Pavankumar Koratikere

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EDUCATION

National Institute of Technology Karnataka, Surathkal, Karnataka, India.

- B. Tech. in Mechanical Engineering — Jul 2016 – Apr 2020
  - Cumulative Grade Point Average :- 8.48/10

WORK EXPERIENCE

Indian Institute of Technology, Bombay - Summer Research Intern — May 2018 – Jul 2018

- Worked as a Research Intern at Lighter than Air Systems Laboratory, IIT Bombay, on development of a simulation platform for analyzing the stability aspect of an Airship and to test new control method.
- Built a Mobile Controlled Airship having a length of 3 m and diameter of 1.33 in team. 6 petals of thin fabric were heat sealed to make an Envelope. Airship was controlled by an on-board controller, Pluto X.
- Volunteered to organize a Do-It-Yourself One Day Drone workshop conducted by Aeronautical Society of India (AeSI), Mumbai Branch at IIT Bombay.

Siemens Limited - Industrial Trainee — Dec 2017

- Completed an Industrial Training for 4 weeks at Siemens Limited (Power Plant Supplier Division). Was introduced to various components of a Power Plant such as Turbine, Generator, Condenser, Boiler, etc.
- Interacted with various departments such as Mechanical, Piping, Electrical, Instrumentation and Control, etc. about their roles and how they contributed to big picture.

PROJECT EXPERIENCE

B. Tech Dissertation - Project Lead — Aug 2019 – Present

Thesis Topic :- Prevention of Loss of Control in the event of an Actuator Failure

- Investigating how aircraft can be prevented from entering Loss of Control due to failure of an elevator or a rudder. Simple control algorithms such as PID are being tested for controlling the airplane after actuator failure. MATLAB and Simulink are used for analysis and FlightGear is used for real time simulation of entire phenomenon.

AIAA Aircraft Design Challenge 2019-20 - Lead Designer — Sep 2019 – May 2020

- Developed a Short Range High Capacity Aircraft as demanded by the Request for Proposal by AIAA, to solve the airport congestion problem. An 8 variable design optimization was conducted to find a design point that offers the least weight.

AIAA Aircraft Design Challenge 2018-19 - Lead Designer — Dec 2018 – May 2019

- Proposed a High Wing, Twin Prop with Conventional Tail and Fixed Landing Gear, having a range of 250 nm, in response to Request For Proposal with a Payload capacity of 6 passengers plus 1 pilot.
- Various design aspects of Conceptual Design Phase such as Market Survey, Mission Profile, Constraint Analysis, Configuration and Layout, Aerodynamics, Propulsion, Empennage, Landing Gear and Weight and Balance were completed.

Inertial Positioning System - Programmer — Jul 2018 – Nov 2018

- Built a Positioning system which uses its on-board Inertial Measuring Unit to track its location. Raspberry Pi was used for on-board computation for implementing Kalman Filter as Sensor fusion algorithm.
- For prediction stage of Kalman Filter, angles were calculated from Accelerometer values. In Update stage, calculated angles were coupled with values from gyroscope to get final values of angles, using which gravity was compensated from acceleration values. Velocity and Position were then calculated using numerical integration of compensated acceleration values.

AIAA Aircraft Design Challenge 2017-18 - Individual Endeavour — Oct 2017 – May 2018

- Designed a Close Air Support Aircraft to replace A-10 Thunderbolt II in a cost effective manner. Initial Weight Estimation along with Constraint Analysis was done. Few aspects of Conceptual Design Phase were addressed such as Wing characteristics and Propulsion.
- Output of the Constraint Analysis was 0.55 of Thrust Loading and 600 kg/m^2 of Wing Loading. Initial Weight of 71,000 lbs, along with Thrust and Wing loading, yielded Wing Area of 53.18 m^2 and a Span of 19.19 m. Two engines with a combined thrust of 40,000 lbs were chosen.

PUBLICATION

- S. Suvarna, D. Sengupta, P. Koratikere and R. S. Pant, ”Simulation of Autonomous Airship on ROS-Gazebo Framework,” *2019 Fifth Indian Control Conference (ICC)*, New Delhi, India, 2019, pp. 237-241. DOI : 10.1109/INDIANCC.2019.8715570

EXTRA CURRICULAR ACTIVITIES

AeroNITK - Aircraft Design Team

- Founder and Lead Designer — Dec 2018 – Present
  - Established a team, in the college, which will compete in Aircraft Design Challenge conducted by AIAA every year. This team will give freshmen and sophomores in the college, an opportunity to explore Aircraft Design. Lead Designer for 2018-19 and 2019-20 Design Cycle of the Team.

Team NITKRacing - Formula Student Team

- Aerodynamics Subsystem Head — Jan 2019 – March 2020
  - Acted as a liaison between the core committee of team and sub-system members. Finalizing the designs of all the components designed by the subsystem such as Nosecone, Side pods, Firewall, etc. Mentored new recruits so that they learn the required technical knowledge.
- Aerodynamics Subsystem Member — Apr 2017 – March 2020
  - Manufactured a Fiber Glass composite nose cone for the car. Negative Mould was made of Styrofoam board according to CAD design. Computer numerical control was used for intricate parts of mould, such as front part of nose cone, to get a contour in accordance with CAD Model. Hand Layup method was used for laying Fiber Glass, along with proportionate amount of Epoxy resin and hardener.
  - Verified the ergonomics of the designed chassis using a 95^{th} percentile male mannequin in CATIA V5. Accordingly, designed a seat on CATIA V5 so as to satisfy the Percy template.

American Institute of Aeronautics and Astronautics

- Student Member — Jan 2018 – Present

SKILL

- **CAD Modelling** :- Catia V5, OpenVSP.
- **Analysis Software** :- XFLR5, USAF DATCOM, ANSYS, Athena Vortex Lattice (AVL).
- **Simulation** :- MATLAB, Simulink, Gazebo, Robot Operating System (ROS), FlightGear.
- **Languages** :- C, Python, Latex.
- **Hardware** :- Raspberry Pi 3, Arduino Uno R3.

MASSIVE OPEN ONLINE COURSE

- **Introduction to Aeronautical Engineering** by TU Delft on EdX (Certified Version).

ACHIEVEMENTS

- Secured an All India Rank of 3803 out of 1 million candidates, in prestigious JEE Mains Exam, a national level Engineering Entrance Exam.
- Grade A certificate in National Cadet Corps (No. 1 Gujarat Air Squadron).

INTERESTS

- Aviation, Aeronautical Engineering, Aircraft Design, Flight Dynamics and Control, Machine Learning.