

## Curriculum Vitae

### **Natascha Trellinger Buswell** (formerly Natascha M. Trellinger)

#### Education

**Doctor of Philosophy**, Engineering Education, December 2017

- School of Engineering Education, College of Engineering
- Purdue University – West Lafayette, IN
- Committee: Brent K. Jesiek (Chair), Ruth A. Streveler, Michael C. Loui, and Jim Borgford-Parnell (University of Washington)
  - Dissertation Title: Swimming upstream: Pathways of new engineering faculty at non-R1 institutions

**Bachelor of Science**, Aerospace Engineering, May 2013

- Second Major: Mathematics
- Syracuse University – Syracuse, NY

#### Appointments

**Assistant Professor of Teaching**, January 2018 – present

Department of Mechanical and Aerospace Engineering, Henry Samueli School of Engineering, University of California, Irvine

#### Honors and Awards

**Apprentice Faculty Grant**, Education Research and Methods Division, American Society for Engineering Education, June 2019

**Early Career Faculty Innovation in Teaching Award**, UCI Henry Samueli School of Engineering, June 2019

**2018-19 Best Professor in MAE Award**, UCI Engineering Student Council, March 2019

**New Faculty Fellow**, IEEE Frontiers in Education Conference, October 2018

**Engineering Education Outstanding Graduate Student Service Award**, School of Engineering Education, April 2016

**Graduate Research Fellowship Program (GRFP) Honorable Mention**, National Science Foundation (NSF), April 2015

**Purdue Doctoral Fellowship**, The Graduate School, Purdue University August 2013 – July 2017

**Charles Libove Memorial Award for Outstanding Aerospace Senior**, College of Engineering and Computer Science, Syracuse University, May 2013

**Yueh-Ying Memorial Award**, College of Engineering and Computer Science, Syracuse University, May 2013

**L.C. Smith College of Engineering Graduation Marshal**, Syracuse University, 2013

**Remembrance Scholar**, Syracuse University, 2012-2013

**Brill Family Scholarship**, Society of Women Engineers, 2012-2013

**Astronaut Scholarship Nominee**, College of Engineering and Computer Science, Syracuse University, 2012

**Record Scholar**, Tau Beta Pi, 2011-2012

**Ellen H. Honnold Scholarship**, Awarded twice, College of Engineering and Computer Science, Syracuse University, 2011-2013

**Founders Scholarship**, Syracuse University, August 2009 – May 2013

## Grants

**National Science Foundation (NSF)** Examining the Roles of STEM Teaching Faculty in Advancing the Use of Evidence-based Teaching Practices at Research Universities. Co-I, \$2,184,551.00. September 2018 – August 2023.

**UC Irvine Office of the Provost**, Academic Initiative for Education Research, Co-P1, \$450,000, 2018-2021

**National Science Foundation (NSF) Subcontract Award.** Engineering Identity, its Predictors, and its Impact on Retention across Educational Stages. Local PI, \$7,000. April 2018 – July 2019

**Women in Engineering Program Travel Grant**, Purdue University, October 2017.

**Women in Engineering Program Travel Award**, Purdue University, June 2016.

**Women in Engineering Program Travel Award**, Purdue University, October 2015.

## Teaching Activities

**Instructor**, University of California, Irvine

- **MAE 150: Mechanics of Structures**
  - Spring 2019, 135 undergraduate students
  - Fall 2018, 235 undergraduate students
  - Spring 2018, 75 undergraduate students
- **MAE 150L: Mechanics of Structures Laboratory**
  - Spring 2019, 122 undergraduate students
  - Fall 2018, 234 undergraduate students
  - Spring 2018, 63 undergraduate students
- **MAE 189: Senior Projects**
  - Spring 2019, 262 undergraduate students
  - Winter 2019, 305 undergraduate students
  - Fall 2018, 326 undergraduate students
- **MAE 295: Developing Teaching Excellence, New course developed Winter 2018**
  - Winter 2019, 10 graduate students
  - Winter 2018, 5 graduate students

**Co-Instructor**, Purdue University

- ENGR 20100: Engineering in Global Context, Spring 2016

**Faculty Apprentice**, Purdue University

- ENE 50600: Content, Assessment, and Pedagogy: An Integrated Engineering Design Approach, Fall 2015
  - Included a pre- and post- self-assessment for students to recognize their learning and growth as engineering educators

**Graduate Teaching Assistant**, Purdue University

- ENGR 20100: Engineering in Global Context, Spring 2015
  - Conducted a scholarship of teaching and learning (SoTL) project on students' beliefs about learning in a nontechnical course, published at FIE 2015
- ENGR 49400: Women in Engineering Seminar: Gender in the Workplace, Spring 2015

