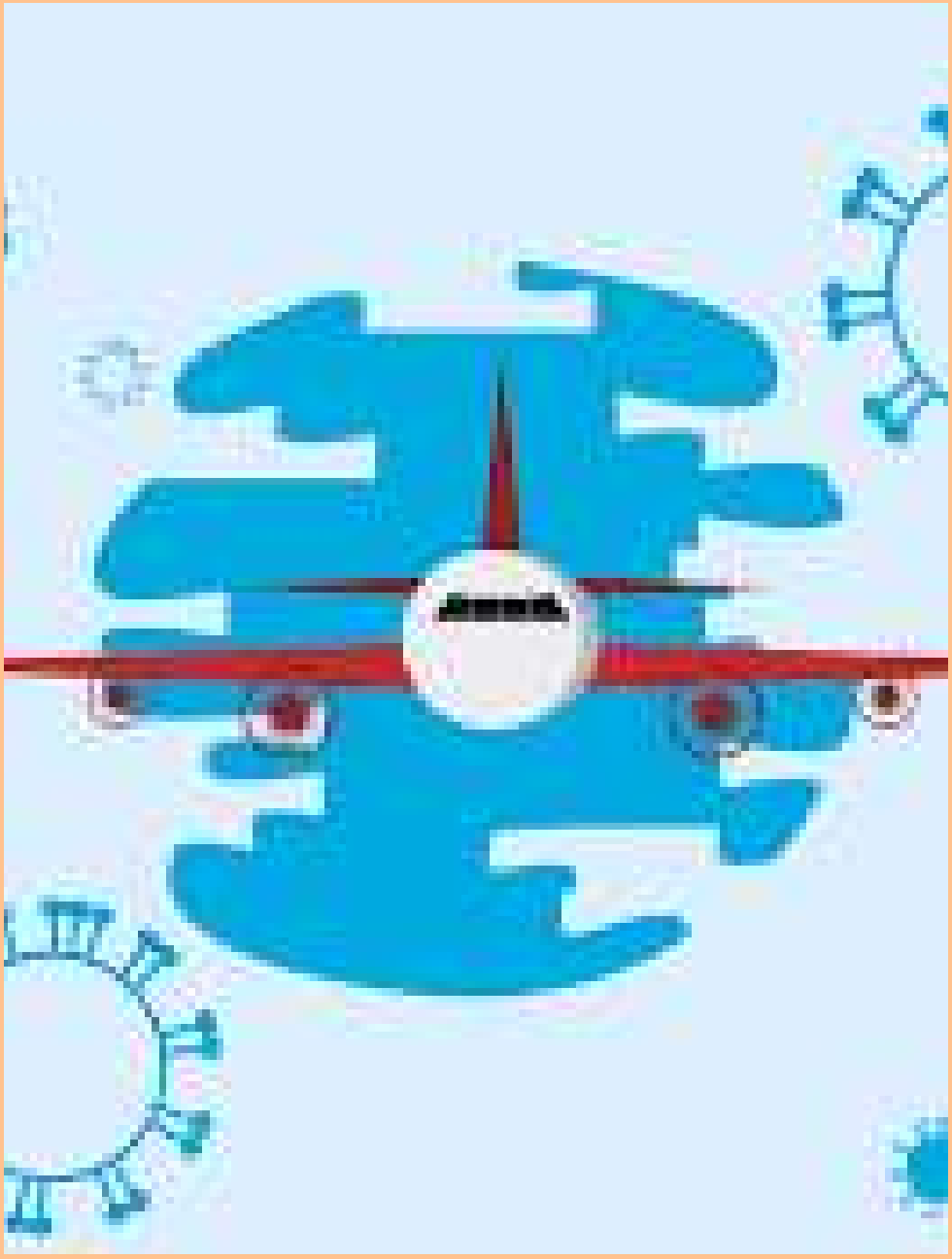
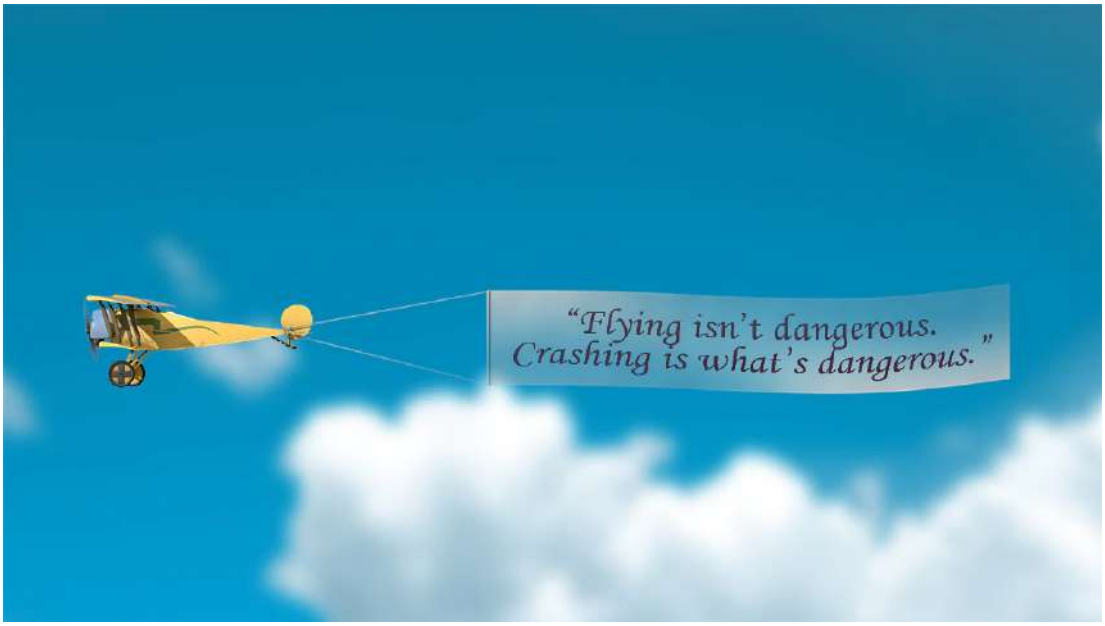
Kavinaam of Tayaran



