Camron Alexander Hirst

CONTACT INFORMATION	3775 Discovery Dr, Room 244 Department of Aerospace Engineering University of Colorado Boulder Boulder, CO 80302 USA	*Cell:* please email me *Email:* camron[dot]hirst@colorado[dot]edu

<small>INTERESTS</small>   Machine Learning, Planning and Decision Making under Uncertainty, Safe Autonomy

<small>EDUCATION</small>

University of Colorado Boulder, Boulder, Colorado

Ph.D., Aerospace Engineering - Controls, Fall 2018 - Spring 2023 (expected)
- GPA: 3.84
- Smead Scholar
- Draper Fellow

Cornell University, Ithaca, New York

B.S., Mechanical Engineering, Fall 2014 - Spring 2018
- GPA: 3.78
- Dean's List: Spring 2015 - Spring 2018
- Magna Cum Laude Honors

<small>RESEARCH PROJECTS</small>

RECUV, University of Colorado Boulder, Boulder, Colorado
Research Advisor: Dr. Eric Frew

UAE Rain Enhancement Project   **Spring 2019 - Present**
Developing autonomous system architecture for scientific exploration of clouds by unmanned aircraft. Specifically, I am working on the trajectory planner that uses information from a distributed radar array to plan viable paths within spatiotemporally dynamic clouds. Project will culminate in a month-long field campaign in the United Arab Emirates during the summer of 2020.

TORUS   **Spring 2019 - Summer 2019**
Deployed on a month-long campaign in the mid-western United States to study severe storms with teams of small unmanned aircraft systems. Was responsible for helping to operate the aircraft, data collection, processing, and visualization. Published work on an autonomous decision making framework for pseudo-Lagrangian drifter deployment in supercell thunderstorms.

Autonomous Systems Laboratory, Cornell University, Ithaca, New York
Research Advisor: Dr. Hadas Kress-Gazit

Kinematic Remapping Project   **Spring 2018**
Created software to demonstrate kinematic remapping onboard two Nao robots by assuming they had different kinematic constraints. Utilized ROS and Python for robotic control, and Vicon for localization of the robot.

Nao Humanoid Robot   **Fall 2017**
Designed and developed software to autonomously control a humanoid robot using Python and ROS. Utilized the ROS navigation stack and Vicon to effectively navigate and localize the robot in a mapped work space. AprilTags were used to detect and identify obstacles in the work space. Software will serve as testing example for algorithms that quickly transfer and synthesize code for different robots.

Laboratory for Atomic and Solid-State Physics, Cornell University, Ithaca, New York
Research Advisor: Dr. Kyle Shen

Superconductor Testing Probe Project   **Spring 2016 - Fall 2016**
Designed and created a dipper probe that utilizes 4-point resistivity measurements to analyze properties of superconductor samples at cryogenic temperatures. Probe is designed to be cooled to a temperature of 4 Kelvin. Also analyzed the morphology and composition of Iron Selenide and Strontium Titanate superconductor samples with the use of a scanning electron microscope

HONORS AND AWARDS	CU Boulder Graduate Student Global Enrichment Fund Grant
	CU Boulder Smead Scholar
	CU Boulder Dean's Assistantship
	Draper Fellowship

SERVICE	CU Boulder Researchpalooza Host, 2019 - Present
	CU Boulder Science Ambassador, 2018 - Present
	Cornell University Steel Bridge Team Leadership, 2016 - 2017
	Cornell University Engineering Ambassador, 2015 - 2018

TEACHING

University of Colorado Boulder, Boulder, Colorado USA

Guest Lecturer, Info 1101   **Fall 2019**
Gave a lecture on autonomous systems and their societal implications to an undergraduate class.

Cornell University, Ithaca, New York USA

Teaching Assistant, Physics 1102   **Fall 2016 - Fall 2017**
Hosted student office hours. Facilitated group discussions about material. Assisted students with questions about assigned problem sets and laboratory experiments

PUBLICATIONS

Hirst, C.A., J. Jackson, and E. Frew. *Autonomous decision making for pseudo-Lagrangian drifter deployment from sUAS*. 2020. AIAA Science and Technology Forum.

Frew, E.W., K. Glasheen, **C.A. Hirst**, J. Bird and B. Argrow. *A Dispersed Autonomy Architecture for Information-Gathering Drone Swarms*. 2020. IEEE Aerospace Conference.

Frew, E.W., B. Argrow, S. Borenstein, S. Swenson, **C.A. Hirst**, H. Havenga and A. Houston. *Field Observation of Tornadic Supercells by Multiple Autonomous Fixed-Wing Unmanned Aircraft*. In Review. Journal of Field Robotics.

PROFESSIONAL EXPERIENCE

Northrop Grumman, Space Systems, Redondo Beach, California USA

Summer Internship   **Summer 2017**
Summer Intern for Product Engineering Department in the Electronics and Payloads Division. Supported various programs through the development of detailed models and drawings in Creo Parametric. Simulated vibrational and static loading of complex assemblies in Abaqus FEA software. Created training materials to support tooling in Abaqus FEA software.

COMPUTER SKILLS

- Languages: Python, MATLAB.
- Applications: ROS, LaTeX, common Windows spreadsheet and presentation software.
- Operating Systems: Unix/Linux, MacOS.