

**Aaron Jesse Fillo**  
**Curriculum Vitae**  
*Oregon State University*  
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**Education**

Oregon State University, Corvallis, OR	Expected Graduation, June 2018
PhD Candidate & NSF Graduate Research Fellow	Mechanical Engineering
Advised by Dr. Kyle Niemeyer	
GPA 3.93/4.00	

Oregon State University, Corvallis, OR	
Masters of Science in Mechanical Engineering	December 2016

Oregon State University, Corvallis, OR	
Bachelors of Science in Mechanical Engineering	June 2014
Graduated Summa Cum Laude (with highest honors)	

**Research Experience**

Visiting Graduate Student Researcher, CalTech	January 2017
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- Developed and implemented efficient dynamic memory algorithm for full multi-component mass diffusion in direct numerical simulation code NGA.
- Verified multi-component mass diffusion algorithm against existing methods and literature.
- Collaborated with CalTech graduate students under advisement of Professor Guillaume Blanquart to study impact of multi-component mass diffusion on 3D premixed turbulent flames.

Graduate Research Fellow, Oregon State University	September 2015-Present
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- Numerically investigated turbulent premixed flame using direct numerical simulation code NGA.
- Evaluated impact of chemical kinetic model reduction on turbulent premixed flame direct numerical simulations using NGA and reduction package MARS.
- Investigated turbulent flame speed of alternative jet fuels as part of Federal Aviation Administration (FAA) National Jet Fuel Combustion Program (NJFCP).
- Numerically investigated laminar burning parameter of FAA NJFCP fuels using Fortran OPPDIF and PREMIX codes.

Graduate Research Assistant, Oregon State University	2014-2015
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- Designed and build turbulent Bunsen burner for vaporized liquid jet fuels.
- Investigated turbulent flame speed of alternative jet fuels as part of Federal Aviation Administration National Jet Fuel Combustion Program.
- Developed technique for visualizing CO<sub>2</sub> diffusion from fresh water under standard conditions.
- Participated in interdisciplinary field research at H.G. Andrews Research Forest with OSU College of Biological and Ecological Engineering.

Senior Design, Oregon State University

Winter- Spring 2014

- Developed test apparatus for investigating potential uses for passively articulated hydrofoil in hydro-kinetic energy extraction.
- Worked with faculty sponsor and graduate student advisor to fulfill complex customer and engineering requirements.
- Wrote comprehensive design report, testing results, and drawing package for final deliverable.
- Served as project manager for team of three mechanical engineering seniors.

Research and Design, Intern ATI Wah Chang, Albany, OR

Spring - Summer 2013

- Researched alternative high precision cleaning system, to retrofit and improve existing apparatus.
- Investigated alternative brush design to withstand highly corrosive environment and high speed application.
- Designed and implemented new cleaning system and brush design.
- Benchmarked design based on exist systems to verify improved cleaning metrics.

Undergraduate Research, Oregon State University

Winter 2013

- Researched effect of quiescent cavitation formed by sudden acceleration of water filled bottles leading to catastrophic bottle failure.
- Numerically analyzed fluid dynamics to determine correlation between water depth and relative size of cavitation formation.
- Experimentally analyzed cavitation formation using high speed camera to verify numeric correlation.
- Presented research and results as part of honor course, Introduction to Fluid Mechanics.

## **Work Experience**

Engineering Consultant, Long Haul Engines LLC.

July 2014 – Present

- Developed comprehensive graphical user interphase for proprietary engine simulation model.
- Developed thermodynamic proofs for alternative internal combustion engine cycle.
- Aided in mechanical design on new alternative internal combustion engine.
- Met with investors to present thermodynamic justifications for alternative engine design and discuss applications in long haul trucking.

Computer Lab Coordinator, Oregon State University, Corvallis, OR

February 2012 - Present

- Managed team of twenty students to clean and maintain all computer labs in the College of Engineering.
- Acted as a liaison between students, professional staff, and faculty.
- Organized hiring, technical and customer service training for all new employees.
- Maintained all training records, scheduling, and inventory, including managing and updating wiki with all information relevant to employee success.

Engineering Intern, ATI Wah Chang, Albany, OR

March - September 2013

- Worked in Plant Engineering Department to maintain and improve both the ATI Albany Operations and ATI Wah Chang facilities in Albany, Oregon.
- Managed capital projects based on lean manufacturing principles.
- Led research and design projects for automated cleaning system improvement and belt polishing system improvements.
- Provided day to day engineering support for ATI Albany Operations facility.

