CURRICULUM VITAE

Hussam-eldin Fathi Elsheikh

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ResearchGate Website: https://www.researchgate.net/profile/Hussam_El-Din_El-Sheikh

Libyan Academy
School of Engineering
Tripoli, Libya

CORE COMPETENCIES

Field of Specialization

MECHANICAL DESIGN (Biomechanics, Stress Analysis, Finite Element Analysis).

Experience Background

A strong background in mechanical design, with broad skills and knowledge in biomechanical component design, and finite element analysis and simulation. Over seven (7) years of industrial and research experience in Technical Research and Developing Center, and twenty (23) years of academic teaching with fife (5) years of academic leadership experience as Chairman Department of Biomedical Engineering, Director of Human Resource Development Institute, and Director of Libyan Academic Center for Consultancy and Engineering Researches. By virtue of education and experience, equally adept in management, teaching, engineering design, and applied research in the following fields:

- Mechanical/Biomechanical components design using ANSYS, Workbench, SolidWorks, AutoCAD.
- Manufacturing and fabricating biomechanical components such as upper and lower limb prostheses.
- Operating Nd-YAG laser for the purpose of carrying out laser surface heating, melting & alloying of various steel substrates.
- Metallographic for the purpose of revealing the microstructures, measuring the dimensions & the hardness of the laser treated zone.

Research Interest

Development of computational design methods for prosthetic devices. (Hip, Knee and Dental).

Modeling of bone biomechanical behavior Bone remodeling.

Cardiovascular mechanics; arterial mechanics (atherosclerotic plaques, aneurysms); balloon angioplasty and stent implantation.

Laser material processing technology.

EDUCATION

Ph.D. in Mechanical Engineering (Biomechanics) Nov 2002
Dublin City University (DCU), Dublin-Ireland
Dissertation: “Finite Element Simulation of the Hip Joint Replacement under Static and Dynamic Loading”.
Advisor: Prof. Mohamed Salim Hashmi

PGD in Manufacturing Engineering Nov 1995

University of Garyounis, Benghazi-Libya
GPA: 3.63/4

B.Sc. in Mechanical and Manufacturing Engineering Nov 1990
Bright Star University of Technology, Brigah-Libya
GPA: 90.439%

HONORS, EWARDS & SCHOLARSHIPS

AMPT'01 International Award, prize for the best paper by a research student at the International Conference on the Advances Materials and Processing Technologies (AMPT'01) held at University Carlos III of Madrid. 2001

Scholarship from the Technical Research and Developing Center to study Ph.D. in Ireland. 1998

PGD awarded with Excellent. 1995

Libyan Ministry of Education Award for Academic Excellence. 1991

B.Sc. awarded With Distinction, With Honors 1991

EMPLOYMENT HISTORY

Professor Jan 2018 - Present
Biomechanical Engineering Division, Department of Biomedical Engineering, Libyan Academy for Postgraduate Studies.

Associate Professor Jan 2013 – Dec 2017
Biomechanical Engineering Division, Department of Biomedical Engineering, Libyan Academy for Postgraduate Studies.

Assistant Professor Jun 2005 – Dec 2012
Biomechanical Engineering Division, Department of Biomedical Engineering, Libyan Academy for Postgraduate Studies.

Director of Engineering Assembly, 2002-2005
Technical Research and Developing Center, Tripoli – Libya.

Lecturer (part-time), 2003-2005
Mechanical Engineering Department, University of El-Zawia, Libya.

Teaching Assistant Jan 1994 – May1997
Mechanical Engineering Department, Faculty of Engineering,
University of Garyounis, Benghazi-Libya

Researcher Engineer, Jun 1991 – Dec 1993
Technical Research and Developing Center, Tripoli – Libya.

