

EMDL

Electromechanical Drivetrain
Laboratory

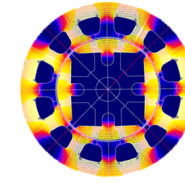


اونيورسيتي مليسيا قهغ السلطان عبدالله
UNIVERSITI MALAYSIA PAHANG
AL-SULTAN ABDULLAH

Electromechanical Drivetrain Lab

Faculty of Manufacturing & Mechatronics Engineering Technology
Universiti Malaysia Pahang Al-Sultan Abdullah

Contents



EMDL

Electrical Machines Design Lab



اوتورسيتي مليسيا فهغ السلطان عبدالله
UNIVERSITI MALAYSIA PAHANG
AL-SULTAN ABDULLAH

1. Recent work in EMDlab

1. Design & prototyping of SynRM
2. Thermal analysis of electrical machines
3. Others: Vibration and mechanical structure

2. Opportunities

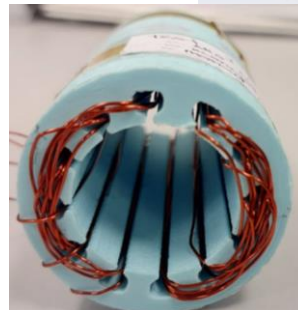
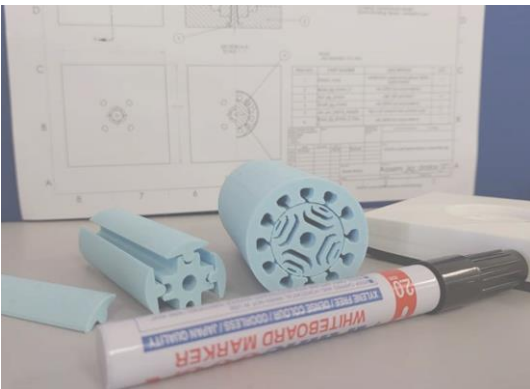
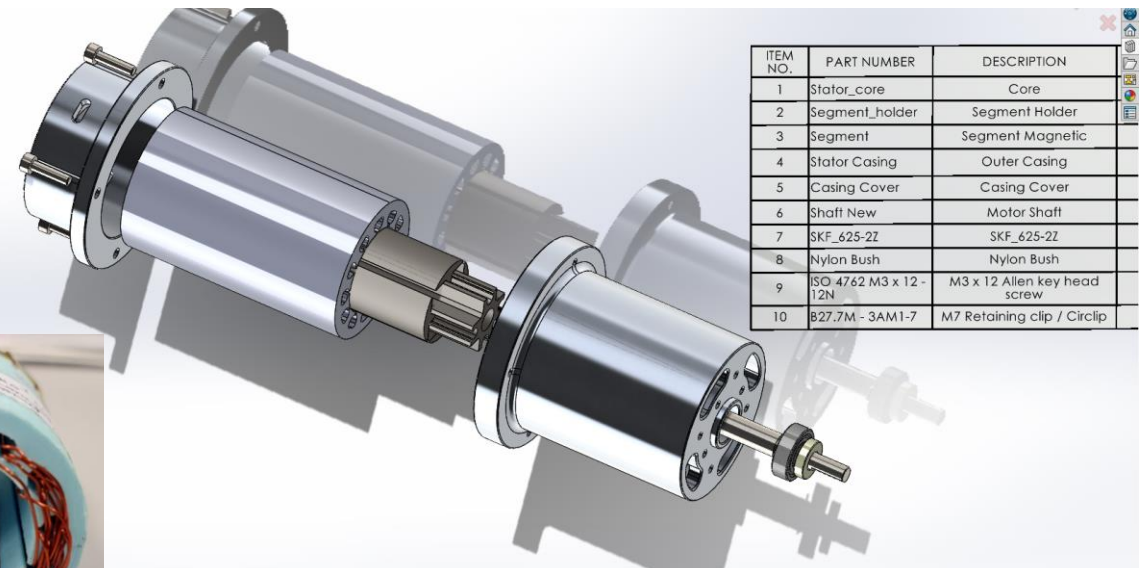
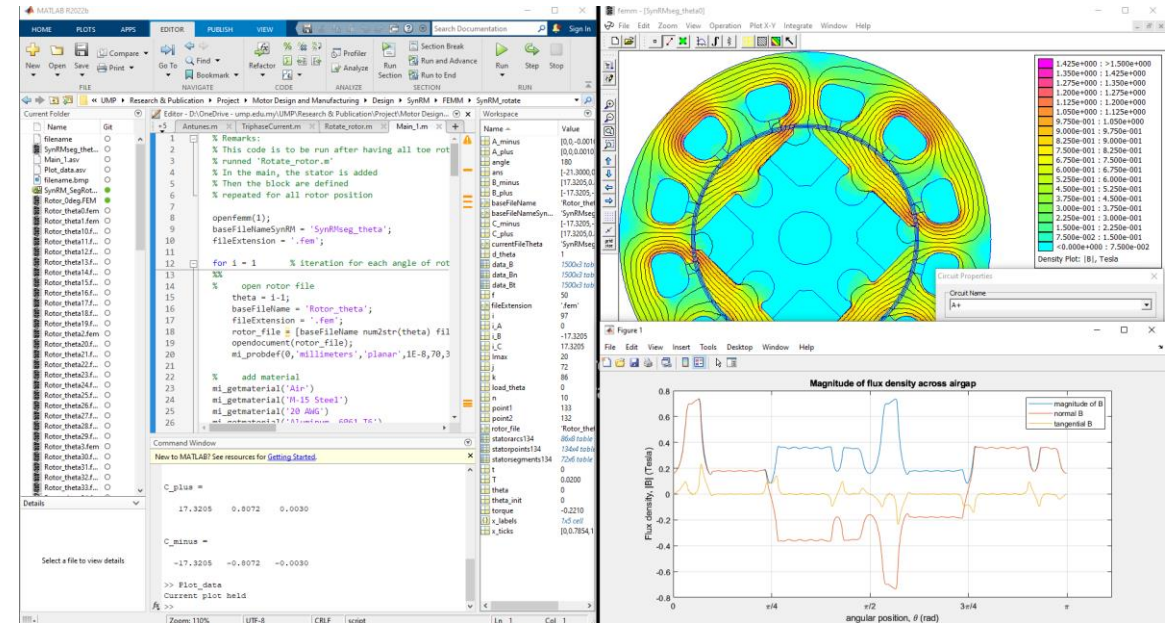
1. Training capabilities
2. Students
3. Financial
4. Partners



