YUANQING, JIA

Tel: 86-15891396977 | Email: qjia@mail.nwpu.edu.cn | Homepage: https://hcho2042.github.io/

EDUCATION

Northwestern Polytechnical University (NWPU) **09/2020 - 07/2024**

Bachelor (B.E.) in Aircraft Design & Engineering

- Overall GPA: **86.7 / 100**
- Core courses: Aerodynamics, Aircraft Design, Mechanics, Aircraft Structural Mechanics, Aircraft Structural Design, Fundamentals of Reliability Engineering, Flight Dynamics, Python & Machine Learning.
- Achievement: Outstanding Individual in Innovation and Entrepreneurship at NWPU, **Top 6%**

UG Visiting Program of The Hong Kong University of Science and Technology (HKUST) **04/2024 - 06/2024**

UG Visiting Student supervised by Prof. Kun XU

- Core courses: Independent Study

2024 University of Science and Technology of China (UTSC) Summer Workshop **07/2023 - 08/2023**

Research Postgraduate Summer Workshop

- Awarded as *Excellent Postgraduate Candidate* of USTC, **Top 10%**

PROFESSIONAL SKILLS

- Language Proficiency: **IELTS 7.0**, Mandarin (Native Speaker)
- Professional Proficiency: Computational Fluid Dynamics, Experimental Fluid Dynamics, Biomimetic Design, Drone Design, 3D Modeling & Manufacturing, Robot Design & Control
- Tools: MS Word, LaTeX for paper writing; Origin for figure drafting; CATIA, FLUENT, CAD, SolidWorks LabView for Modeling and Engineering Analysis; MATLAB for data analysis; C/C++ for embedded programming.

PUBLICATIONS

* indicates the corresponding author

“ Modelling and Analysis of the Intricate Configuration of a V-tail Transport Aircraft ”

- Journal: AIAA Journal, 2024 (Under Review)
- Author List: **Q. Jia**, D. Li*, S. Ding

RESEARCH PROJECTS

Project Leader | New Concept Aircraft Research Institute, NWPU (Supervisor: Prof. Xiaojun YANG) **07/2021 - 06/2023**

" ‘YouLong’ Dragonfly-like Flapping-wing Aircraft. "

- Project overview: Aimed to develop a prototype of a dragonfly-inspired flapping aircraft and an efficient propulsion system which in together are capable of sustained tethered flight.
- **High-lift Flapping Wing Design**: We designed a curved flexible model for the flapping wing, which consisted of a skeleton and wing membrane with two beams (*i.e.*, leading and diagonal beam) and five ribs with a curved airfoil shape on the upper surface distributed from inside to outside based on the stiffness requirements of flapping wings.
- **Experimental Platform Setup**: We designed a lift dynamic measurement platform consisting of a 3D force sensors, amplifiers, and high-speed cameras.
- **Experimental Data Collection & Analysis**: We collected raw signals from the 3D force sensors, which were then amplified, denoise, and smooth via LabView. Further, we utilized balance measurement, suspension lift measurement, and bracket lever measurement to address high interference and low accuracy in measurements.
- **Prototype Construction & Optimization:** We utilized high-precision nylon to print prototype (flapping frequency < 12Hz), and then conducted drive mechanism optimization (flapping frequency rising to 20Hz), while reducing the weight of Transmission system (*i.e.*, reducing rod diameter and bearing size, and replace metal pins with carbon rods), Wing (*i.e.*, hollowing out according to static analysis), and Fuselage (*i.e.*, replace nylon with carbon fiber).
- **Achievement**: **Outstanding Completion** of *College Student Innovation and Entrepreneurship Training Program*

Principal Researcher | School of Material Science, NWPU (Supervisor: Prof. Zhen LI) **05/2022 - 04/2023**

" Long-endurance Unmanned Aerial Vehicle (UAV) " [Team: E-light]