MARCH 2021

TAKING STOCK OF THE PANDEMIC'S IMPACT ON GLOBAL AVIATION

ANNUAL MAGAZINE 2021



"KavinaaM of Tayaran" is combination of language gives the meaning "Great Thinkers of Aviation". KavinaaM is the word taken from the Sanskrit language giving the definition "Great Thinkers". Tayaran is the word which is been found from Arabic language means "Aviation".

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View Point

A year ago, on 11 March 2020, the World Health Organization (WHO) declared the COVID-19 outbreak a pandemic. Since then, daily life across the globe has changed. Air transport has remained one of the hardest-hit global industries since the very beginning of the crisis. The ongoing COVID-19 pandemic has resulted in a full-scale global transportation crisis. It became quickly evident that it would evolve in a crisis like no others bringing the industry into survival mode, impaired by the loss of traffic and revenues.

It is clear that the impact of this crisis reaches way beyond aviation. Since the COVID-19 outbreak started, more than 2.7 million people have died worldwide due this virus. Researchers have recently estimated that the world has lost 20.5 million years of life because of premature COVID-19 deaths, and this number will just continue to increase.

Along with the human tragedy, the crisis has also resulted in dramatic damage to the global economy, trade, and mobility. Practically all aspects of economic and social activity were, and are still, disrupted.

The health, safety and wellbeing of passengers and staff is the aviation industry's number one priority. Airports have introduced many new health and biosafety measures to help ensure the health and safety of passengers, and that airport customer experience reflects their changing expectations and addresses their concerns.

Airports and airlines are united in the call for governments to partner with the industry to prepare to restart global connectivity when the epidemiological situation allows, and the unprecedented global vaccination effort offers a beacon of hope that a return to normality is a possibility in the near future.

Since the first vaccine dose was administered in late 2020, more than 450 million doses have been administered across more than 130 countries. The possibility that summer vacations abroad may happen this year is more likely than ever.

Department of Aeronautical & Aerospace Engineering

Vision

The Department of Aeronautical Engineering envisions becoming a center of excellence, equipping the students with value and skill based education, pursuing globally relevant research and producing professionals committed to nation building.

