SHELBY HAYOSTEK

PhD Candidate - U.S. citizen
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PROFILE DESCRIPTION

Fluid dynamics PhD experimentalist candidate at Rensselaer Polytechnic Institute with a Bachelor's in Aeronatuical Engineering. Experienced in water tunnel testing, engineering principles and practices, computer aided engineering tools, multi-diciplinary design and development teams and operations with familiarity in wind tunnel testing and aircraft system designs as well as some computational research (CFD).

EDUCATION

Rensselaer Polytechnic Institute (RPI) - Troy, NY USA **August 2016 - August 2021**

PhD Candidate in Aerospace Engineering

Thesis: Three-Dimensional Flow Separation of Finite Aspect Ratio Wings at Low Reynolds Number

- Fully funded project through air force and NSF-GFRP
- Multi-disciplinary, international project with experiments, CFD, and stability analysis
- Advisor: Michael Amitay
- GPA 3.63

Rensselaer Polytechnic Institute (RPI) - Troy, NY USA **August 2012 - May 2016**

B.S. Dual in Aeronautical and Mechanical Engineering with minor in Psychology

- ABET accreditation
- GPA 3.41

RESEARCH EXPERIENCE

Rensselaer Polytechnic Institute (RPI) - Troy, NY USA **August 2016 - Current**

- Graduate Research Assistant at the Center for Flow Physics and Control (CeFPaC)
- Experimentally analyzed flow physics in order to understand the vortical structures seen on finite aspect ratio wings under highly separated flows at low Reynolds numbers.
- Performed various techniques in subsonic water tunnels such as stereo-particle image velocimetry (SPIV) and flow visualziation using fluorescent dye
- Collaborated directly with CFD and stability groups in an international project
- First in lab to use a water tunnel configuration for experiments

Rensselaer Polytechnic Institute (RPI) - Troy, NY USA **May 2014 - May 2016**

- Undergraduate Research Assistant
- Participated in research and experiments under multiple projects involving active flow control on a wing, active flow control technology development, and general support
- Designed and built experimental models working with machinist, technicians, and other students

PROFESSIONAL EXPERIENCE

Boeing Co. - Flight Controls Engineer - Everett, WA **Summer 2017**

- Became familiar with the flight control systems of the 767 and 777
- Learned system design philosophy by interacting with engineers and system schematics
- Provided support to the 767 freighter and tanker flight controls
- Worked with a technical fellow to identify new materials/alternative designs for a part on the 777
- Supported efforts to reduce labor and flow time required to complete flight control's functional test on production line

Boeing Co. - Logistics and Product Support Analyst - St. Louis, MO **Summer 2016**

- Updated maintenance tasks on the F-15 program
- Supported product development within Logistics Support Analysis (LSA) team

Boeing Co. - Design & Structural Engineer - St. Louis, MO **Summer 2015**

- Hired through the Engineering Accelerated Hiring Initiative (EAHI)
- Designed structural cover and did minor analysis on the structural integrity of JDAM
- Analyzed wind tunnel results from tests in CALSPAN wind tunnel
- Became proficient in 3D printing models

LEADERSHIP

CeFPaC- RPI **August 2016 - Current**

- Graduate mentor to undergraduates and new graduates in CeFPaC
  - Supervised undergrads in the fabricating and building of models as well as basic experiments
  - Helped new graduate students in lab to become adjusted to grad life and research
- Participated in events involving graduate school enrollment and be part of a group to help bridge the gap between professors and students (Student Advisory Council)

Teaching Assistantship - RPI

- Flight Mechanics **Fall 2020**
  - Assisted professor in tests, projects, and lectures in upper undergraduate course
  - Taught lessons as a requirement for GAANN fellowship and received feedback from students
- Inventor Studios 1, 2, and 3 **Spring 2017**
  - Assisted professor in innovation and design courses
  - Mentored students on their projects while assisting them in the patenting process
- Fluid Dynamics Lab **Fall 2016-Spring 2017**
  - Assisted professor in teaching a wind tunnel experimental based class
  - Instructed and led some classes

Society of Women Engineers (SWE) - RPI **August 2014-May 2019**

- Mentored an incoming freshmen women and assisted her in her career at RPI
- Gave advice on classes, internship, and research as well as participating in social events on campus with her

CIPCE Lego Robotics Mentor - RPI **August 2012-May 2013**

- Traveled to local elementary schools and mentored under privileged children in Lego robotics
- Assisted the students in obtaining a solution to real world issues and supported them in presenting their work in front of a panel of judges

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AWARDS AND HONORS

The Graduate Assistance in Areas of National Need-GAANN **Fall 2020**
Awarded to graduate students with excellent academic records who demonstrate financial need and plan to pursue a Mechanical or Aeronautical Ph.D. with an emphasis on teaching and research.