**Academic Excellence Workshop (AEW) Facilitator**, Syracuse University

- Subjects: Calculus II; Engineering Mechanics: Statics; Engineering Mechanics: Dynamics; Engineering Thermodynamics

## Research Activities

**Graduate Research Assistant**, School of Engineering Education, Purdue University

- **CAREER: Becoming Boundary Spanners Investigating, Enhancing, and Assessing the Experiences of Early Career Engineers**, NSF 1254323, January 2014 – present
  - Coordinated over 20 interviews with early career engineers and intern and co-op students; conducted over 15 of these interviews; analyzed data to thematic categories; co-authored multiple papers
- **Research Initiation Grant: Writing to Learn Engineering: Identifying Effective Techniques for the Integration of Written Communication into Engineering Classes and Curricula**, NSF 1340491, January 2014 – present
  - Contributed to data collection efforts including survey development and deployment, and textbook identification; contributed to data analysis efforts including quantitative survey analysis and qualitative textbook analysis; first-authored and co-authored multiple papers
- **Engineering Education Explorers: First-Year Engineering Choice of Engineering Major**, Purdue University, School of Engineering Education, Fall 2013
  - Analyzed first-year engineering student data about reasons for choosing their major using thematic analysis

**Research Assistant and Trainee**, Center for Engineering Learning and Teaching (CELT), University of Washington

- **Engineering Education Pioneers and Trajectories of Impact**, NSF Grant No. 1263512, January 2014-August 2014
  - Conducted an interview with Dr. Stephanie Adams; constructed a narrative profile about Dr. Adams; analyzed data of all graduate student project participants; first-authored a paper

## Leadership and Mentoring Activities

**Purdue Graduate Student Government (PGSG)**, Purdue University, August 2016 – May 2017.

- Reviewer: Travel, professional, and organizational grants

**Women in Engineering Program (WiEP) Graduate Mentoring Program (GMP)**, Purdue University, June 2014 – June 2016

- The Graduate Mentoring Program plays an instrumental role in the support and retention of female graduate engineering students. The peer-mentoring program formally met once a month and had additional informal meetings based on students' interests
- As a Leadership Team Member, I played an integral role in coordinating the monthly meetings with external speakers, creating and distributing newsletters, and the recruitment and retention of our membership.

**Engineering Education Graduate Student Association (ENEWSA)**, Purdue University, May 2014 – May 2015

- Graduate Student Advisory Board Representative, elected position.

- Attended meetings with the Associate Dean of Graduate Education to report on issues and concerns of the engineering education student body.
- Professional Development Chair
  - Organized the visit of a Distinguish Lecturer.

## Journal Publications

- J3. **Buswell, N. T.**, Jesiek, B. K., Troy, C. D., Essig, R. R., & Boyd, J. (2019). Engineering instructors on writing: Perceptions, Practices, and Needs. *IEEE Transactions on Professional Communication*. 62(1), 55-74.
- J2. Jesiek, B. K., Mazzurco, A., **Buswell, N. T.**, & Thompson, J. D. (2018). Boundary spanning and engineering: A qualitative systematic review. *Journal of Engineering Education*. 107(3), 380-413.
- J1. Essig, R. R., Troy, C. D., Jesiek, B. K., **Buswell, N. T.** & Boyd, J. (2018). Assessment and characterization of writing exercises in core engineering textbooks. *J. of Prof. Issues in Engng Educ. & Practice*, 144(4), 04018007.

## Peer-Reviewed Conference Publications (reverse-chronological order, note: name change in 2018)

- C25. Zerbe, E., & Berdanier, C. G., & **Buswell, N. T.**, & Melo, J. M. M. (2019, June), Validating a Short Form Writing Attitudes Survey for Engineering Writers. *Paper presented at 2019 ASEE Annual Conference & Exposition*, Tampa, Florida. <https://peer.asee.org/33529>
- C24. Malviya, M., & Berdanier, C. G., & **Buswell, N. T.** (2019, June), Visual and Statistical Methods to Calculate Interrater Reliability for Time-Resolved Qualitative Data: Examples from a Screen Capture Study of Engineering Writing Patterns. *Paper presented at 2019 ASEE Annual Conference & Exposition*, Tampa, Florida. <https://peer.asee.org/33541>
- C23. **Buswell, N. T.** & Walter, M. E. (2019). Designing Senior Design for Student-Led Projects with Large Enrollments. *In American Society for Engineering Education Annual Conference and Exposition*. June 16-19. Tampa, FL.
- C22. Danielian, S. A. & **Buswell, N. T.** (2019). Do support sheets actually support students? A content analysis of student support sheets for exams. *In American Society for Engineering Education Pacific Southwest Regional Conference*, April 5-6, Los Angeles, CA.
- C21. Huynh, A. & **Buswell, N. T.** (2019). How was your internship? Stories about engineering internship experiences from five female engineering students. *In American Society for Engineering Education Pacific Southwest Regional Conference*, April 5-6, Los Angeles, CA.
- C20. **Buswell, N. T.** (2018). Behind the scenes: Course syllabi explained. *In Frontiers in Education Conference (FIE), IEEE* (pp. 1-7), October 3-6. San Jose, CA.

