

### CURRICULUM VITAE

Name : Mohsen Mohammed Abdelaal

Academic Position : **Professor**

Date and place of birth : August 1959, Cairo-Egypt

Nationality  : Egyptian

Present Occupation : Professor Doctor,  Mechanical Engineering Department, Faculty of    Engineering, Al-Azhar University, Cairo - Egypt .

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## LANGUAGES

Mother Tongue : Arabic

Other Languages : English (very good)

: Germany ( fair )

**INTRODUCTION:**

The Curriculum Vitae of Professor Mohsen Abdelaal has been divided into practical and consultant experience as well as academic experience.

* **Academic experience**, summarized in research works, supervision on researchers for master and philosophy doctor degrees, supervision of practical projects, foundation and management of laboratories of the specialty (combustion, internal combustion and measurements & instrumentation).

**Practical Project:**

**Note : A list of the practical (national and international ) projects is available if asked to be submitted.**

**ACADEMIC QUALIFICATIONS** :

1- (  June 1983 ) B.Sc.  in Mechanical Engineering, with a grade of "Very Good" , from the Mechanical Engineering Department  ,  Faculty of Engineering ,  Al-Azhar University, Egypt.

2- ( January  1990) M.Sc. , from  the  Mechanical Engineering  department,  Faculty  of  Engineering, Al-Azhar University, Egypt. The thesis title is ; " Flow of a Reactive Gas Mixture Through Supersonic Nozzle

1. ( October  1995 ) Ph.D. , by a channel system between Al-Azhar University Mechanical Engineering  department (Egypt) and Institute for Thermal-Turbomachinery Karlsruhe University (Germany), The thesis title is; " A Study of Intensified Combustion in Furnaces."
2. (June 2002) Associate Professor
3. (June 2009) Professor till now .

**HISTORY OF EMPLOYMENT**:

1. 1985-1990, Demonstrator , Mech. Eng. Dept. , Al-Azhar University., Egypt.
2. 1990-1992, Ass. Lecturer, Mech. Eng. Dept. , Al-Azhar University., Egypt.
3. 1992-1995 ,Ph.D. student, Institute for Thermal-Turbomachinery Karlsruhe University (Germany).
4. 1995-2002,  Assistant Professor , Mech. Eng. Dept. , Faculty of Engineering, Al-Azhar University , Egypt.
5. 1997- 1998 Guest Professor Karlsruhe University, Karlsruhe, Germany.
6. 2002-2009,  Associate Professor , Mech. Eng. Dept. , Faculty of Engineering, Al-Azhar University, Cairo, Egypt.
7. 2009 – Now Professor , Mech. Eng. Dept. , Faculty of Engineering, Al-Azhar University, Cairo, Egypt.
8. 2014-1015 Head of Mechanical Engineering Department- Faculty of Engineering – Al-Azhar University

**ACADEMIC EXPERIENCE**

**TEACHING EXPERIENCE:**

1. Internal combustion engines.
2. Combustion   and  flame.
3. Measurements

**RESEARCH INTERESTS AND GRANTS:**

**Supervision of PhD Thesis under the Following Topics**:

1. A study about NOx emissions from diesel dual engines
2. Applied of dual fuel (natural gas + diesel fuel ) on vehicles
3. Problems resulting from using natural gas in spark ignition engines
4. A study of combustion with enriched oxygen air
5. Radiation furnace
6. Exhaust gas recirculation in CIE
7. Dual fuel burners
8. Two stage combustors RQL
9. flue gas recirculation in furnaces
10. Improvement of the cold starting of spark ignition engines
11. Simulation of Diesel Engine Combustion and Emissions.
12. Exhaust gas recirculation for diesel engines
13. Crude heavy oil transmission through pipeline.
14. Low NOx burner

