

A Curriculum Vitae of Dr. Wael Abou Hashem Azab Moussa

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1- Education

1.1 *PhD in Mechanical Engineering from University of Ottawa, Canada. 2010-2014*

“Thermography-Assisted Bearing Condition Monitoring”

In this study, several theoretical, experimental and computational tracks of study were pursued. These tracks included the following main points.

- Analytical theories of bearing dynamics, contact mechanics, and heat transfer.
 - Design and implementation of moderate to high-speed bearing test rig.
 - A new technique of early fault detection using thermal analysis is proposed. Using thermal excitation and monitoring thermal transient behavior of both healthy and faulty bearings.
 - A new Vibration-based fault detection algorithm was proposed and compared with test rig experimental readings.
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1.2 *MSc. Faculty of Engineering, Alexandria University, Egypt, 2000-2004*

MSc Thesis: **“Prediction and control of vortex flow over slender bodies”**.

In this thesis the following objectives were fulfilled

- Predict vortical flow formation and possible evolving asymmetry over slender conical bodies using CFD code.
- Studying methods to control vortical flow asymmetry over slender conical bodies, comparing them and using CFD simulations to select best method according to achievement of lowest side force and highest lift force.

Some of MSc work was published in one conference paper.

1.3 *BSc. Of Mechanical Engineering from Military Technical College with Very Good with the Honor degree, 1991-1996, Cairo, Egypt.*

Years: 5 years

Number of courses:89 courses include all general courses for mechanical power engineers in addition to some special courses dedicated for rocket mechanics such as (Aerodynamics-rocket propulsion-missile guidance- optics and infrared systems)

2- Academic activities

2.1 Published work.

- Ahmed Hassan, Hassan Elkamchouchi, Noha Korany and Wael Moussa
“Simulation of Shielded Rooms and Its Performance Evaluation for Protection Against LEMP” International Japan-Africa Conference on Electronics communications and Computations, 15-17, December 2025.

- Mazhar B. Tayl , Hassan Nadir Kheirallah , Wael A. Moussa , Ahmed M. ElMasry “Innovative hybrid analysis for underwater MEMS sensor imitating veterinary cilia optimum structure”, *Ain Shams Engineering Journal*,15(2024)102283.
- W A Mousa, H Tork and A Abdallah “ Low-cost noise maker for testing acoustically guided unmanned underwater vehicles”, *Journal of Physics: Conference Series*, Volume 2616.
- Wael A Moussa “A passive thermography approach to bearing condition monitoring: Juniper Online Journal Material Science May, 2017
- Wael A Moussa “A passive thermography approach to bearing condition monitoring” 2nd International Conference and Exhibition on Industrial Engineering November 16-18, 2015 Dubai, UAE.
- W. A. Moussa, “Thermography-Assisted Bearing Condition Monitoring,” University of Ottawa, Ottawa, 2014.
- Wael A. Moussa, Ming Liang “A thermography technique for bearing condition monitoring” CASI 2013 Conference (the conference of the Canadian Aeronautics and Space Institute).
- Hamdy A Kandel, Hassan Warda, Alaa Elmeligui and Wael Abohashem Azab, “Prediction and Control of Vortex asymmetry over slender bodies” International Conference for the Aerospace Engineering, Military Technical College, Cairo, Egypt, 2005.

In processing researches

- Wael A. Moussa, Yasser M. Saad and Ahmed Abdelbary “Finite-Element Homogenization of Short Glass-Fiber/Silicone Rubber Composites: Experimental Validation of RVE and Orientation-Averaged RVE Methods” *Journal of Reinforced Plastics*.

2.2 Supervision

- PhD, Thesis title: “Design of VET-MEMS Vector Hydrophone for Detection of Underwater Target”. Faculty of Engineering, Alexandria University, 2023.
- MSc, Thesis title “Modeling and optimization of EMP shielding room”. Faculty of Engineering, Alexandria University, ongoing.

