

MAHMOUD EL BANNA

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Objective:

Contribute significantly in solving industrial real-life problems in supply chain, machine learning, big data, and healthcare management domains, by directing the university education knowledge towards these problems.

Employment History:

German Jordanian University

July 2017- until now

Dept. Head: Feb., 2018-now

German Jordanian University

Feb. 2011-June. 2017

American University of Middle East (AUM) , Kuwait

Feb., 2010 –Feb., 2011

University of Jordan

Amman, Jordan

Sept., 2006- Jan., 2010

Associate Professor:

Operations Research I, & II (expert in Cplex and Matlab), Production Planning and Supply Chain Management.

Assistant Professor:

Bachelor Courses: Operations Research I &II (Cplex), Production Planning, Supply Chain Management, Six Sigma, and Product development.

Assistant Professor :

○ Bachelor Courses: Statistics I & II, Computer Programming for Engineering (Matlab)

Assistant Professor :

○ Master Courses : Advanced Engineering Statistics, Design of Experiments
○ Bachelor Courses: Six Sigma, Statistics II, Statistics I.

Welding Technology Corporation Farmington Hills, MI, USA

Feb. 2006 – Sept., 2006

Research Engineer (*Responsible for Ford Motor Company Projects*)

Intelligent Resistance Welding project

- The goal of this project was to develop new algorithms to control the parameters that will optimize the strength of welded parts.
- Methods used :Optimization, Fuzzy , and machine learning
- Results: Patent, Book Chapter and Journal paper.

Wayne State University

Detroit, MI, USA

February 2002 – Feb. 2006

Research and Teaching Assistance

Teaching: Optimization

Projects:

- Optimize Hot Metal Gas Forming process, Hydro Forming (HMGF) project.
- Intelligent Resistance Welding project

Education, Licenses and Certificates:

PhD (March 2006). GPA is 3.8 out of 4.0

Major: Industrial Engineering / Artificial Intelligence
Wayne State University
Detroit, MI , USA

Master's (February 2001 / Top 5%)

Major: Industrial Engineering/ Design and Manufacturing
University of Jordan,
Amman, Jordan

Bachelor's (July 1998 / Top 5%)

Major: Mechanical Engineering / Design
University of Jordan
Amman, Jordan

Skills and Abilities:

Excellent in: Python, Matlab, Java, CPLEX , R, SPSS Minitab, Arena, ProModel, TORA, AMPL

ERP Package exposure : SAP

Professional in: data analysis techniques, data Mining, optimization techniques

Membership and Committees:

- College representative in university council 2016/2017
- Department representative in college council 2015/2016
- American Society for Quality (ASQ) membership
- Institute of industrial and system engineers (IISE) membership
- Supervise more than 15 graduation projects, and examiner for more than five master thesis.

Publications:

Patent:

- Method For Controlling Weld Energy / United States Patent US7759596 B2, 2010

Book Chapter:

- El-Banna, M., Filev, D., and Chinnam, R.B., "Automotive Manufacturing: Intelligent Resistance Welding," Computational Intelligence in Automotive Applications, Edited by Danil Prokhorov, Springer Berlin / Heidelberg, 2008 (ISBN-13: 978-3-540-79256-7; pp. 219-235).

Published papers:

