

Aaron Jesse Fillo
Curriculum Vitae
Oregon State University
204 Rogers Hall, Corvallis OR, 97330
(573) 303-2188 filloa@oregonstate.edu

Education

Oregon State University, Corvallis, OR
PhD Candidate & NSF Graduate Research Fellow
Advised by Dr. Kyle Niemeyer
GPA 3.93/4.00

Expected Graduation, June 2018
Mechanical Engineering

Oregon State University, Corvallis, OR
Masters of Science in Mechanical Engineering
2017 OSU Distinguished Master's Thesis Award
Thesis: *The Global Consumption Speeds of Premixed Large-Hydrocarbon Fuel/Air Turbulent Bunsen Flames.*

December 2016

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

June 2014

Communication Experience

Showrunner LIB LAB: The Library Laboratory
February 2017-Present

- Host of YouTube science show LIB LAB, focused on teaching Science, Technology, Engineering, Arts, and Mathematics (STEAM) subjects to K-12 audiences.
- Directed and Produced interactive YouTube series in partnership with Corvallis Benton-County Public Library.
- Wrote scripts and developed on screen science demonstrations.
- Launched community engagement program distributing free science kits to children at Corvallis Benton-County Public Library.

Magician and Actor
2009-2014

- Performed for audiences ranging from 60-500.
- Wrote and produced original content including illusion design, and script development.
- Over 50 successful performances.

Research Experience

Graduate Research Fellow, Oregon State University
September 2015-Present

- 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.

Visiting Graduate Student Researcher, CalTech

January 2017

- 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 Assistant, Oregon State University

2014-2015

- 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.
- 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.

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*, 10th 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*, 10th 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

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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| DaVinci Days STEAM Series Technology Talk | May 8, 2018 |
| 4-H Wildlife Stewards Summit – Corvallis school district | May 3, 2018 |
| Oregon State Salmon Bowl Research Talk | February 3, 2018 |
| Eugene Children’s Film Festival Keynote Speaker | August 19, 2017 |
| 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

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| 2017 OSU Distinguished Master’s Thesis Award | October 2017 |
| 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 |

News Media

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| Library releases new science video, A. Rimel, <i>Corvallis Gazette-Times</i> | March 16, 2018 |
| Roses and Raspberries, M. McInally, <i>Corvallis Gazette-Times</i> | December 8, 2017 |
| Library science videos do a deep dive on pressure, A. Rimel, <i>Corvallis Gazette-Times</i> | December 7, 2017 |
| Video: Diving Deep for Pressure, J. Habjan, <i>Albany Democrat-Herald</i> | December 6, 2017 |
| Eclipse Viewing Alternatives, C. Bonitez, <i>KVAL News 13</i> | August 20, 2017 |
| Library’s science guy, A. Rimel, <i>Corvallis Gazette-Times</i> | May 25, 2017 |

References

Dr. Kyle Niemeyer, Assistant Professor in Mechanical Engineering, Oregon State University, Kyle.Niemeyer@oregonstate.edu

Dr. David L. Blunck, Assistant Professor in Mechanical Engineering, Oregon State University, David.Blunck@oregonstate.edu

Dr. Joshua Gess, Assistant Professor in Mechanical Engineering, Oregon State University, Joshua.Gess@oregonstate.edu

Dr. Bryony DuPont, Assistant Professor in Mechanical Engineering, Oregon State University, Bryony.DuPont@oregonstate.edu