- C19. Saeidi, A., Williams, A., **Buswell, N.**, Mumm, D., & Denaro, K. (2018). Can adding discussion-only active learning increase student learning in materials science class? In *Frontiers in Education Conference (FIE), IEEE* (pp. 1-4), October 3-6. San Jose, CA.
- C18. Berdanier, C. G. P. & **Buswell, N. T.** (2018). Data Visualization for Time-Resolved Real-Time Engineering Writing Processes. *125<sup>th</sup> ASEE Annual Conference & Exposition*, June 23-27. Salt Lake City, UT.
- C17. Jesiek, B. K., **Buswell, N. T.**, & Zhu, Q. (2018). Global Engineering Competency: Assessment Tools and Training Strategies. *125<sup>th</sup> ASEE Annual Conference & Exposition*, June 23-27. Salt Lake City, UT.
- C16. Jesiek, B. K., & **Trellinger, N. M.**, & Nittala, S. (2017). Closing the practice gap: Studying boundary spanning in engineering practice to inform educational practice. In *Frontiers in Education Conference (FIE), IEEE* (pp. 1-9), October 18-21. Indianapolis, IN.
- C15. Berdanier, C. G. P., **Trellinger, N. M.** (2017). Development of a method to study real-time engineering writing processes. In *Frontiers in Education Conference (FIE), IEEE* (pp. 1-9), October 18-21. Indianapolis, IN.
- C14. Trellinger, N. M.**, & Jesiek, B. K. (2017). How six assistant professors landed their jobs at baccalaureate colleges and master's institutions: A focus on pathways and teaching (un)preparedness. *124<sup>th</sup> ASEE Annual Conference & Exposition*, June 25-28. Columbus, Ohio. <https://peer.asee.org/28449>
- C13. Jesiek, B. K., & **Trellinger, N. M.**, & Nittala, S., & Campbell, S. J. (2017). Interns in the wild: Using structured reflection and interviews to investigate early career engineering practice. *124<sup>th</sup> ASEE Annual Conference & Exposition*, June 25-28. Columbus, Ohio. <https://peer.asee.org/28575>
- C12. Trellinger, N. M.** & Jesiek, B. K. (2016). Teaching pathways in the academy: A narrative study of engineering faculty at institutions with varying research and teaching activity. In *Frontiers in Education Conference (FIE), IEEE* (pp. 1-5), October 12-15. Erie, PA.
- C11. Trellinger, N. M.**, Jesiek, B. K., Troy, C. D., Boyd, J. & Essig, R. R. (2016). Engineering faculty on writing: What they think and what they want. *123<sup>rd</sup> ASEE Annual Conference and Exposition*, June 25-28, New Orleans, LA.
- C10. Jesiek, B. K., **Trellinger, N. M.** & Mazzurco, A. (2016). Becoming boundary spanning engineers: Research methods and preliminary findings. *123<sup>rd</sup> ASEE Annual Conference and Exposition*, June 25-28, New Orleans, LA.
- C9. Troy, C. D., Essig, R. R., Jesiek, B. K., **Trellinger, N. M.** & Boyd, J. (2016). Writing to learn engineering: Identifying effective techniques for the integration of written communication into engineering classes and curricula. *123<sup>rd</sup> ASEE Annual Conference and Exposition*, June 25-28, New Orleans, LA.
- C8. Trellinger, N. M.** & Loui, M. C. (2015). Learning philosophies: A glimpse into students' approaches to learning. In *Frontiers in Education Conference (FIE), IEEE* (pp. 1-8), October 21-24. El Paso, TX.

