

# Khaled Ibrahim E. Ahmed, Ph.D.

**Affiliation:** Associate Professor, Mechanical Engineering Department, King Abdulaziz University, Jeddah, KSA.  
**General Profession:** Mechanical Engineering  
**Focused Profession:** Mechanical design, Manufacturing Processes, Metal forming, Solid mechanics, Failure analysis, Experimental and numerical material analysis and multidiscipline numerical simulations.  
**Citizen** Canadian  
**Date/Place of Birth** 1-03-1965 / Cairo, Egypt  
**Email:** [kahmed@kau.edu.sa](mailto:kahmed@kau.edu.sa)  
[dr.kh.ahmed@aun.edu.eg](mailto:dr.kh.ahmed@aun.edu.eg)

## EDUCATION

Joint Ph.D. (University of British Columbia - Vancouver, BC, Canada June 1999 – June 2004  
and then Awarded from Assiut University, Assiut, Egypt) Nov. 2005

### *Doctor of Philosophy in Mechanical Engineering*

Thesis topic: “High Quality Cups by Blank-Holding Assisted Spinning of Sheet Metals”

University of British Columbia - Vancouver, BC, Canada Nov. 2007

### *Masters in Finite Element Analysis*

Thesis topic: “Finite element modeling of non-linear structural response of transmission towers including bolted joint slippage”

Assiut University, Assiut, Egypt Dec. 1994

### *Master of Applied Science in Mechanical Engineering*

Thesis topic: “Blank-Holding Assisted Spinning of Sheet Metals”

Ain Shams University, Cairo, Egypt July 1987

### *Bachelor of Science in Mechanical Design and Production Engineering*

Senior Project topic: “Components Coding Scheme in Computer Aided Process Planning”

Ranked: 1<sup>st</sup> /23 students V. Good with Honor Degree and Senior Project with Distinction

## EMPLOYMENT HISTORY

### From January 2018 – Present

**Associate Professor** at Mechanical Engineering Department, King Abdulaziz University, Jeddah, KSA

### From December 2012 – December 2017

**Visiting Researcher** at Mechanical & Industrial Engineering Department, Qatar University, Qatar

### From September 2012 – Present,

**Associate Professor on leave from** Mechanical Engineering Department, Assiut University, Egypt

**From June 2008 – September 2012,**

**Assistant Professor** at Mechanical Engineering Department, Assiut University, Egypt

**From September 2006 – June 2008**

**Post-Doctoral Fellow** at Mechanical Engineering Department, University of British Columbia, Canada

**From November 2005 – June 2006,**

**Assistant Professor** at Mechanical Engineering Department, Assiut University, Egypt

**From June 1999 – June 2004**

**Graduate Student** at Mechanical Engineering Department, University of British Columbia, Canada

**From March 1989– November 2005**

**Teaching Assistant** at Mechanical Engineering Department, Assiut University, Egypt

**FUNDED INDUSTRIAL PROJECTS AND CONSULTANCY**

1- Funded Projects by Stira, Jeddah, KSA (November 2018 - Present)

- Designing and manufacturing of high strength / light fixtures to work under high frequency conditions (40 g equipment) using finite element design optimization (4 fixtures so far).
- Designing and manufacturing of heatsink for PCB's boards of submersed controlled cameras working in harsh environment (40g vibration and 60°C weather) using finite element analysis.
- Designing and manufacturing of passive and semi active dampers for submersed controlled cameras working in harsh environment (40g-80g shocks) using finite element analysis.

2- Funded project by Delta Doha Corporation, Qatar. (November 2018 – November 2019)

- Design evaluation using finite element of Quick Lock connectors QLC sizes 21” and 13” working under harsh environmental conditions.

3- Funded Projects by Maersk Oil Qatar, Qatar (2014-2016)

- Fitness For Service level 3 API579 finite element integrity analysis using ANSYS for oil separator vessel ASAB-V-3401, October, 2014
- Fitness For Service level 3 API579 finite element integrity analysis using ANSYS and optimization for pre and post repair of vessel ASAB-V-3401, December, 2014
- Fitness For Service level 3 API579 finite element integrity analysis using ANSYS for oil separator vessel ASCDA-V-3401, June, 2015
- Fitness For Service level 3 API579 finite element integrity analysis using ANSYS for oil separator vessel ASBDA-V-3401, January, 2016
- Fitness For Service level 3 API579 finite element integrity analysis using ANSYS for HP flare vessel ASACZ -V-4001, March, 2016.
- Fitness For Service level 3 API579 finite element integrity analysis and optimization using ANSYS for pre-repair of vessel ASCDA-V-3401, April, 2016

