Emily K. Book
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My goal is to obtain a career where I lead, challenge and am challenged by utilizing my technical expertise and management skills.

Work History

The Citadel
The Citadel School of Engineering; Charleston, South Carolina
- Assistant Professor, Department of Mechanical Engineering (January 2017 – Present)
  - Focus on power and energy
  - Courses Taught:
  - MECH 101 – Introduction to Mechanical Engineering
  - MECH 102 – Engineering Computer Applications
  - MECH 310 – Thermal-Fluid Systems I
  - MECH 311 – Thermal-Fluid Systems II
  - MECH 325 – Computer Applications-Solid Works
  - MECH 419 – Power and Energy
  - MECH 417 – Renewable Energy

The University of Wisconsin
Masters of Engineering in Engine Systems; Madison, Wisconsin
- Instructor, Department of Mechanical Engineering (August 2016 – Present)
  - Focus on internal combustion engine design

Cummins Inc.
Cummins Technical Center; Charleston, South Carolina
- Combustion Performance & Emissions Engineering Team Leader, High Horse Power Marine Engines (February 2015 – June 2016)
  - Completed a unique to Cummins process (5i) to determine the feasibility of using an innovative strategy to meet Tier 4 PM emissions. Assembled a cross-functional team to execute project successfully.
  - Remotely developed a calibration for QSK60 engine located in India.
  - Co-founder and Vice President of the LEED (Leading, Empowering, Educating & Developing Women) group at Cummins Charleston facility.
  - Developed team through coaching, mentoring and utilizing each team member's strengths to build an optimized team.
- Combustion Performance & Emissions Engineer, High Horse Power Duel Fuels (June 2014 – February 2015)
  - Calibrated a QSK19 engine to run on both diesel and natural gas in a dynamometer.
  - Implemented controls that determine when and how much natural gas is needed to run with diesel.
  - Discovered a software issue the test cell was having for 3 months with shutdowns.
  - Green belt six sigma trained.

John Deere Power Systems Division
John Deere Engine Works; Waterloo, Iowa
- Computation Fluid Dynamics and Combustion Engineer (August 2011 – May 2012)
  - Model urea injection using AVL FIRE for final Tier IV diesel engines.
  - Research urea decomposition via thermolysis to understand how it will perform in the aftertreatment system.
- Engine Field Performance Engineer (September 2009 – August 2010)
  - Determined the root cause of performance related issues on John Deere and OEM vehicles in production.
  - Implemented solutions to the issues found in the field.
- Engine Calibration Engineer (October 2008 – September 2009)
  - Calibrated engines for tractors and graders with Tier IV EPA compliant engines.
  - Developed computer system tools for the calibrations.

John Deere Construction and Forestry Division
John Deere Dubuque Works; Dubuque, Iowa (August 2003 – October 2008)

- Engine and Cooling Engineer, Excavators
  - Designed cooling package for 270 and 350 Tier IV prototype builds.
  - Completed engine and cooling testing for excavators and supported start of production for the excavators.
  - Designed cooling package, consisting of a radiator, oil cooler and charge air cooler, for the 120D excavator using analytical tools including KULI.
  - Worked with engine supplier to customize performance for the 120D excavator.
  - Provided project management leadership during the update of the 120D excavator with John Deere and suppliers.
- Powertrain Engineer, Backhoe Module
  - Backhoe Module Powertrain Team Leader
  - Maintained design of powertrain, drivetrain and electrical components on current production backhoes.
  - Instructed contract engineers tasks he was responsible for.
  - Implemented design updates to reduce returns and allowances and reduce material cost.
  - Gained an understanding of considerations necessary for working in a UAW facility.

- Engineering Development Program
  - Rotated through three different job positions including testing, future product design and current product design during first year of employment.

Purdue University Math Tutor
West Lafayette, Indiana (Aug 1999 – May 2003)

- Tutored students in high school and various math classes at Purdue.
- Met with the students at least weekly to teach an understanding of mathematical concepts.

Ford Motor Company Engineering Internship
Kentucky Truck Plant Super Duty Paint; Louisville, Kentucky (May 2002 – August 2002)

- Designed a parts rack to optimize production.
- Participated in initial stage of an innovative production route for the two tone trucks.
- Conducted research on problematic Fanuc Robots to improve quality.

