Guru Prakash Sahu

+91 9669571706 | gpsahu@alumni.iitm.ac.in | Personal Website | LinkedIn

EDUCATION

Degree	University	CGPA	Year
M.S. (Mechanical Engineering)	Indian Institute of Technology Madras	9.2/10	2022
B.E. (Mechanical Engineering)	CSVTU Bhilai	8.69/10	2017

SCHOLASTIC ACHIEVEMENTS

- Received Half Time Research Assistantship of **$152/Month** for 2.5 years by the MHRD, Government of India, to pursue M.S. at IIT Madras
- Secured **97.86 percentile** among 0.2 million candidates in **GATE 2018**
- Two times recipient of **Shri Sajjan Jindal Scholarship** receiver of **$490** based on academic performance

ACADEMIC RESEARCH

MS Thesis: Surface temperature measurement using waveguide-based sensors **2021**

Supervisor: Prof. Krishnan Balasubramanian, IIT Madras

- **Finite Element Modelling** of guided wave propagation (SH0 mode) in a 1 mm Aluminium & Steel strips
- **Optimized** sensor parameters for accurate temperature measurement.
- Innovated an L-bent Strip Waveguide for versatile temperature monitoring. **(Resulted in Patent)**
- Conducted **successful experiments** validating the temperature **prediction model**.

Distributed surface temperature measurement of a pedestal (Sponsored by LAM Research India) **2021**

- **Designed** a waveguide-integrated metal plate and **established sensor calibration curves**.
- Pioneered **low-wave-leakage** Strip Waveguide sensors for enhanced precision.

Bachelor Thesis: Fault diagnosis of mechanical components within rotational machines using infrared thermography method. Supervisor: Prof. Mahesh Bhiwapurkar, OPJIT (CSVTU) **2017**

- Explored **thermal imaging** through extensive literature research.
- Utilized infrared camera thermal images to analyse and pinpoint **causes of component failure**.

RESEARCH OUTPUT

1. **PATENT: Guru Prakash Sahu**, Nishanth Raja, Krishnan Balasubramanian (IIT Madras) "An apparatus for determining surface temperature of an object and a method thereof" 2022. **One out of 9 patents which was licensed to XYMA Analytics for ~$300K.** Patent application No-202241016778
2. **DISCLOSURES: (Associated with EATON India innovation centre, Pune)**
   - **Guru Prakash Sahu et al.,** "Bearing health monitoring using ultrasound method", 2022.
   - **Guru Prakash Sahu et al.,** "Automation algorithm to track internal tool usage from 200+ employees", 2023
   - **Guru Prakash Sahu et al.,** "Novel zero leak ribbon attachment concepts", 2023
3. **JOURNAL PAPER: Guru Prakash Sahu**, et al., "Surface temperature mapping of a metal plate using ultrasound-guided wave technique," Journal of Nondestructive Evaluation, Diagnostics and Prognostics of Engineering Systems, 4(4). 2021 [https://doi.org/10.1115/1.4051175]
4. **CONFERENCES:**
   - **Guru Prakash Sahu**, Nishanth Raja, Krishnan Balasubramanian "Surface Temperature Mapping of a Metal Plate Using Ultrasound Guided Wave Technique", presented at the 47th International Annual Review of Progress in Quantitative Non Destructive Evaluation (QNDE-Virtual Conference), August 25-26, 2020, USA
   - **Guru Prakash Sahu**, Nishanth Raja, Krishnan Balasubramanian "Distributed Temperature Sensing of Components Using Acoustic Waveguide Sensors ", presented at the Conference and Exhibition on Non-Destructive Evaluation (ISNT-NDE), December 2020, India [Presentation Link]

TECHNICAL SKILLS

Software : ANSYS, ABAQUS, COMSOL Multiphysics, Solidworks, nCode, Disperse, Inkscape, OBS, Procreate
Equipment : Technofour, Olympus/Optel Pulser-Receiver, RITEC, Oscilloscope, NI Data Acquisition unit
Language/Tools : MATLAB, Python, ANSYS ACT, Excel VBA, Basic C++ , MS word/PowerPoint, Paint.Net

