CURRICULUM VITAE
NIZAR TAYEM, Ph.D.

Assistant Professor
Electrical Engineering Program
Department of Engineering and Technology
Texas A&M University-Commerce
Commerce, Texas 75429

EDUCATION

Ph.D., in Electrical Engineering, Wichita State University, Wichita, KS-US, (2001- 2005)
GPA: 3.95/4.0

MS in Physics and Electronics, Al-Najah National University, Palestine (1996- 1998)

BS in Physics and Electronics, Al-Najah National University, Palestine (1991-1995)

ACADEMIC APPOINTMENTS

Assistant Professor   **July 2018-Present**
Electrical Engineering program
Department of Engineering and Technology
Texas A&M University-Commerce, TX

Chair of Electrical Engineering Department   and   **Jan. 2010 – Jun 2018**
Assistant Professor
Electrical Engineering department
Prince Mohammed bin Fahd University
Al-Khobar, Saudi Arabia

Visiting Assistant Professor   **Aug. 2008 - Oct. 2009**
Electrical and Computer Engineering
Miami University, Ohio

Faculty of Communication and Electronics Engineering **Sep. 2007 - Aug. 2008**
 ITT Technical Institute
 Electrical and Computer engineering
Owings Mills, MD, USA

Postdoctoral Researcher Follow   **July 2006 - Aug. 2007**
Electrical and Computer Engineering department
Louisiana State University
Louisiana**,** USA

Visiting Assistant Professor   **Oct. 2005 - May 2006**
Electrical and Computer Engineering department
West Virginia University Institute of Technology
West Virginia, USA

Senior RF Engineer   **April 2005 – Oct. 2005**
Sprint Nextel Communication
Ft. Lauderdale, Florida, USA

Graduate Research Assistant   **Aug. 2001 – Mar. 2005**
Electrical and Computer Engineering Department
Wichita State University, Wichita, KS
Kansas, USA

ADMINISTRATIVE POSITION

Chair of Electrical Engineering department, Prince Mohammad Bin Fahd University, KSA
Jan. 2010 – Jun.2018

MAJOR INDUSTRIAL RESEARCH PROJECTS

- Air Force Research Laboratory Challenge 2021 (TAMUC) (in progress)
- Smart Antenna for Future US Army Frequency-Hopping Communications Systems," US Army Research under State of Kansas Defense Experimental Program to Simulate Competitive Research (DEPSCoR)
- DOA Estimation scheme for wireless communication, US Army Research Laboratory, USA
- DOA Estimation and Downlink Beam Study for 3GPP," Samsung Electronics Co., LTD, Information and Telecommunication R&D Center
- Developed algorithms for WCDMA TDD Mode for Samsung Electronics
- Proposed and implemented Unitary Root Music and Unitary Music with real valued Rank Revealing Triangular factorization algorithm for Wright-Patterson Air Force Base, USA
- Real time implementation for Direction of arrival estimation (DOA) Hardware implementation using FPGA for Direction of arrival estimation (DOA) proposed methods
- Developed an algorithm for Time of arrival estimation (TOA)
- Developed and proposed many algorithms in one dimensional and multidimensional array signal processing for parameter estimation

TEACHING EXPERINCE

- Teaching The EE Curriculum that has been developed by Texas International Education Consortium (TIEC)
- More than fifteen years of teaching experience in universities
- Received excellent student evaluation (avg. 4.8/5)
- Taught courses and laboratories in different areas of electrical engineering