- Project overview: Aimed to design a long-endurance high-altitude drone equipped with ultra-thin perovskite flexible batteries and energy storage systems, which could achieve autonomous power supply, tailored solutions, efficient collection, rapid storage, and intelligent flight.
- **Structural Design & Force Analysis Simulation**: To improve the static deformations caused by aeroelastic effects, we employed advanced aeroelastic tailoring optimization by utilizing topological techniques to effectively trim excess parts, significantly enhancing the structural efficiency of the aircraft.
- **Aerodynamic Design & Simulation**: Independently designed high aspect ratio, high static stability margin, large sweepback angle, and large horizontal stabilizer area. Additionally, I paid extra attention to parameters, *e.g.*, lift-to-drag ratio power factor and solar radiation power-wing loading curve. We further employed CFD for fluid dynamics simulation, conducting simulation analysis on the established aerodynamic model, and generating lift-drag curves and pressure-velocity contour plots.
- **Research Outcome**: Built a long-endurance high-altitude drone equipped with ultra-thin perovskite flexible batteries and energy storage systems, successfully achieving solar-powered test flights.
- **Achievement**: " Internet+ " Provincial **Gold** Award Project

Principal Researcher | School of Civil Aviation, NWPU (Supervisor: Dr. Wei DAI) **06/2021 - 12/2021**

" Unmanned Aerial Vehicle (UAV) Intelligent Inspection System " [Team: Cloud Intelligence IoT]

- Project overview: Aimed to develop an all-in-one drone power inspection system which integrated long-endurance drones, LiDAR spatial detection technology, automated data classification, image recognition, and fault diagnosis technologies, to enhance the autonomy of traditional drone inspections and improve the data storage efficiency.
- **Composite-wing UAV Design**: Designed and built a composite-wing UAV with long-endurance and heavy Payload. We first designed the 3D numerical model, focusing on weight reduction, rotor-wing and fixed-wing structure layout, payload considerations, and reserving space for flight control system. Then, we employed lightweight composite molding, and integral forming technology during manufacture for weight optimization.
- **Flight Route Planning Module Design**: Utilized the GIS drone route planning system combined with onboard LiDAR to acquire geographical information, which was then used to create a 3D point cloud model. Utilized the PointCNN to extract building spatial information from the point cloud, and selected unobstructed inspection route.
- **Achievement**: " Internet+ " Provincial **Gold** Award Project

Final Year Project | NWPU & HKUST (Supervisor: Prof. Dong LI & Prof. Kun XU) **05/2022 - 06/2023**

" Modelling and Analysis of the Intricate Configuration of a V-tail Transport Aircraft. "

- Project overview: Aimed to replicate the Boeing Speed Agile concept by combining the orthographic views of the original specifications with relevant reference materials, and then determined key design parameters, *e.g.*, takeoff weight and wing loading, followed by an analysis of the rationality of design criteria and parameters.
- **Aerodynamic Simulation**: Used Fluent algorithm to calculate pressure, temperature contour maps, and velocity field contour maps on the model surface, and analyze the flow field. Utilized dynamic mesh methods to compute the variation curve of lift-to-drag ratio with angle of attack, determined the stall angle, and lift-to-drag ratio.
- **Model Optimization**: Evaluated the aerodynamic characteristics of the model based on simulation results, analyzing design advantages. Further conduct optimization from different perspectives, *e.g.*, local flow separation, and explore optimization solutions from the perspectives of parametric modeling.
- **Outcome**: One Journal paper submitted to *AIAA Journal*

INTERNSHIP EXPERIENCE

Engineer Intern | Aviation Industry Changhe Aircraft Industry (Group) Co., Ltd. **07/2023 - 08/2023**

- Responsibility**:** Participated in workshop process optimization, CNC machining, and blueprint design.
- **Achievement & Outcome**: experience and knowledge of helicopter design and simulation, improved skills in Catia modeling and CAXA drawing.

AWARDS

Outstanding Winner | "Sanhang Cup" Academic Science and Technology Works Competition 04/2023
Gold Award | Provincial level Internet+ University Student Innovation & Entrepreneurship Competition 09/2022
Silver Award | Provincial level Internet+ University Student Innovation & Entrepreneurship Competition 09/2022
Gold Award | Provincial level Internet+ University Student Innovation & Entrepreneurship Competition 08/2021
3rd Prize | Second Promoting BRICS Industrial Innovation Cooperation Competition 09/2021