## **Publications/Presentations**

- J.M. Bonebrake, A.J. Fillo, D.L. Blunck, AIAA, Sci. Tech. (2017) *In Progress*
- A.J. Fillo, J. Schulp, G. Blanquart, K.E. Niemeyer, *Assessing the importance of multicomponent transport properties using direct numerical simulation of premixed, turbulent flames*, 10<sup>th</sup> U.S. National Combustion Meeting, Combust. Inst. 2017, (Paper and Presentation).
- A.J. Fillo, J.M. Bonebrake, D.L. Blunck, *Impact of fuel chemistry and stretch rate on the global consumption speed of large hydrocarbon fuel/air flames*, 10<sup>th</sup> U.S. National Combustion Meeting, Combust. Inst. 2017, (Paper and Presentation).
- A.J. Fillo, K.E. Niemeyer, *Impact of chemical kinetic model reduction on premixed multi-dimensional flame characteristics*, SIAM Numerical Combustion Meeting, SIAM, 2017, (Oral Presentation).
- A.J. Fillo, *The Global Consumption Speeds of Premixed Large-Hydrocarbon Fuel/Air Turbulent Bunsen Flames*, Master of Science Thesis, Oregon State University Scholars Archive, 2016, URL: <http://hdl.handle.net/1957/60072>
- A.J. Fillo, D.L. Blunck, *Effects of fuel chemistry and turbulence intensity on turbulent consumption speed for large hydrocarbon fuels*, West. States Sect. Combust. Inst., 2015, (Paper and Presentation).
- J.M. Bonebrake, A.J. Fillo, D.L. Blunck, *Effect of Turbulent Fluctuations on Radiation Emissions from a Premixed Flame*, West. States Sect. Combust. Inst. 2015, (Paper and Presentation).

## **Poster Presentations**

- A.J. Fillo, J.M. Bonebrake, D.L. Blunck, *Impact of fuel chemistry and stretch rate on the global consumption speed of large hydrocarbon fuel/air flames*, OSU COE Graduate Research Showcase, 2017.
- A.J. Fillo, J.M. Bonebrake, D.L. Blunck, *Sensitivity of jet fuel global consumption speeds to fuel chemistry and turbulence intensity*, Int. Combustion Symposium, WIPP, 2016.

## **Conference Reviewer**

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| 69th Annual Meeting of the APS Division of Fluid Dynamics              | Reviewer |
| ASME International Mechanical Engineering Congress and Exposition 2016 | Reviewer |

## **Invited talks**

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| O'Hara Catholic School                              | June 5, 2016     |
| SPARK Engineering Event, Oregon State University    | April 14, 2017   |
| OSU Material Research Society guest speaker         | October 20, 2016 |
| Hillsboro High School Guest Lecturer, Hillsboro, OR | Spring 2014      |

## **Teaching Experience**

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| Substitute Lecturer, Oregon State University              | Ongoing                 |
| Graduate Teaching Assistant, Oregon State University      | 2014-2015 Academic Year |
| Undergraduate Teaching Assistant, Oregon State University | 2013-2014 Academic Year |

## **Outreach Experience**

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| Creator, Writer, Director, Host of Lib Lab: Library Laboratory educational YouTube Series in Partnership with Corvallis Benton-County Public Library | On Going |
| Founder and President of OSU Outreach Organization Project X   | On Going |
| Developing Partnership between OSU and Hillsboro High School   | On Going |

OSU SESEY Mentor, Oregon State University, Corvallis, OR	Summer 2014 & 2015
Hillsboro High School Guest Lecturer, Hillsboro, OR	Spring 2014
Grant Coordinator, Engineers Without Borders, Corvallis, OR	Fall 2011 - Spring 2012
Eagle Scout Project, BSA Troop 77, Geneva Switzerland	January 2008 – May 2009
Habitat for Humanity Construction Crew, Braga, Portugal	September 2007 – June 2008

### **Honors and Awards**

First place poster OSU COE Graduate Research Showcase	March 2017
NSF Graduate Research Fellowship	September 2015 to Present
OSU College of Engineering GTA Fellowship	2014 Academic Year
Honor Roll, Oregon State University	Fall 2011 – Spring 2014
Mechanical Engineering Scholarship Fund, Oregon State University	September 2013
Anita Aitkenhead Memorial Scholarship	August 2013
Honor Roll, University of Missouri Columbia	Fall 2009 – Spring 2011
Eagle Scout, BSA Troop 77, Geneva Switzerland	May 2009

### **References**

Dr. Kyle Niemeyer, Assistant Professor in Mechanical Engineering, Oregon State University, [Kyle.Niemeyer@oregonstate.edu](mailto:Kyle.Niemeyer@oregonstate.edu)

Dr. David L. Blunck, Assistant Professor in Mechanical Engineering, Oregon State University, [David.Blunck@oregonstate.edu](mailto:David.Blunck@oregonstate.edu)

Dr. Joshua Gess, Assistant Professor in Mechanical Engineering, Oregon State University, [Joshua.Gess@oregonstate.edu](mailto:Joshua.Gess@oregonstate.edu)

Dr. Bryony DuPont, Assistant Professor in Mechanical Engineering, Oregon State University, [Bryony.DuPont@oregonstate.edu](mailto:Bryony.DuPont@oregonstate.edu)