4- Funded Project by Mudus-QSTP, Qatar (2016)

- Dynamic finite element model for optimizing wire line new tool for oil-well logging, January 2016
- Fluid-Structure interaction model for mud motors for wellbore drilling, January 2016

- 5- Funded Project by Pirelli Tires, Egypt (2015)
  - Defining of safe distance by CFD Analysis on the Exploded Air Due to Bead Lock Failure for Pirelli Tires, October 2015
- 6- Funded Project by 4D Think, Stevenage, Hertfordshire, UK (2015)
  - Rotor dynamic and fatigue analysis using finite element of TA-100 turboprop engine, July 2015
- 7- Funded Project by Aspire academy, Doha, Qatar (2012)
  - Stadium Design Optimization for Better Spectator Thermal Comfort in Hot Windy Weather for Cup World 2022 stadium designs, July 2012
- 8- Funded Projects by “Al-Wataniya Concrete Corporate”, Doha, Qatar., (2010-2011)
  - Full design using ANSYS of a new concrete cooling facility for hot weather concreting. The new design is approved for a USA patent filing.
- 9- Funded Projects by Totally Green Company, Ontario, Canada. (2009)
  - Remaining useful life Analysis using ANSYS of rotating parts of the organic digester machine ORCA, with size of 1.5x1.5x1.0 meters.
- 10- Funded Projects by Westport Innovations Inc., Vancouver, BC, Canada (2008)
  - Root cause failure analysis using ANSYS for hybrid diesel-propane injector.
- 11- Funded Projects by Tri-Star, Vancouver, BC, Canada (2002-2007)
  - Root Cause Failure analysis using ANSYS of a Spiral squeezer for a pulp and paper press with the size of 11x2 meters.
  - Root Cause Failure analysis using ANSYS of a Liner-less Pulp Valve for Lincoln Pulp & Paper, USA, with the size of 3x2 meters subjected to thermal loads and saturated steam pressure.
  - Weight optimization using ANSYS for a pulp and paper dryer drum with the size of 4x12 meters by which the weight was reduced 40% with the same level of working stresses.
  - Root Cause Failure analysis using ANSYS for pipe washer drum of size 4x8 meters subjected to pulsating water flows with rotating drum.
  - Successful Design modification using ANSYS for faultless pipe washer drum of size 4x8 meters subjected to pulsating water flows with rotating drum.

## **FUNDED RESEARCH PROJECTS**

- 1- “Development of a water-based bullet proof helmet” Awarded by King Abdulaziz University, Research deanship, 2020
- 2- “Multi-Objectives Optimization of the Current Collector of the Tubular Solid Oxide Fuel Cells for High Performance and Safe Operation”, Awarded by King Abdulaziz University, Research deanship, 2019
- 3- “Expansion-Reduction Hybrid Method for the Manufacturing of Seamless Conical frusta with Functionally Graded Stiffness”, Awarded by King Abdulaziz University, Research deanship, 2018
- 4- “Functionally Graded Direct Carbon Solid Oxide Fuel Cell for Safer Thermal Stresses”, Awarded by King Abdulaziz University, Research deanship, 2018

## PH.D. COLLABORATING SUPERVISION:

- 1- Hamoud Abdulsalam Mohammed AL-Nehari, "A Study on the Effects of Air Pollutants and Dispersion in Urban Atmospheres", Mechanical Engineering, Faculty of Engineering, Assiut University, Assiut, Egypt, Completed in 2010
- 2- Abdullah Ali Mohsen Dhaiban, "Simulation and Experimental Verification of a Novel Deep-Drawing Process to Produce Elliptical-Shaped Sheet Metal Parts Through Conical Dies Without Blank Holder", Department of Mechanical Engineering, Assiut University, Assiut, Egypt, Completed in 2014
- 3- Abdullah Mohamed Qaid Hasan, "FATIGUE BEHAVIOR OF STYRENE BUTADIENE (SBR) AND NITRILE BUTADIENE (NBR) RUBBER COMPOUNDS", Department of Mechanical Engineering, Assiut University, Assiut, Egypt, Completed in 2014
- 4- Ayman Abd-Eltwab, "Optimization of Internally-Spline Sleeves forming by Ball Spinning", Department of Mechanical Engineering, AlMinia University, Egypt, Completed 2017.

