2008.
- Judge, Freshman Engineering Design Exp, May and November, 2008.
- Faculty mentor for LATechSTEP, a program to encourage high school students entering college to pursue a major in science, technology, engineering, or mathematics, January 2005 – 2012.
- Advised Freshman College of Engineering and Science majors, Fall 2006, Fall 2007, and Fall 2008.
- Faculty advisor for a multidisciplinary team to compete in the annual Mathematical Contest in Modeling, February 2007 and February 2008.
- Leadership Team Associate, January 2007 – May 2007.
- Integrated Engineering Curriculum Committee, 2006 – 2007.
- Numerical Analysis Qualifying Exam Committee, 2005 – present.
- Postdoctoral Researchers Supervised: Dr. Richard Idowu, December 2012 – present
- Graduate Student Committees Chaired
  - Ashleigh Curdy, Engineering PhD – Cyber concentration, current.
  - Trey Carpenter, MS Mathematics, current.
  - Jonathan Walters, CAM PhD, 2014, MS Mathematics, 2014.
  - Scarlett Bracey, CAM PhD, 2013, MS Mathematics, 2011.
  - Richard Idowu, CAM PhD, 2012, MS Mathematics, 2009.
  - J. Teye Brown, CAM PhD, 2012, MS Mathematics, 2011.
  - Lisa Kuhn, CAM PhD, 2011, MS Mathematics, 2009.
  - Kevin Pereira, MS Electrical Engineering, 2009.
  - Ross Mansfield, MS Mathematics, 2008.

**Service to Academic Program:**

- Undergraduate Mathematics Research, two students (three projects), December 2012 – present.
- Committee Chair, Outstanding Mathematics Program Alumni, September 2011 – present.

- Committee Chair, Advanced Math Courses Review, September 2009 – August 2010.
- Committee Chair, Math Redesign, September 2008 – November 2008.
- Mathematics and Statistics Program Faculty Search Committee, 2006-2007 and 2007-2008.
- WeBWorK course development (Math 243: August 2006; Math 245: December 2006 – August 2007; Math 308: November 2007)
- WeBWorK support, administration, and course updates, September 2006 – present.
- Course coordinator for Math 243, 2005 – present.
- Co-course coordinator for Math 414 and 415, 2005 – 2010.
- Mathematics and Statistics Research and Teaching team, 2005 – present

## SCHOLARSHIP

### Research grants:

07/2013-06/2016	(PI) <i>OPES (Open-source Problems in Engineering Studies): Making the WeB WorK</i> , NSF, \$249,980.
07/2013-06/2015	(Co-PI) <i>Pre-clinical development of a multi-wavelength pulse photometer for non-invasive real-time pharmacokinetics</i> , Louisiana Board of Regents Industrial Ties Research Subprogram, \$180,000.
01/2013-08/2013	(PI) <i>REU Supplement - Mathematical Modeling of Biological and Biomedical Engineering Processes</i> , NSF, \$5,240.
09/2010-08/2013	(PI) <i>Mathematical Modeling of Biological and Biomedical Engineering Processes</i> , NSF, \$99,997.
01/2010-09/2010	(PI) <i>Modeling Challenges for Control of Aeroelastic Wing Unmanned Aerial Vehicles</i> , NSF EPSCoR via LA Board of Regents, \$10,000.
Summer 2010, 8 weeks	(PI) <i>Proposal: Control Strategies of Aeroelastic-Winged Micro Munition Vehicles</i> , Air Force Summer Faculty Fellowship Program, \$22,696.
Summer 2009, 8 weeks	(PI) <i>Proposal: Control Strategies of Aeroelastic-Winged Micro Munition Vehicles</i> , Air Force Summer Faculty Fellowship Program, \$12,400.
Summer 2008, 8 weeks	(PI) <i>Proposal: Control Strategies of Aeroelastic-Winged Micro Munition Vehicles</i> , Air Force Summer Faculty Fellowship Program, \$12,400, accepted to program but declined due to family illness.
07/2008-06/2009	(Co-PI) <i>H-DIML: High-speed Digital Imaging and Modeling Laboratory</i> , Louisiana Board of Regents Enhancement Program, \$64,656.
06/2007-06/2011	(PI) <i>Sensitivity Analysis for the Design of MinMax Controllers</i> , Louisiana Board of Regents Research Competitiveness Subprogram, \$73,413.
01/2007-05/2007	(PI) <i>WeBWorK Server</i> , Louisiana Tech University Student Technology Fee Board, \$3,502.

