Sam D. Simons-Wellin

Turbulence and Energy Systems Laboratory
Department of Mechanical Engineering
427 University of Colorado Boulder
Boulder, CO 80309

1931 Grandview Avenue #G
Boulder, CO 80302
(510) 735 – 6588
sam.simonswellin@colorado.edu

Education

Expected 2024 **Doctor of Philosophy in Mechanical Engineering,** University of Colorado Boulder
Advisor: Dr. Peter E. Hamlington, GPA: 3.88

2020 **Bachelor of Science in Mechanical Engineering,** University of Colorado Boulder
GPA: 3.77, Cum Laude

Research Interests

Computational fluid dynamics, reduced order modelling methods, multidisciplinary optimization techniques to model and design industrial and energy systems.

Research Experience

2020 **Graduate Research and Development Intern,** *3M Corporation*, St. Paul, MN.

Topic of investigation: Modelling and optimizing polymer processing industrial flame systems.

2019 – Present **Graduate Research Assistant,** *Turbulence and Energy Systems Laboratory*, Department of Mechanical Engineering, University of Colorado Boulder, Boulder, CO. Advisor: Dr. Peter E. Hamlington

Topic of investigation: Creating reduced order models of 3-dimensional turbulent simulations of polymer processing industrial flame systems for use within numerical optimization routines.

2019 – 2020 **Systems Engineer – Modelling Team Lead,** *Senior Design Project*, Department of Mechanical Engineering, University of Colorado Boulder, Boulder, CO. Funded by John Zink-Hamworthy Combustion

Topic of investigation: Optimizing novel laser-based optical methods to measure and control surface temperature inside industrial furnaces, and building custom data acquisition software that analyzes spectra to determine changes in temperature and geometry.

2019 **Research Intern,** *Summer Program for Undergraduate Research*, College of Engineering and Applied Science, University of Colorado Boulder, Boulder, CO. Advisor: Dr. Peter E. Hamlington

Topic of investigation: Designing an efficient proper orthogonal decomposition algorithm in Python by leveraging data structure patterns in nearest neighbor interpolated adaptively refined computational meshes produced from AMReX.

Papers in Preparation

[1] M.A. Meehan, **S.D. Simons-Wellin**, P.E. Hamlington. An Efficient Proper Orthogonal Decomposition Algorithm for Adaptively Refined Meshes.

[2] **S.D. Simons-Wellin**, C. Lapointe, O.G. Brown, J.D. Christopher, N.T. Wimer, T.R.S Hayden, G.B. Rieker, P.E. Hamlington. Optimization of Temperature Field between Rotating Cylinder and Turbulent Buoyant Jet.

Conference Presentations

[3] **S.D. Simons-Wellin**, M.A. Meehan, P.E. Hamlington (2019) An Efficient Proper Orthogonal Decomposition Algorithm for Adaptively Refined Meshes. 5th Rocky Mountain Fluid Mechanics Research Symposium. 29 July 2019, Boulder, CO.

Teaching Experience

2018 – 2019 **Computational Methods Teaching Assistant,** *Department of Mechanical Engineering*, University of Colorado Boulder

Held weekly office hours to work with students on coding, scripting, and solutions of computationally intensive numerical and engineering problems. Graded homework and exams, and proctored exams.

2019 **Engineering Projects Teaching Assistant,** *College of Engineering and Applied Science*, University of Colorado Boulder

Guest lectured on engineering material selection for design and manufacturability. Lead group of first year engineering students in design to build process. Graded papers, and held office hours to assist students with fabrication, coding, and scientific writing.

2015 – 2017 **Math, Science, and Engineering Tutor,** Laney College, Oakland, CA

Worked multiple times per week with students from extremely diverse learning and cultural backgrounds. Subjects included algebra to differential equations as student population ranged from college bound early adults to middle aged adults obtaining their GED.

Professional Experience

2013 – 2015 **Fixture and Die Fabricator,** *Performance Structures Inc.*, Oakland, CA

Machined and fabricated high precision custom engineered stainless steel structures. Measured and scanned parts with CMM to tolerances of ±.0005 inches, maintained and operated PLC controlled 1200 ton hydraulic press and ABB robotic systems.

2011 – 2012 **Bronze Casting Technician,** *Kunstguss Kastel*, Wiesbaden, Germany

Designed and built wax gating systems for standard and ceramic shell invested bronze and aluminum casted sculptural and industrial parts, finished parts using machine tools and TIG welding to specifications.

Honors and Awards

2020 – 2021 **Vogel Family Fellowship,** Department of Mechanical Engineering, University of Colorado Boulder

2020 – 2021 **Dean's Graduate Fellowship,** College of Engineering and Applied Science, University of Colorado Boulder

Spring 2020 **Outstanding Graduate for Research**, Department of Mechanical Engineering, University of Colorado Boulder

Spring 2019 **Dean's List**, University of Colorado Boulder

Fall 2018 **Dean's List**, University of Colorado Boulder

2018 **Mackison Prize for Writing in Engineering**, Program for Writing and Rhetoric, University of Colorado Boulder

2018 – 2019 **Engineering Scholarship Fund Merit Scholarship**, University of Colorado Boulder

2018 **College of Engineering Summer Session Incentive Award**, University of Colorado Boulder

2017 **Ars Magna Math Scholarship**, Peralta Colleges Foundation

Funding

2020 – 2021 **Chair's Graduate Assistantship,** Department of Mechanical Engineering, University of Colorado Boulder

2019 – 2020 **Gift Support Grant,** 3M Corporation

2019 **Engineering Excellence Fund**, College of Engineering and Applied Science, University of Colorado Boulder

Languages

German Proficient