Recent works

Design & Prototyping SynRM

1. FE analysis by FEMM
 1. Parametrization and automation
 2. Optimization/sensitivity study (RSM ..)
2. Manufacturing and winding



Recent works

Thermal analysis

1. LPTN model development and validation
2. Observation by thermal imaging
3. DC motor controller with integrated temperature instrumentation

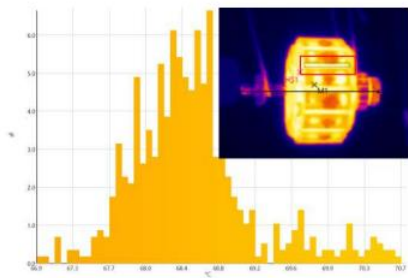
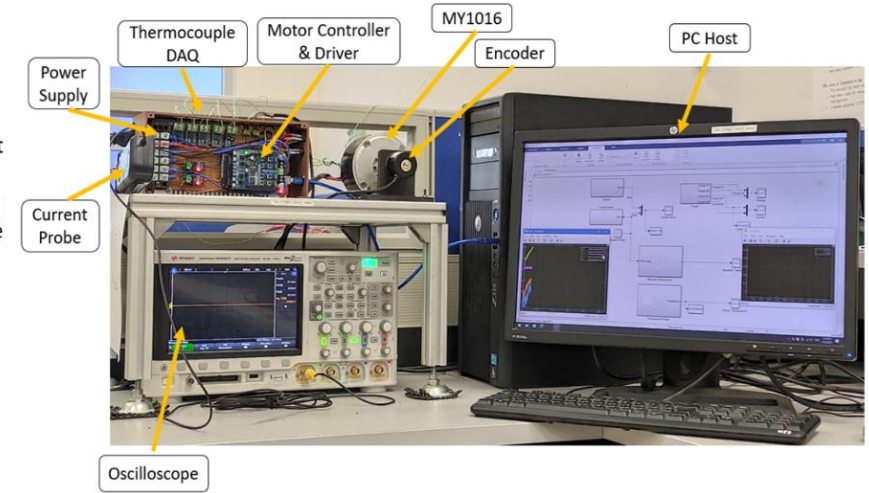
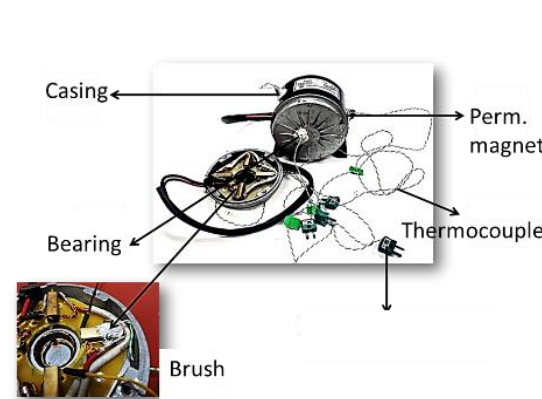


Fig. 6. Winding. Maximum 70.7°C; Minimum : 66.9°C; Average: 68.5°C.

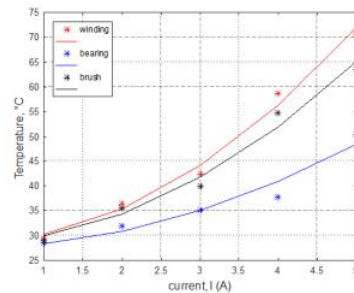


Fig. 9. Maximum temperature of the armature winding, brush and bearing from the thermal image at different current.

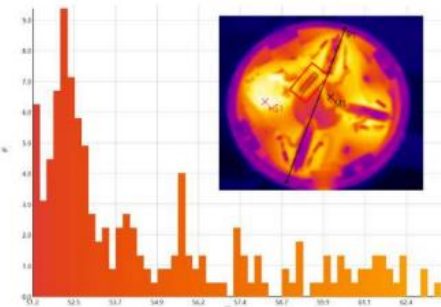
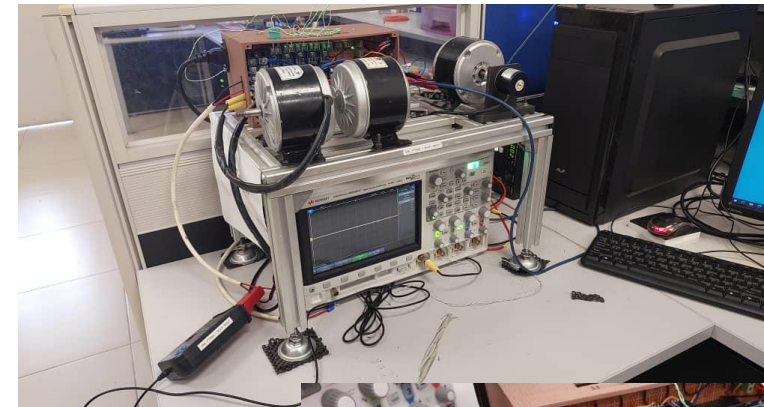
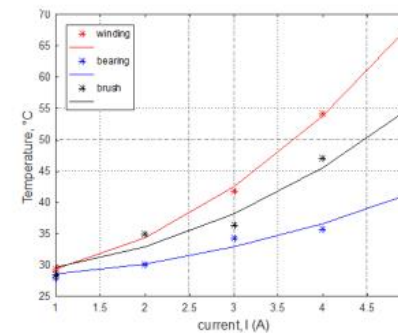


