Shaun Harris | Mechanical Engr.

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Education

Stanford University — **Stanford, CA**
PhD. Mechanical Engineering, Current GPA – 3.7 — *June 2021*

Stanford University — **Stanford, CA**
M.S. Mechanical Engineering, GPA – 3.7 — *Apr 2018*
- Depth in Fluid Mechanics

Utah State University (USU) — **Logan, UT**
B.S. Mechanical Engineering, GPA – 3.95 — *May 2016*
- Summa Cum Laude
- Emphasis: Aerospace
- Minors: Management and Mathematics

Utah State University — **Logan, UT**
A.S. General Studies, GPA – 4.0 — *Aug 2010*

Experience

Sandia National Laboratories — **Albuquerque, NM**
Graduate Research Year-Round Intern — *06/19 – present*
- Computed instability for high-speed compressible flow and modeled the growth and compared to experimental results for development of reduced order model

Center for Turbulence Research — **Stanford, CA**
Graduate Research Student — *01/18 – present*
- Developed model to study instabilities by using Orr-Sommerfeld-Squire and Parabolized Stability equations for study in laminar, transitional, and turbulent fluid flows
- Generated documentation and published on website `https://stanford.edu/~srharris/SPE/`

Sandia National Laboratories — **Livermore, CA**
Graduate Research Summer Intern — *06/18 – 09/18*
- Simulated computational fluid dynamics multi-componenet repair garage for hydrogen fuel cell vehicle failure analysis [1], [2]
- Created meshes from scratch, calculated boundary conditions, conducted refinement/parameter studies, and analyzed results

Flow Physics and Computation Engineering — **Stanford, CA**
Graduate Research Student — *09/16–11/17*
- Combined LES modeling with weather forecasting data assimilation techniques to enrich scales of LES models using experimental data from high-fidelity 3D PIV system [4], [5]
- `https://web.stanford.edu/group/ihmegroup/cgi-bin/MatthiasIhme/`

Sandia National Laboratories — **Albuquerque, NM**
Technical Undergraduate Year-Round Intern — *05/15 – 08/16*

- Performed uncertainty quantification, verification, and validation of computation model of thermal batteries [6], [7]

High Performance Computational Fluid Dynamics Lab (USU) **Logan, UT**
Undergraduate Computational Fluid Dynamics (CFD) Researcher *05/14 – 04/16*
- Coded, as part of a team, parts of a CFD strand code (C++ and Fortran) [3], [8], [9]
- `http://hipercfd.usu.edu/`

Experimental Fluid Dynamics Lab (USU) **Logan, UT**
Undergraduate Research and Creative Opportunities Grant Recipient *1/14 – 12/14*
- Led research and conducted experiment [10]

Experimental Fluid Dynamics Lab (USU) **Logan, UT**
Undergraduate Research Assistant *12/12 – 03/14*
- Assisted CFD validation experiments for safety analysis of nuclear reactors
- Designed and assembled various parts for particle image velocimetry (PIV) experiment
- `http://efdl.neng.usu.edu/EFDL/EFDL_Home.html`

Synthetic Biomanufacturing Center (USU) **Logan, UT**
Undergraduate Research Assistant *06/10 – 12/10*
- Experimental phase of cohabitating two species in growth reactor for effective bio- diesel algae production
- Presented research finding to professors at conclusion of summer research

Awards

Fall 2016: Stanford Graduate Engineering Fellowship Award

Undergraduate Awards: Academic Excellence Senior (2016), Outstanding Undergraduate Researcher (2015), A-pin award (2014), Outstanding Pre-Professional Award (2014)

Undergraduate Scholarships: George S. & Dolores Doré Eccles Foundation University, Integrated University Program, USU Presidential, and New Century

Spring 2010: High School Salutatorian of 453 students

Skills

Coding: Python, Vim, C++, MatLab, Fortran, Linux OS, batch scripts for HPC, and LabVIEW

Software: ParaView, CUBIT, Solid Works, and Solid Edge

Written: Microsoft Office, LaTeX, and $\approx$ 90 WPM

Technical: hand tools, saws, mills, drill presses, and soldering

Biological: autoclave, optical density machine, centrifuge, flow hoods, and pipets

Leadership and Volunteer

01/15 – Current: Member of the Tau Beta Pi Society

01/14 – 12/17: Member of the American Nuclear Society (ANS)
- Communications Officer (ANS) USU section (Kept meeting minutes and constructed flyers)

01/13 – 11/13: Member of the American Society of Mechanical Engineers (ASME)

01/11 – 12/12: Full-time Service Volunteer for non-profit organization in Atlantic Canada
- Leader over fellow volunteers in door-to-door communications
- Trained and instructed fellow volunteers in presentation effectiveness
- Worked with people providing addiction recovery and life coaching

2008: Eagle Scout

Articles

[3] O. Tong, Y. Yanagita, R. Schaap, S. Harris, and A. Katz, "High-order strand grid methods for shock turbulence interaction," *International Journal of Computational Fluid Dynamics GCFD*, 2018.

[4] H. Wu, J. Labahn, S. Harris, and M. Ihme, "Evaluation of the ensemble kalman filter for assimilation of experimental data in large-eddy simulations," *XXX - **Submitted***, 2018.

Reports

[2] S. Harris, M. Blaylock, and et al., "Hydrogen repair garage failure simulations," Sandia National Laboratories, Sandia Report SAND2019-XXXX - **DRAFT**, 2019.

[6] S. A. Roberts, S. R. Harris, A. C. Hetzler, E. S. Piekos, B. B. Schroeder, and B. L. Trembacki, "Establishing the credibility of the thermally activated battery simulator, full-battery version 4: Verification, validation, and uncertainty quantification," Sandia National Laboratories, Sandia Report SAND2017-3397, 2017.

Conferences

[1] *Ehrhart, B. D.*, S. R. Harris, M. Blaylock, A. B. Muna, and D. Olivia, in *International Conference on Hydrogen Safety*, 2019. [Online]. Available: `https://www.hysafe.info/myfiles/ichs2019/ICHS_2019_Draft_Program.pdf`.

[5] *Harris, S.*, J. Labahn, and M. Ihme, "The coupling of high-speed high resolution experimental data and LES through data assimilation techniques," in *70th Annual Meeting of the APS Division of Fluid Dynamics*, 2017. [Online]. Available: `http://meetings.aps.org/Meeting/DFD17/Session/L28.11`.

[7] *B. Trembacki*, S. Harris, E. Piekos, and S. Roberts, "Uncertainty quantification, verification, and validation of a thermal simulation tool for molten salt batteries," in *47th Power Sources Conference, Orlando FL*, 2016.

[8] *Tong, Oisin*, Y. Yanagita, S. Harris, D. Work, and A. Katz, "Asymptotic geometry representation for complex configurations on strand grids," Jan. 2016. DOI: `10.2514/6.2016-1584`.

[9] *Tong, O.*, Y. Yanagita, R. Schaap, S. Harris, and A. Katz, "High-order strand grid methods for shock turbulence interaction," in *22nd AIAA Computational Fluid Dynamics Conference, Dallas TX*, 2015,

[10] *Harris, S.* and B. Smith, "Olive oil tracer particle size analysis for optical flow investigations in a gas medium," in *67th Annual Meeting of the APS Division of Fluid Dynamics*, 2014. [Online]. Available: `http://meetings.aps.org/link/BAPS.2014.DFD.R29.9`.