**Supervision of MSc. and PhD. Thesis under the Following Topics**:

1. A study about fuel economics and emissions from internal combustions
2. A study of combustion properties of a prevaporized premixed diesel fuel
3. Experimental study of dual fuel engines
4. A study of metal powder atomization
5. Diesel engines cycle analysis
6. Mixing parameters affecting the performance of the dual fuel burner
7. Effect of exhaust gas recirculation on performance and emissions of dual fuel engines
8. Effect of gaseous fuel on performance and knocking of dual-diesel engine
9. Combustion parameters affecting the flame noise and flame fluctuations
10. A study of some parameters affecting performance dual diesel engines
11. Combustion properties of compression ignition engines
12. A study of combustion properties in radiation furnaces
13. The use of hydrogen as a fuel in internal combustion engines
14. Study of the improvement of the performance of parabolic solar collector
15. Parametric study of the emissions emitted from diesel engines
16. Parametric study of the two staged combustion
17. Optimization of the Diesel Engines Operates in off-road Equipment
18. Inverse Diffusion Flame Burner
19. Emissions formation in Diesel Engines
20. Hydraulic power optimization of off road equipment
21. Delaval nozzle calculations and design
22. Methane gasoline blend fuel for spark ignition engines.

**Supervision of Practical Projects of the Following Titles**:

1. Operating Instructions and Calibration of Ricardo E6/MS Engine.
2. Study of the Effect of Preheating of Diesel Fuel on CIE performance.
3. Design of a Dual Fuel Burner.
4. Parametric Study of Homogeneous Charge Compression Ignition Engines (HCCI).
5. Experimental study on diesel engine fueled with natural gas.
6. Design of radiation furnace with oxygen enriched air combustion to improve energy and reduce emissions.
7. Experimental study of mixing parameters affecting dual-fuel-burner performance.
8. Parametric study of the development of gas turbine combustor using lean premixed Prevaporized flame (LPP).
9. Stratified charge spark ignition engine.
10. Super charged air effect on diesel engines
11. Exhaust gas recirculation and CNG in diesel engines performance and emissions
12. A new technique to rise up the Nasser Lake clay
13. Bio gas from house biowastes
14. Design and manufacture of a small city car
15. Power hydraulic circuit modification for saving power
16. Design of formula student racing car
17. Design and manufacturing of supersonic rocket engine (1)
18. Hydrogen fueled vehicle
19. Modification of the design of the supersonic rocket engine (2)
20. Design of a mini gas turbine engine
21. Bio methane as a fuel for spark ignition engines

**LABORATORY EXPERIENCES:**

* Founding, and equipping, of the continuous combustion laboratory. Al-Azhar University, Faculty of Engineering, Mech. Eng. Dept.
* Founding, and equipping, of the internal combustion engine laboratory. Al-Azhar University, Faculty of Engineering, Mech. Eng. Dept.
* Founding, equipping, of the experiments of measurement laboratory. Al-Azhar University, Faculty of Engineering, Mech. Eng. Dept.

**CONFERENCES ATTENDED :**

- The Third International Conference on Aeronautics and Aviation Technology , April 1989 , Military Technical College, Cairo ,Egypt.

- The  First Engineering Conference of Al-Azhar University, AEC 1989, Cairo, Egypt.

- The Third National Conference of Chemistry and Energy 1989, Cairo, Egypt.

- 7th International Conference on Mechanical Power Engineering, Cairo University Dec. 1990.

- The  Second Engineering Conference of Al-Azhar University, AEC 91, 1991, Cairo, Egypt.

* The  Fourth Engineering Conference of Al-Azhar University, AEIC 95, 1995, Cairo, Egypt.
* Atomization and Sprays 4,-6 Mai 1998, Karlsruhe, Germany.
* 11th International Mechanical Power engineering Conference, Cairo, Feb.(5-7) 2000.
* Al-Azhar Engineering 6th International Conference, Cairo, September (1-4) 2000.
* ICS Training Course on Laser Diagnostics of Combustion Processes, Cairo, 18-22 Nov., 2000.
* Al-Azhar Engineering 7th International Conference, AEIC 2003, Cairo, 7-10 April 2003.
* Al-Azhar Engineering 9th International Conference, AEIC 2007, Cairo, 12-14 April 2007.
* 4th International Exergy Energy and Environment Symposium IEEES-4 American University of Sharjah, April 19-23, 2009
* Al-Azhar Engineering 13th International Conference, AEIC 2014, Cairo, 25 December 2014.