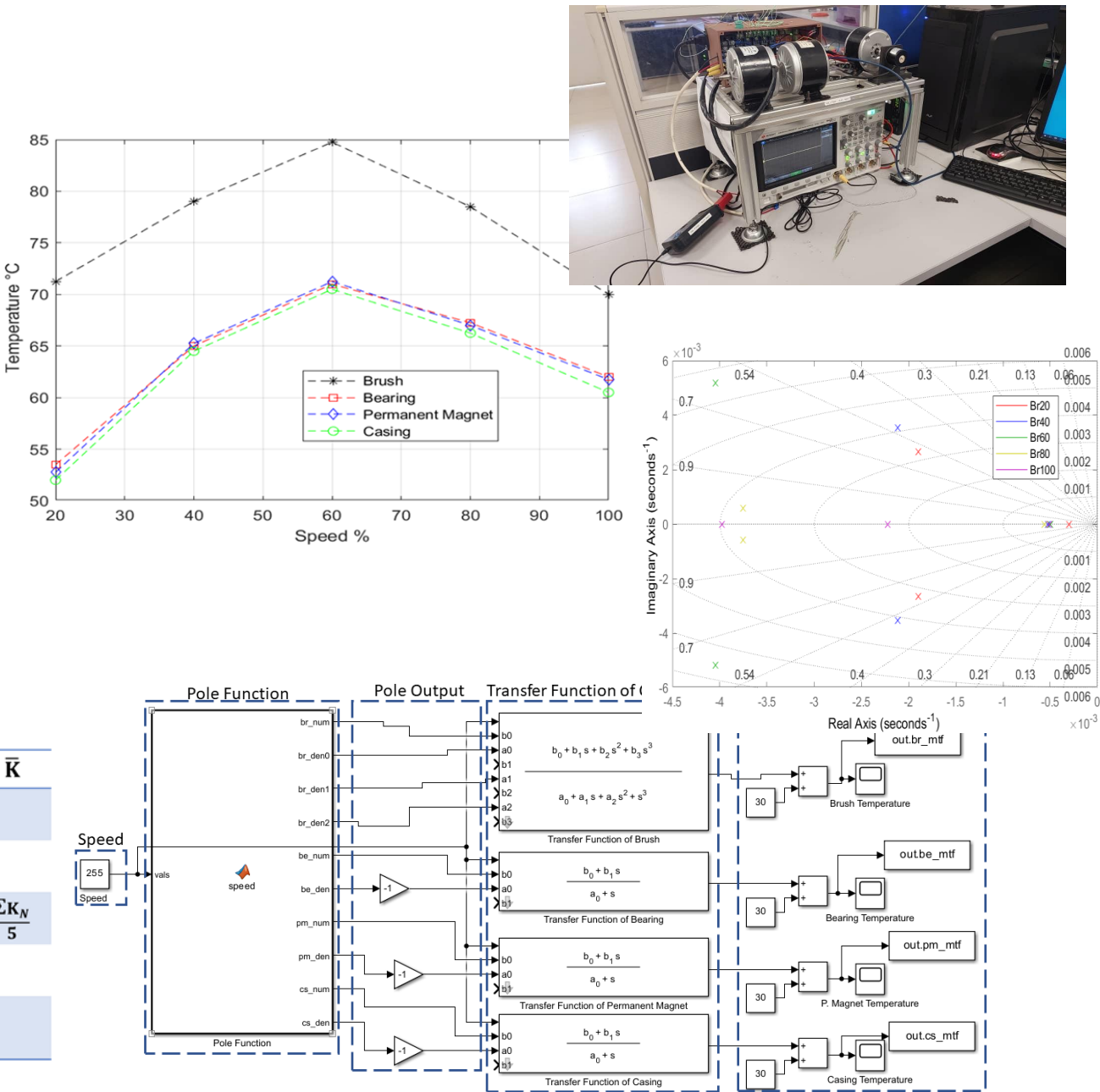
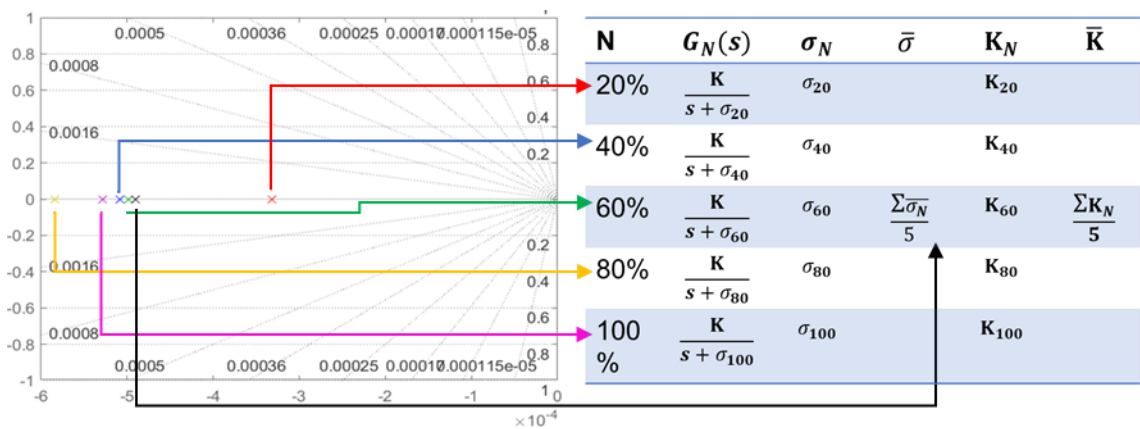
Fig. 7. Brush. Maximum 63.6°C; Minimum : 51.2°C; Average: 54.7°C.



