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Artificial intelligence-based condition monitoring for practical electrical drives

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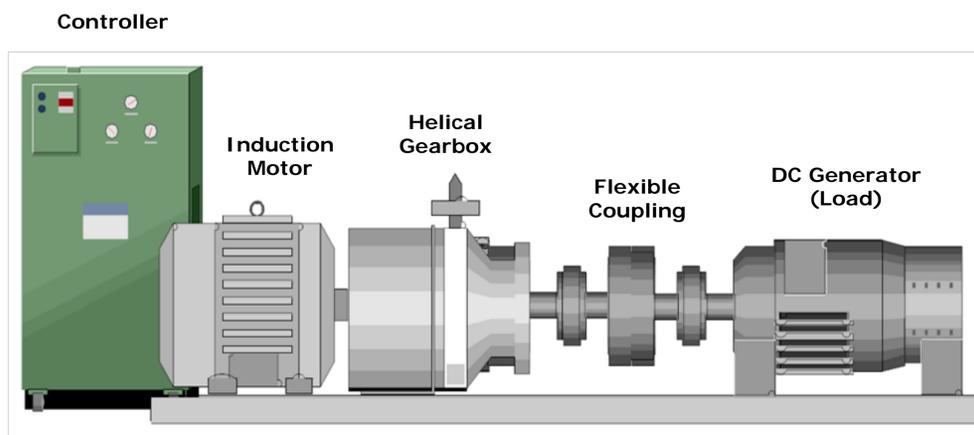
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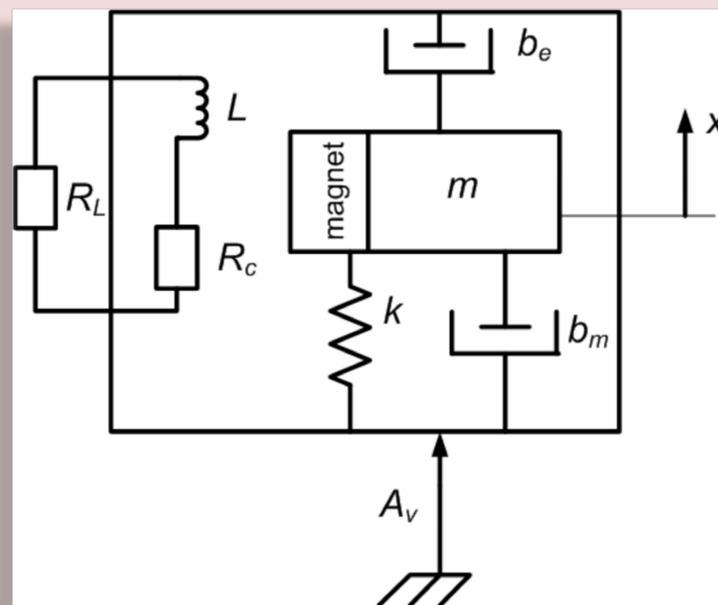
Experimental Test Rig



Condition Monitoring Methods for Electrical Drives

1. Motor Current Signature Analysis (MCSA)
2. Induction machine condition monitoring using notch-filtered motor current
3. Parameter estimation using Genetic Algorithm (GA)
4. Instantaneous Angular Speed (IAS)
 - Band-pass filtering.
 - Analytic representation (Hilbert transform).
 - Carrier frequency removal (frequency shifting).
 - Angle calculation and differentiation.

SOMA Used for the Optimisation of Ambient Vibration Energy Harvesting



SOMA

- Self-Organizing Migrating Algorithm
- Optimisation using Artificial Intelligence

A_v Ambient Vibration

Mechanism

- Mechanical part (mass m , spring k , damper b_m)
- Electromagnetic Energy Converter (coils L and R_c)
- Electrical Load R_L

Optimisation can help in generating the maximum amount of electrical power

Next Steps

- Improve the quality factor of the model
- New harvester design for wireless application

Design of Expert System