ACADEMIC POSITIONS

Chairman Department of Biomedical Engineering, Libyan Academy. 2022-Prsnt

Advisor of Biomechanical Engineering Division, Libyan Academy. 2006-Prsnt

Director of Human Resource Development Institute at Libyan Academy. 2014-2016

Director of Libyan Academic Center for Consultancy and Engineering Researches, Libyan Academy. 2013-2014

Advisor of Biomechanical Engineering Department (part-time), College of Engineering, Sebrata-Libya. 2010-2013

Chairman Department of Biomedical Engineering, Libyan Academy. 2008-2011

MEBERSHIP

Member of committee for Scientific Sobriety for Scientific Research and Publication at Libyan ministry of education. 2019-present

Member of Scientific Committee of Biomedical Engineering Department, Libyan Academy. 2007-present

Active member in the European Society of Biomechanics, ESB. 2013-2014

TEACHING EXPERIENCE

Teacher Assistant (Full-time) 1994-1997
University of Garyounis, Mechanical Eng. Dep, Benghazi-Libya
Courses Taught at Undergraduate Level:
Engineering Mechanics (Tutorials),
Engineering Drawing (Lab.),
Engineering Material (Lab).

Teacher Assistant (Part-time) 1995-1997
Institute of Mechanical and Electrical Professions, Benghazi-Libya
Courses Taught at Undergraduate Level:
Diesel Engines,
Pumps and Blowers.

Lecturer (part-time) 2003-2005
University of El-Zawia, Mechanical Engineering Department, Libya.
Courses Taught at Undergraduate Level:
Applied Thermodynamics

Lecturer (part-time) 2004-2005
Higher Institute of Comprehensive Professions, Mechanical Eng. Dep, Suq-alkhamis Amsyhl – Libya.
Courses Taught at Undergraduate Level:
Engineering Mathematics,
Heat Transfer.

Assistant Professor (Full-time) 2005-2012
Libyan Academy for Postgraduate Studies, Biomechanical Division, Tripoli.
Courses Taught at Graduate Level:
Applied Finite Element Analysis (ANSYS),
Computer Aided Drafting (AutoCAD),
Biomechanics of movement,
Orthopedics in Bioengineering,
Prosthetics and Orthotics Science,
Dental Implant Design.

Assistant Professor (part-time) 2005-2007
Advanced Centre of Technology, Manufacturing Eng. Dep, Tripoli-Libya.

Courses Taught at Graduate Level:
Computer Aided Drafting (SolidWorks),
Theory of Metal Cutting.

Assistant Professor (part-time) 2005
University of the seventh of April, Faculty of Engineering, Zawia-Libya.
Courses Taught at Undergraduate Level:
Thermodynamics

Assistant Professor (part-time) 2004-2006
University of Marqab, Faculty of Engineering, Alkhms – Libya.
Courses Taught at Undergraduate Level:
Computer Aided Drafting (AutoCAD),
Dynamics,

Assistant Professor (part-time) 2006-2011
Higher Institute of Medical Sciences and Technology, Prosthetics & Orthotics Department, Mslata-Libya.
Courses Taught at Undergraduate Level:
Workshop Technology,
Biomechanics (Basics),
Engineering Drawing,
Prosthetics and Orthotics Technology.

Assistant Professor (part-time) 2008-2012
University of Tripoli, Mechanical Engineering Department, Libya.
Courses Taught at Undergraduate Level:
Workshop Technology,
Applied Finite Element (ANSYS).

Assistant Professor (part-time) 2010-2013
College of Engineering, Biomechanical Engineering Dept, Sebrata-Libya.
Courses Taught at Undergraduate Level:
Prosthetics and Orthotics Science,
Applied Finite Element (ANSYS),
Engineering Mechanics,
Fluid Mechanics.

Associate Professor (Full-time), 2013-2017
Libyan Academy for Postgraduate Studies, Biomechanical Division, Tripoli.
Courses Taught at Graduate Level:
Applied Finite Element Analysis (ANSYS),
Computer Aide Draughting (SolidWorks),
Biomechanics of movement,
Orthopedics in Bioengineering,
Prosthetics and Orthotics Science,
Dental Implant Design.

