A U Nachiketh Kumar

Aerospace Undergraduate, Final Year, Research intern, IITK.

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Indian

PROFILE

Aerospace undergrad with keen interest in Space Engineering, Hypersonic flows, Space and air vehicles and new-found innovations in Aerospace. Having been actively engaged in various research endeavors in the aerospace engineering domain, which have provided me with invaluable experience and a deeper understanding of the field. Always looking forward to come up with next generation innovative technologies in aerospace which creates a significant impact on society.

PROJECTS

Study of Hypersonic flow and Heat-Transfer over Blunt cone flare body (DART) Winged Re-Entry Vehicle

11/2022 – present

Numerical study of hypersonic flow over blunt body, winged Re-entry configuration(DART), calculation of aerodynamic data, heat transfer using FLUENT and open source SU2 solver.Study on Non-equilibrium flow during the re-entry thermal loading was carried out using SU2 NEMO.

Novel path-planning algorithm for parrot mini-drone using MATLAB Simulink

06/2022 – 10/2022

Developed a novel computer vision algorithm incorporating Image processing and Path planning algo using Stateflow and simulink models to facilitate precise path tracking for Parrot Mambo drone.Testing was carried out by deploying algorithm on actual drone in real environment.

Conceptual design of water-scooping amphibian aircraft for aerial fire-fighting

11/2021 – 05/2022

Conceptual designing of scooper aircraft is carried out using indian standards. Performed Initial-Sizing, Constraint analysis, Airfoil powerplant selection, performance parameter calculations, cost analysis etc.CFD Analysis and CAD design were performed using open source solvers.

Development of Deep-Learning model for runway classification and aerial vehical detection using transfer learing approach

07/2023 – 08/2024

Developed a robust deep-learning model for runway classification and aerial vehicle detection. Employed Transfer Learning to pre-trained CNN network (ResNet, GoogLeNet) for target tasks, further compared training algorithms (SGD, Adam, RMSProp) for optimal performance.

EDUCATION

Secondary School,
Indraprastha Vidyalaya
2008 – 2018 | Uppinangady, India
Maths, Science, Social Science, English, 2 Languages

High School, *Indraprastha PU College*
2018 – 2020 | Uppinangady, India
Physics, Chemistry, Maths, Biology

Undergraduate Degree, *M S Ramaiah University of Applied Sciences*
12/2020 – present | Bangalore, India
B-Tech, Aerospace Engineering

PROFESSIONAL EXPERIENCE

Summer Internship Programme,
Aeronautical Development Agency, DRDO
05/2023 – 06/2023
National Aerospace Laboratories (NAL), India
Worked with the National CLAW team on computer vision techniques for motion estimation, runway path alignment, and detection during the landing and approach phases of fighter aircraft by utilizing optical flow algorithms. Gained knowledge of fighter aircraft control laws and flight data analysis.

R&D Intern, *GENEX Space*
01/2023 – present | Bangalore, India
Product Design and Prototyping. Involved in developing new prototypes for CANSAT's and initiated testing, analysis. Developed Software application for its Telemetry. Worked on various aerospace rapid-prototyping designs using CAD.

Research Intern, *Learn by Research*
01/2022 – 03/2022 | Mumbai, India
Worked on Biomimetic design and analysis of flapping wing drone. Literature survey, case study, conceptual design and analysis were carried out throughout the research.

Student Intern, *DST Inspire Internship*
Mangalore, India
Involved in various pure science practical lab experiments and attended talks from scientists on cutting edge technologies and innovation in research field of nano-science, bio-tech, physics.

Innovation cordinator,
Institution Innovation council
01/2022 – present | Bangalore, India
Lead innovation promotion eco-system in the campus and managed various engineering exhibition.

Design and Analysis of Hall-effect thrusters
09/2022 – present
Literature and preliminary studies were performed on the theory behind electric propulsion and plasma physics.MATLAB code development for calculations on Thruster Sizing and performance parameters .Created CAD designs for Prototype building and testing

Design and Analysis of Bio-Inspired Mechanical Pickup and delivery mechanism for unmanned aerial vehicle
11/2022 – 12/2022
Designed an unpowered and spring based mechanism for pickup and delivery for Unmanned aerial vehicle using Autodesk FUSION 360 software.Mechanism and structural analysis were performed. Generative design was created using the generative design module in fusion 360.

Averrhoa Bilimbi -A Natural Coagulant For Rubber Latex
06/2017 – 09/2021
Created an eco-friendly rubber sheet by using Bilimbi fruit extract while replacing toxic formic acid. This innovation ensures environmental sustainability and maintains the high quality of the rubber sheets, all achieved at an affordable production cost.

AWARDS

National Child Award (Rashtreeya Bal Shakthi Award),
Government of India
Facilitated by National Child Award for Exceptional Achievement in the field of Innovation by Govt of India from honorable president Sri Ram Nath Kovind and honorable prime minister Sri Narendra Modi.

National Geographic Explorer Award, *National Geography*
From National geography in International Google Global Science Fair-California USA

Global and Regional Finalist, *Google*
One among the top 20 global finalist from all over the world in Google science fair-2019

Silver Medlist, *I-SWEEEP*
International Level I-SWEEEP Project Olympiad Science Fair Competition-Houston USA

Gold Medalist, *Science society of India*
Gold medal in National and regional level INSEF science and engineering fair

Young Scientist Award, *Kannada and Cultural Department, Bangalore*

National Finalist, *Aeronautical society of India*
National Finalist in Conceptual design of water scooping fire fighting aircraft NACDeC-2022

Top 5 Finalist, *Mathworks*
One among the top 5 finalist all over India in Mathworks Mini drone competition 2022- Indian institute of technology (IIT) Kanpur

Gold Medalist, *National Council of Science and Technology*
National children science congress-NCSC Chandigarh, Punjab

BCF Young Scientist Award, *Beary's Cultural Forum*

PUBLICATIONS

National Symposium of Shock Waves (NSSW-2023), *PRL*
Ahmedabad, India
Computational study on hypersonic flow over winged re-entry module for Heat flux prediction using SU2

Student Volunteer, *SSERD- Society for Space education research and development*
08/2022 – present | Bangalore, India
Actively managed and coordinated Bengaluru International Space Exhibition and Conference- 2022

SKILLS

- Aircraft conceptual design and Model based design
- Research and Project development
- MATLAB, Simulink, Python,C++ Programming GUI, Stateflow
- Open source solver for Analysis and Simulation, SU2, Open VSP, XFLR
- CAD Design, CATIA V5, Fusion 360
- CFD Solvers, ANSYS, FLUENT, Nastran Patran, Flight Gear, FEMM
- Deep-Learning, Sequence Classification
- Computer Vision, Image Processing
- Grid tool GAMBIT, ICEM
- Problem Solving
- Operating system Linux, Windows, Microsoft office

COURSES

MATLAB onramp, *Mathworks*

Simulink Onramp, *Mathworks*

Aerospace Engineering: Astronautics and Human Spaceflight,
Massachusetts Institute of Technology

Computer Vision, Stateflow and Image processing Onramp, *Mathworks*

Aircraft design, *IIT Bombay-NPTEL*

INTERESTS

Innovation and Technology,
Every kind of sports, Art and Design,
Reconstruct, Building, Gamming, Cooking

STRENGTHS

Creative Thinking, Strong work ethic,
Collaborative, Team-working, Innovative

LANGUAGES

English • Hindi • Kannada • Tulu

SOCIAL MEDIA

LinkedIn, *@A U Nachiketh Kumar*

Instagram, */nachiketh1_kumar*

Twitter, *@NachikethKumar*