

Luke Burks

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Aerospace Autonomy Engineer

EDUCATION

UNIVERSITY OF COLORADO AT BOULDER | PH.D. IN AEROSPACE ENGINEERING SCIENCES

Controls Track | Graduated Summer 2020 | Boulder, CO

THESIS: ACTIVE COLLABORATIVE PLANNING AND SENSING IN HUMAN-ROBOT TEAMS

UNIVERSITY OF ARKANSAS | HONORS BS IN PHYSICS

Graduated May 2015 | Fayetteville, AR

EXPERIENCE

GRADUATE RESEARCH ASSISTANT | COOPERATIVE HUMAN-ROBOT INTELLIGENCE LAB

August 2015 – Present | University of Colorado Boulder, Ann and H.J. Smead Aerospace Engineering Sciences

- Research focusing on formal integrated planning and perception strategies for cooperative human-robot information gathering missions
- Supervision of an undergraduate team for hardware integration
- Ph.D. Advisor: Dr. Nisar Ahmed

TEACHING ASSISTANT (TA) | THERMODYNAMICS AND HEAT TRANSFER

August 2015 – December 2015 | University of Colorado Boulder, Ann and H.J. Smead Aerospace Engineering Sciences

Taught interactive labs and conducted office hours for junior level undergraduate course

SENIOR UNDERGRADUATE RESEARCH ASSISTANT | HONOR'S THESIS RESEARCH

August 2014 – May 2015 | University of Arkansas, Fulbright College, Physics Department

Conducted research on High Pressure Liquid-to-Glass phase transitions under Dr. William Oliver

NSF SUMMER UNDERGRADUATE RESEARCH FELLOW | LASER INTERFEROMETER GRAVITATIONAL-WAVE OBSERVATORY (LIGO)

Summer 2013 | California Institute of Technology

Developed a model of optical response for gravitational-wave strain sensing under Dr. Alan Weinstein and Dr. Jameson Rollins

UNDERGRADUATE RESEARCH ASSISTANT

August 2012 – May 2013 | University of Arkansas, Fulbright College, Physics Department

Performed analysis of photometric data for the triple star system HP Aurigae under Dr. Claud H. Sandberg Lacy.

Published results: <https://arxiv.org/abs/1310.3856>, "ABSOLUTE PROPERTIES OF THE TRIPLE STAR HP AURIGAE"

PEER-REVIEWED JOURNAL PUBLICATIONS

OPTIMAL CONTINUOUS STATE POMDP PLANNING WITH SEMANTIC OBSERVATIONS: A VARIATIONAL APPROACH

LUKE BURKS, IAN LOEFGREN, NISAR AHMED

IEEE Transactions on Robotics | August 2019

SUBMITTED JOURNAL PAPERS IN PEER-REVIEW

FULLY BAYESIAN HUMAN-MACHINE DATA FUSION FOR ROBUST ONLINE DYNAMIC TARGET CHARACTERIZATION

JEREMY MUESING, NISAR AHMED, LUKE BURKS, MICHAEL IUZZOLINO, DANIELLE ALBERS SZAFIR

Journal of Aerospace Information Systems | January 2020

JOURNAL PAPERS IN PREPARATION

COLLABORATIVE HUMAN-AUTONOMY SEMANTIC SENSING AND STRUCTURED PLANNING WITH POMDPS

LUKE BURKS, IAN LOEFGREN, LUKE BARBIER, JEREMY MUESING, JAMISON MCGINLEY, SOUSHEEL VUNNAM, NISAR AHMED

ACTIVE SEMANTIC SENSING AND PLANNING FOR HUMAN-ROBOT COLLABORATION IN UNCERTAIN ENVIRONMENTS

LUKE BURKS, JAMISON MCGINLEY, SOUSHEEL VUNNAM, HOLDEN KJERLAND-NICOLETTI, NISAR AHMED

PEER-REVIEWED INTERNATIONAL CONFERENCE PROCEEDINGS

COLLABORATIVE SEMANTIC DATA FUSION WITH DYNAMICALLY OBSERVABLE DECISION PROCESSES

LUKE BURKS, NISAR AHMED

22nd International Conference on Information Fusion | July 2019 | Ottawa, Canada

FULLY BAYESIAN HUMAN-MACHINE DATA FUSION FOR ROBUST DYNAMIC TARGET SURVEILLANCE AND CHARACTERIZATION

JEREMY MUESING, LUKE BURKS, MICHAEL IUZZOLINO, DANIELLE SZAFIR, NISAR AHMED

AIAA Scitech | January 2019 | San Diego, CA

CLOSED-LOOP BAYESIAN SEMANTIC DATA FUSION FOR COLLABORATIVE HUMAN-AUTONOMY TARGET SEARCH

LUKE BURKS, IAN LOEFGREN, LUKE BARBIER, JEREMY MUESING, JAMISON MCGINLEY, SOUSHEEL VUNNAM, NISAR AHMED

21st International Conference on Information Fusion | July 2018 | Cambridge, United Kingdom

OPTIMAL CONTINUOUS STATE PLANNING WITH SEMANTIC OBSERVATIONS

LUKE BURKS, NISAR AHMED

56th IEEE Conference on Decision and Control | December 2017 | Melbourne, Australia

SUBMITTED INTERNATIONAL CONFERENCE PAPERS IN PEER-REVIEW

COOPERATIVE HUMAN-ROBOT EXPLORATION OF A PARTIALLY-KNOWN ENVIRONMENT USING MULTIPLE UAVS

SHIVAM CHOUREY, LUKE BURKS, NISAR AHMED, KEVIN KOCHERSBERGER

AIAA Scitech | Submitted June 2020

PEER-REVIEWED INTERNATIONAL WORKSHOP PAPERS

OPTIMAL CONTINUOUS STATE PLANNING WITH SEMANTIC OBSERVATIONS

LUKE BURKS, NISAR AHMED

Multi-Disciplinary Conference on Reinforcement Learning and Decision Making | 2017 | Ann Arbor, MI

NON-ARCHIVAL CONFERENCE AND WORKSHOP PAPERS

FLEXIBLE SEMANTIC HUMAN-ROBOT SENSING IN UNKNOWN ENVIRONMENTS USING DYNAMIC INFORMATION GATHERING POLICIES

LUKE BURKS, NISAR AHMED

International Conference on Robotics and Automation | May 2018 | Brisbane, Australia

Workshop "Robot Teammates Operating in Dynamic, Unstructured Environments" (RT-DUNE)

INVITED SEMINARS, GUEST LECTURES, AND RESEARCH TALKS

ARMY RESEARCH LAB November 2019

Invited Presentation, Adelphi, MD

UNIVERSITY OF COLORADO BOULDER March 2019

Guest Lecturer for the Graduate Special Topics Course: "Probabilistic Algorithms for Aerospace Autonomy"

TECHNOLOGY COLLABORATION CENTER'S AUTOMATION, AI, AND ROBOTICS WORKSHOP

March 2019

Invited Session Talk, Johnson Space Center, Houston TX

BOULDER STARTUP WEEK May 2017

Invited Session Talk, Boulder CO

UNIVERSITY OF COLORADO BOULDER April 2017

Guest Lecturer for the Graduate Special Topics Course: "Algorithms for Aerospace Autonomy"

MISCELLANEOUS NON-FOCUS AREA PUBLICATIONS

ABSOLUTE PROPERTIES OF THE TRIPLE STAR HP AURIGAE

CLAUD H. SANDBERG LACY, GUILLERMO TORRES, MAREK WOLF, LUKE BURKS

The Astronomical Journal Volume 147 | 2013