National Institute of Technology Rourkela

Progress Seminar

Seminar Title	: Study on Textured Gas Foil Bearings through Numerical Simulations and Experiments
Speaker	: Srusti Priyadarshini (Rollno : 522me6009)
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Venue	: ME-001, Seminar Room
Date and Time	: 26 Nov 2024 (5:15 PM)
Abstract	: Current Research investigates the performance of bio-inspired Herringbone Grooved-Gas Foil Journal Bearings (HG-GFJBs) using numerical simulations based on the Reynolds equation. Drawing inspiration from the natural arrangement of feather riblets of birds, the study explores how biologically inspired groove geometries can improve the efficiency and functionality of Gas Foil Journal Bearings (GFJBs). These natural patterns, which have evolved to enhance pressure distribution, are applied to the surface topographies of gas foil bearings to examine their impact on static performance. The results indicate that the air-lubricated HG-GFJBs are capable of operating at high speeds and sustaining significant axial loads. Furthermore, an Artificial Neural Network (ANN) was trained using numerical analytic data in order to assess performance using the regression coefficient. A decision surface plots of the Adaptive Neuro-Fuzzy Inference System (ANFIS) were then produced in order to determine the optimal bearing parameters. By leveraging principles derived from nature, the study opens up new possibilities for enhancing the performance and longevity of GFBs, making them more efficient and reliable for a variety of engineering applications.