Skyler Baugher | Resume

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Objective

To obtain a PhD in the Computational Sciences.

Education

PhD **Columbus, OH**
Ohio State University: Aeronautics and Astronautics *August 2020 - Present*

- *Dissertation: Analysis of Cavity Bay Configurations with Doors*
- *Credits: 40, GPA: 3.85*
- *Anticipated Graduation: Spring 2024*

Masters **Toledo, OH**
University of Toledo: Mechanical Engineering (Thermal and Fluid Sciences) *August 2017 - May 2020*

- *Thesis: Development of a RANS and LES Hybrid Methodology for Aerodynamic Flows (Overflow and U^2NCLE CFD Codes)*
- *Credits: 48, GPA: 3.866*

Bachelors Degrees **Toledo, OH**
University of Toledo: Mechanical Engineering and Astrophysics *August 2013 - May 2017*

- *Credits completed: 177, GPA: 3.84, with honors*

Experience

AFRL Student **Dayton, Ohio**
Air Force Research Lab RQVI *June 2022-August 2022*

- Analysis of store trajectories
- Application of parallel multi-block data driven techniques
- Development of CPOD parallel multi-block code to condense large data sets (100Tbs)
- Grid movement
- Hybrid RANS/LES simulations

AFRL Student **Dayton, Ohio**
Air Force Research Lab RQVI *June 2021-August 2021*

- Analysis of Frontier Project Data
- Development of parallelized multi-block POD/DMD methods
- SPOD implemented for multi-block
- Captured new low-frequency motions
- Chimera Grid Tools (Scripting,hole cutting, multi-block, various)

AFRL Student **Dayton, Ohio**
Air Force Research Lab RQHF *June 2020-August 2020*

- LES/Hybrid modeling of HiFIRE6 configuration
- Use of Machine Learning and Monte Carlo Simulation to study/predict unstart
- Statistical analysis and processing of experimental data

DAGSI Student **Dayton, Ohio**
Air Force Research Lab RQHF *May 2019-May 2020*

- Implementation of entropy based DES shielding function in Overflow
- Implementation and validation of LES and RANS/LES hybrids in Overflow
- Validation of LES and RANS/LES in U^2NCLE

Graduate Assistant **Toledo, Ohio**
University of Toledo *June 2017 - May 2019*

- TA for Fluid Mechanics and Energy Lab
- Thesis work in Computational Fluid Dynamics: LES and LES/RANS hybrid modeling

Configuration Aerodynamics Branch Intern **Hampton, Virginia**
NASA Langley *June 2018-August 2018*

- Simulations for Lockheed Martin's Low Boom Flight Demonstrator (LBFD) with the codes FUN3D and USM3D.
- Determined ground noise levels.
- Performed studies on turbulence model, numerical schemes and different configurations for LBFD.

No publication due to proprietary data.

Space Communications And Navigation Intern **Cleveland, Ohio**
NASA Glenn *June 2017-August 2017*

- Quantum Key Distribution (Quantum Communications and Encryption).
- Optical sorting and efficiency optimization.
- Quantum source characterization of type I entangled photons in PP KTP waveguide
- Data analysis, Poisson and photon statistics.
- Use of B92 security protocol in free space application and encryption keys.
- Parsing and sifting code. Use of Labview and Python.

Tutor **Toledo, Ohio**
University of Toledo *January 2017-May 2017*

- Completed training for effective learning and teaching methods.
- Tutored Physics, Mechanical Engineering, Math courses, Civil and Electrical Engineering courses.

Material Science Lab TA **Toledo, Ohio**
University of Toledo *January 2015-May 2017*

- Taught labs, helped students and graded lab reports.
- Performed analysis of materials through many means such as hardness tests and analyzing grain structures in welds.