Professor (Full-time), 2018-
Libyan Academy for Postgraduate Studies, Biomechanical Division, Tripoli. Present
Courses Taught at Graduate Level:
Applied Finite Element Analysis (Workbench),

Computer Aide Draughting (SolidWorks),
Biomechanics of movement.
Orthopedics in Bioengineering,
Prosthetics and Orthotics Science,
Dental Implant Design.

PROFESSIONAL TRAINING EXPERIENCE

Instructor for computer aided design using ANSYS. Training course held in Technical Research and Developing Center, Tripoli - Libya.	Aug 2003
Instructor for lower limbs prosthetics fabrication. Training course held in Janzour Rehabilitation Center for postgraduate students from Libyan Academy.	2011-2013 (3 courses)
Part-time instructor for lower limbs prosthetics fabrication. Training course held under supervision of International Medical Corps (IMC) at Janzour Rehabilitation Center, Tripoli – Libya.	2013-2014
Part-time instructor for computer aided design using ANSYS. Training course held in Mellitah Oil and Gas B.V.	Feb 2017
Part-time instructor for computer aided drafting using Solidworks. Training course held in Mellitah Oil and Gas B.V.	Jun 2017

RESEARCH EXPERIENCE

Graduate Research Assistant

1) Using a high-power CO_2 CW laser of wavelength 10.6μm in surface treatment such as surface melting, alloying, cladding, and ceramic particle injection. The objectives are to modify the surface composition and structure and make it more resistance to wear, erosion, corrosion and oxidation, 1996-1997, University of Garyounis, Department of Mechanical Engineering.
2) Optimization of implant design for the bone fastenerod using bench testing and finite element analysis, Dublin City University, 2002
3) Computational design and analysis of a new implant for fracture fixation in veterinary orthopaedic surgery, Dublin City University, 2002.

Industrial Research (1992 – 2005)

Member of Applied Mechanics and Manufacturing Research team in the Technical Research and Developing Center, Tripoli-Libya. The team focuses on several basic and applied research topics such as stresses analysis of composite pressure vessels, testing the effects of pressures upon the combustor wall of gas turbine, and many other technical consultancies like designing and analyzing several systems using finite element method in support with analytical approach.

POSTGRADUATE RESEARCH SUPERVISION (MSc. Thesis)

1) Basem Mohamed Hashem Magoura, "**Optimizing Cutting Parameters Based on Taguchi Method for Improving Surface Roughness in Turning Operation**", a project thesis for the degree of Master of Science, Libyan Academy of Graduate Studies, under completion, a project thesis for the degree of Master of Science, Mechanical Engineering Department, Libyan Academy of Graduate Studies, 2019.

2) Siham Ibrahim Elgiribi, "**Simulation of Stent Deployment in a Realistic Human Coronary Artery**", a project thesis for the degree of Master of Science, Biomechanics Division, Libyan Academy of Graduate Studies, 2019.
3) Huda Othman Aldebri, "**A Two-Dimensional Velocity Analysis of Bileaflet Artificial Heart Valve**", a project thesis for the degree of Master of Science, Biomechanics Division, Libyan Academy of Graduate Studies, 2019.
4) Samah Ibrahim Algerbi, "**Preclinical Biomechanical Investigation of Intermedullary Nail for Tebial Diaphyseal Fractures**", under completion, a project thesis for the degree of Master of Science, Biomechanics Division, Libyan Academy of Graduate Studies, 2018.
5) Hossam-eddin Ahmed Alraouby, "**Design of Prosthetic Hand**", a project thesis for the degree of Master of Science, Biomechanics Division, Libyan Academy of Graduate Studies, 2018.
6) Masaud Omar Ibrahim Abulkasem, "**The Use of Angulated Implants in the Maxillary Tuberosity Region**", a project thesis for the degree of Master of Science, Biomechanics Division, Libyan Academy of Graduate Studies, 2017.
7) Fatma Mohmed Sifaw Gazah, "**The Effects of Dental Implant Neck Geometry on Biomechanical Responses: A Three-Dimensional Finite Element Analysis**", a project thesis for the degree of Master of Science, Biomechanics Division, Libyan Academy of Graduate Studies, spring 2016.
8) Soliman Ahmed Elshebi, "**Shell Heat Loss Estimations of Souk Elkhamis Cement Rotary Kiln**", a project thesis for the degree of Master of Science, Libyan Academy of Graduate Studies, spring 2016.
9) Amal Abdelatif Hassan Esouri, "**Biomechanical Analysis of Implant Designs on Mandibular Molar Edentulous Restoration**", a project thesis for the degree of Master of Science, Academy of Graduate Studies, 2010.
10) Tarek S. El-Gnemi, "**A Study on the Machining Parameters Optimization of Electrical Discharge Machining**", a project thesis for the degree of Master of Science, Technical Studies and Research Canter, 2010.
11) Mohammed Abdullah Abdul Rahim, "**Study the Effects of Geometrical and Material Parameters of Femoral Hip Prosthesis**", a project thesis for the degree of Master of Science, Biomechanics Division, Libyan Academy of Graduate Studies, 2009.
12) Zinab Abo-Alkasem Farag Al breki, "**Evaluation and Redesign of Dental Prosthesis**", a project thesis for the degree of Master of Science, Mechanical Engineering Department, Libyan Academy of Graduate Studies, 2009.
13) Alsalhen Ali M. Abdelkaber, "**Study of Composite Rods Durability for Concrete Structures**", a project thesis for the degree of Master of Science, Technical Studies and Research Canter, 2009.
14) Tarak Ali A. Amine, "**Laser Surface Melting and Alloying of Tool Steel**", a project thesis for the degree of Master of technology, Technical Studies and Research Canter, 2006.