2.3 Teaching Experience

- Teaching several engineering courses for the students of the Military Technical college (MTC) and Military Technical Institute (MTI)(2019-2023), including:
 - Physics for 1st year students in MTI.
 - Special Electrical equipment for mechanical 2nd year students in MTI.
 - Construction of Naval guidance systems, airborne systems, Naval Armament Department, 5th year, MTC.
 - Construction of Underwater Guidance Systems, (Acoustic and Magnetism based Systems, Naval Armament department, 5th year, MTC.
- Lecturer of EME452, *Microprocessor-Based Mechanical Systems* course at Alexandria Higher Institute for Engineering and Technology, AIET, winter 2016.
- Lecturer for ME220, *Measurement and Sensors*, course at PUA, Pharos University in Alexandria, Fall 2015 and Fall 2016.
- Teaching Assistance, TA, of the course MCG3130, "*Advanced Dynamics*" University of Ottawa, 2011/2012.

- Lecturer for the Missiles basics and Missiles Mechanical Systems in both the Naval Institute for Graduate Studies and the Naval College, Alexandria, Egypt (2004-2010).

3- Professional Development, Egyptian Naval Forces.

3.1 General

Accomplished senior engineering consultant and naval systems expert with over 25 years' experience leading multidisciplinary engineering programs, technology integration, and high-stakes defense and industrial projects. Proven track record in system design, fault detection, and performance optimization across naval, mechatronics, and advanced manufacturing domains. Adept at managing large teams, developing innovative engineering solutions, and delivering measurable results in complex environments.

3.2 Professional Competencies

- ISO-9001 Lead Auditor certified.
- Engineering Project Management & Leadership
- Systems Integration & Technology Transfer
- Naval & Underwater Systems (Torpedoes, Mines, Acoustic Targets)
- Mechatronics, Vibration & Thermography Analysis
- EMP Shielding & Electromagnetic Protection Systems
- Advanced Modeling & Simulation (COMSOL, Star CCM+, ANSYS)
- Risk Assessment, Standards Compliance (STANAG, MIL-23659)
- Stakeholder Communication & Technical Consulting

3.3 Employment experience.

- (Jan 2022 till in Jan 2025 with Naval Admiral rank) Head of planning branch, Torpedoes and Naval mines department.
- (Jan2020-2022) The head of the Torpedo Branch in EN.
- (Jan2019-Jan2020) The head of the naval department (electrical/mechanical marine engineering) in the Military Technical Institute, MTI.
- (Jan. 2015-Jan 2019) Accomplished successfully the leadership positions, two years as a Chief engineer and two years as a commander of a military unit that consists of several missile workshops.
- (Jan2004-Jan 2010) Promoted from a junior engineer to senior engineer.
- Jul1996-Jan2004) Worked as a system engineer (analysis, testing, alignment, calibration and supply) for advanced weapon systems in the Egyptian navy since graduated from the Military Technical College in 1996.

3.4 Examples of some research activities

- Complete assessment of fuzing systems according to STANAG 4487, AOP-52, MIL-23659 and AOP-4187(2024).
- Design and implementation of an underwater acoustic target for naval application. A published Journal Paper: "Low-cost noise maker for testing acoustically guided unmanned underwater vehicles".
- Participating in several militant researches that are in different fields such as: smart system, reverse engineering, acoustic sensing, IR sensing, fuzing systems, etc ..

4- Software Skills.

- COMSOL software, a program for multiphysics modeling. (piezoresistivity, solid mechanics, AC/DC, CFD and Heat transfer modules

- Hydrodynamic simulation and vessels design optimization using Star ccm and CAESSES.
- Catia, Solid Work, AutoCAD
- Matlab [signal processing, curve fitting, envelope analysis, image processing, time averaging, wavelet analysis, time-frequency domain analysis].
- Labview [data acquiring, data analysis].
- Ansys [Friction analysis, Dynamic Analysis].
- Microsoft Word, Access, Excell.

5- Subjects of Interest.

Quality Management		
Mechatronics	Heat transfer	Modeling& simulation
Fluid Dynamics	Thermography	Electromagnetism. EMP shielding
Measurement	Vibration& Vibration Analysis	Acoustic sensing and Noise makers
Advanced Dynamics	Digital Signal Processing	smart systems.