**LIST OF PUBLICATIONS :**

1. Study of the interaction between chemical and fluid dynamic variables in hydrogen fueled rocket engines. Proceedings of the Third Minia Conference on Energy and its Applications , Faculty of Engineering and Technology , Minia University , March 28-30 , 1989 .
2. Study of the expansion of hydrocarbon-oxygen products through supersonic nozzles. Proceedings of the Third Int. Conference on Aeronautics and Aviation Technology, Military Technical College , Cairo, Egypt ,April 4-6 , 1989 .
3. Consideration of geometrical aspects in modeling of the flow of reactive gas mixture through nozzles. Proceedings  of Al-Azhar Engineering First  Conference,  AEC 89, Cairo, Egypt, 9-12 December 1989.
4. study of a twin-stage conical bluff body flame stabilizer. Proceedings of the 7th International Conference on Mechanical Power Engineering held at Cairo University, 17-20 Dec. 1990.
5. Investigation of the lean blowout and mixing pattern behind a twin-stage conical bluff body, first International Conference on Combustion Technologies for a Clean Environment, Portugal, Aug. 1991.
6. An aerodynamic study of the cold flow pattern behind a twin stage conical bluff body, Engineering research bulletin, Vol. 5- November 1990.
7. Evaluation of rape-seed oil as a fuel for gas turbine engine., Proceedings  of Al-Azhar Engineering Fourth Conference,  AEIC 95, Cairo, Egypt, 16-19 December 1995.
8. An overview of the use of alternative fuels and air pollution crisis., “Environment 97”, International Conference & Trade Fair, Feb. 16 -18 1997, Cairo, Egypt.
9. The study of the performance and emissions of a dual fuel engine the gas diesel engine Al-Azhar engineering sixth international conference (aeic 2000).
10. Dual fuel burner generating low emissions, Journal of Engineering and Applied Science, (2001)

# Combined flame combustion (CFC) generating ultra low emissions 11th international mechanical power engineering conference (impec 2000) Cairo.