UNDERGRADUATE RESEARCH SUPERVISION

1) "**Design Gas Turbine Shaft of High Critical Speed**", a project thesis for the degree of High Diploma of Technology, Mechanical and Electrical Institute of Benghazi, 1998.
2) "**Four Stroke Gas Engine Maintenance**", a project thesis for the degree of High Diploma of Technology, Mechanical and Electrical Institute of Benghazi, 1997.

EXTERNAL EXAMINER (MSc. Thesis Examination)

I was appointed and served as External Examiner for the following M.Sc. Thesis examinations:

1) "Mechanical Properties of Commercial Amalgam - Amalgam Types in Libya", Libyan Academy of Graduate Studies. — Fall 2020
2) "A Simulation Based Approach for Evaluating Two-Echelon Inventory Systems of Repairable Items", University of Benghazi (Garyounis), Faculty of Engineering. — Spring 2016
3) "A Proposed Clustering Methodology Based on Mathematical Formulation for Operations Sequence and Time Dependent Cell Formation", University of Benghazi (Garyounis), Faculty of Engineering. — Spring 2016
4) "Comparison Study of the performance of internal combustion engine that uses Conventional spark plug against another uses developed Corona Wire", Libyan Academy of Graduate Studies. — Fall 2010
5) "Experimental Investigation of Forming Tube Side Edge by Hole Expansion", Libyan Academy of Graduate Studies. — Fall 2010
6) "A Flexible Robot Gripper for Industrial Assembly Operations", Libyan Academy of Graduate Studies. — Fall 2009
7) "Laser Surface Alloying for Titanium", University of Benghazi (Garyounis), Faculty of Engineering. — Fall 2008
8) "Artificial Heart Development", University of Benghazi (Garyounis), Faculty of Engineering. — Fall 2007

EXTERNAL EXAMINER (BSc. Thesis Examination)

I was appointed and served as External Examiner for the following BSc. Final year graduation project:

1) "Industrial Robots and Designing an Industrial Robot Arm", Zawia University, Sabratah Engineering Faculty. — Fall 2011

PROFESSIONAL TRAINING

Design and Fabrication of Foot Orthoses, FOPTO, Czech Republic.	Oct. 2010
Design and Fabrication of Limbs Prostheses, FOPTO, Czech Republic.	Nov. 2010
Fabrication Technology of Spine and Limbs Orthoses, FOPTO, Czech Republic.	Dec. 2010
Manufacturing a Transtibial Prosthesis with Soft Socket, Otto Bock, Germany.	June 2012
Manufacturing a Transtibial Prosthesis with Silicon Linear and Shuttle Lock, Otto Bock, Germany.	July 2012
Finishing a Transtibial Prosthesis with Flexible Inner Socket and Lamination Frame, Otto Bock, Germany.	July 2012
Prosthetic Treatment after Partial Foot Amputation, International Medical Corps IMC, Tripoli-Libya.	Sep. 2013

