KEVIN W. HOUSLEY

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EDUCATION

Rensselaer Polytechnic Institute (RPI), Troy, NY
Doctorate in Aeronautical Engineering (Advisor: Michael Amitay, Ph.D.) May 2020
Cumulative Graduate GPA: 3.78
Bachelor of Science, Dual Major in Aeronautical and Mechanical Engineering May 2014

TECHNICAL SKILLS

Software Matlab, LabVIEW, Altair AcuSolv, ANSYS, ParaView, DaVis, Siemens NX, Linux, LaTeX
Skills Experimental testing and troubleshooting, Data analysis, Stereoscopic particle image velocimetry (SPIV), Computational fluid dynamics (CFD), Semi-empirical modeling, Constant temperature hot wire anemometry (CTA), Composites fabrication, CNC and manual machining, Amateur radio (Built all-band, all-mode open-source HF transceiver), Proficient in Spanish

RELEVANT EXPERIENCE

Graduate Research Assistant Summer 2014 - Fall 2016
Center for Flow Physics and Control (CeFPaC), RPI

- Developed and fabricated synthetic jet actuators with 15% improvement in velocity and increased robustness (compared to commercially available products) for active aerodynamic flow control
- Formulated a semi-empirical model based on fluid structure interaction that predicts velocity performance of piezoelectric synthetic jet actuators; experimentally validated the model at various design conditions
- Collaborated with engineers from multiple labs at Boeing through bi-weekly project meetings; trained in bimorph design and construction at smart materials lab in Seattle
- Wrote Matlab scripts to process actuator velocity, pressure, temperature, and displacement data synchronously
- Collected and analyzed SPIV results on a synthetic jet at various pitch and skew angles interacting with a turbulent crossflow in a wind tunnel; showing bifurcation of vortex pairs under some conditions

Shop Assistant Summer 2012
Greene Plumbing and Heating Co, Pocatello, ID

- Installed HEPA filtration and air processing systems at ON Semiconductor; inspected systems prior to operation
- Worked under cleanroom conditions around delicate equipment and hazardous materials

Undergraduate Research Assistant Fall 2012 - Spring 2014
URP, CeFPaC, RPI

- Refurbished subsonic wind tunnel, including machining new test section, and generated CAD models

RELEVANT COURSEWORK

- *Intro to Computational Fluid Dynamics* - Finite element, finite difference, and finite volume methods
- *CFD of Momentum Injection* - Independent study on a turbulent flowfield; AcuSolv on Linux on a parallel cluster
- *Aerodynamic Flow Control* - Control authority, excitation of instabilities, and engineering trade-offs
- *Introduction to Hydrodynamic Stability* - Absolute and convective forms; Kelvin-Helmholtz, Rayleigh-Bénard, etc.
- *Embedded Control* - C programming of microcontroller for autonomous navigation on a lighter-than-air uav
- *Numerical Computing* - Principles of numerical methods, uncertainty quantification, verification, and validation
- *Modeling and Analysis of Uncertainty* - Statistical analysis of data and ethical representation of scientific results
- *Electronic Instrumentation* - Analog and digital circuit design; sensors, op-amps, TTL, noise mitigation, etc.
- *Materials Science for Engineers* - Material properties at diverse conditions; including thermal protection materials
- *Boundary Layers and Heat Transfer* - Aero-thermodynamics, fluid mechanics, and transitioning flows

- *Thermal and Fluids Engineering I* - Fluid and material thermal response; convective, conductive, and radiative
- *Conductive Heat Transfer* - Modeled heat transfer through multiple layers and regions of smart material actuator
- *Turbulence* - Analytical models of turbulence at various scales and regions and process of energy cascade
- *Modeling and Control of Dynamic Systems* - Laplace transforms and closed loop control
- *Aerospace Structures and Materials* - Aerodynamic loading of slender and bluff body semi-monocoque structures
- *Advanced Manufacturing Processes and Systems* - Hands-on experience with current capabilities and requirements
- *Writing for Classroom and Career* - Technical and persuasive principles of writing and communication

LEADERSHIP EXPERIENCE

Mentoring Undergraduate Research Assistants (URP Participants) 2015 - 2018
CeFPaC, RPI

- Nick Worley - Capturing phase-averaged pressure distributions inside synthetic jet actuator cavities
- Harry Waskow - Quantifying synthetic jet velocity performance through hot wire anemometry
- Joe Hatch - Fabrication of piezoelectric bimorphs with carbon fiber composites for use in synthetic jet actuators

Graduate Teaching Assistant 2017 - 2019
Mechanical, Aerospace, and Nuclear Engineering Department, RPI

- Aerodynamics I - Aided students in writing and debugging numerical models of fluid mechanics problems; Matlab
- Fluid Dynamics Laboratory - Helped students gain hands-on experience with experimental wind tunnel testing
- Thermal and Fluids Engineering Laboratory - Led lab sessions and discussions on scientific methods and reporting

Lead TA, Annual Aerospace Summer Camp for High School Students 2013 - 2017
Summer@Rensselaer, RPI

- Planned camp activities including constructing RC planes, conducting wind tunnel experiments, touring research labs, and visiting student clubs
- Managed group of four TAs, procured supplies for 96+ participants, and ensured compliance with campus Health and Safety requirements

Treasurer and Co-Lead of Propulsion Group 2011 - 2013
Design/Build/Fly Club, RPI

- Won 3rd Place team (out of 60+ teams) in international AIAA DBF competition, Tucson, AZ, 2013
- Managed budget and coordinated resources between design groups
- Designed and tested power, communication, and electric motor systems for RC planes

Full-Time Volunteer Missionary in Guatemala July 2009 - July 2011
The Church of Jesus Christ of Latter-Day Saints

- District Leader of groups of up to 10 missionaries (10 months) and trained new missionaries (6 months)
- Financial Secretary, managed mission budget (housing, food, and transportation for 190+ people) (7 months)

SELECT PUBLICATIONS AND CONFERENCE PRESENTATIONS

Housley, K., Clingman, D., and Amitay, M., "Development of piezoelectric-based membranes for synthetic jet actuators: experiments and modeling." Industrial and Commercial Applications of Smart Structures Technologies 2016. Vol. 9801. International Society for Optics and Photonics, 2016.

Housley, K., Amitay, M., "Exploration of Piezoelectric Bimorph Deflection in Synthetic Jet Actuators", 70th Annual Meeting of the APS Division of Fluid Dynamics, Denver, CO, November 2017.

Housley, K., Amitay, M., "More Insight of Piezoelectric-based Synthetic Jet Actuators", 69th Annual Meeting of the APS Division of Fluid Dynamics, Portland, OR, November 2016.

Housley, K., Chang, L., Rathay, N., and Amtiay, M., "Synthetic Jet Actuator Performance Enhancement." 1000 Islands Fluid Dynamics Meeting, Gananoque, Ontario, Canada, May 2014.