National Science Foundation-GRFP **Summer 2017**
Awarded to outstanding graduate students who possess intellectual merit and whose research and work aim to have broader impact

Boeing Scholarship **Fall 2014**
Awarded to students who show academic success and excellence with a clear drive for research that was funded by the Boeing company

Rensselaer Leadership Award **Fall 2012**
Awarded to students with outstanding record of academic and personal achievements, commitment to excellence and illustration of intellectual curiosity.

SKILLS

Software - ParaView, Unigraphics NX (CAD software), LaVision DaVis, LaTeX, MATLAB, LabView, Ansys (CFD Software), Microsoft Excel
Technical - Water tunnel maintenance and operation, wind tunnel operation, data acquisition and analysis, SPIV theory and application, Flow Visualization, technical writing, oral presentations
Personal - Ability to work in a group and independently, Multi-Lingual (English, German, and French)

PUBLICATIONS

Accepted Journal Publications

1. Zhang, K., **Hayostek, S.**, Amitay, M., He, W., Theofilis, V., & Taira, K. (2020). On the formation of three-dimensional separated flows over wings under tip effects. Journal of Fluid Mechanics, 895.

2. Zhang, K., **Hayostek, S.**, Amitay, M., Burtsev, A., Theofilis, V., & Taira, K. (2020). Laminar separated flows over finite-aspect-ratio swept wings. arXiv preprint arXiv:2005.09737.

In preparation

3. **Hayostek, S.**, Zhang, K., Taira, K., Burtsev, A., Theofilis, V., & Amitay, M. (2021). Three Dimensional flows over low Aspect Ratio Wings at Low Reynolds number.

4. Burtsev, A., He, W., **Hayostek, S.**, Zhang, K., Taira, K., Amitay, M., & Theofilis, V. (2021). Instability mechanisms and flow separation over 3-D wings

CONFERENCE PRESENTATIONS

1. **Hayostek, S.**, & Amitay, M. (2019). Effect of boundary conditions on 3-D separation over an airfoil. Bulletin of the American Physical Society.

2. **Hayostek, S.**, Amitay, M., Zhang, K., Taira, K., He, W., Burtsev, A., & Theofilis, V, "Collaborative Investigation of 3-D separation on Low Aspect Ratio Finite Span Wings." The 59th IACAS, Haifa and Tel Aviv, Israel, March 4-6, 2019

3. Taira, K., Zhang, K., Amitay, M., **Hayostek, S.**, Theofilis, V., He, W., & Burtsev, A. Separated Flows over Finite-Aspect Ratio Wings: Computational, Experimental, and Stability Analyses. In International Symposium on Turbulence and Shear Flow Phenomena (2019).

4. **Hayostek, S.**, Amitay, M., Zhang, K., Taira, K., He, W., & Theofilis, V. (2019). Wake Dynamics of Finite Aspect Ratio Wings. Part I: An Experimental Study. In AIAA Scitech 2019 Forum (p. 1384).

5. Zhang, K., Taira, K., **Hayostek, S.**, Amitay, M., He, W., & Theofilis, V. (2019). Wake Dynamics of Finite Aspect Ratio Wings. Part II: Computational Study. In AIAA Scitech 2019 Forum (p. 1385).

6. He, W., Burtsev, A., Theofilis, V., Zhang, K., Taira, K., **Hayostek, S.**, & Amitay, M. (2019). Wake Dynamics of Finite Aspect Ratio Wings. Part III: TriGlobal Linear Stability Analysis. In AIAA Scitech 2019 Forum (p. 1386).

7. **Hayostek, S.**, & Amitay, M. (2018). Three-dimensional separation on finite aspect ratio swept back wings. In 2018 Fluid Dynamics Conference (p. 3729).

8. **Hayostek, S.**, Spatcher, D., and Amitay, M., “Active Flow Control Devices for Along the Vertical Tail”, Thousand Island Fluid Dynamics Conference, 2015 May, Thousand Island, Canada

9. **Hayostek, S.**, Lewis, D., and Amitay, M., “Quantification of the PDOS actuator: materials selection”, Thousand Island Fluid Dynamics Conference, 2016 April, Thousand Island, Canada