



Faculty Development Program



Title : Design of Intelligent Machine Condition Monitoring System

Date : 2025-09-18 - 2025-09-18

Time : 10:00 - 13:15

Venue : LIBRARY CONFERENCE HALL

Event Outcome

- Attendees will learn why machine downtime is a major issue in manufacturing and how intelligent monitoring can solve it. The talk will highlight statistics on unplanned downtime and its financial impact. Participants will also learn about the core technologies



Resource Person 1 - Details

Name : Dr JOSEPH EMERSON RAJA

Designation : Assistant Professor, FACULTY OF ENGINEERING AND TECHNOLOGY

University/ Company : Multimedia University, Melaka

Address : Malaysia, 75450.

Resource Person's Profile :

1. Profile of Dr JOSEPH EMERSON RAJA

Dr. Joseph Emerson Raja is a Assistant Profes in the Faculty of Engineering and Technology at Multimedia University (MMU), Malaysia. He holds a Ph.D. in Engineering from MMU and a bachelor's and master's degree in Computer Science and Engineering from the University of Madras, India. His research focuses on applying soft computing techniques to machine health monitoring. A key area of his work involves tool condition monitoring using emitted sound analysis, specifically employing the Hilbert Hu

This talk introduces a machine condition monitoring system designed to prevent unplanned downtime from equipment failures. The method focuses on tool flank wear monitoring by analyzing audible sound. The system uses a competitive neural network (CNN) to classify a cutting tool's condition as fresh, slightly worn, or severely worn. It analyzes sound signals and extracts key features using the Hilbert Huang Transform (HHT). This approach is based on the finding that as a tool wears, its sound pressure amplitude increases while its frequency decreases. This sound-based method offers a practical and non-invasive solution for intelligent maintenance in manufacturing.

PyHHT - Python module that implements the Hilbert Huang Transform (HHT). It uses Empirical Mode Decomposition (EMD) to find Intrinsic Mode Functions (IMFs), then applies the Hilbert Transform to analyze instantaneous frequency and amplitude. It's built on NumPy and SciPy.

Coordinator's: Prof. MANOOV R 13337 - Assistant Professor Sr. Grade 1 - SCOPE
Prof. SUJATHA V 13403 - Assistant Professor Grade 2 - SCOPE