General Motors Engineering Internship
Powertrain; Pontiac, Michigan (May 2001 – August 2001)

- Worked with GM Powertrain in the Marketing Department.
- Designed and developed a brand identity book for Northstar Engine.
- Updated motorsports web page and traveled to interview racecar drivers.

Caterpillar Mechanical Engineering Internship
Cary, North Carolina (May 2000 – August 2000)

- Installed a cooling system on a wheel loader and prepared manufacturing instructions.
- Built a prototype of a skid steer track type loader.

Education

- **Ph.D. in Mechanical Engineering,**: May 2014, GPA: 3.8
  North Carolina State University, Raleigh, NC
- **Masters of Engineering in Engine Systems**, August 2010, GPA: 3.9
  University of Wisconsin, Madison, WI,
- **Masters in Business Administration**, May 2007, GPA: 3.8
  Clarke College, Dubuque, IA,
- **Bachelor of Science in Mechanical Engineering**, Minor: Mathematics, May 2003, GPA:3.56
  Purdue University West Lafayette, IN,

Technical Projects and Research

- Researching effects that temperature and fuel have on particulate matter on heavy duty diesel engines at the Environmental Protection Agency in the Research Triangle Park (May 2012)
- Sample and analyze exhaust from a Dodge Ram and a Ford F550 in a temperature controlled chassis dynamometer by operating an EEPS, ECPC, PAX, Aethalometer, and CAPS as the instrumentation.
- Built a program in R that is used to analyze the data from the exhaust.
- Scheduled a procedure of tests to determine trends of particulate matter when varying fuels, temperature, vehicle and load.
- Obtained funding for exhaust research through Oak Ridge Institute for Science and Education by reaching out to contacts with similar skills.
- Researched high pressure combustion. Studied soot formation and temperature profile of a laminar jet diffusion flame.
- Built a LabVIEW program for two actuators to measure the 2D temperature profile of the flame at pressures varying from atmospheric to 16 atmospheres.
- Teaching Assistant for Experimental Aerodynamics Lab, experiments involve pressure and force/moment measurements of aerospace vehicle components using a subsonic wind tunnel (Aug 2010 – May 2012).

Selected Publications

- **Book, E.,** Snow, R., Long T., Fang, T., Bauldauf, R., "Temperature effects on particulate emissions from DPF-equipped diesel trucks operating on conventional and biodiesel fuels," *Journal of the Air & Waste Management Association*, Vol 65, December 2015, pp.751-758.
- Kailasanathan, R., **Book, E.,** Fang, T., Roberts, W., "Hydrocarbon Species Concentrations in Nitrogen Diluted Ethylene-Air Laminar Jet Diffusion Flames at Elevated Pressures," *Combustion Institute Manuscript*, August 2012.
- Rabb, R., Martin, A., **Book, E**., Bower, K. (2017), "Math Problem Solving Sessions for Freshman Engineering Success," *Proceedings of the Ninth Annual First Year Engineering Experience (FYEE) Conference*, Daytona Beach, FL, Aug 6-8.
- Bubacz, B., Rabb, R., Howison, J., Skenes, K., Bass, P., Geathers, J., **Book, E.** (2017), " ABET Program Assessment (A.P.A.) for a New Engineering Program," *Proceedings of the 2017 ASEE Zone 2 Annual Conference*, San Juan, Puerto Rico, Mar 2-5.
- **Book, E.,** Wood, T., Plumblee, J., Thackston, M., "Student and Faculty Perspectives and Survey Results on an Innovative Homework Process," *Proceedings of the 2019 Annual ASEE Conference*, Tampa, FL, June 2019.
- Wood, T., Batouli M., Michalaka, D., Brown K., **Book, E**., "Perspectives on an Innovative Homework Policy," *Proceedings of the 2019 Southeastern Section Conference,* Raleigh, NC, March 2019.
- Howison, J., Rabb, R., **Book E**., Washuta, N., "A Simple, Economic Refrigeration Lab for Thermal/Fluids Courses," *Proceedings of the 2019 Annual ASEE Conference*, Tampa, FL, June 2019.