### Articles in peer-reviewed journals:

- Chakravarthy, A., K.A. Evans, L.M. Kuhn, and J.B. Walters, “Frequency and time domain analysis of an aeroelastic wing multiple component structure,” *Journal of Mathematical Analysis and Applications*, under review.
- Schröder, B.S.W., J.B. Walters, and K.A. Evans, “A Cacciopoli-type inequality to prove coercivity of a bilinear form associated with spatial hysteresis internal damping for an Euler-Bernoulli beam,” *Journal of Mathematical Analysis and Applications*, under review.
- Batten, B.A. and K.A. Evans, “Reduced order compensators via balancing and central control design for a structural control problem,” *International Journal of Control*, 83(3), 563-574, 2010.
- Batten King, B.A., N. Hovakimyan, K.A. Evans, and M. Buhl, “Reduced order controllers for distributed parameter systems: LQG balanced truncation and an adaptive approach,” *Mathematical and Computer Modeling*. Vol. 43, no. 9-10, 1136-1149, 2006.
- Evans, K., M. Konikoff, J. J. Madden, R. Mathis, and G. Whipple, "Totally ordered commutative monoids," *Semigroup Forum*, vol. 62, no. 2, pp. 249-278, 2001.

#### Peer-reviewed conference papers:

- Bracey, S.S. and K.A. Evans, “Analysis of tracking control designs for a delay differential equation model used in the study of nanoparticle dosing strategies,” *Proceedings of the 2014 American Control Conference*, Portland, OR, 353-358, invited, 3 peer reviews, 67% acceptance rate, June 2014.
- Adhikari, P., S.S. Bracey, K.A. Evans, I. Magana, D.P. O’Neal, “LQR tracking of a delay differential equation model for the study of nanoparticle dosing strategies for cancer therapy,” *Proceedings of the 2013 American Control Conference*, Washington, DC, 2010-2015, invited, 3 peer reviews, 61% acceptance rate, June 2013.
- Bracey, S.S., K.A. Evans, I. Magana, P. Adhikari, D.P. O’Neal, “Modeling the bioavailability of circulating gold nanoparticles,” *Proceedings of the Spring 2012 MAA LA/MS Section Meeting*, <http://sections.maa.org/lams/proceedings/spring2012/index.html>.
- Idowu, R.A., K.R. Cotton, K.A. Evans, M. Paun, and M. DeCoster, “Statistical evaluation of dynamic brain cell calcium activity,” *Proceedings of the Spring 2012 MAA LA/MS Section Meeting*, <http://sections.maa.org/lams/proceedings/spring2012/index.html>.
- Chakravarthy, A., K.A. Evans, J. Evers, and L.M. Kuhn, “Nonlinear controllers for wing morphing trajectories of a heave dynamics model,” *Proceedings of the 2011 Conference on Decision and Control*, Orlando, FL, 2788-2793, invited, 3 peer reviews, 59% acceptance rate, December 2011.
- Chakravarthy, A., K.A. Evans, J. Evers, and L.M. Kuhn, “Target tracking strategies for a nonlinear, flexible aircraft-inspired model,” *Proceedings of the 2011 American Control Conference*, San Francisco, CA, 1783-1788, invited, 2 peer reviews, 63% acceptance rate, June 2011.
- Chakravarthy, A., K.A. Evans, and J. Evers, “Sensitivities and functional gains for a flexible aircraft-inspired model,” *Proceedings of the 2010 American Control Conference*, Baltimore, MD, FrA06.3, 4893-4898, invited, 3 peer reviews, 62% acceptance rate, June 2010.

