Bobby Hodgkinson

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Work Experience

August 2018 - Current

Instructor at University of Colorado Boulder, *Smead Aerospace Engineering Sciences*

Primarily focused on the experiential learning lab activities for sophomore and junior level aerospace courses. This includes responsibility for the lab experiment hardware in the areas of aerodynamics, structures, controls, thermodynamics, vehicle design, materials, electronics, etc. Also attend and grade senior design project presentations.

July 2013 - August 2018

Professional Research Assistant at University of Colorado Boulder, *Smead Aerospace Engineering Sciences*

Provide instrumentation and electronics technical support for labs, senior projects, graduate projects and research activities in the department. Staff, organize and maintain equipment in the Electronics and Instrumentation Laboratories that serve student, lab support and department needs. Maintain and improve existing laboratory experiment hardware and software. Work closely with faculty to develop, design and implement new experimental labs and validate against specific learning objectives.

May 2011-May 2013

Laboratory Manager at Institute for Networked Autonomous Systems

University of Florida Department of Mechanical and Aerospace Engineering

Design, implementation and testing of electrical, mechanical, and software improvements to research group's robots (aerial, surface and underwater). Advise team of undergraduate students working towards annual MATE ROV competition. Manage the group's electronic shop and machine shop. Research, design, and verify new sensors for small unmanned robots in sensor networks. Management of research group personnel. Work closely with faculty, staff, and vendors to ensure researchers have necessary research resources.

August 2005 - May 2011

Electronics Shop Teaching Assistant University of Colorado Boulder, *Department of Aerospace Engineering Sciences*

Assisted undergraduate students with hands-on laboratory experiments ranging from sophomore level water rockets to senior level spacecraft control experiments. Assisted faculty, graduate and undergraduate students in the technical aspects of electronic engineering. Experience with analog and digital printed circuit board design, testing and verification.

Education

May 2011

Master of Science in Aerospace Engineering,
University of Colorado Boulder, Boulder, CO
Focus Area: Vehicle Controls

May 2010

Bachelor of Science in Aerospace Engineering,
University of Colorado Boulder, Boulder, CO
Minor: Electrical Engineering

Teaching Experience

Fall 2018, Fall 2019, Fall 2020

ASEN 2002 Aerospace Engineering Sophomore Laboratories
University of Colorado Boulder, *Smead Aerospace Engineering Sciences*

Lab activities for sophomore level thermodynamics and aerodynamics. 4 lab sections, 8 contact hours/week. In addition to the typical lab coordination I was responsible for the entirety of lab activities. I gave lab intros, helped students grasp and understand the lab assignments along with completing the assignment.

Spring 2019, Spring 2020

ASEN 2003 Aerospace Engineering Sophomore Laboratories
University of Colorado Boulder, *Smead Aerospace Engineering Sciences*

Lab activities for sophomore level dynamics and controls. 3 lab sections, 12 contact hours/week. In addition to the typical lab coordination I was responsible for the entirety of lab activities. I gave lab intros, helped students grasp and understand the lab assignments along with completing the assignment.

Fall 2013 - Current

ASEN 4018/4028 Senior projects workshops and Project Advisory Board
University of Colorado Boulder, *Smead Aerospace Engineering Sciences*

Four lecture style workshops given to 20-200 senior undergraduates for the purpose of aiding the electrical, software, and sensor aspects of capstone design projects. Attend, critique, question, and grade team presentations throughout the two semester course.

Maymester 2014 and 2015

ASEN 2519 Aerospace CAD/CAM Basics
University of Colorado Boulder, *Aerospace Engineering Sciences*

Team taught introduction to SolidWorks (computer aided drafting) and SolidCAM (computer aided manufacturing) software packages and Aerospace machining practices. Gave 18 one hour long lecture style presentations to 15-20 undergraduate students during the 4 week course. Topics ranged from basic mechanical design concepts to manufacturing safety, technique, best practices, and tips.