Recent works

Thermal analysis

4. Temperature response modeling by transfer function for light condition monitoring



Recent works

Others

1. Mechanical: structural (torsional and centrifugal force)
2. Vibrational:
 1. Modal analysis – FEA & hammer test
 2. Condition monitoring
 3. Frequency response

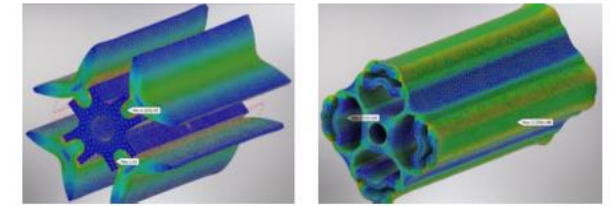


Fig. 8. The centrifugal deformation observed on the segmented (left) and flux barrier(right) rotor structure.

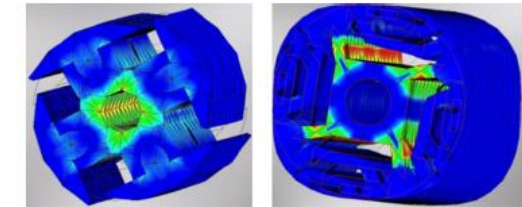
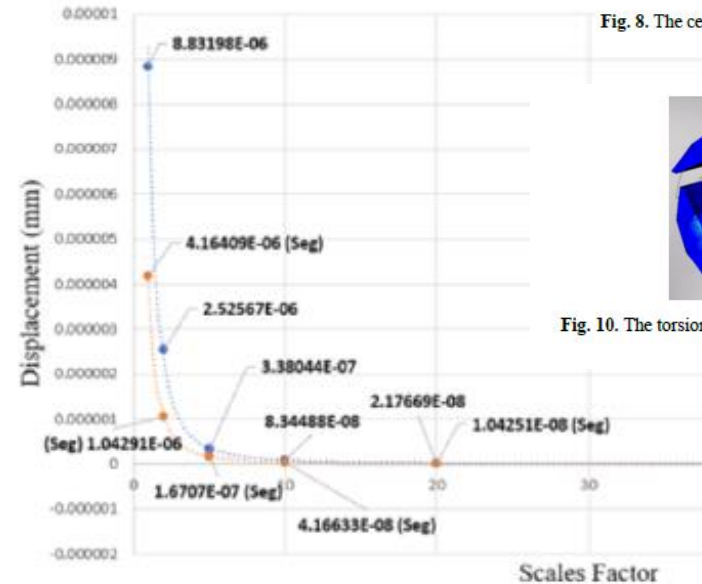


Fig. 10. The torsional deformation observed on the segmented (left) and flux barrier(right) rotor structure.