## M.SC. COLLABORATING SUPERVISION:

- 1- Ahmed AlJuhani, "Optimum Thickness of Boiler Water-Wall Tubes in the steam power plant", Mechanical Engineering Department, King Abdulaziz University, Started September 2018.
- 2- Abdullah Ali Mohsen Dhaiban, "FINITE ELEMENT MODELING OF AN ELLIPTICAL EXHAUST ACOUSTICAL MUFFLER", Department of Mechanical Engineering, Assiut University, Assiut, Egypt, Completed in 2011
- 3- Abdullah Mohamed Qaid Hasan, "FATIGUE IN RUBBER: STATE OF THE ART", Department of Mechanical Engineering, Assiut University, Assiut, Egypt, Completed in 2011
- 4- Emad Gamal Barakat Hussein, "Effect of Flow Passage Configurations on the Performance of Proton Exchange Membrane Fuel Cells (PEMFCs)", Department of Mechanical Engineering, Assiut University, Assiut, Egypt, Completed in 2015
- 5- Mohamed Eid Saied, "Performance Study of Solid Oxide Fuel Cell with Functionally Graded Electrodes", Department of Mechanical Engineering, Assiut University, Assiut, Egypt, Completed in 2016.
- 6- Abu Mohammed Sifullah, "Thermo-mechanical numerical and experimental analysis of laser cutting on stainless steel-304", Department of Mechanical Engineering, University of Malaya, Kuala Lumpur, Malaysia, Still Running.

## PUBLICATIONS

### Patents

- 1- AM Hamouda, **KIES Ahmed**, SS Mirjavadi, M Gadala. Apparatus for measuring the effective thermal conductivity of packed bed of aggregates- US Patent App. 16/055,756, 2019 designs: numerical
- 2- Hamouda AM, **Ahmed KI**, Mirjavadi SS, Gadala M, inventors; QATAR UNIVERSITY, assignee. Aggregate cooling for hot weather concreting. United States patent application US 15/080,049. 2018 Sep 18.

### International Journal Publications (ISI)

- 3- Saleh, B., Ayman A. Aly, Ageel F. Alogla, Awad M. Aljuaid, Mosleh M. Alharthi, **Khaled IE Ahmed**, and Y. S. Hamed. "Performance investigation of organic Rankine-vapor compression refrigeration integrated system activated by renewable energy." *Mechanics & Industry* 20, no. 2 (2019): 206.