September 2013 - current

Laboratory Experiments
University of Colorado Boulder, *Smead Aerospace Engineering Sciences*

10-30 minute introductory explanations and discussions given to 50-80 students at a time in laboratory environment to detail mechanical, electrical and software design concepts, and experimental procedure. Small group discussions and clarifications during the conduction of experiment. Experiments in statics, structures, thermodynamics, aerodynamics, dynamics, aerospace vehicle design, and electronics.

Publications and conference papers

- **B. Hodgkinson**, D. Lipinski, L. Peng, K. Mohseni, "High resolution atmospheric sensing using UAVs", *Distributed Autonomous Robotic Systems*, 104, 31-45, Springer Berlin Heidelberg, 2014, DOI 10.1007/978-3-642-55146-8.
- **B. Hodgkinson**, D. Lipinksi, L. Peng, K. Mohseni, "Cooperative Control Using Data-Driven Feedback for Mobile Sensors", Proceedings of IEEE International Conference on Robotics and Automation (ICRA 2013), Karlsruhe, Germany, 6-10 May 2013.
- **B. Hodgkinson**, D. Shyu, K. Mohseni, "Acoustic Source Localization System Using a Linear Arrangement of Receivers for Small Unmanned Underwater Vehicle", IEEE/MTS OCEANS 2012, Hampton Roads, Virginia, 2012
- **B. Hodgkinson**, D. Lipinski, L. Peng, K. Mohseni, "High resolution atmospheric sensing using UAV swarms", International Symposium on Distributed Autonomous Robotic Systems (DARS 2012), Baltimore, MD, 2012
- **B. Hodgkinson**, D. Lipinski, L. Peng, K. Mohseni, "Environmental Monitoring with K-means Error Reduction Using UAVs Controlled by a Fluid Based Scheme", International

Conference on Intelligent Robots and Systems (IROS 2012 WREM), Vilamoura, Algarve, Portugal, 2012

- L.Peng, D. Lipinski, **B. Hodgkinson**, K. Mohseni, "Dynamic Data Driven Application System for Puff Estimation Using UAVs", 2013 International conference on Unmanned Aircraft Systems (ICUAS 2013), Atlanta, GA, 2013
- M.Krieg, P. Klein, **R. Hodgkinson**, and K. Mohseni, "A hybrid class underwater vehicle: Bioinspired propulsion, embedded system, and acoustic communication and localization system," Marine Technology Society, pp. 153-164
- D. Ambrosio, R. D. Gizzi, **B. Hodgkinson**, J. Kirkpatrick, C. Miller, J. Price, and T. Thomas, "Cuboat: Colorado underwater buoyant oceanic acoustic network", in 49th Aerospace Science Meeting Including the New Horizons and Aerospace Exposition, January 2011

Conference Presentations

- IEEE/MTS OCEANS '12. Hampton Roads, Virgina, October 14-19, 2012
- AIAA International Student Conference, Orlando, FL, January 4-7, 2011
- National Instruments Student Design Showcase, Austin, TX, August 3-5, 2010 (1st place)

Recent service rolls at CU Boulder

- Dean's ad hoc budget committee. Provided feedback to college of engineering dean on budgetary recommendations to meet the COVID-19 mandatory funding cuts.
- Engineering social club. Coordinated and implemented social gathering events for students and faculty in the college of engineering.
- Undergrad committee. Provide feedback and discuss new strategies to improve and maintain the Aerospace engineering curriculum.
- Engineering Education Research group (AeroBEER). Discussed papers and studies related to engineering education research to help improve the delivery of education materials and research the effects of these strategies.
- Computing committee. Provided feedback and suggestions on various computing topics related to curriculum.
- Capstone COVID workgroup. Developed strategies and recommendations with key players in other engineering disciplines related to the delivery and expected outcomes of senior capstone projects throughout the college of engineering due to COVID-19 mandates.
- COVID 3D printing initiative. Worked with Make4Covid to fabricate and distribute PPE during the initial PPE shortage due to the COVID-19 pandemic.

Computer Skills

LabVIEW	Altium	Arduino	MATLAB/Simulink	SolidWorks	SolidCAM
C/C++	LaTeX	Linux,	PowerPoint	Word	Excel