Texas A & M University-Commerce	
ENGR 2304 Computing for Engineers	EE 330 Continuous Signals & Systems (**with Lab**)
EE 220 Circuit Theory (with Lab)	EE 470 Capstone Design /Internship1
EE 310 Digital Sys/Embedded Control **(with Lab)**	EE 440 Electric Machinery **(with Lab)**
EE 430 Discrete Signals and Systems	EE 435 Control Systems **(with Lab)**
EE 433 Digital Signal Processing	
Prince Mohammad bin Fahd University	
EE Senior Design Project I &II	Advanced Applied Mathmatics
Wireless Communication systems	Control Systems
Digital Communication Systems(**with Lab)**	Propablity and Random Signal Analysis
Electromagnetic Field and Waves	Electric Circuits I (**with Lab**)
Digital Signal Processing **(with Lab)**	Electric Circuit II (**with Lab**)
Communication System **(with Lab)**	Electronics I & Electronics II (**with Lab**)
Digital System **(with Lab)**	LabVIEW and MATLAB Programming
Sensor and Instrumenation **(with Lab)**	Signals and Systems
Electric Machinary	Microprocesser and Microcontroller **(withLab)**
Miami University , OHIO, USA	
Digital switching (**with Lab**)	Circuit Analysis I (**with Lab**)
Local Area Network (**with Lab**)	Circuit II
West Virginia Univversity , WEST VIRGINIA, USA	
Introduction to communiucation system **(with Lab)**	Digital Signal Processing **(with Lab)**
Electric Circuit 1 **(with Lab)**	Circuit II (**with Lab**)
ITT Technical Instituite , MARYLAND , USA	
Network Standards and Protocols	Electronics I & II (**with Lab**)
Network Management	Circuits I & II (**with Lab**)
Electronics Communication system I **(with Lab)**	Programable logic control
Data and computer Communication **(with Lab)**	Microprocessor **(with Lab)**
Electronics Communication System II **(with Lab)**	Digital Systems **(with Lab)**

SENIOR DESIGN PROJECTS

- Supervised more than 30 senior design projects in the areas of Communication System, Electronics, Power System, and Control System
- Teaching senior design project course for more than 8 years

Samples of senior design projects I supervised:

- ❖ Pipe Cleaning Robot (TAMUC)
- ❖ Electric Bike (TAMUC)
- ❖ Real Time Implementation for DOA Estimation using USRP (TAMUC)
- ❖ Chemical Mixer (TAMUC)
- ❖ Autonomous Vehicle Platform (TAMUC)
- ❖ RC Solar Autonomous Car (TAMUC)
- ❖ Child Safety Seat (TAMUC)
- ❖ Obstacle Avoidance & Navigational Autonomous Robot
- ❖ Remote weather station
- ❖ Peer to Peer Communication for Robotics System
- ❖ Performance Analysis and Implementation of Maximal Ratio Combining Using NI PXI System
- ❖ Off Grid On Demand Street Light System
- ❖ Smart Home Monitoring and control
- ❖ Smart Parking System
- ❖ Autonomous Quadcopter
- ❖ Remote Controlled Submarine
- ❖ Power Management System
- ❖ Motor Fault Detection
- ❖ Child Seat Safety System
- ❖ Lifeguard boat

- ❖ Wireless Charger

HARDWARE/SOFTWARE ELECTRICAL ENGINEERING LABRATORIES ESTABLISHMENT:

➢ Established the following Electrical Engineering laboratories at TAMUC:

LAB NAME
Communication System Lab
Digital Communication Lab
Control System Lab
Electric Machinery Lab
Electric Circuit Lab

➢ Established the following Electrical Engineering laboratories at PMU:

LAB NAME	LINKS
General purpose Computer Lab	http://www.pmu.edu.sa/PDF/Viewer.aspx?ID=316
Electronics Lab	http://www.pmu.edu.sa/PDF-HTML/Electronics%20Lab/Electronics_Lab-1.html
Electric Circuits Lab	http://www.pmu.edu.sa/PDF-HTML/Electric%20Circuits%20Lab/Electric_Circuits_Lab-1.html