PROFESSIONAL EXPERIENCE

FEA ENGINEER: EATON Pune August 2021-present

- Developing End-to-End **automation tool** for Differential case FEA (**saving of ~$90K/Year)** utilizing Python, VBA
- Designed a time-saving stress data automation tool, **reduced workload by 75%** with **Excel VBA** and **AnsysACT**
- Conducted **40+ structural analyses** (Linear and Non-linear FEA), **optimizing designs** for components like differential cases, lock plates, cross shafts, and fuel valves.
- **Won MCF Filtration hackathon**: Out of 90 submitted idea my idea for "Bearing Health monitoring using Ultrasound" was one among 3 selected idea for disclosure filing.
- **Won Peoples choices award** for best poster out of 15+ posters presented at **EATON India.**

Ultrasound Engineer: XYMA Analytics (Part time), Chennai June 2019-july 2021

- Part of the core team who collaborated on this startup initiative before its official inception
- Developed **novel ultrasound-based methodologies** for robust and reliable process monitoring for the industry
- Designed sensor components and performed Finite Element simulation studies to optimise sensor parameters. Calibrated sensor for measuring temperatures up to 400°C, **with an accuracy of ±0.5°C**
- Prepared reference manuals on a simulation study to facilitate training for new employees

PROJECT ASSOCIATE: ICSR, IIT Madras Jan-July 2021

- Developed **gauge length optimizer** for temperature sensor length. This helped in improving accuracy of the temperature sensor
- I was responsible for coordinating lab experiment for temperature measurement using ultrasound guided wave technique for various projects

POSITION OF RESPONSIBILITIES

COORDINATOR – Career Development Cell-Research, IIT Madras June 2020-April 2021

- Organized career fairs and virtual events
- Coordinated Live streaming of events on YouTube, designed Poster and banners for the event

TEACHING ASSISTANT: Course- "Engineering Drawing Me1480" Jan-May 2020

Instructor – Prof. Piyush Shakya, IIT Madras

- Maintained attendance records and evaluated assignments for a batch of 80 students
- **Tutored students** during CAD modelling and manual drawing sessions

CORE – Research Scholars Day (RSD 2020), IIT Madras Oct-2019-April 2021

- **Team Leader** for a group comprising 10 students for organizing RSD event
- Designed Brochures/Posters/T-Shirts and Maintained website for the event

OTHER RELAVENT PROJECTS

Evaluation of material characteristic and image formation using ultrasound methods 2019

- Used Pulse-Echo mode to Measure the Material Property
- Reconstructed Image by Processing Data from Ultrasound Phased Array Probe using **MATLAB**

MATLAB implementation of finite element analysis of 2d elasticity problems 2019

- Solved plane strain and plane stress problems in MATLAB
- Verified results with the **ABAQUS** simulation results

Developed a python algorithm for article summarization for quick reading 2020

- Web-Crawling for the Articles and data cleaning
- Summarized pre-processed article using NLTK framework

REFERENCES

Prof. Krishnan Balasubramanian
Institute Professor
Dept of Mechanical Engineering
Indian Institute of Technology Madras
Chennai, India 600036
Phone : +91 9840200369
Email : balas@iitm.ac.in
Google Scholar : Link

Prof. Raju Sethuraman
Institute Professor
Dept of Mechanical Engineering
Indian Institute of Technology Madras
Chennai, India 600036
Phone : +91-44-2257-4673
Email : sethu@iitm.ac.in
Google Scholar : Link

Prof. Boby George
Institute Professor
Dept of Electrical Engineering
Indian Institute of Technology Madras
Chennai, India 600036
Phone : +91-44-2257-4465
Email : boby@iitm.ac.in
Google Scholar : Link