Mostafa H. S. Abobaker (BSc, MSc, PhD)

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PERSONAL PROFILE:

Mechanical design and analysis with strong research background and extensive hands-on experience in the numerical modeling and simulation for mechanical systems, and flight simulations. I have a deep understanding of fluid mechanics , aerodynamics and computational fluid dymamics. Good experience also, in ANSYS-Fluent, and Catia. Very good experience in using simulation tools such as MATLAB, Simulink. Good skills in programming.

I have been engaged in research, teaching, training, and learning for more than 15 years, where I have used many research and teaching experience to engineers and students.

KEY SKILLS:

Teaching, training and learning: very good skills in teaching and training, training material preparation, development and assessment of learning, use of different teaching and learning strategies to enhance student learning and critical thinking to move them to higher levels.

Research oriented skills: Planning, designing and conducting experimental work with good understanding of physics, project management, Preparing mathematical model, Building 3D soild modles CATIA, conduction simulations and anlysis, result interpertations ANSYS. Modelling and design MATLAB/Simulink. Wind tunnel testing, measurment and data reduction.

Subsonic/supersonic airframe conceptual, prilemenry analysis and design. Preparation of data for flight simulation codes. Measurment of mass center , and moments of inertia. Extracting flight vehicel engine charactristics Flight simulations Flight testing of Unmanned areial Vehicals. Designing and building experimental test beds and running tests, measurements and data acquisitions.

Higher education studies: Higher education programs planning. Lecturing of Advanced Numerical Methods via MATLAB. Computational Fluid Dynamics (CFD) course using ANSYS-FLUENT. Google Class rooms for online-teaching and assessment. Currently involved in an Air Quality assessment project using CFD,

EXPERIENCE:

2017- Present: Associate Professor at Aeronautical Engineering Department, Engineering Faculty, University of Zawia-Libya.

- Establishing the Renewable energy research group within Aeronautical / Mechanical departments.
- Setting up of an educational wind tunnel Laboratory within aeronautical department.
- Teaching under graduate courses: Vector mechanics, fluid dynamics, flight mechanics, aerodynamics, introduction to aeronautics, computer programming, computer drawing.
- Teaching post graduate courses: Advanced numerical methods, Computational fluid dynamics.
- Supervising student projects in wind turbine blade design, gas dispersion form power palnts using CFD.
- Computational thinking for modeling and simulation, MITx online Course, 2019.
- Ahands on introduction to engineering simulations, Cornell University online course, 2017.
- Good impact and experience gained from teaching students, using **Google class rooms.**
- Good impact and experience gained from teaching using ***Matlab life scripts.***
- Writing technical reports and publishing academic papers.

2013-2017: PhD student at the Mechanical Engineering Faculty, Belgrade Serbia.

Responsibility: Resaerch and simulation in 'Low Reynolds Number Aerodynamics".

- Develop/validate a computer code for airfoils design at low Reynold's numbers, suitable for UAV / wind turbine applications.
- Validation of ANSYS-FLUENT commercial code for experimental M5 wing.
- Using CATIA and ANSYS-FLUENT to simulate gas dispersion form electric power plant.
- Gained good knowledge and skills in fluid flow modelling and simulations using CFD.

2010 – 2013 : staff member at department of aeronautical engineering, Engineering Faculty, University of Zawia, Libya

Responsibility: teaching undergraduate engineering courses such as Vector mechanins, Computer programming, numerical methods, Fluid mechanics, Aerodynaimcs, Flight mechanins, Macine design , Elements of machines.

- Teaching engineering cources: Vector mechanins, Computer programming, numerical methods, Fluid mechanics, Aerodynaimcs, Flight mechanins, Macine design , Elements of machines. Use simulation tools MATLAB and Simulink, CATIA, FLUENT-GAMBIT.
- Installation/training of industrial and mechanical engineering laboratories from Labvolt company.

2005-2010: Head of Aerodynamics and Flight Mechanics Department in Libyan Research and Development Center in Tripoli-Libya.

Responsibility: Conceptual and Preliminary design of flight vehicles, preparing aerodynamic data, mass and balance data, flight simulations. Supervising wind tunnel testing, wind tunnel data reduction, flight testing planning and assessment.

- Flight vehicle design studies, starting from mission requirements.
- Provide data for forces and moments acting on flight vehicles at critical flight points.
- Performe 3DOf and 6DOF flight simulations.
- Calculate aerodynamic coefficients, and derivatives and hinge moments.
- Supervise wind tunnel testing of flight and flight tests.

1992-2005: Research engineer at Aerodynamics and Flight Mechanics Department in Libyan Research and Development Center in Tripoli-Libya.

Responsibility: Gain experience in Mechanical parts drawing, running computer codes, and reporting.

- Use of soild modling, aerodynamic, fluid mechanics, and flight simulation codes.
- Gain experience in programming.

