

# Yuxiang Guan

**Research Interests:** Robotics, Recursive Bayesian Estimation, Perception, Planning and Control  
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## EDUCATION

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**University of Virginia**, Charlottesville, VA, **GPA: 4.0/4.0** Aug. 2021 - Dec. 2024  
**Doctor of Philosophy, Mechanical Engineering**

**University of Southern California**, Los Angeles, CA, **GPA: 3.77/4.0** Jan. 2018 - Dec. 2019  
**Master of Science, Aerospace Engineering**

**Shenyang Jianzhu University**, Shenyang, China, **GPA: 91.63/100** Sept. 2013 - July. 2017  
**Bachelor of Engineering, Building Environment and Energy Application Engineering**

## WORK EXPERIENCE

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**Simulation Engineer**, Vision Creative LLC, Los Angeles, CA May. 2020 - May. 2021

- Develop an algorithm using **C++** and **Eigen** library to decompose a polygon area into  $n$  polygonal pieces based on each UAV's search capability and position for terrain-covering
- Devise sweep direction adjustable **Lawn Mower Search Pattern** and **Spiral Search Pattern** methods using **C++** and **Eigen** library for a UAV to search a convex polygon area
- Designed an optimization planner based on **Greedy Search Strategy** for Multi-UAVs autonomously explore large-scale unknown environments
- Create a video player utilizing **Java** and **Exoplayer** library to stream video from UAV's onboard camera

## TEACHING EXPERIENCE

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**University of Southern California**, AME 532A: Flight Vehicle Stability and Control

*Teaching Assistant* Jan.-May. 2020

- Graded students' homework based on the requirements of the professor
- Held office hour once per week to answer students' questions from homework and lectures
- Instructed students to design a 6 DoF simulator in Simulink of an autonomous aircraft

**University of Southern California**, AME 541: Linear Control System II

*Teaching Assistant* Aug.-Dec. 2019

- Graded students' homework based on the requirements of the professor
- Held office hour once per week to answer students' questions from homework and lectures

## ACADEMIC PROJECTS

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**Research Assistant**, Center for Advanced Manufacturing (USC), Los Angeles, CA Sept. 2019 - May. 2020

*Advisor: Prof. S.K. Gupta*

- Created a **Forward Simulation-based Alert System** using **Python** in **ROS** to help the human supervisor control Multi-Robot teams to avoid undesirable hazards in challenging environments

- Implemented **PyBullet** to simulate a **Husky** robot in a physics-based simulator to acknowledge the need of **Discrete Event Simulation** model for time-critical missions
- Summarized experimental results in a paper and accepted by **IROS 2020**

### **Autonomous Exploration System of Multi-UAVs**

May. 2019 - Aug. 2019

*Advisor: Dr. John McArthur*

- Designed a user interface using **App Designer** in **MATLAB** to input and control UAV settings and display UAV's position information
- Developed an optimization planner based on **Travelling Salesman Problem (TSP)** in **MATLAB** for Multi-UAVs autonomously explore large-scale unknown environments

### **A 6 Degree of Freedom Simulator and Visualization of An Autonomous Aircraft**

Jan. 2019 - May. 2019

*Advisor: Dr. John McArthur*

- Led a team of three members and constructed a 6 DoF simulator and visualization system in **Simulink** & **FlightGear** for an autonomous aircraft to avoid static obstacles
- Programmed an algorithm based on **Dubins** method in **MATLAB** to provide aircraft a flyable obstacles free path
- Designed **PID** and **LQR** controllers in **Simulink** to automatically control and stabilize aircraft

## **PUBLICATIONS**

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S. Al-Hussaini, J. M. Gregory, Y. Guan, and S. K. Gupta. Generating alerts to assist with task assignments in human-supervised multi-robot teams operating in challenging environments. *IEEE International Conference on Intelligent Robots and Systems (IROS)*, Las Vegas, NV, USA, Oct 2020.

## **HONORS & AWARDS**

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Outstanding Graduates in Liaoning Province	2017
First Place in Building Environment and Energy Application Engineering	2017
Excellent Graduation Design Project	2017
National Scholarship	2015
First Prize of Mathematical modeling contest in Three Provinces of Northeastern China	2015
Meritorious Winner of Mathematical Modeling Contest	2015
Liaoning Provincial Government Scholarship	2015

## **SKILLS**

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**Programming:** C++, Python, Java

**System:** Robot Operating System

**Library:** Eigen, PyBullet, Exoplayer

**Application:** MATLAB, Simulink, Visual Studio, Android Studio, Qt, Git, FlightGear, Arduino

**Languages:** English (fluent), Mandarin (native)