- Batten, B.A. and K.A. Evans, “Theoretical considerations of control design for the Klein-Gordon partial differential equation,” *Proceedings of the Spring 2010 MAA LA/MS Section Meeting*.
- Evans, K.A., “Sensitivity analysis for control parameter determination for a nonlinear cable-mass system,” *Proceedings of the 2009 American Control Conference*, St. Louis, MO, FrA05.2, 4091-4096, 3 peer reviews, 67% acceptance rate, June 2009.
- Zietsman, L., K.A. Evans, J.T. Brown, and R.A. Idowu, “Riccati conditioning and sensitivity for a minmax controlled cable-mass system,” *Proceedings of the 2008 IEEE Conference on Decision and Control*, Cancun, Mexico, 4007-4011, 5 peer reviews, 50% acceptance rate, December 2008.
- Kyle, J., K.A. Evans, and M.F. Costello, “Atmospheric wind energy extraction by a micro autonomous glider,” *Proceedings of the American Institute of Aeronautics and Astronautics Atmospheric Flight Mechanics Conference*, San Francisco, CA, 2005-6233.pdf, August 2005.
- Evans, K.A. and B.A. Batten King, “Full order compensator-based feedback control of a cantilevered Euler-Bernoulli beam,” *Proceedings of the 2004 IEEE Conference on Decision and Control*, Atlantis, Paradise Island, Bahamas, pgs. 1508-1513, invited, 50% acceptance rate, December 2004.
- Evans Camp, K.A. and B.A. Batten King, “A comparison of linear quadratic Gaussian and central compensators for a structural control,” *Proceedings of the 2003 American Control Conference*, Denver, CO, TA04-3.pdf, 2003, invited, 68% acceptance rate, June 2003.
- Evans Camp, K.A. and B.A. Batten King, “A comparison of balanced truncation techniques for reduced order controllers,” *Proceedings of 15th International Symposium on Mathematical Theory of Networks and Systems*, Notre Dame, IN, 23323\_2.pdf, August 2002.

#### **Book chapters:**

- DeCoster, M.A., J. McNamara, K. Cotton, D. Green, C. Jeyasankar, R. Idowu, K.A. Evans, Q. Xing, and Y. Lvov, “Chapter 8: Bionanocomposites for Multidimensional Brain Cell Signalling,” *Natural Polymers, Biopolymers, Biomaterials, Blends, and IPNs; Recent Advances in Materials Sciences (vol. 2)*. Sabu Thomas, Neethu Ninan, Sneha Mohan, and Elizabeth Francis (Ed.). Point Pleasant, NJ: Apple Academic Press, 2012.

#### **Short Abstracts:**

- K.R. Cotton, M. DeCoster, K.A. Evans, R.A. Idowu, and M. Paun, “Statistical evaluation of dynamic brain cell calcium activity,” *Short Abstracts of the 8th International Symposium on Bioinformatics Research and Applications*, 35-38, 2012.

#### **Other scholarship:**

- Participation in online homework survey and conference call discussion for W. H. Freeman and Company, June 2009.

- Textbook review (Chapter 7: First-Order Differential Equations) of *Calculus: Early Transcendental Functions*, Third Edition by Drs. Bob Smith and Roland Minton.

### **Invited Presentations:**

- “Sensitivities and Functional Gains for a Flexible Aircraft-Inspired Model,” University of Florida – REEF Summer Seminar Series, Shalimar, FL, August 2010.
  - “Sensitivities and Functional Gains for a Flexible Aircraft-Inspired Model,” American Control Conference, Baltimore, MD, July 2010.
  - “Sensitivities and Functional Gains for a Flexible Aircraft-Inspired Model,” Virginia Tech Mathematics Department Colloquium, Blacksburg, VA, April 2010.
  - “Control Parameter Determination for a Nonlinear Cable-Mass System,” University of Florida – REEF Summer Seminar Series, Shalimar, FL, August 2009.
  - “Controlling Physical Systems,” Dean’s New Faculty Lecture Series, Louisiana Tech University, Ruston, LA, December 2005.
  - “Reduced Order Control Design for a Cantilevered Euler-Bernoulli Beam,” Society for Industrial and Applied Mathematics Conference on Computational Science and Engineering, Orlando, FL, February 2005.
  - “Balanced Reduction Control Techniques for a Cantilevered Euler-Bernoulli Beam,” Applied Mathematics Seminar, Montana State University, Bozeman, MT, September 2004.
  - “The Central Reduced Order Compensator for a Structural Control,” Computation, Control, and Biological Systems VIII, Montana State University, Bozeman, MT, July 2003.
  - “A Comparison of Linear Quadratic Gaussian and Central Compensators for a Structural Control,” American Control Conference, Denver, CO, June 2003.
  - “Reduced Order Controllers via Balancing Techniques for Distributed Parameter Systems,” Virginia Tech Department of Mathematics Colloquium, Blacksburg, VA, March 2003.
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- A Comparison of Balancing Techniques for Reduced Order Controllers for Systems of PDEs,” Mathematical Theory of Networks and Systems, University of Notre Dame, Notre Dame, IN, August 2002.