- 4- Aly, Ayman A., B. Saleh, M. M. Bassuoni, M. Alsehli, A. Elfakhany, and **Khaled IE Ahmed**. "Artificial neural network model for performance evaluation of an integrated desiccant air conditioning system activated by solar energy." *AIMS Energy* 7, no. 3 (2019): 395.
- 5- Eltaher MA, Almalki TA, Almitani KH, **Ahmed KI**, Abdraboh AM. Modal participation of fixed-fixed single-walled carbon nanotube with vacancies. *International Journal of Advanced Structural Engineering*. 2019 Feb 1:1-3.
- 6- Eltaher MA, Almalki TA, **Ahmed KI**, Almitani KH. Characterization and behaviors of single walled carbon nanotube by equivalent continuum mechanics approach. *Adv Nano Res*. 2019 Jan 1;7(1):39-49.
- 7- Saied M, **Ahmed K**, Nemat-Alla M, Ahmed M, El-Sebaie M. Performance study of solid oxide fuel cell with various flow field designs: numerical study. *International Journal of Hydrogen Energy*. 2018 Oct 5. [doi:10.1016/j.ijhydene.2018.09.034](https://doi.org/10.1016/j.ijhydene.2018.09.034)
- 8- Abd-Eltwab, Ayman A., S. Z. El-Abden, **Khaled IE Ahmed**, M. N. El-Sheikh, and Ragab K. Abdel-Magied. "An investigation into forming internally-spline sleeves by ball spinning." *International Journal of Mechanical Sciences* 134 (2017): 399-410. [doi:10.1016/j.ijmecsci.2017.10.033](https://doi.org/10.1016/j.ijmecsci.2017.10.033)
- 9- Saied, M., **K. Ahmed**, M. Ahmed, M. Nemat-Alla, and M. El-Sebaie. "Investigations of solid oxide fuel cells with functionally graded electrodes for high performance and safe thermal stress." *International Journal of Hydrogen Energy*, 42, no. 24, (2017): 15887-15902, [doi:10.1016/j.ijhydene.2017.05.071](https://doi.org/10.1016/j.ijhydene.2017.05.071)
- 10- Sifullah, A. M., **Khaled I. Ahmed**, Y. Nukman, M. A. Hassan, and A. Hossain. "Laser Cutting of Square Blanks in Stainless Steel-304 Sheets: HAZ and Thermal Stress Analysis." *Sains Malaysiana* 46, no. 5 (2017): 755-762, [doi:10.17576/jsm-2017-4605-10](https://doi.org/10.17576/jsm-2017-4605-10)
- 11- Fernandes, Ralston, Sami El-Borgi, **Khaled Ahmed**, Michael I. Friswell, and Nidhal Jamia. "Static fracture and modal analysis simulation of a gas turbine compressor blade and bladed disk system." *Advanced Modeling and Simulation in Engineering Sciences* 3, no. 1 (2016): 30
- 12- **Ahmed, Khaled I.**, Mohamed S. Gadala, and Mohamed G. El-Sebaie. "Deep spinning of sheet metals." *International Journal of Machine Tools and Manufacture* 97 (2015): 72-85, [doi:10.1016/j.ijmachtools.2015.07.005](https://doi.org/10.1016/j.ijmachtools.2015.07.005).
- 13- **Khaled I.E. Ahmed**, A.M.S. Hamouda and M.S. Gadala, "Design Development of Aggregates Cooling Systems for Hot weather Concreting." *International Journal of Mechanics and Materials in Design*, Springer, ISSN: 1569-1713, (2015) 1-16, [doi:10.1007/s10999-015-9294-1](https://doi.org/10.1007/s10999-015-9294-1).
- 14- M.A. Hassan, **K. I.E. Ahmed**, and N. Takakura, "A Developed Process for Deep Drawing of Metal Foils Square Cups" *Journal of Materials Processing Technology*, 212 (2012) 295– 307, [doi:10.1016/j.jmatprotec.2011.09.015](https://doi.org/10.1016/j.jmatprotec.2011.09.015).
- 15- Mahmoud Nemat-Alla, **Khaled I.E. Ahmed**, and Ibraheem Hassab-Allah, "Elastic-Plastic Analysis of Two Dimensional Functionally Graded Materials under Thermal Loading," *International Journal of Solids and Structures*, 46, (2009) 2774–2786, [doi:10.1016/j.ijsolstr.2009.03.008](https://doi.org/10.1016/j.ijsolstr.2009.03.008).
- 16- **K.I.E. Ahmed**, R.K.N.D. Rajapakse and M.S. Gadala, "Influence Of Bolted-Joint Slippage On The Response Of Transmission Towers Subjected To Frost-Heave," *Advances in Structural Engineering*, Volume 12, Number 1, February 2009, pp. 1-17(17), [doi:10.1260/136943309787522641](https://doi.org/10.1260/136943309787522641).

#### **Refereed Conference Publications (Scopus)**

- 17- **Ahmed K**, Al-Khawaja M, Suleiman M. Optimization of energy pile conductance using finite element and fractional factorial design of experiment. *InIOP Conference Series: Materials Science*

and Engineering 2018 Jul (Vol. 383, No. 1, p. 012034). IOP Publishing. [doi:10.1088/1757-899X/383/1/012034](https://doi.org/10.1088/1757-899X/383/1/012034)

- 18- **AHMED K**, AL-KHAWAJA MO, SULEIMAN M. UNIFORM FRACTIONAL FACTORIAL DESIGN TABLES FOR ENERGY PILES WITH MAXIMUM THERMAL CONDUCTANCE. WIT Transactions on Ecology and the Environment. 2017 Dec 7;224:175-86.
- 19- **Khaled I.E.** Ahmed, Ali K. Abdel-Rahman, Mahmoud Ahmed, and Wael M. Khairaldien, "Virtual Height Aided Solar Chimney: A New Design," Proceedings of the ASME 2011 International Mechanical Engineering Congress & Exposition, IMECE2011-65819, pp. 1267-1273, Denver, Colorado, USA, November 11-17, 2011, [doi:10.1115/IMECE2011-65819](https://doi.org/10.1115/IMECE2011-65819)
- 20- **Khaled I.E. Ahmed**, A.M.S. Hamouda and M.S. Gadala, "Development Of A Belt Conveyor Cooling System For Concrete Aggregates," Proceedings of the ASME 2011, International Mechanical Engineering Congress & Exposition, IMECE2011-65748, pp. 1297-1306, Denver, Colorado, USA, November 11-17, 2011, [doi:10.1115/IMECE2011-65748](https://doi.org/10.1115/IMECE2011-65748).
- 21- **K.I.E. Ahmed**, A.M.S. Hamouda and M.S. Gadala, "Drum Cooling System For Concrete Aggregates: FEA Simulation," Proceedings of the ASME 2010 International Mechanical Engineering Congress & Exposition, IMECE2010-39144, pp. 483-492, Vancouver, Canada, November 12-18, 2010, [doi:10.1115/IMECE2010-39144](https://doi.org/10.1115/IMECE2010-39144).
- 22- Ahmed M. R. Fath El Bab and **Khaled I.E. Ahmed**, "A Novel Tactile Sensor Design For Stiffness Detection Of Soft Tissues," Proceedings of the ASME 2010 International Mechanical Engineering Congress & Exposition, IMECE2010-38794, pp. 439-446, Vancouver, Canada November. 12-18, 2010, [doi:10.1115/IMECE2010-38794](https://doi.org/10.1115/IMECE2010-38794).