Process Control Lab	http://www.pmu.edu.sa/PDF-HTML/Process%20Control%20Lab/Process_Control_Lab-1.html
Data Acquisition Lab	http://www.pmu.edu.sa/PDF-HTML/DAQ%20Lab/DAQ_Lab-1.html
Automatic Controls Lab	http://www.pmu.edu.sa/PDF/Viewer.aspx?ID=314
Sensors & Instrumentation Labs	http://www.pmu.edu.sa/PDF-HTML/Sensors%20and%20Instrumentation%20Lab/Sensors%20an d%20Instrumentation%20Lab-1.html
Robotics & Embedded Systems Labs	http://www.pmu.edu.sa/PDF-HTML/Embedded%20Systems%20and%20Robotics%20Lab/E mbe dded_Systems_and_Robotics_Lab-1.html
Digital Systems and MicroprocessorsLabs	http://www.pmu.edu.sa/PDF-HTML/Digital%20Systems%20Lab/Digital_Systems_Lab-1.html
Communications & Signal ProcessingLab	http://www.pmu.edu.sa/PDF-HTML/Communications_Lab/Communications_Lab-1.html
Electrical Machinery Lab	http://www.pmu.edu.sa/PDF-HTML/Electric%20Machinery%20Lab/Electric_Machinery_L ab- 1.html

Developed the Following Undergraduate Courses and Lab Manuals:
- Digital Communication System
- Communication System
- Probability and Random Process
- EE Senior Design Project
- Lab Manual for Communication System
- Lab Manual for Sensor and Instrumentations
- Lab Manual for Digital Communication Systems
- Lab Manual for Circuit I

Developed the following Graduate Courses:
- EEEN5352 Digital Control Systems (MS)
- EEEN 5321 Digital Communication Systems (MS)
- EEEN 6322 Cellular Communication Networks (MS)
- EEEN 6323 Advance Wireless Communication (MS)
- EEEN 6332 Adaptive Signal Processing (MS)
- EEEE 6333 Information Theory and Coding (MS)

HARDWARE SKILLS

- National Instruments (NI) compactDAQ
- NI myRIO
- NI CompactRIO Controller
- NI PXIe-5652, PXIe-5601, PXIe-5622, PXIe 7965, LabVIEW, LabVIEW FPGA Module
- Intel, Motorola, and Atmel Microcontrollers
- NI Universal Software Radio Peripheral (USRP)

COMPUTING SKILLS

- C, MATLAB/ Simulink, Pspice,
- MULTISIM, TINA
- LabVIEW, FPGA
- Operating Systems: Windows
- Microsoft Word, Power Point, Excel, Visio

ABET TRAINING AND CERTIFICATES

- Attended workshop organized by The institute for the Development of Excellence in Assessment Leadership (IDEAL) MD, USA
- Attended Program Assessment Workshop (Oregon, USA)

ACCREDITATION (ACHIEVEMENTS)

- Led and achieved ABET accreditation for Electrical Engineering department for the first time for Texas A & M University under the supervision of the department chair

- Led and achieved ABET accreditation for Electrical Engineering department for the first time for full six years till 2022 (PMU)
- Led the department effort in achieving NCAAA institutional accreditation

EE PROGRAM ASSESSMENT (ABET ACCREDITATION)

- Developed a number of assessment tools, rubrics, and surveys for direct and indirect assessment; defined the continuous improvement process for the EE department
- Developed Student Outcome Assessment Report (SOAR) and Continuous Program Improvement Report (CPIR) forms for ABET
- Devloped Course Assessment Report (CAR) and LAB assesment report (LAR) forms
- Led the devlopment of Senior Design Project Report Template and other assessment tools to cater to ABET assessment requirements
- Developed Student Outcome Assessment Report (SOAR) form for documenting the assessment of all student outcomes a – k.
- Developed a Continuous Program Improvement Report (CPIR) form for documenting the process of "closing the loop".
- Led the EE department effort in defining the EE Dept. Goals, Mission, and Program Educational Objectives
- Guided Civil and Mechanical engineering departments in preparing for ABET accreditation

SCHOLARSHIPS and AWARDS

- Outstanding Ph.D. Award in Electrical and Computer Engineering Wichita State University spring 2004.
- Certified LabVIEW Associate Developer (CLAD)

