Johnathan Tucker

EDUCATION

The University of Colorado at Boulder

Aerospace Engineering Sciences Candidate, Expected graduation - May 2021

- Conducted multiple lab-based projects, including balloon satellite design, construction, and launch.
- Modeled dynamical systems including water bottle rockets, spacecraft despinners, and quadrotors.
- CU Merit Scholarship awardee.
- CU Engineering Dean's List.

RESEARCH EXPERIENCE

Research Interests: Certifiable computer vision algorithms, robotic perception, semantic scene understanding, and integrated task and motion planning.

The University of Colorado at Boulder

Autonomous Systems Undergraduate Research Assistant August 2020 - Present

- Investigating the integration of robust human pose tracking into 3D dynamic scene graphs.
- Faculty Advisor: Dr. Zachary Sunberg

SSA Undergraduate Research Assistant May 2020 - Present

- Applying reachability analysis to determine the custody of cislunar space objects.
- Faculty Advisor: Dr. Marcus Holzinger

GNSS Undergraduate Research Assistant August 2019 - May 2020

- Developed novel algorithms to localize GPS jammers and spoofers as part of a National Science Foundation grant.
- Faculty Advisor: Dr. Dennis Akos

TEACHING EXPERIENCE

The University of Colorado at Boulder

Smead Aerospace Engineering Sciences Teaching Fellow August 2020 - Present

- ASEN 3200: Orbital Mechanics and Attitude Dynamics
- Held office hours each week to improve students' understanding of the material.
- Led laboratories designed to give students hands-on experience.
- Assisted with lab, homework, and exam grading.

PUBLICATIONS

J. Tucker, C. Puskar, W. Lee, and D. Akos, *GPS/GNSS Interference Power Difference of Arrival (PDOA) Localization Weighted via Nearest Neighbors,* ION GNSS+, Sep 21 - 25 2020 **[Peer Reviewed]**

J. Tucker, M. Holzinger, *Cislunar Space Object Custody Determination Using Position Reachable Set Analysis*, AMOS, 2021 **[In Progress]**

CONFERENCE PRESENTATIONS

J. Tucker, C. Puskar, W. Lee, and D. Akos, *GPS/GNSS Interference Power Difference of Arrival (PDOA) Localization Weighted via Nearest Neighbors,* ION GNSS+, St. Louis, MO

GRANTS

Undergraduate Research Opportunity, *Student Individual Grant*, $3,000   May-August 2020

ENGINEERING EXPERIENCE

Lockheed Martin Corporation

Software Engineering Intern August 2018 - August 2019
- Developed a ground software GUI in C++ to support an active defense contract.
- Originated production software architecture as a member of a team in an agile environment.
- Modified quality assurance scripts to support the testing of satellite ground software.

Laboratory for Atmospheric and Space Physics

Software Engineering Intern April 2018 - August 2019
- Supported a contract with Lockheed Martin Corporation.
- Trained at LASP in software development, database management, and system administration.
- The training culminated in the development of a neural network toolbox GUI.

PROFESSIONAL EXPERIENCE

UNITED STATES ARMY, Fort Riley, Kansas

Sergeant, 1st Infantry June 2014 – August 2017
- Infantry team leader.
- Successfully complete Basic Leadership Course; graduating in the top 10%.
- Aided in the strategic planning of combat operations.
- Supervised a military combat team of 3 and effectively trained others.
- Honorably discharged in August of 2017 earning multiple awards.

VOLUNTEER EXPERIENCE

The Broadening Opportunity through Leadership and Diversity (BOLD) Center

Volunteer Tutor August 2019 – Present
- Tutored underrepresented students in freshmen through senior-level courses.
- Attended multiple tutoring workshops to ensure I'm adaptable to different students learning styles.

PROFESSIONAL SKILLS

- C++, Python, Matlab, SQL
- Algorithmic motion planning
- Optimal control and state estimation
- Dynamics modeling
- Secret Level Security Clearance