

Tarek A. Tutunji

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EDUCATION

University of Oklahoma Oklahoma, USA

Ph.D.	Industrial Engineering	May 1996	GPA 4.0/4.0
	<i>Research area: Optimization Methods & Algorithms</i>		
MS	Electrical Engineering	May 1993	GPA 3.5/4.0
	<i>Research area: Digital Signal Processing</i>		
BS	Electrical Engineering	Dec 1990	GPA 3.6/4.0

WORK EXPERIENCE

9/02- **Philadelphia University** **Amman, Jordan**

Present *Associate Professor (2009), Faculty of Engineering / Mechatronics Department*

Vice-Dean, Faculty of Engineering (2010-present)

Chairman, Mechatronics Engineering Department (2003-2005, 2006-2008,2010-present)

- Manage the engineering faculty which is composed of 50 staff members, 30 engineers, and 1200 students. This includes (but not limited to): organizing and distributing the staff work, monitoring and controlling progress, implementing quality assurance, planning the faculty budget, organizing class schedules, recruiting staff members, allocating resources, resolving conflicts, solving students and faculty problems, communicating with other faculties, and managing several short-term and long-term projects.
- Founder of the Mechatronics Engineering Department at Philadelphia University
- Established the Mechatronics Labs. Equipments included Robotic Systems, CNC Machine, PLC System, Hydraulic & Pneumatic Systems, Fuzzy & Digital Control Systems, Motors, DSP Kits, Microprocessor Kits, Oscilloscopes, Function Generators, and Labview & Matlab Softwares. All fully integrated with PCs through data acquisition cards.
- Taught several classes including Digital Control, Machine Intelligence, PLC, Microcontrollers, Microprocessor Systems, DSP Systems, Interface and Simulation, Electric Circuits, Electronics, Reverse Engineering, Mechanical Statics, Applied Statistics and Calculus.

6/00- **Seagate Technology** **Okla. City, OK**

6/02 *Senior Advisory Development Engineer*

- Integrated Signal Communication within the Hard Drive System between R/W Channels, DSP Chips, SCSI Controllers, Servo Controllers, DRAM, and FLASH Memory Chips to Assure System & Protocol Integrity
- Implemented Digital Signal Processing, Control, & Optimization Algorithms for Hard Drive Development
- Tested and Modified Hardware and Firmware Systems for Hard Drive Development
- Tested and Applied C/C++ & MATLAB Programs for Hard Drive System Development
- Integrated Functional Block Diagrams & IC Components within Printed Circuit Boards

6/98- **Halliburton Energy Services** **Houston, TX**

6/00 *Signal Processing & Optimization Engineer (Log Analyst)*

- Researched and Applied DSP & Optimization Algorithms to Enhance Signal Detection & Classification
- Built C & MATLAB models and Tested on Simulation & Field Data
- Developed Software Applications for Data Analysis and Interpretation

6/96- **Halliburton Energy Services** **Dallas, TX**

6/98 *Electronic Test & Manufacturing Engineer*

- Planned Electronic testing strategy for Printed Circuit Boards (PCBs), Modules, and Logging Tools
- Developed and Interfaced Systems to Automate Production testing
- Defined Test Requirements, Environment, Specs, and Procedures
- Developed AST (Accelerated Stress Testing) and HASS (Highly Accelerated Stress Screening)

- Tested prototype Circuit Boards and Reported results for Design Modification
- Analyzed and Resolved production and field failures
- Controlled Quality and Assured Reliability throughout Production

1/91- **School of Electrical / Industrial Engineering, University of Oklahoma** **Norman, OK**
5/96 **Research Assistant**

- Lectured Simulation and Neural Network courses
- Programmed C and MATLAB codes for Optimization on Artificial Intelligence
- Conducted student sessions for Digital Signal Processing and Electronics courses
- Supervised / Monitored Electronics and Digital Design Labs

7/08- **Hikma Pharmaceuticals** **Amman, Jordan**
10/08 **Consulter (Faculty for Factory Program)**

- Studied and Analyzed the Packaging and Production lines at the factory in order to establish their Performance Factor Indicators.
- Proposed a Strategy for Optimizing the Performance of the factory lines. The Strategy was based on optimizing the job / machines scheduling through advance scheduling algorithms.