Slinky lamination assembly

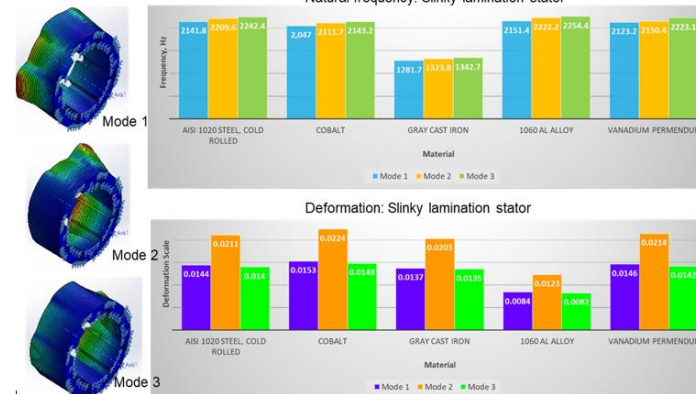
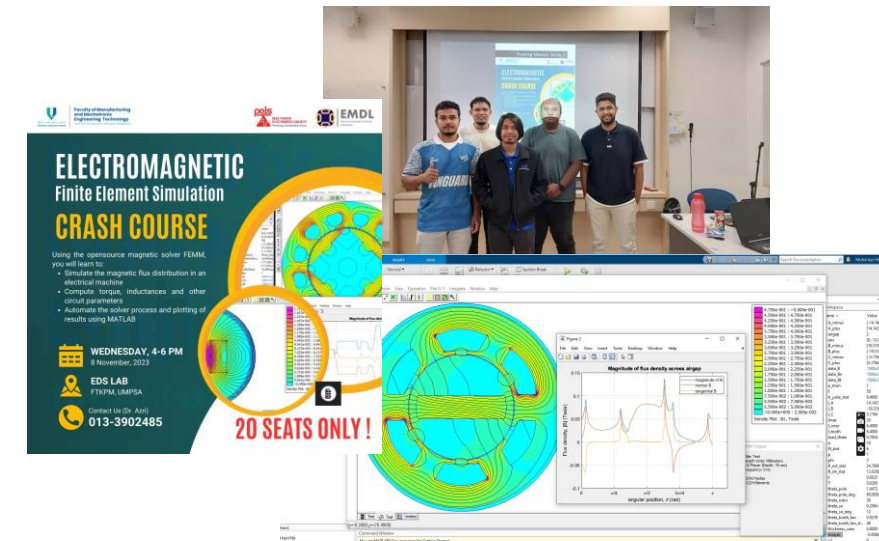
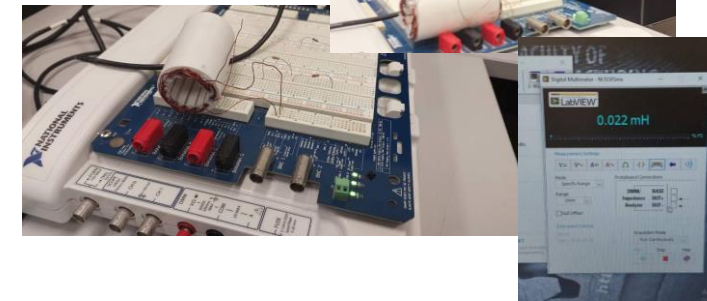
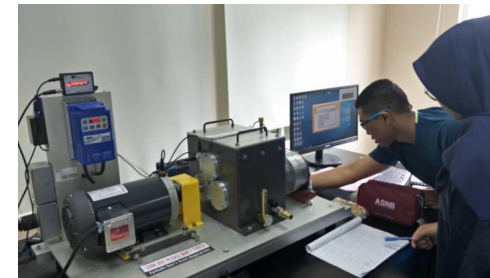
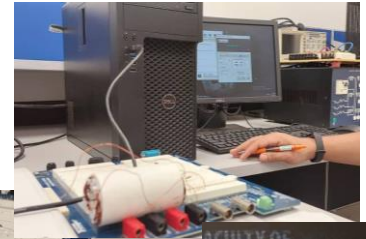
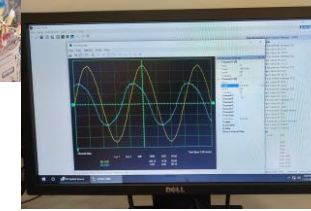
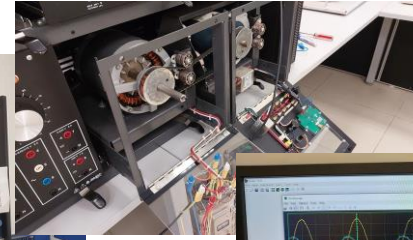