### **Contributed Presentations:**

- “Theoretical considerations of control design for the Klein-Gordon partial differential equation,” MAA LA/MS Section Meeting, Clinton, MS, March 2010.
- “Sensitivity Analysis for Control Parameter Determination for a Nonlinear Cable-Mass System,” American Control Conference, St. Louis, MO, June 2009.
- “Consideration of Low Order Control Design for the Klein-Gordon Relativistic Wave Equation,” MAA LA/MS Section Meeting, Mississippi College, March 2009.



- “Parameter Determination for Low Order Controllers,” Southeastern-Atlantic Regional Conference on Differential Equations, University of Arkansas at Little Rock, Little Rock, AR, October 2008.
- “A Survey of Theoretical Considerations of Control Design for the Klein-Gordon Relativistic Wave Equation,” Mathematical Association of America MathFest, San Jose, CA, August 2007.
- “Modeling Depolarization-induced Calcium Dynamics,” Atlantic Coast Conference on Mathematics in the Life and Biological Sciences sponsored by Virginia Tech Interdisciplinary Center for Applied Mathematics, Virginia Bioinformatics Institute, Virginia Tech SIAM Student Chapter, NC State Center for Research in Scientific Computation, Statistical and Applied Mathematical Sciences Institute, Virginia Tech, Blacksburg, VA, May 5, 2007.
- “Balanced Reduction Techniques for a Structural Control Problem,” Society for Industrial and Applied Mathematics Annual Meeting, Portland, OR, July 2004.
- “Balancing Techniques for Reduced Order Controllers,” Southeastern-Atlantic Regional Conference on Differential Equations, University of Tennessee, Knoxville, TN, October 2002.
- “The Search for a Reduced Order Controller: Comparison of Balanced Reduction Techniques,” Society for Industrial and Applied Mathematics 50<sup>th</sup> Anniversary and Annual Meeting, Philadelphia, PA, July 2002.

## **PROFESSIONAL MEMBERSHIPS**

- Society for Industrial and Applied Mathematics (SIAM)
- Institute for Electrical and Electronics Engineers (IEEE)
- American Society for Engineering Education (ASEE)

## **REFERENCES**

- Dr. Belinda Batten, Director, Northwest National Marine Renewable Energy Center, Oregon State University, 204 Rogers Hall, Corvallis, OR 97331, (541) 737-9492, [bbatten@enr.orst.edu](mailto:bbatten@enr.orst.edu)
- Dr. Jenna Carpenter, Associate Dean for Undergraduate Studies, College of Engineering and Science, Louisiana Tech University, P.O. Box 10348, Ruston, LA 71272, (318) 257-2101, [jenna@latech.edu](mailto:jenna@latech.edu)
- Dr. Stan Napper, Vice President for Research and Development, Louisiana Tech University, P.O. Box 10348, Ruston, LA 71272, (318) 257-3056, [san@latech.edu](mailto:san@latech.edu)
- Dr. Jim Nelson, Emeritus Associate Dean for Undergraduate Studies, College of Engineering and Science, Louisiana Tech University, 971 Riser Road, Ruston, LA 71270, (318) 255-3258, [jdn@latech.edu](mailto:jdn@latech.edu)

- Dr. Bernd Schröder, Chair, Department of Mathematics, University of Southern Mississippi, Southern Hall (SH) 319, 118 College Drive #5045, Hattiesburg, MS 39406, (601) 266-4289, [bernd.schroeder@usm.edu](mailto:bernd.schroeder@usm.edu)