Astrophysics Undergraduate Research Assistant **Toledo, Ohio**
University of Toledo *May 2016-January 2017*

- Studied early star formation in Cepheus 03B
- Used and created programs in IDL and Python.
- Analyzed and performed photometry on large arrays of data.
- Certification to conduct research (for NSF grant)

Honors And Awards

Dean's List, The University of Toledo, Fall 2013-Fall 2016
University of Toledo Rocket Scholar, WACE National Co-op, SAE, SSOE and various other scholarships
University of Toledo Honors Program And Honors Degree
Outstanding Undergraduate Natural Sciences and Mathematics student in Physics

Technical Skills

Below in order of familiarity or preference

Programming Languages: Python, Fortran90, Bash, Matlab, IDL, Perl, Ruby C++
CFD Solvers: OVERFLOW, SAFF, FUN3D, USM3D, U^2NCLE, Cart3D
CFD Postprocessing: Paraview, Fieldview, Tecplot and their scripting languages
Grid Generation: Chimera Grid Tools, Pointwise, Solidmesh, Vgrid/Postgrid, Heldenmesh, Gridtool
3D/2D Modeling: SolidWorks, Inventor, CAD
Office Skills: Latex, Microsoft Office, Libre/Apache Office
Operating Systems: Linux, Mac, Windows
MISC: ArcGIS, GrassGIS, Photometry, Data Reduction

Collegiate Activities, Volunteering

Student Member of the American Society of Mechanical Engineers and Society of Physics Students
Tutoring of local Toledo students (in association with Honors College).
Environmental surveying and a book club in the Environmental Science Department.
Conservation volunteer for TNC including wildfire treatment, brush-cutting and tree management.
Natures Nursery (Animal Rehabilatation and Outreach) Volunteer

Interests

Fluids, Quantum Mechanics, Astrophysics/Earth Sciences
Big data, high performance computing

Guitar, Piano, Music, Hiking/camping, Fishing

Publications And Presentations

Publications

Katz, Evan et al.,*Coincidence Studies Of Entangled Photon Pairs Using Nanowire Detection And High-Resolution Time Tagging For QKD Application*, SPIE 10559, Broadband Access Communication Technologies XII, January 29th 2018

Sheng, C., Schindler, R., Baugher, S., and Zhao, Q. *"Transition Modeling and Prediction Using an Unstructured Grid RANS CFD Code,"* AIAA-2018-1042, 56th AIAA Aerospace Sciences Meeting, AIAA SciTech, 8-12 January 2018, Kissimmee, Florida

Schindler, R., Baugher, S., and Sheng, C., *"RANS Modeling for XC-142 Tiltwing Application,"* 30th International Conference on Parallel Computational Fluid Dynamics, 14-17 May 2018, Indianapolis, Indiana

Zhao, Q., Baugher, S., and Sheng, C., *"NASA PSP Rotor Hover Simulation with Fuselage Effect,"* AIAA-2019-0594, AIAA SciTech 2019 Forum, 7-11 January 2019, San Diego, California

Zhao, Q., Sheng C. and Baugher, S., *"Numerical Investigation of Rotor Aerodynamics Using High-Order Unstructured Grid Schemes,"* AIAA-2020, AIAA SciTech 2020 Forum, 6-10 January 2020, Orlando, Florida

Baugher, S., *Development of a RANS and LES Hybrid Methodology for Aerodynamic Flows*, University of Toledo, 2020

Baugher, S., Bisek, N., *Application of Hybrid Reynolds Averaged Navier–Stokes and Large-Eddy-Simulation Eddy Viscosity Blending Methods in OVERFLOW*, AIAA Journal 2021

JANNAF, not for public release, 2021

Baugher, S., Prasad, C., Gaitonde D., *Large Eddy Simulation and Modal Analysis of Cavity Bays with Different Door Configurations*, AIAA SciTech 2022 Forum, January 2022

Baugher, S., Speth, R., Sherer, S., Gaitonde D., *3D Cavity Bay Dynamics with Effect of Doors*, AIAA SciTech 2023 Forum, January 2023

Presentations/Projects

Data driven analysis of store trajectories in weapons bases, AFRL, August 2022

Low frequency bifurcation in open cavities, AFRL, August 2021

Machine learning and Monte-Carlo Simulation to Analyze and Predict Scramjet Unstart, AFRL, August 2020

Near-Field and Ground Pressure Signatures of Lockheed Low-Boom Flight Demonstrator (X-Plane), NASA Langley, August 2018

References

Available upon request