AWARDS

- National Technology Parade Award for best students project – Industry Theme (2011)
- National Technology Parade Award for best students project – Robotics Theme (2008)
- Engineering Association Award for best students project – Electrical Engineering Branch (2010)
- Engineering Association Award for best students project – Electrical Engineering Branch (2008)
- Engineering Association Award for best students project – Electrical Engineering Branch (2004)
- Best Instructor Award in the Faculty of Engineering at Philadelphia University (2005-2006)
- Philadelphia University Award for Best Invention (2003)
- KADDB project (2005-2006)

SPECIAL TRAINING COURSES

Manufacturing & Electronic Test Technology

- Highly Accelerated Life Test (HALT) and Highly Accelerated Screen Test (HASS)
- Design for Six Sigma (DFSS)

Hard Disc Technology

- Disk Drive Systems: Theory and Functionality of hard discs: a Mechatronic System
- Read/Write Technology
- Small Computer System Interface (SCSI)
- Serial ATA

Oil Logging Technology

- Logging While Drilling (LWD): Theory and Applications of oil logging tools
- Compensated Wave Resistivity (CWR): Theory & Applications of tools that use Electro Magnetic Technology
- Compensated Long Spaced Sonic (CLSS): Theory & Applications of tools that use Acoustic Technology
- Log Interpretation: Methods to analyze data & graphs from the oil fields to identify hydrocarbon potentials
- Basic Desktop Petro-Physics (DPP): Software used to analyze data from various oil logging tools
- Core Analysis: Theory of petro-physics and geology

PROGRAMMING LANGUAGES

C/C++, ASSEMBLY, FORTRAN, LABVIEW and MATLAB Expertise with all Toolboxes: Signal Processing, System Identification, Frequency Analyses, Optimization, Control, Fuzzy and Neural Networks

U.S. PATENTS

- System and Method for Enhanced Vertical Resolution for Magnetic Resonance Image Logs (#6,337,568)
- System and Method for Geologically-Enhanced Magnetic Resonance Imaging Tool (#6,255,819)

SELECTED JOURNAL PUBLICATIONS

1. Saleem, *Tutunji*, and Al-Sharif “**Mechatronic System Design Course for Undergraduate Programmes**” European Journal of Engineering Education. Vol 36, No. 4 August 2011, pp 341-356
2. Saleem, Issa, and *Tutunji* "**Hardware-in-the-Loop for On-line Identification and Control of three-phase squirrel cage Induction Motors**" Simulation Modelling Practice and Theory (Elsevier Publication 18 (3), 277-290 (2010)
3. *Tutunji*, Saleem, and Abdrabbo "**Undergraduate Mechatronics Project Class at Philadelphia University: Methodology and Experience**" IEEE Transactions on Education, Vol. 52, No. 3, August 2009.
4. Saleem, Abdrabbo, and *Tutunji* "**On-line identification of pneumatic servo-drives via a mixed reality environment**" International Journal of Advanced Manufacturing Technology 2009, 40:518-530. Springer Publication
5. *Tutunji*, Molhem, and Turki “**Mechatronics Systems Identification using an Impulse Response Recursive Algorithm**”, Simulation Modelling Practice and Theory Journal (Elsevier Publication), 15 (2007) 970-988
6. Abd Rabbo and *Tutunji* "**Identification and Analysis of Hydrostatic Transmission System**" International Journal of Advanced Manufacturing Technology 2008, 37:221-229. Springer Publication
7. *Tutunji*, Jumah, Hosamel-deen, and Abd Rabbo “**Mechatronics Curriculum Development at Philadelphia University**” Mechatronics Journal (Elsevier Publication), 17 (2007), 65-71
8. Trafalis and *Tutunji* "**Barrier and stochastic barrier Newton-type methods for training feedforward neural networks with bounded weights,**" International Journal of Smart Engineering System Design, 1, 241-254, 1998.
9. Trafalis, Couellen, and *Tutunji* "**Interior point methods for supervised training of artificial neural networks with bounded weights,**" *Network Optimization*, edited by P.M. Pardalos, D. Hearn and W. Hager, Lecture Notes in *Economics and Mathematical Systems*, 450 Springer Verlag, 441-470, 1997.