Mission

- Impart quality technical education and unique interdisciplinary experiences
- Develop the analytical, computational and design capabilities to provide sustainable solutions
- Expose the students to the current trends and opportunities in the global Aerospace industry
- Inculcate professional responsibility based on an innate ethical value system

ACHIVEMENTS

AKASH SUVARAJ, THEJSHRI, NARESH CHANDRA & KSHIJIT TYAGI AERO/ IV YEAR IET PROJECT CHALLENGE FIRST PRIZE

DIMPAL KUMARI AERO/II YEAR NCC BEST CADET (BRONZE MEDAL)

SAI VISHNU PRASAD AERO/II YEAR NCC MAITREYI (GOLD MEDAL)

JANANI AERO/II YEAR NCC QUIZ COMPETITION (SILVER MEDAL)

ANU S AERO/II YEAR NCC GK AND GSK (BRONZE MEDAL)

ZUBAIR HAMED AND BHUVANESH RAJA AERO/II YEAR PHYSICS CONCEPT VIDEO FOR IUCEE NE – 2021 (FIRST PRIZE)

AKASH AND RAVI KUMAR AERO/IV YEAR CLEARED GATE EXAM 2021

3 TEAMS (2 FROM FINAL YEAR AND ONE FROM THIRD YEAR) IN SAE AEROTHON DESIGN CHALLENGE 2020

SNEGHA AERO/IV YEAR FIRST PRIZE IN DEBATE, BLOG WRITING AND FLASH FICTION COMPETITION HELD AS PART OF LOCKDOWN EVENTS BY KCG COLLEGE

THEJSHRI AERO/IV YEAR FIRST PRIZE IN ONLINE VIDEO COMPETITION “LEGACY OF DR. APJ ABDUL KALAM”

ALUMNI CORNER

SHIVANANTHITA

MANAGING DIRECTOR

SOSHER DRONECRAFTS, CHENNAI

2013-2017

ANAND RAJ

AIRCRAFT MAINTENANCE ENGINEER

IN AIR INDIA.

2012 - 2016

RAJA RAVI KIRAN

DESIGN ENGINEER

BELCAN INDIA PRIVATE LIMITED

2015 - 2019

YUVARAJ

CAPTAIN, AIR WING,

INDIAN ARMY

2012 - 2016

CHALLENGES OF BEING AN ENTREPRENEUR

Shivananthitha (Alumni)

In a vast, extensive market like India, precision component manufacturing Industries for Aerospace and other sectors have always played a major role. India has emerged as the second most sought after manufacturing destination across the world, and the global precision parts market is projected to observe a growth of CAGR 10% till FY2025 due to increase in demand for complex products. Alumni Ms. Shivananthitha, and Mr. Sorna Raj (Aero 2013 - 2017) founded SOSHER, a manufacturing unit established at the SIPCOT Aerospace Park to bring improvements to the existing processes in the prevailing precision component market to deliver unmatched quality and delivery.

Our journey stared at KCG College of Technology. After graduating as state level rank holders in the field of Aeronautical Engineering, with the support of our Aeronautical Department, we had the privilege to reach our 1st milestone. We were selected as project Interns in 'E-Bird Technology (Drone) for Tiger Conservation Project' with the Government of India for the Development of UAS at the Wildlife Institute of India, Dehradun under the Ministry of Environment, Forestry and Climate Change in the year 2017. This was the result of our work done on flapping MAV while in college.

With the knowledge gained in Wildlife Institute of India (WII) we reached our 2nd milestone and founded A.R.C.H. DRONES (Autonomous and Remotely Controlled Hybrid) in 2018, which aims at incorporating Drones in every industry to address their real time issues and help them solve it. As a result, we are proud to say we administering drones in M/s Srikalahasthi Pipes Limited (formerly known as Lanco), which deploy drones for the Safety of their Workers for the First Time in India. They also got an opportunity to exhibit at the Humanitarian Assistance and Disaster Relief (HADR) 2019 organized by the Indian Navy.

We started the ground works for our next milestone by applying for NEEDS (New Entrepreneur cum Enterprise Development Scheme) and I was the youngest candidate to be selected by the Task Force committee chaired by the Collector of Kancheepuram for funding and other benefits through the District Industries Centre. We signed a Memorandum of understanding with the Government of Tamil Nadu at the Global Investors Meet 2019 to establish a manufacturing unit at the SIPCOT Aerospace Park. The project was presented multiple times to multiple officials along the journey to get it approved for its establishment. We approached SIPCOT (State Industries Promotion Corporation of Tamil Nadu) and after multiple rounds of committee panel interviews, we were the first one to register a parcel of land, 1.09 acre in the Chennai Aerospace Park in April 2019 and commenced construction activities. We saw the development of the park itself from scratch and we are delighted to have witnessed its development. All the approvals related to the establishment and operation of a factory from all the departments such as the DTCP, DISH, TNFRC, TANGEDCO, TNPCB, BDO, DPH and MSME were acquired in a year and a half time-line in the midst of COVID-19 and achieved our 3rd milestone by starting our Commercial production

