Hem Raj Pandeya

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Education

Bachelor's Degree in Mechanical Engineering Aug 2017 - Jun 2022
IOE, Pulchowk Campus, Tribhuvan University *Percentage: 79%*

Relevant Coursework: Fluid Mechanics, Numerical Methods, Finite Element Method, Machine Design and Simulation, Thermodynamics, Heat Transfer, Probability & Statistics, Computer Programming, Numerical Methods, Control System

Projects

Optimization of Eagle Ray Blended Body Wing Vehicle April 2021 - March 2022
- Used Adjoint method in SU2 for gradient-based optimization
- Used BOBYQA method in Aelous for non-gradient-based optimization
- Used Ansys for validating the optimization results
- Used XFLR5 for static and dynamic stability analysis

Gauthali, a fixed-wing medical drone funded by UNICEF Sep 2022 - Feb 2023
- Gauthali is a Hybrid Fixed Wing VTOL designed and manufactured in Nepal
- Used a open source autopilot firmware: Ardupilot
- Developed with a maximum range of 40km and payload of 1.5 kg
- Structural and aerodynamic analysis were performed in ANSYS

Design and CFD simulation of a centrifugal impeller Jul 2020 - Nov 2020
- 3D model was created on SolidWorks
- Used ANSYS-Fluent for the simulation of the impeller
- Required pressure head was obtained fulfilling various design constraints

Real-time data acquisition system and decision support mechanism April 2021 - March 2022
- Developed a cheap and robust way of communication between ground control station and Data acquisition system
- Integrated the Data acquisition system in a quad-copter
- Processed and analyzed various sensor data and created a 3D map of a place showing changes in various parameters

A self balancing vehicle 2020
- Used Arduino Uno as the microcontroller and MPU 650 as the sensor for accelerometer and gyroscope data
- Used PID controller for balancing the vehicle autonomously

Experience

National Innovation Centre Nepal (NIC) | *Full time* Mar 2023 - Present

- Selection of suitable airfoils for fixed-wing UAVs
- Design of airframe and wing by optimizing aerodynamics, strength, and durability
- Ensure the stability and control of the designs
- Testing of various locking mechanisms to connect and separate fuselage from the wing
- Develop methodology for fabrication of fuselage, wing, and control surfaces
- Design of a Foam-cutter used for the fabrication of UAVs
- Seek potential collaboration with private and public partners/organizations
- Guiding school students about various projects which are in progress in NIC

Prokura innovations | *Internship* Sep 2022 - Feb 2023

- Design fixed-wing drones to meet mission requirements by optimizing
- aerodynamics, propulsion, strength, and durability
- Creating 3D models using SolidWorks
- CFD analysis of wing and fuselage
- Structural analysis of wing in ANSYS
- Operating 3D printers and laser cutter

Robotics Club | *Pulchowk campus* 2017 - 2022

- Designed and fabricated various mechatronics and mechanical projects
- Participated in various National and International Competition

Professional Tutoring | *Anirudra Higher Secondary School* 2023
Taught Science and Maths

Technical Skills

Programming Languages: C/C++, ROS(Robot Operating System) Python, Matlab, Simulink, Arduino Programming

Engineering Design and Simulation: Solid Works, Catia, AutoCAD, ANSYS, SU2, XFLR5, Gazebo, 3D printing, Laser Cutting

Documentation and Word Processing: Microsoft Office, LaTeX

Publications

Conference paper(Accepted and to be presented on November 29, 2023
Hem Raj Pandeya, Anurag Karki, Sudip Bhattarai, "AERODYNAMIC SHAPE OPTIMIZATION OF BLENDED WING BODY PLANFORM", IOE Graduate Conference, 2023

Awards

Registered Mechanical Engineer, *Nepal Engineering Council* 2022

Unique Concept Award, *B.E. Mechanical Design Competition, MechTRIX 8.0* 2018

Most Disciplined Student of the Year Award, *Anirudra Higher Secondary School* 2013

Zonal Level Quiz competition, *Mahakali Zone* 2011

Events Participation and Volunteering

Participant of BE Design Competition in MechTrix 8.0 2018
MechTrix 8.0: 8th National Mechanical Engineering Exhibition by Society of Mechanical Engineering, IOE Pulchowk Campus

Participant of 1st International Symposium: ISCEN-2018 2018
ISCEN-2018: 1st International Symposium :Control-, Energy-, and Nano-Engineering held at Nepal Academy of Science and Technology (NAST) on January 27, 2018

Participant of BE Design Competition in MechTrix X 2020
MechTrix X: 10th National Mechanical Engineering Exhibition by Society of Mechanical Engineering, IOE Pulchowk Campus

Volunteering work at Nayno initiative 2020
Nayno initiative: Initiative to distribute clothes to needy people to protect freezing winter