SELECTED CONFERENCE PUBLICATIONS

1. Al-Shabi, Saleem, and *Tutunji* “**Smooth Variable Structure Filter for Pneumatic System Identification**” IEEE AEECT (Applied Electrical Engineering and Computer Technology) Dec6-8, 2011. Amman, Jordan
2. Al-Sharif, Saleem, and *Tutunji* "**Mechatronics System Design: The Ideal Capstone Course**" IEEE 7th International Symposium Mechatronics and its Applications (ISMA) 2010, Sharjah, UAE.
3. Younis and *Tutunji* "**Reverse Engineering in Mechatronics Education**" IEEE ISMA 2010 conference, Sharjah, UAE
4. Miasa, Al-Mjali, Al-Haj Ibrahim, and *Tutunji* "**Fuzzy Control of a Two-Wheel Balancing Robot using DSPIC**" IEEE SSD 2010 Conference, Amman, Jordan
5. *Tutunji* “**Approximating Transfer Functions using Neural Network Weights**” 4th International IEEE EMBS Conference on Neural Engineering. April 29-May 2nd 2009. Antalya, Turkey.
6. Saleem, *Tutunji*, and Issa "**Control Strategy Based on Hardware-in-the-Loop for 3-Phase Induction Motor**" 5th International Symposium on Mechatronics and its Applications, ISMA 09. March 24-26,2009 Sharjah, UAE
7. *Tutunji* and Saleem "**A Method for On-Line Identification and Control Based on Hardware-In-The-Loop Concept**". IEEE 5th International Multi-Conference on Systems, Signals, and Devices (SSD08), July 20-23. Accepted for publications. Amman, Jordan. Philadelphia University
8. Saleem, *Tutunji*, and Issa "**On-Line Identification for Induction Motors: Experiments and Results**" 5th International Symposium on Mechatronics and its Applications, ISMA 08. May 27-29,2008 Jordan
9. Ashraf, Saber, and *Tutunji* "**Mixed-Reality Environment for Online System Identification of Nonlinear Systems**" 13th international conference on Applied Mechanics and Mechanical Engineering, May 27-29, 2008, Cairo-Egypt

10. **Tutunji**, Abd Rabbo, and Saleem "**Four Practical Projects from the Mechatronics Engineering Department at Philadelphia University**" 6th Jordanian International Engineering Conference (JIMEC06), 22-24 October 2007, Amman - Jordan
11. Turki, **Tutunji**, and Molhem "**Gyroscope System Identification using an Impulse Response RLS Algorithm**" IECON '06 32nd Annual Conference of the IEEE Industrial Electronics Society, Paris-France Nov 7-10, 2006
12. Turki, **Tutunji**, and Molhem "**Identification of Electro-Mechanical Systems using Neural Networks**" Sep 2006, IPEC2006, Philadelphia University, Jordan
13. **Tutunji** "**DC Motor Identification using Impulse Response Data**" EUROCON2005, Serbia & Montenegro, Belgrade, Nov22-24, 2005. pp 1734-1736
14. Ebeid, Abd Rabbo, and **Tutunji** "**Fuzzy Logic control of overhead Crane Load Sway**" 8th International Conference on production Engineering, Design and Control. Akexandria, Egypt 27-29 December 2004
15. **Tutunji** "**Applying Newton Algorithms within Neural Networks to forecast ballistic missile trajectory**" 10th Conference on Aerospace Sciences & Aviation Technology. Cairo, Egypt 13-15 May 2003
16. **Tutunji**, Higwara, and Day "**Geologically-Enhanced Vertical Resolution of NMR Echo-Train Data**" SPWLA 41st Annual Logging Symposium. Dallas, TX. June 2000
17. **Tutunji**, Khodr, and Zhao "**HASS and ATE Results in Production: Failure Analysis & Comparison of Vendors**" IEEE /CPMT Workshop on Accelerated Stress Testing. Pasadena, CA Sep. 1998
18. Corzine, DeBrunner and **Tutunji** "**Methods to design low sensitivity canonical digital filters using impulse response data**" International Symposium on Circuits and Systems (ISCAS) 1996, Atlanta, GA, vol. II, pp. 397-400, May 1996.
19. Trafalis and **Tutunji** "**A Stochastic Logarithmic Barrier Function Method for Neural Network Training with Bounded Weights**", Intelligent Engineering Systems through Artificial Neural Networks (ANNIE), eds. C.H. Dagli, Akay, Chen, B.R. Fernandez and J. Ghosh, ASME Press, 5, 167-172, 1995. (Nominated for best paper award)
20. Trafalis and **Tutunji** "**A Quasi-Newton Barrier Function Method for Artificial Neural Network Training with Bounded Weights**", Intelligent Engineering Systems through Artificial Neural Networks (ANNIE), 1994, pp 161-166
21. **Tutunji** and DeBrunner "**Pareto Optimal Designs of Low Sensitivity Digital Filters: Parallel and Cascade Structures**" International Conference on Statistics and Probability (ICASP) 1994, Adelaide, Australia, vol. 3, pp. 557-560, April 19-22, 1994.