CONTINUING EDUCATION AND DEVELOPMENT

Attended *Skills of Negotiation, Preparation, and Contract Management*, National Institute of Administration, Tripoli-Libya.	July 2005
Attended *Creative Facilitation Skills*, International Medical Corps – Libya.	July 2013

Attended *Entrepreneurship, innovation and generate ideas*, Libyan Enterprise.	Sep 2013
Attended *Human Relations and Interrelationships*, Dale Carnegie Center, Libya.	Jun. 2015
Attended *DevInfo, Data admin and user beginner lab*., The National Council for Economic and Social Development, Tripoli-Libya.	Nov. 2015
Attended *Mendeley for research and reference management*, Tripoli-Libya.	Apr. 2016
Attended *Training of Trainers (TOT),* Tripoli Libya.	Oct. 2016

PUBLICATIONS

Journal publications.

1) H. F. El-Sheikh, B. J. MacDonald and M. S. J. Hashmi, "Material Selection in the Design of The Femoral Component of Cemented Total Hip Replacement", *Journal of Materials Proceeding Technology*, 122, pp.309-317, 2001.
2) H. F. El-Sheikh, B. J. MacDonald and M. S. J. Hashmi, "Finite Element Simulation of the Hip Joint During Stumbling: A Comparison Between Static and Dynamic Loading", *Journal of Materials Processing Technology*, Volumes 143-144, pp 249-255, 20 Dec. 2003.
3) Tarak A. Amine, Abdullatif Kamashushi and Hussam F. El-Sheikh, "Laser Surface Melting and Alloying of Tool Steel", *Alacademia Journal for Basic and Applied Science,* 1(3), pp. 5-14, July 2007.
4) H. F. El-Sheikh, "Finite Element Analysis of Progressive Marginal Bone Loss around Oral Implants", *Alacademia Journal for Basic and Applied Sciences*, **4(9)**, 2010.
5) H. F. El-Sheikh, "Nonlinear Finite Element Studies of RC Beams Strengthened with GFRP Layers", *International Journal of Engineering & Science Research*, **2(8)**, Aug 2012.
6) H. F. El-Sheikh, "Failure Simulation for Reinforced Concrete Beams Strengthened with GFRP Layers", *Alacademia Journal for Basic and Applied Science,* **5(10)**, March 2012.
7) Z. A. Al breki, H. F. El-Sheikh, "Dental Implant Geometry: Effects of Dental Implant Neck Geometry on Biomechanical Responses in Bone around Implants: A 3-D Linear Finite Element Analysis", *Alacademia Journal for Basic and Applied Sciences*, 5(11), 2012.
8) Tarak Amine, Joseph W. Newkirk, Hussam El-Din F. El-Sheikh, Frank Liou, "Microstructural and Hardness Investigation of Tool Steel D2 Processed by Laser Surface Melting and Alloying", *Int J Adv Manuf Technol*, 73:1427–1435, 2014.
9) A. A. Abdelkaber, H. F. El-Sheikh, "Application of Glass Fiber Reinforced Polymer Rods as an Alternative to Iron in Concretes", *Journal of Academy for Basic and Applied Sciences,* 14(2), 2015.
10) Tarek S. El-Gnemi, Hussam El-Sheikh, "Analysis of The Influence of Edm Parameters on Material Removal Rate and Electrode Wear Ratio of Al-Cu", *Libyan Journal for Engineering Research,* 1(1) March 2017.
11) Suliman A. Shaibi, and Hussam F. El-Sheikh "Thermal Efficiency Evaluation of Souk Elkhamis Cement Rotary Kiln", *Libyan Journal for Engineering Research,* 1(2), 2017.
12) Masoud Omar I. Algoul, Hussam El-Din F. El-Sheikh, "Finite Element Simulation for Angulated Dental Implant Used in the Maxillary Tubersity Region", *Journal Massarat Elmeya,* 3(1), June 2017.