- Ramadan, Saleem Z., and Mahmoud El-Banna. "Breast cancer diagnosis in digital mammography images using automatic detection for the region of interest." *Current Medical Imaging* 16, no. 7 (2020): 902-912.
- El-Banna, Mahmoud and Ahmed Alabadleh, "Shelf Space Allocation during Promotion Periods". 7th IESM 2017 Conference, October 11–13, 2017, Saarbrücken, Germany.
- El-Banna, Mahmoud, "Modified Mahalanobis Taguchi System (MMTS) for Imbalance Data Classification". *Computational Intelligence and Neuroscience*, 2017. (**Impact factor 1.215**)
- El-Banna, Mahmoud. "A Novel Approach for Classifying Imbalance Welding Data: Mahalanobis Genetic Algorithm (MGA)" *International Journal of Advanced Manufacturing Technology* 77, no. 1-4, (2015): 407-425. (**Impact factor 2.209**)
- El-Banna, Mahmoud. "Patient Discharge Time Improvement by Using the Six Sigma Approach: A Case Study." *Quality Engineering* 25, no. 4 (2013): 401-417. (**Impact factor 1.295**)
- El-Banna, Mahmoud A. "Improving Patients Discharge Process in Hospitals by using Six Sigma Approach." *International Journal of Mechanical, Aerospace, Industrial, Mechatronic and Manufacturing Engineering*, 6, no. 8, 2012.p 1378-1387.
- El-Banna, Mahmoud, Dimitar Filev, and Finn Tseng. "Force-based weld quality monitoring algorithm." *International journal of intelligent systems technologies and applications* 10, no. 1 (2011): 1-14.
- El-Banna, Mahmoud, Dimitar Filev, and Ratna Babu Chinnam. "Online qualitative nugget classification by using a linear vector quantization neural network for resistance spot welding." *The International Journal of Advanced Manufacturing Technology* 36, no. 3-4 (2008): 237-248. (**Impact factor 2.209**)
- A New Approach For Assessing The Wear Resistance Of Soft Ductile Materials / *International Symposium on Advanced Materials*, ISAM, 2007
- El-Banna, Mahmoud, Dimitar Filev, and Ratna Babu Chinnam. "Intelligent constant current control for resistance spot welding." In *Fuzzy Systems, 2006 IEEE International Conference on*, pp. 1570-1577. IEEE, 2006.
- Mahalanobis Taguchi System For Feature Extraction and Nugget Quality Classification in Resistance Spot Welding / Sheet Metal Welding Conference XII 2006, USA
- Experiments on The Effect of Zirconium on the fatigue life of Aluminum / Sixth International Conference on Production Engineering & Design for Development- PEDD 6, 2002, Egypt.

Submitted papers:

- El-Banna, Mahmoud et al, New solution procedures for the order picker routing and storage assignment problem in U-shaped order picking warehouses with a movable depot. (*Journal of production planning and control*)
- El-Banna, Mahmoud. Substitution Goal Programming Model for Retail Products Assortment. Submitted to *Operational Research An International Journal*.

Papers on progress:

1. Using Multi class imbalanced genetic algorithm for improving cancer masses detection
2. Health care capacity allocation using Theory of Constraints (TOC) approach
3. Vehicles Routing Problem (VRP) with Time Window metaheuristics approaches

Research Visits:

- **Technical university of Darmstadt (TUD) 2018:** Using Logic based bender decomposition approach for optimization order picking process in U shape warehouse operations
- **University of Siegen /Germany/ June-Aug. 2008:** Optimizing number of stages in deep drawing process.

References: Available upon request

Brief description of current funded project (\$47,400):

- Deep learning/optimization approach for enhancing operating room utilization: This project aims to enhance the utilization of operating room (theatre), by coupling the deep learning approach -which is used to predict the operation length- with an optimization /heuristic algorithm to reschedule the remaining operations.
- Stochastic optimization model for shelf space allocation during the promotion period: This model includes the competitor price and other factors in the product demand estimation, which results in a nonlinear (i.e. exponential) optimization model for the shelf space allocation. The model has been linearized and solved by using CPLEX.
- Computer Aided Detection\Diagnosics (CAD) for the Cancer tumors: The objective of this project is to enhance the cancer detection accuracy using the digital mammograms; the current detection accuracy is around 70%. Multiclass Imbalanced Mahalanobis Genetic algorithm will be used to enhance the classification accuracy

for different types of breast cancer (i.e. classification, masses ...). This project will be performed with King Hussein Cancer Center (KHCC).