Internship Project

Title of project	Induction Motor Bearing Fault Detection Device for Bearing Health Assessment and Remaining Useful Life Prediction							
Laboratory / Department	Department of Electrical and Electronics Engineering							
Location	Block 22							
Supervisor(s)	Dr. Kishore Bingi							
Circle the areas required* (can be more than one)	**EE**	**ME**	**CVE**	**CHE**	**IT**	**BIS**	**CIS**	**PE**
	AP	**AC**	**PGS**	**BM**	**Others:**			
Summary of project	Traditional methods for detecting motor bearing faults are labour-intensive, disruptive and limited in their ability to detect early-stage faults. Our research proposal aims to develop a state-of-the-art Motor Bearing Non-Invasive Fault Detection (MOBIT) system that uses Motor Current Signature Analysis (MCSA) and machine-learning algorithms for real-time monitoring. The strategically placed current sensors capture these signatures, which are then processed and analyzed using advanced signal processing and machine learning techniques. The MOBIT system provides real-time fault warnings, facilitating proactive maintenance interventions and reducing the risk of critical failures. Various AI techniques are used to model the complex relationships between sensor data and bearing degradation. The result is a robust AI model capable of making accurate Remaining Useful Life (RUL) predictions, aiding in timely maintenance planning and resource allocation. The objectives are: 1. To device a non-invasive testing device with a monitoring system that integrates various sensors and data acquisition techniques to collect real-time data from motor bearings without disassembly or invasive inspections. 2. To develop and implement advanced artificial intelligence models to analyze the sensor data and accurately predict motor bearings' remaining useful life (RUL), effectively differentiate between normal operating conditions and early signs of bearing deterioration and validate the device in lab testing for a controlled environment.							

* *EE: Electrical & Electronic Engineering, ME: Mechanical Engineering, CVE: Civil Engineering, CHE: Chemical Engineering, ICT: Information & Communication Technology, BIS: Business Information System, PGS: Petroleum Geoscience, PE: Petroleum Engineering, AP: Applied Physics, AC: Applied Chemistry, BM: Business Management*