- C7. Jesiek, B. K., Mazzurco, A., **Trellinger, N.** & Ramane, K. (2015). Becoming boundary spanners in engineering: Identifying roles, activities, and competencies. In *Frontiers in Education Conference (FIE), IEEE*. (pp. 1-5), October 21-24. El Paso, TX.
- C6. Kong, N., Forin, T. R., Jesiek, B. K. & **Trellinger, N. M.** (2015). Purdue-Tsinghua undergraduate research dual exchange: A new programmatic implementation for enhancing global learning. *122nd ASEE Annual Conference and Exposition*, June 15-18, Seattle, WA.
- C5. Trellinger, N. M.**, Essig, R. R., Troy, C. D., Jesiek, B. K. & Boyd, J. (2015). Something to write home(work) about: An analysis of writing exercises in fluid mechanics textbooks. *122nd ASEE Annual Conference and Exposition*, June 15-18, Seattle, WA.
- C4. Trellinger, N. M.**, Sattler, B. & Turns, J. (2015). “I realized that I myself am on the path to being a pioneer”: Characterizing the experiences of graduate students in an innovating interviewing experience. *122nd ASEE Annual Conference and Exposition*, June 15-18, Seattle, WA.
- C3. Adams, R., Berdanier, C. G. P., Branham, P., Choudhary, N., Fletcher, T., Goldstein, M., Joslyn, C., Mathis, C., Siverling, E., **Trellinger, N. M.** & Wilson, M. D. (2014). A community of practice approach to becoming an engineering education research professional. *121st ASEE Annual Conference and Exposition*, June 15-18, Indianapolis, IN.
- C2. Essig, R. R., Troy, C. D., Jesiek, B. K., Boyd, J. & **Trellinger, N. M.** (2014). Adventures in paragraph writing: The development and refinement of scalable and effective writing exercises for large-enrollment engineering courses. *121st ASEE Annual Conference and Exposition*, June 15-18, Indianapolis, IN.
- C1. Troy, C. D., Essig, R. R., Jesiek, B. K., Boyd, J. & Trellinger, N. M. (2014). Writing to learn engineering: Identifying effective techniques for the integration of written communication into engineering classes and curricula. *121st ASEE Annual Conference and Exposition*, June 15-18, Indianapolis, IN.

### **Presentations (in reverse-chronological order)**

- P15. Designing Senior Design for Student-Led Projects with Large Enrollments. *American Society for Engineering Education Annual Conference and Exposition*. Tampa, FL. June 17<sup>th</sup>, 2019.
- P14. Behind the scenes: Course syllabi explained. *Frontiers in Education Conference (FIE), IEEE*, San Jose, CA, October 3<sup>rd</sup>, 2018.
- P13. Finding an Academic Career Path That is Right for You, *NextProf Nexus Workshop*, University of California, Berkeley, CA, September 13<sup>th</sup>, 2018.
- P12. Visualization for Time-Resolved Real-Time Engineering Writing Processes. *125<sup>th</sup> ASEE Annual Conference & Exposition*, Salt Lake City, UT, June 27<sup>th</sup>, 2018.
- P11. Overcoming perceived failure on the pathway to a non-R1 institution. *SABER West Poster Presentations*, Irvine, CA, January 13<sup>th</sup>, 2018
- P10. Development of a method to study real-time engineering writing processes. *Frontiers in Education Conference (FIE)*, Indianapolis, IN, October 19<sup>th</sup>, 2017.

- P9. How six assistant professors landed their jobs at baccalaureate colleges and master's institutions: A focus on pathways and teaching (un)preparedness. *ASEE Annual Conference & Exposition*, Columbus, OH, June 27<sup>th</sup>, 2017
- P8. Your engineering toolbox in action. *University of California, Irvine, MAE 145*, Irvine, CA, April 17<sup>th</sup>, 2017.
- P7. Teaching pathways in the academy: A narrative study of engineering faculty at institutions with varying teaching and research activity. *Frontiers in Education Conference*, Erie, PA, October 14<sup>th</sup>, 2016
- P6. Engineering faculty on writing: What they think and what they want. *ASEE Annual Conference and Exposition*, New Orleans, LA. June 28<sup>th</sup>, 2016
- P5. Learning philosophies: A glimpse into students' approaches to learning. *Frontiers in Education Conference*, El Paso, TX, October 24<sup>th</sup>, 2016.
- P4. Something to write home(work) about: An analysis of writing exercises in fluid mechanics textbooks. *ASEE Annual Conference and Exposition*, Seattle, WA, June 17<sup>th</sup>, 2015.
- P3. "I realized that I myself am on the path to being a pioneer": Characterizing the experiences of graduate students in an innovating interviewing experience. *ASEE Annual Conference and Exposition*, Seattle, WA, June 16<sup>th</sup>, 2015.
- P2. Participation outcomes of the pioneer interviewers. *Center of Engineering Teaching and Learning (CELT)*, University of Washington, Seattle, WA, August 13<sup>th</sup>, 2014.
- P1. First Year Engineering (FYE) Choice of Major Research. *School of Engineering Education Seminar at Purdue University*, West Lafayette, IN, November 21<sup>st</sup>, 2013.