WORKSHOPS AND TRAINING COURSES

- Advance OPNET Modular (OPNET Technology, Bethesda, MD, USA
- Introduction to OPNET Modular (OPNET Technology, Bethesda, MD, USA

- Introduction to ACE (OPNET Technology, Bethesda, MD, USA)
- NI myRIO (National Instruments, PMU , Al-Khobar, KSA)
- LabVIEW Core 1 (National Instruments, PMU , Al-Khobar, KSA)
- LabVIEW Core 2 (National Instruments, PMU , Al-Khobar, KSA)
- LabVIEW Core 3 (National Instruments, PMU , Al-Khobar, KSA)
- DATA Acquisition and Signal conditioning (National Instruments, PMU, Al-Khobar, KSA)
- NI ELVIS (National Instrument, PMU, Al-Khobar, KSA)
- NI Multisim (National Instrument, PMU, Al-Khobar, KSA)
- NI Test Stand (National Instrument, PMU, Al-Khobar, KSA)
- Radio Frequency (RF) fundamental (National Instrument, PMU, Al-Khobar, KSA)
- MIMO Systems (National Instrument, King Saudi University, Riyadh, KSA)
- Electrical Machinery Course (LD-didactic, Germany)
- Control Design and Robotics Hands-on training (NI Arabia Academic week 2011, Lebanon)
- LabVIEW FPGA Hands-on training (NI Arabia Academic week 2011, Lebanon)
- VeriStand Hands-on training (NI Arabia Academic week 2011, Lebanon)
- DIAdem Hands-on training (NI Arabia Academic week 2011, Lebanon)
- LabVIEW Hands-on training (NI Arabia Academic week 2011, Lebanon) Professional Activities

TECHNICAL PRESENTATIONS AND TALKS

- **N. Tayem**, "Capon Root-MUSIC-like Direction of Arrival Estimation Based on Real Data," *2021 IEEE 94th Vehicular Technology Conference (VTC2021-Fall)*, 2021, pp. 1-6, doi: 10.1109/VTC2021-Fall52928.2021.9625275.
- **N. Tayem** "Computationally Efficient Forward/backward Averaged DOA Estimation of Coherent Sources in Pairs," *2021 IEEE 94th Vehicular Technology Conference (VTC2021-Fall)*, 2021, pp. 1-7, doi: 10.1109/VTC2021-Fall52928.2021.9625061
- **Nizar Tayem** "Propagator Rooting Method Direction of Arrival Estimation Based on Real Data," IEEE MILCOM 2021,San Diego, CA, November 28-Decmber 2.
- **Nizar Tayem**, "LDL Decomposition-based Real-time FPGA Implementation of DOA Estimation", Asilomar Conference on Signals, Systems, and Computers, Oct. 28-31, 2018, California, USA.
- **Nizar Tayem**," Undergraduate Engineering Program Assessment, Evaluation, and Continuous Improvement Process: A Case Study," Engineering Engineering Education (E3): Innovations in the Classroom and Beyond" April 2020 **(Virtual Presentation)**
- **N Tayem,"** Quality Assurance of Capstone Senior Design Projects: A Case Study," American Society for Engineering Education (ASEE) Virtual Conference, July 2020 **(Virtual Presentation)**
- Harmonic Estimation Employing QR factorization and Power Spectral Density for fault detection in Induction Motor," Machinery failure Prevention technology 2018, Virginia beach, Virginia
- Teaching Communications Engineering Using NI ELVIS and LabVIEW, NI Week 2016 **Austin**, Texas, August 2016
- Partial Data Matrix DOA Estimation without Eigenvalue Decomposition", International Conference on Digital Signal Processing Kuala Lumpur, Malaysia April 2017
- Real Time Implementation of Direction of Arrival Estimation Schemes using LabVIEW and NI PXI Platform" at King Fahd University for Petroleum and Minerals, March 2015
- Direction of Arrival Estimation Schemes using NI PXI Platform at Prince Sultan Advanced Technologies Research Institute (PSATRI) King Saud University, KSA, November 2014
- Direction of Arrival Estimation Schemes using NI PXI Platform at Advanced Sensors and Electronic Defence (ASED), KACST, KS A 2014
- QR-TLS ESPRIT for Source Localization and Frequency Estimations, IEEE Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, November 2013
- Parallel TSQR-TLS and QR-TLS factorization for Joint Time Delay and Frequency Estimation, IEEE Asilomar Conference on Signals, Systems, and Computers, Pacific Grove,