CHAPTERS IN BOOKS

1. Trafalis and **Tutunji** "**Deterministic and Stochastic Logarithmic Barrier Function Methods for Neural Network Training**", Parallel Computing in Optimization, (A. Migdalas, P.M. Pardalos and S. Stroy, Eds) Kluwer Academic Publishers, Chapter 13, pp. 519-574, 1997

DISSERTATION TITLE

"Logarithmic Barrier Functions and Newton-type Methods with Applications to Neural Network Training"

THESIS TITLE

"The Design of Low Sensitivity State-Space Digital Filters using Pareto Optimal Multi-Criterion"

PROFESSIONAL MEMBERSHIP

- Jordan Engineers Association member since 1998
- IEEE (Institute of Electronics and Electrical Engineering) member since 1997
- Eta Kappa Nu (Electrical Engineering Honor Society) member since 1990
- Founding Father of Alpha Gamma chapter of Pi Kappa Phi Fraternity (1988)

OTHER ACTIVITIES

- Head of consulting committee, Technology Business Incubator at Philadelphia University. 2010
- Chair of the Executive Committee for National Technology Parade 2011. May 9-10, 2011
- Member of the Review Committee for the National Program "Faculty for Factory" 2008 - present
- Organizing Member for Philadelphia University Engineering Day "Mechatronics and Secure Wireless Networks". May 20th. 2009
- Organizing Member and Track Chair for the 5th International Symposium on Mechatronics and its Applications ISMA08. May 27-29, 2008 Jordan
- Organizing Member and Track Chair for the 5th International Multi-Conference on Systems, Signals, and Devices (SSD'08). 20-23 July 2008 Jordan
- Organizing member for the 24th Arab Engineering Conference. 14-16 July 2007. Amman-Jordan
- Organizing member for the 6th Mechanical Engr. Conference. 22-27 October 2007. Amman-Jordan
- Head of committee for the evaluation, review, and modifications of the Mechatronics accreditation guidelines in Jordan (2005)
- Organizer for UNESCO workshop "Programmable System on Chip" at Philadelphia university 15-19/4/2007
- Organizing member for the "Computational Aspects and Their Applications in electrical Engineering Conference" Philadelphia university 2003
- Organizing member for the "International Philadelphia Engineering Conference" 9/2006
- Organizing member for the Mechatronics Workshop. Held at University of Jordan. Organized and Sponsored by Engineering Association in Jordan. March 8, 2004

INVITED LECTURES

- Invited Speaker at NATO-ASI, Advanced All-Terrain Autonomous Systems Workshop. Cesme-Ismir, Turkey, August 15-24,2010
- Key Note Speaker at the 5th International Multi-Conference on Systems, Signals, and Devices. Topic: Digital Signal Controllers and their Applications in Mechatronics.
- Lecturer at the Mechatronics Workshop at Tishreen university, Syria 3/2006
- Lecturer at the Engineering Education Techniques Workshop. Held at Al-Quds Hotel, Jordan. May 10-11, 2005. Organized and Sponsored by Engineering Association in Jordan. 2004
- Lecturer at the Engineering Accreditation Workshop. Held at Al-Isra University, Jordan. Organized by the Ministry of Higher Education, August 8 2004
- Lecturer at the Autotronics Workshop. Held at University of Jordan. Organized and Sponsored by Engineering Association in Jordan. 2004
- Lecturer at the 32nd Industrial Electronics Conference (IECON '06 32nd). Annual Conference of the IEEE Industrial Electronics Society, Paris-France Nov 7-10, 2006
- Lecturer at the TEMPUS-FINSI. Integrated Engineering Development: Beirut May 28-30 2004, Tripoli Nov. 1-7 2004, and Damascus, March 2-7 2005
- Lecturer at the Mechatronics Workshop. Held at University of Jordan. Organized and Sponsored by Engineering Association in Jordan. March 8, 2004
- Lecturer at the 10th International Conference on Aerospace Sciences and Aviation Technology – Military Technical College – Cairo, Egypt 2003
- Lecturer at the IEEE (Institute of Electronics & Electrical Engineers) / Component Packaging & Manufacturing Workshop on Accelerated Stress Testing -- IEEE/CPMT TC-7 on AST -- Pasadena, Sep. 98
- Lecturer at the Artificial Neural Networks & Intelligent Systems -- ANNIE -- St. Louis, Feb. 95