## Book Review

Jesiek, B. K. & **Trellinger, N. M.** (2014). Book Review: Arguments that count: Physics, computing, and missile defense by Rebecca Slayton, MIT Press. *IEEE Annals of the History of Computing*, 36(4), 88-90.

## Panels and Workshops

Panelist for the Engineering Student Affairs Female Faculty Panel, April 11, 2019.

**Preparing Future Faculty: Developing Your Teaching CV**, Panelist for the UCI DECADE Learning Community Event, March 6, 2019.

**Finding an Academic Career Path That is Right for You**, Workshop developed for the *NextProfNexus Workshop*, University of California, Berkeley, CA, September 13<sup>th</sup>, 2018.

Academic Teaching Careers in Mathematics Panel. Invited Moderator. Irvine, CA, March 12<sup>th</sup>, 2018.

## Other Scholarly Work

**Trellinger, N. M., Sattler, B., & Turns, J.** (2014). Participation outcomes of the pioneer interviewers. CELT Technical Report, CELT 14-04, Center for Engineering Learning and Teaching, University of Washington, Seattle, WA, USA.

**Trellinger, N.M.** (2014). Engineering Education Pioneers Profile on Stephanie G. Adams. <http://depts.washington.edu/celtweb/pioneers-wp/?p=477>

### **Professional Development Activities**

**UCI HSI Conference: Pathways for Hispanics in STEM**, attendee, Costa Mesa, CA, January 22-24, 2018

**Reflections Workshop** led by Drs. Jennifer Turns and Cindy Atman, attendee, University of Washington, September 14-15, 2017

**NextProf Workshop**, invited attendee, University of Michigan, September 27-30, 2016.

**Women in Engineering ProActive Network (WEPAN) Annual Conference**, attendee, Broomfield, CO, June 14-16, 2016.

**Effective Teaching Workshop** moderated by Drs. Richard Felder and Rebecca Brent, attendee, Purdue University, March 2<sup>nd</sup>, 2016.

**Conference for Pre-Tenure Women**, attendee, Purdue University, September 24-25, 2015.

### **Service Activities**

#### **Henry Samueli School of Engineering, UC Irvine**

Program Accreditation Review Committee (PARC), The Henry Samueli School of Engineering, November 2017 – present

#### **Department of Mechanical and Aerospace Engineering, UC Irvine**

MAE Undergraduate Studies Committee, March 2018 - Present

MAE Senior Design Task Force, July 2017 – Present

#### **Community of Irvine, CA, Outreach Activities**

UCI Professors Series – What is Engineering? Invited Guest Speaker, University High School Engineering Club, Irvine, CA, February 14<sup>th</sup>, 2018

Athena Olympiad, Invited Guest Speaker, University of California – Irvine, Irvine, CA. April 7<sup>th</sup>, 2018.

### **Professional Organizations**

#### **Reviewer – Journals**

- Journal of Engineering Education (JEE), 2015 – Present
- International Journal of Chinese Education (IJCE), 2015

#### **Reviewer – Conferences**

- American Society of Engineering Education (ASEE) Annual Conference and Exposition, 2014 - Present



- Frontiers of Education (FIE), 2015 – Present

## **Graduate Level Engineering Coursework**

### **Course Work:**

- AAE590: Mechanical Behavior of Materials, Purdue University, Spring 2015
- AAE590: Air Transportation Systems, Purdue University, Fall 2015
- ME577: Human Motion Kinetics, Purdue University, Spring 2016

## **Industry Experience**

### **Launch Operations Intern**, United Launch Alliance (ULA), Cape Canaveral, FL, Summer 2013

- Acted as Person in Charge (PIC) leading technicians and inspectors supervising procedures and conducting tasks including the installation of the flight ground wire on the vehicle's first stage (Atlas).

### **Mission Design Intern**, United Launch Alliance (ULA), Centennial, CO, Summer 2012

- Designed and programmed a graphical user interface in support of a manual data manipulation project.
- Acted as the Project Manager for the Intern Rocket Recovery Team

### **Structures Intern**, United Launch Alliance (ULA), Centennial, CO, Summer 2011