Guruva Sawan Kumar
Date of Birth: 20/12/1992
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Education and Training

Sapienza Universita di Roma, Roma, Italy
Master's Degree in Space and Astronautical Engineering **[Sept 2016 - Oct 2020]**
Courses: Aerospace Structures – Nonlinear Analysis of Structures – Experimental Testing For Aerospace Structures -Aerospace Materials – Space Propulsion – Combustion - Compressible Flows - Experimental Aerodynamics - Space Mission And Systems - Spaceflight Mechanics - Spacecraft Design – Control Systems – Safety And Maintenance For Industrial Systems.
Thesis: Experimental Identification of Hysteresis of Nanocomposite Beams via Dynamical Analysis.
Studied about the polymer-matrix nanocomposites and estimated its elastic stiffness with different geometrical inclusions, manufactured the PMMA fibre and CNTs viscous solution and estimated the damping ratio of PMMA with CNTs. Performed the experimental dynamical analysis on polycarbonate and polycarbonate with CNTs to identify the behaviour of the frequency response curves. Executed a finite element model in COMSOL to capture hysteresis response. Accomplished a computational dynamical analysis in COMSOL with Matlab interface for a qualitative agreement with experiment results.

Jawaharlal Nehru Technological University, Hyderabad, India
Bachelor's of Technology in Aeronautical Engineering **[Sept 2009 - May 2013]**
Thesis: Aerothermodynamic Analysis of Expert Capsule Reentry Vehicle Using CFD.
Evaluated the aero-thermodynamic analysis of re-entry vehicles, performed the computational fluid dynamic analysis to show the flow field around a blunted cone–flare in hypersonic flow. This problem is of particular interest since it features most of the aspects of the hypersonic flow around re-entry vehicles. A numerical approach has considered to study the flow field around the EXPERTS capsule.

Work Experience

Assistant Lecturer:
Organization: Kasi Reddy Narayan Reddy College of Engineering and Research, Hyderabad, India. **[Feb 2014 - Aug 2016]**
Responsibilities:
Individually assisted to all the students with their respective subjects and research assignments.
Organized day-to-day activities for a smooth workflow.

Research Assistant
Organization: National Aerospace Laboratories (CSIR), Bengaluru, India [Aug 2012 - Dec 2012]
Title: Experimental Studies on a Twin-Valveless Pulse-Jet engines
Experimental studies on the two geometrically similar inline intake valveless pulse jet engines arranged out of phase manner to bring down the noise level of the pulse jet engines.
Responsibilities:
Studied theoretical and experimental limitations of inline intake valveless pulse jet engines. Designed the plenum chamber to suppress the noise level of the engines.

Publications:

- Nonlinear Damping Characteristic of Nanocomposite Beams Via Dynamical Analysis publishing in Nonlinear Dynamic Conference (Nodycon) Feb - 2021,(in progress)
- Design Development and CFD Simulation of Variable Twist Wing published in Imperial Journal of Interdisciplinary Research (IJIR) Vol-3, Issue-5, Nov - 2017
- Determination of Fatigue Life of Surface Propeller by Using Finite Element Analysis published in International Journal of Engineering Science and Computing (IJESC), August - 2016
- Design and Analysis of a 3-wheeler Integrated Monocoque Chassis published in International Journal of Scientific Engineering and Technology Research (IJSTER) Feb - 2016.

Projects:

A Concept Mission for the Stellar Population and Evolution with Cubesats Sep. 2017 – Jan. 2018
Engineered mechanisms that can facilitate in changing the filters in real time for the payload to capture varied spectrum of the stars.
Responsibilities:
Studied about the thermal absorption materials (radiation and conduction). Performed a transient and steady - state thermal analysis on the Cubesat using Ansys.

Study of Pulsejet engines May 2012 - June 2012
Studied pulsating combustion is a combustion process that occurs under oscillatory conditions. That means that the state variables, such as pressure, temperature, the velocity of combustion gases, etc. Which describe the condition in the combustion zone, vary periodically with time.

Delta Wing Aircraft Modelling and Design Feb 2012 - Mar 2012
Studied a conceptual designs and experimental limitations for the modelling of aircraft. Designed RC-built aircraft with different wings (Delta, Swept, Blended Body wings) of a confined geometrical valves, analysed and developed tests to validate the design.

Expertise

Technical:
• **Structures:** Good knowledge of aerospace structures, finite element methods and experimental testing methods especially, when beams subjected to base excitations. Shear flow in closed sections and open section of beams. Good understanding of the linear and nonlinear mechanics of structures. Excellent understanding in estimating the modal parameters that is resonance frequency, damping ratio and mode shapes from experimental data.
• **Materials:** Good knowledge of nanocomposite with different matrix's, shape memory alloys and cellular solids. Novel techniques to improve the surface of the material.
• **Propulsion:** Excellent knowledge nozzle characteristic and parameters which effects the overall efficiency of a chemical propulsion-based system.

Software:
• **COMSOL:** Executed a finite element model in the COMSOL Multi-physics environment to obtain quasi-linear hysteresis cycle. Computational dynamical analysis performed on polymer and polymer with CNTs, using COMSOL with Matlab interface.
• **Matlab:** Experience accumulated while estimating the modal parameters, signal processing, interferometric laser imaging for droplet sizing. In thesis, implemented a mathematical models for estimating elastic stiffness of nanocomposites for different geometric inclusion.
• **ABAQUS:** Gained experience while analysed the nonlinear response and stability of shallow shell under vertical central point force per unit area applied, to obtain force-deflection diagram from the Ricks static module. Determination of fatigue life of surface propeller.
• **ANSYS:** Gained experience during the bachelor's degree thesis, paper publications and again used for thermal analysis on a Cubesat.
• **LATEX:** Experience accumulated during the master's degree thesis work.
• **CATIAV5:** Experienced with the software during the bachelor's degree thesis, paper publications.
• **Mathematica:** Once used to finish an assignment related to nonlinear analysis of structure.
• **Python:** Learning (in progress)

Languages:
• **Telugu (Native)**
• **English (fluent)**
• **Hindi (fluent)**
• **Italian (A1)**

Computer Skills
• Skilled user in operative systems; Windows (from version 2000 to 10).
• Excellent knowledge of basic hardware computer components.
• Good knowledge of Microsoft office.

Soft Skills
- Multicultural teamwork skills
- Strong interpersonal skills
- Initiative and self-organizational skills
- Ability to adapt to new environments

Activities and Awards:
- Team member in media and data management for Nonlinear Dynamics Conference, Rome 2019
- Sapienza Aerospace Student Association (AIAA-Student chapter) - (2017 - 2018)
- American Institute of Aeronautics and Astronautics (AIAA) – Student Member (2017- 2018)
- Runner up in Aero-Modelling design and Robotic design in HITAM College.

Other Information

Sports and Hobbies
I practice different sports activities such as cricket, badminton, swimming and jogging. I love reading books and listening to music.