Shulong Jiang

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EDUCATION

Chongqing University (CQU), Chongqing, China 09/2018-06/2022

Bachelor's degree in Engineering.

Major: Aerospace Engineering

Hong Kong University of Science and Technology (HKUST), Hong Kong, China 09/2022-06/2023

Master's degree in Engineering

Major: Aeronautic Engineering

RESEARCH EXPERIENCES

Unmanned aerial vehicle (UAV) navigating through a narrow gap 09/2022-05/2023

Independent Project in HKUST

- Use Intel D435i to fuse visual and IMU sensors and implement position and attitude estimation during flight using MSCKF.
- Implement narrow gap crossing for high maneuverability drones in a Gazebo simulation environment, mainly use Ego-planner.

Acquisition of inertial sensor data and attitude measurement in FWMAV flight control system 12/2021-06/2022

Bachelor's thesis

- Implemented data acquisition for Bosch 9-axis IMU BNO055 on STM32, utilizing multiple communication protocols, including UART and I2C
- Analyzed and disassembled Adafruit products and designed an integrated PCB for a flapping-wing drone controller with Bluetooth, MCU, and IMU. Produced prototypes and performed hardware debugging.
- Tested the performance of the integrated controller in attitude measurement and applied simple Kalman filtering to the collected data.

Carrying and Returning of the Model Rocket 03/2019-10/2019

Member, China Aeromodelling Design Challenge (CADC) in 2019, Won the Provincial First Prize

- Designed a model rocket that can perform separation and safely land the payload in a designated area without damage.
- Constructed the framework using a wooden structure to reduce the weight of the rocket. Explored the effects of different skins on the aerodynamic performance of the rocket head and optimized the manufacturing process.
- Managed the version iteration of the rocket's electronic control program.

Launch and Load Recovery of the Multistage Model Rocket 03/2020-11/2020

Team Leader, China Aeromodelling Design Challenge (CADC) in 2020, One of the World's Top Three Competitions in Aircraft Design, Won the National Second Prize

- Designed and welded the integrated circuit PCB board, integrating the MP180 and IMU JY901 with the minimum system of the microcontroller. Optimized the circuit layout on the rocket, achieving a hybrid design of structure and electronics.
- Used ANSYS (Fluent) to analyze the aerodynamic characteristics of rockets with different shapes, achieving faster speeds and higher altitudes.
- Designed the mechanical structure of a multi-stage model rocket, including the electromagnetic separation mechanism, second-stage ignition device, and parachute deployment mechanism.

Exploration of two-phase coexistence temperature range in MnAs/GaAs (001) thin films based on strain regulation mechanism 06/2020-06/2021

Team Leader, Student Research Training Program (SRTP)

- By reviewing the literature, the temperature range for the coexistence of two phases has been summarized.
- Using knowledge of elasticity mechanics, explain how to use stress-strain mechanisms to control the proportion distribution of the two-phase crystals in thin films.

The application of NLP on the big database of Amazon At Spring term in 2020

Member, Mathematical Contest In Modeling (MCM), Honorable Mention

- Clean and label large amounts of data, use NLP models in Sk-learn to analyze customer reviews, and classify them to obtain different sentiment tendencies.
- analyzed the word frequency in customer text to form a word cloud, which reflects the impression of the user group on the products

INDIVIDUAL PROJECTS

Aerodynamics

Aerodynamic simulation of aero-engine turbine based on rotor-37 06/2021-07/2021

- Conducted Conduct research on Rotor37 and learn how to use Fluent's sliding mesh method to simulate the distribution of rotors and stators in turbines.
- Verify the computational results of the flow field, observe the changes in the velocity field, pressure field, and vorticity field during each cycle, and speculate where the stall is most likely to occur.

Aerodynamic Simulation of Supercritical Airfoil under Supersonic Condition 07/2021-08/2021

- Compare the effects of shock wave displacement and the difference in shock wave intensity between SC-0518 supercritical airfoil and symmetric airfoil NACA0012 under control as a reference.

Solid mechanics / Material

Vertical penetration simulation of depleted uranium warhead 07/2021-08/2021

- Utilize the Johnson-Cook damage model to reproduce the self-sharpening effect of depleted uranium penetrators during penetration.
- Compare the penetrating capabilities of three different materials (235 steel, uranium, tungsten) against the target.

Static loading analysis of airfoil 12/2021-01/2022

- Wing dimensions were measured, and a mechanical model was established using Abaqus for load simulation.
- Experimental instruments were used to design and measure stress-strain in actual loading conditions of the wing.
- Modal and natural frequencies of the wing were measured and analyzed, and simulation results were compared to experimental results to analyze discrepancies.

Conceptual Design / Control

Conceptual Design of Eight-rotor Aircraft Flight 10/2021-12/2021

- Balanced the demand of weight and endurance, established the optimization model to pursue the maximum load in limited capital, and rated flight time.
- Optimized structure design, self-designed suitable size of the rotary wing frame, assembly of the aircraft
- Used MATLAB for dynamic simulation and used Simulink toolbox to simulate the response feature of aircraft for control adjustment
- Participate in flight control adjustment, realized aircraft taking-off and landing

EXTRACURRICULAR ACTIVITIES

Aeromodelling Team of Chongqing University 11/2019-05/2021

Team Leader, Project Leader of Model Rocket

- Led the team members to participate in CADC competitions and acted as the person in charge of a research project, and shared duties including task arrangements, operational management, and training supervision

MSC (Microsoft Student Club) of Chongqing University 10/2019-10/2020

Chief

- Organized a series of student activities
- Participated in and helped organize invitational competitions like Hackathons

OTHER SKILLS

Computer: Proficient: Altium Design, Abaqus, Python, C++, STM32cubeMX, OpenFoam; Familiar: ANSYS, SolidWorks

Equipment Operation: 3D Printer, Laser Cutting Machine, Experimental Teaching Wind Tunnel, PIV

OriginLanguage: Mandarin (native), English (proficient), Russian(junior)