#### **Refereed National Journal Publications**

- 23- **Ahmed, K.I.E.**, El-Sebaie, M.G., Bayoumi, M.R. and, Gadala, M.S., "FE Modeling of Blank-Holding Assisted Spinning of Sheet Metals," Journal of Engineering Sciences JES, Vol. 32, No. 5, pp. 1993-2011, November 2004.
- 24- **Ahmed, K.I.E.**, El-Sebaie, and, M.G., Bayoumi, M.R., "Enhanced Finite Element Modeling and Its Experimental Verification of the Blank-Holding Assisted Spinning Of Sheet Metals," Journal of Engineering Sciences JES, Vol. 33, No. 4, pp. 1381-1407, July 2005.
- 25- **Khaled I.E. Ahmed**, "A New Ball Set for Tube Spinning of Thin-Walled Tubular Parts with Longitudinal Inner Ribs", Journal of Engineering Sciences, JES, Vol. 39, No. 1, pp. 15-32, January 2011

#### **Conferences Publications**

- 26- **Khaled Ahmed**, Mohammed Al-Khawaja, Muhannad Suleiman, "Uniform Fractional Factorial Design Tables for Energy Piles with Maximum Thermal Conductance." 7<sup>th</sup> International Conference on Energy and Sustainability, 20-22 September, 2017, Seville, Spain.
- 27- **Khaled Ahmed**, Mohamed Senousy, "Numerical Prediction of Thermal Conductivity of FGM and Powder Composites", NAFEMS AMERICAS CONFERENCE, June 2016, SEATTLE, USA.
- 28- M.S. Gadala, **K. Ahmed**, and ElSadig Mahdi, "Inverse Heat Conduction Analysis of Cooling on Run Out Tables," ICFMTE 2014: XII International Conference on Fluid Mechanics and Thermal Engineering, 29-30 September 2014, Istanbul, Turkey.

- 29- E. Barakat, **K. Ahmed**, M. Ahmed, Ali K. Abdel-Rahman and Ahmed Hamza H. Al, "Influence of Parallel Flow Field Design on the Performance of PEM Fuel Cells." ICCE 2013: International Conference & Exhibition on Clean Energy, September 9 - 11, 2013, Ottawa, Ontario, Canada.
- 30- **Khaled Ahmed**, ElSadig Mahdi, Saud Ghany, and Mohamed Gadala, "Numerical Investigation Of An Impingement Flow over Ratchet Surface Due to a Circular Water Jet." 2nd International Conference on Mechanical, Automotive and Aerospace Engineering (ICMAAE 2013), 2-4 July 2013, Kuala Lumpur
- 31- **K.I.E. Ahmed**, A.M.S. Hamouda and M.S. Gadala, "Cooling Concrete Aggregates: Challenges in Design and Simulation," invited paper in The 6th IASME/WSEAS International Conference on Heat Transfer, Thermal Engineering and Environment (HTE'08), Rhodes (Rodos) Island, Greece, August 20-22, 2008.
- 32- Mahmoud Nemat-Alla, **Khaled Ahmed**, "3-D Elastic-Plastic Finite Element Analysis Of Two Dimensional Functionally Graded Materials Under Cyclic Thermal Loading," the 7th International Congress on Thermal Stresses, Taipei, Taiwan, June 4-7 2007.
- 33- **Ahmed, K.I.E.** and El-Sebaie, M.G., "A Novel Process in Sheet Metal Spinning," MEATIP1, 1st Int. Conf. On Mech. Eng. Advanced Tech. For Indus. Prod., Assiut University, Assiut, Egypt, pp 245-260, December 1994.

## REFERENCES

References are available upon request