

## BIODATA

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Institution	Indian Institute of Technology Dharwad

## EDUCATION

Doctor of Philosophy in Mechanical Engineering, IIT Dharwad, Dharwad, India CGPA: 8.47	2020 – Present
Master of Technology in Machine Design, RV College of Engineering, Bengaluru, India CGPA: 8.97	2016 – 2018
Bachelor of Engineering in Mechanical Engineering, The National Institute of Engineering, Mysuru, India CGPA: 9.03	2010 – 2014

## PROFESSIONAL EXPERIENCE

**Raman Research Institute, Bengaluru || Research Assistant || July 05<sup>th</sup> 2018 – August 27<sup>th</sup> 2020**

**Project:** *RRI Efficient Linear array Imager (ELI)*: A novel method to image the galactic plane in the frequency range 10-30 GHz, by reducing the primary area and at the same time increasing the instantaneous field of view.

**BMM ISPAT LTD., Hosapete || Engineer, Bar Rod Mill || October 13<sup>th</sup> 2014 – August 31<sup>st</sup> 2016**

**Work:** Supervision and monitoring of erection, commissioning of mechanical equipment like rolling stands, rolling stand assembly units, gear boxes, motor couplings, hydraulic and lubrication power packs that were spread across the Mill area, Cooling bed, Stacker and Handling area.

## ACADEMIC RESEARCH EXPERIENCE

**Indian Institute of Technology Dharwad (IIT Dharwad)**

**September 2020 – Present**

***Doctoral Student***

**Provisional thesis title:** *Case-specific 3D models of arbitrarily complex branched topologies for modeling morphology and growth*

The work aims at generating CAD models from three-dimensional images obtained from medical scans. Hyperelastic material modelling of flexible membranes by studying their deformation under pneumatic pressures and morphological analysis of roots of hydroponically grown plants was also performed.

**Supervisor:** Dr. Samarth S. Raut, Assistant Professor, IIT Dharwad, Dharwad

- Studied the effect of segmentation accuracy and mesh smoothing on the geometric and mesh parameters
- Utilized *3D depth cameras* to track deformation and model *inflation of flexible membranes*, corroborated by numerical investigations using ANSYS
- Fabricated a setup to monitor growth and perform *morphological analysis* of roots of *hydroponically grown plants*
- Developed rudimentary *GUIs* to perform *semi-automatic segmentation*, *plant root morphological analyses* and *mesh smoothing* in Python

**RV College of Engineering, Bengaluru**

**July 2016 – July 2018**

***Master Student***

**Thesis title:** *Numerical investigation of hardness and residual stresses induced in an induction hardened rocker arm bearing shaft* || GTCI, SKF Bearings, Bengaluru (Worked with Mr. Vijayraghavan, Process Specialist)

The project dealt with simulation of the induction hardening process. The heat transfer simulation was carried out using the CFD tool STARCCM+, followed using CAM tool DEFORM to compute the residual stresses due

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to quenching.

**Supervisor:** Dr. Nataraj J R, Associate Professor, RV College of Engineering

**The National Institute of Engineering, Mysuru**

**September 2010 – July 2014**

**Bachelor Student**

**Thesis title:** *Design of control system to delay stall using active flow control at subsonic flows* || CTFD, National Aeronautics Laboratory (CSIR), Bengaluru (worked with Dr. Ramesh V, Chief Scientist, CTFD, NAL)

**Supervisor:** Dr. T N Shridhar, Professor, Department of Mechanical Engineering, NIE

The entire project consisted of four modules. First module involved validation of a turbulence CFD model on NACA0012 aerofoil. The second module involved the inclusion of one of the many active flow-control methods available i.e., synthetic jets. The third module involved simulating an array of piezo resistive sensors to pick up stalling pressure prevalent over the aerofoil. The last module involved the design of a control system to simulate synthetic jets and optimize the parameters, namely speed and angle of mass ejection.

## ACHIEVEMENTS

1. Awarded **second best poster** for “Error assessment in image based 3D reconstruction and 3D printing” at the **ANRF-INAE Conclave on Atmanirbhar Technologies: Engineering a Secure Future**, under the “**Indigenous Technology Development**” theme

## PUBLICATIONS/CONFERENCES

1. Avinash Kumar K M, Samarth Raut, “Error assessment in image based 3D reconstruction and 3D printing”, 30<sup>th</sup> Congress of the European Society of Biomechanics 2025
2. Rahul Maurya, Avinash Kumar K M, Samarth Raut, “Contactless Mechanical Material Characterization of Hyperelastic Membranes Using Stereoscopic Depth Map”, ASME SB3C Summer Bioengineering Conference 2025
3. Avinash Kumar K M, Aishwary Singh, D. Narasimha, Rahul Maurya and Samarth Raut, “Transfer-learning based multi-class areca nut image classification under uncontrolled lighting on a conveyor system for automated sorting”, in *2024 IEEE Conference on Engineering Informatics (ICEI)*, pp. 1-7. IEEE, 2024.
4. Avinash Kumar K M, Hemantha Manjunatha, Aashish V Bhat, Bhagyashree Kulkarni, “Active flow control using Synthetic jets and neural network”, 16<sup>th</sup> Annual CFD Symposium, NAL-CSIR, September 2014

## TECHNICAL SKILLS

1. Programming Languages: C++, Python, Julia
2. Tools: MATLAB, ANSYS Workbench, SolidWorks, Autodesk Inventor, Latex, MS Office

## REFERENCES

Dr. Samarth S. Raut  
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## RESEARCH INTERESTS

Image-based reconstruction  
Computer vision applications

Continuum mechanics  
Growth mechanics

Mesh generation and smoothing  
Hyperelastic modelling

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