1. An investigation of flashback and autoignition phenomena in premixing prevaporizing combustion , Al-Azhar engineering sixth international conference (aeic 2000)
2. Combustion instabilities leading to flashback, The Second Mediterranean Combustion Symposium. (2002).
3. An investigation of dual fuel engine performance and emissions. The Second Mediterranean Combustion Symposium. (2002).
4. Flame temperatures redistribution for low thermal NOx formation, Journal of Engineering and Applied Science, (2002).
5. Evaluation of the Economical Impact of Air Pollution of Transportation Sector in Egypt. AEIC April 2003, Cairo, Egypt.
6. Economical Evaluation of the Use of Natural Gas for Transportation Sector in Egypt. AEIC April 2003, Cairo, Egypt.
7. Uniform Shading Effects on Photovoltaic Module and Time Battery Charging, Al-Azhar University Engineering Journal, AUEJ, Vol. 9/1, January 2006.
8. Effect of Flame Holder Geometry of Annulus Flame on Emissions and Performance of Lean Co-Axial Flames. Journal of Engineering and Applied Science, Vol. 53/1, February 2006.
9. Effect of Inner Flame Swirl Intensity on the Lean Co-Axial Premixed with Non-Premixed Flames. Al-Azhar University Engineering Journal, Vol.2, April 2006.
10. Effect of Inner Flame Equivalence Ratio on the Lean Co-Axial premixed with Non-premixed Flames, Al-Azhar Uni. Ninth International Conference, Faculty of Engineering, AEIC, April 12-14 2007.
11. Effect of Oxygen Enriched Air on The Performance and Emissions of Diesel Engine, Scientific Journal of Engineering Ain Shams Uni. Vol. 42/2, June 2007.
12. New Technique for Ultra Lean Stable Premixed Flame, Journal of Engineering and Applied Science, Vol. 54/3, June 2007.
13. Evaluation of Homogeneous Charge Compression Ignition Engine (HCCI) Techniques. Journal of Engineering and Applied Science, Vol. 55/2, August 2007.
14. Internal Combustion Engines Laboratory Course. Al-Azhar University, Faculty of Engineering.
15. Effect of Oxygen Enriched Air on the Performance and Emissions of Diesel Engine. Ain Shames Int. Journal, Vol. 42/2, June 2007
16. Dual Fuel Diesel Engine's Performance and Emissions With EGR & Water-Emulsion. IEEES 2009
17. Effect of Inner Flame Equivalence Ratio on the Lean Co-Axial premixed with Non-premixed Flames. Journal of Engineering and Applied Science, Vol. 62, May, 2009
18. The Effect of Gaseous Fuel on the Knock Characteristics of Dual Fuel Diesel Engine. Journal of Engineering and Applied Science, Vol. 61/2, Marsh, 2009.
19. NOx Emissions Control in SI Engines by Adding Argon gas to the Intake Mixture. Journal of Energy Conversion and Management. Vol. 50, 11 November 2009.
20. Effect of Oxygen Enriched Air and EGR on Diesel Engine Pressure and Ignition Delay. Ain Shames Int. Journal, Vol. 50/2, June 2009
21. Experimental Investigation of Porous Radiant Burner Performance, Journal of Engineering and Applied Science, Vol. 56, No3, June 2009, pp.283-294.
22. Effect of oxygen enriched air on porous radiant burner performance and NOx emissions. Experimental Thermal and fluid science, Vol. 45, Feb. 2013, pp. 163-168.
23. Combustion and emission characteristics of a natural gas-fueled diesel engine with EGR. Energy Conversion and Management, Vol. 64, December 2012, pp. 301-312.
24. Effect of adding oxygen to the intake air on a dual fuel engine performance, emissions and knock tendency, Energy Journal, November 2013, Vol.61: 612-620.
25. Numerical investigation of jet in cross flow mixing of rich quench lean combustors. JAUES, Vol. 8, No. 27, April 2013, 733-744.
26. Parametric study of multiple jets mixing with heated cross flow. JAUES, Vol. 8, No. 27, April 2013, 721-731.
27. Gaseous fuel for lower emissions during the cold start and warming up of spark ignition engines. International Journal of Global Warming · July 2016.

# Gaseous Fuel for Improving Cold Starting and Reducing Emissions of Gasoline Engines. 13th International Conference on Clean Energy, ICCE 2014, At Istanbul – Turkey.

1. Cross Gas Pulse with Fuel Spray in Diesel Engine During Injection. JMEST, Vol. 2, 12 December – 2015.
2. Characteristics of Oxy-Fuel Combustion Using Flue Gas Recirculation. JAUES (acceptance 30 -08 – 2016) to be press
3. Effect of Flue Gas Recirculation on Burner Performance and Emissions. JAUES (acceptance 30 -08 – 2016) to be press
4. Investigation of a new design of inverse diffusion flame burner. JAUES (05 -09 – 2016)

An Investigation of the Effect of Gaseous Fuel Inlet on the Design and Modelling of a Gas -Turbine Combustor for Heating Purposes. International Journal on Emerging Technologies 11(5): 261-268(2020). ISSN No. (Print): 0975-8364. ISSN No. (Online): 2249-3255

1. Design and Modelling of Biodiesel Fueled Combustion Chamber. JAUES (07 – 2020)
2. Characteristics and flame appearance of oxy-fuel combustion using flue gas recirculation. Fuel 297 (2021) 120775
3. “Improving the performance and emissions of DI Diesel engine by increasing inlet air temperature” JAUES (01 -2022)