EDUCATION:

- 2013- 2017, **PhD** in aeronautical department, Mechanical engineering, Belgrade university, Serbia.
- 1995 –1997, **M.Sc** in aeronautical department ,Mechanical engineering, Belgrade, Serbia.
- 1988-1992, **B.sc** in aeronautical engineering, Tajura Academy, Tripoli-Libya.

KEY TRAINING AND AWARDS:

- 2019, MATLAB onramp training course, online training course, MathWorks website, Feb. 2019.
- 2019, Computational Thinking for Modeling and Simulation, MITx online course, May 2019.
- 2017, A hands on Introduction to Engineering Simulations, Conrnell university online course, June 2017.
- 2015 ANSYS-FLUENT mesh generation and simulations, Mechanical Engineering Faculty, Belgrade, 2015.
- 2014, Mechanical Drawing using CATIA, Mechanical Engineering Faculty, Belgrade, 2014.
- 2014, Project management, Mechanical Engineering Faculty, Belgrade, 2014.
- 2002-2008, 6 Training courses in flight vehicle autopilot design simulation and design, VTI,

Belgrade.

- 2006, Introduction to computational fluid dynamics, finite volume method, Zawia, Libya.
- 1992-2000, Training courses in Pro Engineer, MATLAB, FORTRAN, ORIGIN GAMBIT.

PUBLICATIONS:

Future papers:

1. *Mostafa Abobaker, Abdalhafid A., Sogair A, Numerical Study of Wind-Tunnel Wall Effects on lift and drag characteristics of NACA 0012 airfoil, (ARFMTS) Journal of Advanced Research in Fluid Mechanics and Thermal Sciences.*

Published paper:

1. *Mostafa Abobaker , Sogair Addeep , Lukmon O Afolabi, Abdulhafid M. Elfaghi 'Effect of Mesh Type on Numerical Computation of Aerodynamic Coefficients of NACA 0012 Airfoil', International Conference on Mechanical & Manufacturing Engineering 2021 (ICME2021). August 25, 2021 – August 26, 2021*

1. *Mostafa Abobaker, Abdalhafid A., Sogair A, Numerical Study of Wind-Tunnel Wall Effects on lift and drag characteristics of NACA 0012 airfoil, (ARFMTS) Journal of Advanced Research in Fluid Mechanics and Thermal Sciences.*
2. *Mostafa Abobaker, Aerodynamic optimization for wind turbine blade section, 2nd conference for engineering science and technology, 29-31 October 2019.*
3. Mostafa Abobaker, Airfoil Optimization by Systematic Shape Modification at Low Reynolds Numbers, cist19 conference ,Tripoli, 2019.
4. M Abobaker, Z Petrovic, V Fotev, N Toumi, I Ivanovic , Aerodynamic characteristics of low Reynolds number airfoils, Technical Gazette 2017 24 (1), 111-118.
5. Mostafa Abobaker, Faisal Mohamed, Mirolub Adzic, Naser Shteba , Investigatory CFD study of exhaust gas dispersion from power plant in west Zawia city in Libya, VI international Symposium on environmental and material flow management. EMFM 2016
6. M. Essuri, Noureddine Toumi, Tarek Elfeed, Ivan Kostic, Ansys-Fluent Validation for Transonic Flow over ONERA-M6 Wing at Different Angles of Attack and Mach Numbers, Oct. 2014, Kraljevo, Srbija.
7. R. A. Al-Madani, M. Jarnaz, K. Alkharmaji, M. Essuri, Finite Element Modeling of Composites System in Aerospace Application, Trans Tech Publications, Applied Mechanics and Materials, Vol. 245, pp. 316-322, Dec. 2012, ISSN: 16627482, 16609336, (IF = 0.15).
8. Ibrahim M. Rashed, Mostafa H. S. Abobaker, Influence of Rated Wind Speed on the Energy Yield at a Site, 4th International Renewable Energy Conference, Dec-2012, Tunis.
9. Ćuk Danilo, Abobaker H.S. Mustafa, Mandic D. Slobodan, A New Guidance Law for a Tactical Surface-to-Surface Missile, Vojnotehnički glasnik/Militarz Technical Courier, 2012., Vol. LX, No. 1, pp 116-135.
10. M. Essuri, K. Alkurmaji, A. Ghmmam, Developing a Dynamic Model for Unmanned Aerial Vehicle Motion on Ground during Takeoff Phase, Trans Tech Publications, Applied Mechanics and Materials, Vol. 232, pp. 561-567, Nov. 2012. ISSN: 16627482, 16609336, (IF = 0.15).
11. J. Hawisa, E. Eddeeb, M. Essuri, Comparison of Numerical and Experimental Results of Low Reynolds Number Flow over 2D FX 63-137 Airfoil, ICASAT - Alfateh University Tripoli, (2007).