Journal papers in Review

1) Mohamed B. Alajili, Ali I. Bennur, Hussam F. El-Sheikh, "Effects of Dental Implant Length and Bone Quality on Biomechanical Responses in Bone Around Implants: A 3-D Non-Linear Finite Element Analysis", *Journal of Academy for Basic and Applied Sciences.*
2) Tarek S. El-Gnemi, Hussam El-Sheikh, "A Study on The Machining Parameters Optimization of Electrical Discharge Machining to Improve Material Removal Rate and Surface Roughness for Al-Cu", *Journal of Academy for Basic and Applied Sciences.*
3) H. F. El-Sheikh, "Effect of Expanded Dental Implant Design on Load Distribution", *Journal of Academy for Basic and Applied Sciences*.

Conference papers

1) H. F. El-Sheikh, B. J. MacDonald and M. S. J. Hashmi, "Finite Element Simulation of the Hip joint During Stumbling: A Comparison between Static and Dynamic Loading", *International Conference on Advances in Materials and Processing Technologies*, 18-21 September 2001, Madrid, Spain.
2) H. F. El-Sheikh, B. J. MacDonald and M. S. J. Hashmi, "Analysis of a Femoral Hip Prosthesis Designed to Reduce Stress Shielding", ESDA2002, *6th Biennial Conference on Engineering Systems Design and Analysis*, Istanbul, Turkey, July 8-11, 2002.
3) H. F. El-Shiekh, "Design Development of An Endosseous Dental Implant", *19th Congress of the European Society of Biomechanics*, 2013.

Poster Presentation

1) H. H. F. El-Sheikh, B. J. MacDonald and M. S. J. Hashmi, "Effect of Design Features of AHJ: Role of Collar on The Femoral Stem of Cemented Total Hip Replacements", *National Committee for engineering science conference: Engineering Design in an Academic Environment*, 12 –13 October 2000, Academy House, 19 Dawson St., Dublin 2, Ireland.

EDITORIAL SERVICE

- Editor of *Alacademia Journal for Basic and Applied Sciences*. 2013-2017
- Member of Editorial Board, *Libyan Journal for Engineering Research*. 2016-2018

REFEREE FOR PUBLICATION IN A JOURNAL

I reviewed the following one paper for its suitability for publication:

- "Influence of MIG and TIG Welding on Microstructure and Properties of Duplex Stainless-Steel Joint", *Journal of Academy for Basic and Applied Sciences*, 2016.

SKILLS

Computer Skills

- Experienced and skillful user of ANSYS, Workbench, SolidWorks, AutoCAD.
- Well experienced with Microsoft Windows and Office products.
- Excellent internet user.
- Fair level of knowledge in SPSS.

Technical Skills

- Familiar and experienced in using Nd-YAG laser for the purpose of carrying out laser surface heating, melting, and alloying of various steel substrates.

- Good experience in metallographic for the purpose of revealing the microstructures, and measuring the dimensions and the hardness of the laser treated zone.

Languages

- Arabic: Excellent speaking, reading and writing (mother tongue).
- English: Well spoken, read and written.

REFERENCES

Prof. M. S. J. Hashmi
Former Chairman Department of Mechanical and Manufacturing Engineering,
School of Mechanical and Manufacturing Engineering,
Dublin City University, DCU.
Phone: +353 1 704 5545
Email: *hashmiS@dcu.ie*

Prof. Bryan MacDonald
School of Mechanical and Manufacturing Engineering
Dublin City University, DCU.
Phone: +353 1 700 8046
Email: *bryan.macdonald@dcu.ie*

Prof. Mohamed Amer Jmae
Chairman Department of Biomedical Engineering,
Libyan Academy.
Phone: +218927305062
Email: *mohamed.amer@academy.edu.ly*