Figure 8. Slinky lamination rotor: the first 3 deformation mode shape. The natural frequency and deformation



Opportunities

- Training capability
 - Lab facility
 - Power electronics modules
 - Induction machines/dc machines bench
 - Electrical drive vibration bench
 - Impedance / inductance measurement
- Softwares expertise
 - MATLAB
 - Magnetic FEA (FEMM)
 - CAD & Structural/mechanical FEA (Solidwork, Inventer, Ansys)



Opportunities

- Students
 - Postgraduates
 - 2 current Masters students
 - Up to 4 Final Year project students every semester (2 semester projects)
 - Open candidature for Msc/PhD all year round
 - Undergraduates
 - Electrical Drive System class – 30 students/sem
 - Analog electronics / power electronics - 30 students/sem
- Financial supports
 - UMP-industry matching grant – 50/50 contribution
 - Internal UMP grant (up to USD 10k / 2 years)



Postgraduate Opportunities
MASTER OF SCIENCE

PROJECT
Temperature Distribution and Heat Transfer in Electrical Motor

SCOPE / AREA
- Heat Transfer
- Electrical Machine
- Modeling
- Experimental Validation
More info, visit:
<https://sites.google.com/ump.edu.my/malraiad>

REQUIREMENT
- Bachelor Degree in Mechatronics / Mechanical / Electrical Engineering
- GPA > 3.0
- Familiar with Matlab/Simulink
- Basic knowledge in:
 - Heat transfer
 - Electrical machines (motor)
- Good command in written and spoken English
- Full time research mode
- Local or international students

REMUNERATION / BENEFITS
- RM 1,500 per month
- Duration: 24 months
- Training, International & Industrial exposure

FOR APPLICATION
- Send your CV to the contact details below
- Offer for immediate intake
- Call / video conference for more information

CONTACT DETAILS
Dr. Mohd Afi Huzam Bin Rosid
Email: mahmud.ahmad@ump.edu.my
Phone: 013-3902485
Website:
<https://sites.google.com/ump.edu.my/malraiad>

EMDL
Engineering Materials Development Laboratory

EMDLab Seminar
INSTRUMENTATION FOR ROTATING EQUIPMENT

A rotating equipment like electric motor, generators and gear train needs several common control and monitoring instrumentation. This includes speed and temperature monitoring, as well as the speed control.

Our technical solution presented by:

Nazmi Rosli
Real-time Temperature Monitoring with IoT (Matlab-Simulink)

Nasrullah Haslan
Real-time DC Motor Control with Custom Cycle (Matlab-Simulink)

Aulia Aliqah
Real-time Encoder Angular Position Monitoring (Matlab-Simulink)

MORE INFO:
013-3902485
<https://sites.google.com/ump.edu.my/malraiad>

10 SEPTEMBER 2022
11 AM - 12 PM
GOOGLE MEET
<https://meet.google.com/fgp-qjp-qm>

Opportunities

- Partners

- Industries:

- Vibratec Asia Pacific (branch of Vibratec France)
 - TT Electronics Malaysia – Kuantan
 - MITS Asia solutions

- Universities

- Universite de Technologie de Compiegne (UTC), France – LEC lab
 - Joint research projects, grant and publication
 - Universitas Negeri Yogyakarta, Indonesia – Automotive Department
 - Visiting lecturer (Elec. system), research grant
 - Universitas Negeri Semarang, Indonesia - Automotive Department
 - Visiting lecturer (Elec. system), research grant



Thank you

