K PRABITH

Rotordynamics, Nonlinear dynamics, Metamaterials, Wave propagation
Laboratory for Engineered Materials and Structures
Department of Aerospace Engineering, Indian Institute of Science Bengaluru

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EDUCATION

2016- 2022   Indian Institute of Space Science and Technology, Thiruvananthapuram
Ph.D.   **Rotordynamics, Department of Aerospace Engineering**

2010- 2012   University of Kerala, India
M. Tech.   **Machine Design, Department of Mechanical Engineering**

2006- 2010   Kannur University, India
B. Tech.   **Mechanical Engineering, Department of Mechanical Engineering**

RESEARCH EXPERIENCE

IOE-IISc Postdoctoral Fellow in Department of Aerospace Engineering

June 2022- Present   Indian Institute of Science Bengaluru

Research and Teaching Assistantship:

- **Area:** Metamaterial, Wave propagation
- **Labs:** Laboratory for Engineered Materials and Structures

Main Accountabilities and Key Duties:

- Perform the experimental and numerical research works focused on wave propagation in metamaterials.
- Supervising the other members in carrying out the necessary research works.
- Presentation of research at internal and external seminars/conferences.
- Write manuscripts and prepare the research work for publications.

TEACHING EXPERIENCE

Assistant Professor in Department of Mechanical Engineering

Feb 2014 - July 2016   Sree Narayana Guru College of Engineering and Technology Payyanur

Courses: Machine Design, Mechanics of Machinery, Dynamics of Machinery, Design and Engg.

Main Accountabilities and Key Duties:
- Plan, schedule, and organize lectures for the students.
- Guide, lead and mentor students in their project work.
- Evaluate, monitor and review student academic progress.
- Participate in departmental and college activities.
- Assist and support senior professors in their day-to-day tasks and function

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PROFESSIONAL EXPERIENCE

Assistant System Engineer in Engineering Industrial Service

Nov 2012 -Sep 2013   Tata Consultancy Services Ltd. Bengaluru

Projects:
- System-level benchmarking for Automobile Chassis parts – Nissan & competitors
- Modal analysis of brake drum plate

Main Accountabilities and Key Duties:
- Benchmarking, competitor analysis & strategy and specification planning.
- Construct CAD & CAE models and complete analysis for automotive components.
- Construct meshes and build models in Hypermesh.
- Perform CAE analysis in Abaqus or ANSYS
- Study problems and recommend countermeasures.

Ph.D. Thesis: Dynamic analysis of a two-spool aero-engine model undergoing multi-disk rub-impact using a semi-analytical method.

- Modelling and analysis of rotating machinery consisting of single-spool rotor models and two-spool aero-engine models (similar to CFM56-5B engine)
- Analysis of rotating machinery components such as rolling contact bearings, fluid film bearings, seals and squeeze film damper
- Model reduction and steady-state response analysis of aero-engine model undergoing multi-disk rub-impact
- Stability and bifurcation analysis of the aero-engine response using the Floquet theory
- Parametric analysis to understand the effects of rub and squeeze film damper parameters

M.Tech. Thesis: Condition monitoring of Rotor System Using Genetic Algorithm Based Artificial Neural Network.

- Vibration acquisition from a single-disk rotor model using a data acquisition system
- Feature extraction and optimization using genetic algorithm technique
- Multi-fault diagnosis by artificial neural network using optimized statistical features
- Experimental validation of the proposed condition monitoring technique

SKILLS

Software Proficiency:

CAD	AutoCAD, SOLIDWORKS	■ ■ ■ ■ ◻
CAE	ANSYS, Abaqus	■ ■ ■ ■ ◻
Programming Language	Python, MATLAB	■ ■ ■ ◻ ◻

PEER-REVIEWED JOURNAL PUBLICATIONS

[1] K Prabith., I R Praveen Krishna., "A time variational method for the approximate solution of nonlinear systems undergoing multiple-frequency excitations", *Journal of Computational and Nonlinear Dynamics*, **15**(3): 031006 (2020).
https://doi.org/10.1115/1.4045944

[2] K Prabith., I R Praveen Krishna., "The numerical modeling of rotor-stator rubbing in rotating machinery: a comprehensive review", *Nonlinear Dynamics* **101,** 1317–1363 (2020).
https://doi.org/10.1007/s11071-020-05832-y

[3] K Prabith., I R Praveen Krishna., "The stability analysis of a two-spool rotor system undergoing rub-impact", *Nonlinear Dynamics* **104**, 941–969 (2021).
https://doi.org/10.1007/s11071-021-06370-x

[4] K Prabith., I R Praveen Krishna., "Response and stability analysis of a two-spool aero-engine rotor system undergoing multi-disk rub-impact", *International Journal of Mechanical Sciences* **213**: 106861(2022).
https://doi.org/10.1016/j.ijmecsci.2021.106861

INTERNATIONAL CONFERENCES

[1] K Prabith., I R Praveen Krishna., "A modified model reduction technique for the dynamic analysis of rotor-stator rub", *10th IFToMM International Conference on Rotor Dynamics*, *Rio de Janeiro, Brazil (2018)*.

[2] K Prabith., I R Praveen Krishna., "Bifurcation studies of a nonlinear mechanical system subjected to multi-frequency-quasi-periodic excitations", *Second International Nonlinear Dynamics Conference NODYCON 2021*, Rome (2021).

[3] K Prabith., I R Praveen Krishna., "An optimum frequency ratio calculation for the quasi-periodic response analysis of nonlinear systems", *27th International Congress on Sound and Vibration ICSV27*, Prague, Czech republic (2021).

[4] K Prabith., I R Praveen Krishna., "Influence of squeeze film damper on the rub-impact response of dual-rotor model", *16th International Conference on Vibration Engineering and Technology of Machinery VETOMAC - XVI*, Bengaluru, India (2021).

[5] K Prabith., A Samson., "Prediction of faults in the rotor system using genetic algorithm based artificial neural network and fuzzy inference system", *20th International Congress on Sound and Vibration ICSV20,* Bangkok, Thailand (2013).

BOOK CHAPTER

[1] K Prabith., I R Praveen Krishna., "A modified model reduction technique for the dynamic analysis of rotor-stator rub", *In Proceedings of the 10th IFToMM International Conference on Rotor Dynamics*, *Mechanisms and Machine Science* **62**, 400-411 (2018), Springer, Cham. https://doi.org/10.1007/978-3-319-99270-9_29

[2] K Prabith., I R Praveen Krishna., "Bifurcation studies of a nonlinear mechanical system subjected to multi-frequency-quasi-periodic excitations", *Advances in Nonlinear Dynamics, NODYCON Conference Proceedings Series* **1**, 735-745 (2018), Springer, Cham. https://doi.org/10.1007/978-3-030-81162-4_63

REFERENCE

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