A U Nachiketh Kumar

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Education

- **Bachelor of Technology - Aerospace Engineering** — Bangalore, India
  M S Ramaiah University of Applied Sciences; GPA:9.32 — *Dec 2020 - June 2024*
  Courses:*Aerodynamics,Propulsion, Structures, CFD, Control system, Manufacturing Materials, Aircraft mechanics, CAD, AI-ML, FEM*

Skills Summary

- **Languages/Tools**: MATLAB, Python, C++, Simulink, StateFlow, GUI, Deep-learning, Computer Vision, STK
- **Modelling**: Catia V5, Autodesk FUSION 360, AutoCAD, GAMBIT, ICEM, Aircraft Design, Gazebo
- **Solvers**: ANSYS FLUENT, SU2, NASTRAN PATRAN, Open VSP, XFLR 5, FEMM, OpenRocket
- **Platforms**: Linux, Web, Windows, Arduino, PX4, Raspberry, Flight Gear, 3D Printing, Paraview, Qg Control
- **Soft Skills**: Exceeded expectations, tackled, initiative, self-motivated, reliable, driven, Collaborated effectively

Experience

- **Aeronautical Development Agency, DRDO, Summer Internship** — Onsite
  Flight Mechanics and Control Divison, National Aerospace Laboratories (NAL) (Full-time) — *May 2023 - Jun 2023*
  - **Runway alignment and motion estimation**: Developed and implemented a computer vision algorithm using optical flow techniques, resulting in a significant improvement in runway alignment and motion estimation accuracy for fighter aircraft landings, leading to enhanced safety and efficiency.
- **GENEX Space, Research and Development intern** — Onsite
  Kormangala (Full-time) — *Jan 2023 - Feb 2023*
  - **Product and Software development**: Product prototyping, 3D Printing and development of Telemetry data visualization application for CANSAT's, enabling real-time monitoring and analysis of critical mission data.
- **Indian Institute of Technology, Kanpur, Research internship** — Remote
  Department of Aerospace engineering (Part-time) — *Aug 2023 - Present*
  - **Fluid Structure interaction (FSI)**: Numerical study on supersonic aeroelasticity and FSI using partitioned approach

Projects

- **Numerical investigation of Hypersonic flow and Heat-Transfer over large angle blunt cone and Winged Re-Entry Vehicle**: Investigated the accuracy of different thermochemistry models on hypersonic flow. Validated heat flux predictions over a re-entry vehicle forebody, contributing to the development of reliable Martian atmospheric entry models.
- **Novel Path-following Algorithm for parrot mambo mini-drone using MATLAB Simulink** : Performed SITL simulation, code deployment and testing of Precise path tracking algorithm on mambo flight controller hardware
- **Development of Autonomous drone for surveillance using Pixhawk FC and Raspberry pi** : Prototype build, implementation of DroneKit library to execute MAVLink protocol, Integrated Deep-learning models on onboard computer for object detection and tracking
- **Conceptual aircraft designing of water scooping amphibian aircraft for aerial fire-fighting**: Conceptual Aircraft designing according to given requirments, CAD, CFD and preliminary designing of scooper aircraft
- **Development of deep-learning network for runway classification and aerial vehicle detection using YOLO and ResNet** : Designed a robust deep learning model for runway and aerial vehicle detection through transfer learning and traning algorithm optimization.
- **Design and Analysis of Hall-Effect Thrusters**: Developed MATLAB program for optimizing key performance parameters such as thrust and Isp. Developed 3D CAD models for analysis, contributing to the advancement of electric propulsion tech.

Publications

- **National symposium of Shock wave (NSSW 2023) Ahmedabad**: Computational aerothermodynamic study of winged re-entry vehicle using opensoure SU2 Solver
- **4th International SU2 conference, Italy-23**: Assessment of thermochemistry modeliing of hypersonic non-equilibrium flow in martian atmosphere (CO2 species) using SU2 NEMO and Mutation ++

Honors and Awards

- **National Geography Explorer Award**, Google science fair (GSF) California United States
- **Rastriya Bal Shakthi Award (National child Award)**, Govt of India, Ministry of Woman and Child Welfare
- **University student achiever Award**,National Innovation Day, MSRUAS
- **5th place all India in minidrone competition**, MathWorks, SAE India, IIT Kanpur
- **2nd Place Autodesk Design Hackathon**, DSU, AUTODESK
- **Silver medal, International Sustainable World Energy, Engineering Project**,TX United States

Volunteer Experience

- **Society for Space Education, Research and Development (SSERD)** — Bangalore, India
  Managed and coordinated International Space Exhibition and Conference in 2022 along with CII.Nov 2022 - Present
- **Institutes Innovation Council (IIC), Innovation coordinator** — Bangalore, India
  Administered the promotion of different engineering activities and exhibitions in university. — *Jun 2021 - May 2023*