BEST PROJECTS

COMPARATIVE STUDY OF CHAOTIC NATURE OF FLEXIBLE WING WITH RIGID WING IN ARTIFICIAL FLYERS

Asad Ahmed R, Sakthivel S, Santhosh R, Satham Hussain J, Srivathsan B

chalz1998@gmail.com

Flapping wing is unique, regarding its capability of providing both lift and hovers for flight vehicles. The design of MICRO AERIAL VEHICLES is a significant research in the scientific community to develop it for military exploration missions and to perform reconnaissance, search and surveillance operations. Previous studies of wing shapes have been limited to rigid wings. Inspired by extraordinary flapping flight modes found in nature, researchers continue to explore insect flight and bird flight for developing micro aerial vehicles (MAV). The parameters like wing geometry, flexibility and kinematics are the key drivers of lift enhancement and flight efficiency. From this testing we shall completely understand the aerodynamic characteristics of the flapping wing flyer, by varying the ratio of flexibility and rigidity of the wingspan. By using a material made of plastic film, rectangular wingspan is taken for testing process. At a specific percentage of flexibility ratio, peak value of lift is obtained. That flexibility ratio can be applied practically to obtain peak value of lift. As wings determine the aerodynamic efficiency of flyers, effect of flexibility of wings are studied, so that its practical applications are made vast. Its real time application may lead to the constructions of larger aircrafts.

BEST PROJECTS

TURBULENCE EFFECT ANALYSIS IN DOUBLE ROTOR WIND TURBINE

Dr.Asad Ahmed, Jagan Babu C, Jenifer C, Ishwarya V, Karthick Raja K

jaganbabu534@gmail.com

This paper presents an analysis of the phenomenon of turbulence effect in a double rotor wind turbine and attempts to minimize turbulence. We all are aware that the existing fossil fuel energy will not last long due to its rampant usage and depleting availability. On the contrary, wind energy is freely available and environmentally friendly. Normally, wind turbines do not utilize full energy obtained from wind due to the phenomenon called interference. In a typical double rotor wind turbine, two types of turbulence occur, one is called the atmospheric turbulence and the other one is the turbulence created within the blades. Atmospheric turbulence is due to the continuously changing air motions. This impacts wind energy in several ways such as power performance effects, turbine loads, fatigue and wake effects. Similarly, the turbulence between the blades may affect the blade rotation and leads to blade failure. So, it is necessary to reduce the turbulence by adjusting the angular positions of the turbine hub or blade orientations and by varying the distances from the primary to the secondary rotor. The analysis starts with the design of a scaled model of double rotor wind turbine using CATIA V5 R20 software followed by the fabrication of a scaled model. The analysis is done in two phases. The first one is the monitor phase in which the design is analyzed by ANSYS 13.0 software. Next one is the wind tunnel testing for flow visualization, pressure, and force measurement by varying the angular positions of turbine hub or blade orientations and by varying the distances from primary to secondary rotor analysis for different types of terrains. From the analysis, the turbulence over various regions can be determined and the optimum angular positions of turbine hub or blade orientations and the distance from primary to secondary rotor blades can be arrived at to obtain least turbulence.

BEST PROJECTS

INVESTIGATION OF 2-D SCRAMJET INLET FOR INCREASED TOTAL PRESSURE RECOVERY

Vijaya Raja.K, Shivam Kumar Tiwari, Supriya, Morvadia Aisha, Sabareshwaran
supriyanathanjs913@gmail.com

A preliminary design of two-dimensional scramjet-rectangular cross-sectional inlet to maximize the total pressure recovery is analyzed in this present work .The intake allows to maintain supersonic airflow throughout the entire engine that helps the scramjet to operate efficiently at extremely high speeds .The total pressure recovery is main intake efficiency parameter which decrease the overall efficiency of the scramjet, by maximizing the total pressure recovery the overall efficiency of the scramjet can be increased. The design is analysed for starting Mach number 4 to Mach number 6. The inlet is operational up to Mach number 6 and further increment of Mach number will affect the efficiency parameter due to change in adiabatic index. In this design, the analysis is done for adiabatic index value of [1.4] for air. Alternation of the cowl tip is proposed as an effective method to maximize the total pressure recovery. Analytical calculation is performed on three different design using oblique shock relation on single ramp, two ramp, three ramp, and the design were analyzed using CFD [k-sst omega] turbulence model. Keywords: Scramjet inlet , Rectangular cross-sectional, starting Mach number, Adiabatic index, Intake efficiency, Total pressure recovery ,Supersonic airflow, Cowl-tip ,K-SST omega.

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