CA, November 2013

- NI Graphical design in Developing RF Direction Finding Application, NI Arabia academic day 2013
- 2 D DOA estimations for multiple coherent sources using a new antenna array configuration," IEEE Military communication conference, Orlando, Florida, November. 2012
- QRC-ESPRIT for Wideband Signals, Second International Conference on Advances in Information and Communication Technologies, Amsterdam, Netherlands, Dec 2011
- Range and Bearing Estimation for Near-Field Sources," IEEE Vehicular Technology Conference Fall, Ottawa, Canada, September 2010
- Propagator Method for Joint Time Delay and Frequency Estimation," IEEE Conference on Signal, System & Computers, Pacific Grove, CA, Oct. 2008.
- Unitary MUSIC algorithm for Source bearing estimation," IEEE Vehicular Technology Conference, Baltimore, MD, October 2007
- Angle of Arrival Estimation for Non-Circular Signals" IEEE Sarnoff Symposium 2006, Princeton, New Jersey, March 2006.
- DOA Estimation for Coherent Sources with Spatial Smoothing without Eigen-decomposition under Unknown Noise Field," IEEE GLOBECOM Conference 2005, St Louis, MO, December 2005.
- 2-D Directional of Arrival Angle Estimation Non-Based on the Eigen Structure Approach, IEEE Vehicular Technology Conference, Los Angeles, CA, September 2004.

COMMITTEE WORK (Department, College, University)

- Chair of EE department council
- Chair of College of Engineering ABET Committee
- Chair of EE senior design project committee.
- Chair of EE Teaching and accreditation committee
- Chair of EE Lab committee
- Member of faculty search committee
- Member of graduate research committee.
- Member of the college council
- Member of research and development committee
- Member of University IT committee

REVIEWER FOR TECHNICAL PAPERS

Reviewer for international journals and conferences including:

- IEEE Transaction of Antenna and Propagation
- IEEE Vehicular Technology Conference
- IEEE Transaction on signal processing
- Signal Processing Journal
- IEEE signal processing Letter and Transactions
- IEEE Antenna and Wireless Propagation letter
- IEEE GLOBECOM Conference
- IEEE Transaction in Wireless Communication
- **General Co-Chair** of International Conference on Technology Innovation – ICTI 2016 at New York, USA

MEMBERSHIP IN PROFESSIONAL SOCIETIES

- Senior member of institute of Doctors Engineering and Scientists (IDES)
- IEEE member
- Member of World Academy of Science, Engineering, and Technology
- Member of the institute of Electronics, Information, and Communication Engineers
- Editor-in-Chief of International Journal on Electrical and Power Engineering (ACEEE, USA).

RESEARCH PUBLICATIONS: JOURNALS

1. **N. Tayem**, Ahmed A. Hussain," FPGA-based Hardware Implementation of Computationally Efficient Multi-Source DOA Estimation Algorithms, Wireless communication Handbook National Instruments, 2020

2. A.A. Hussain, **N. Tayem,** A. Soliman and R. M. Radaydeh, "FPGA-Based Hardware Implementation of Computationally Efficient Multi-Source DOA Estimation Algorithms," in IEEE Access, vol. 7, pp. 88845-88858, 2019.

3. Redha Radaydeh, Fawaz Alqahtani, Mohamed-Slim Alouini, and **Nizar Tayem** ,"Adaptive Spectrum-Shared Association for Controlled Underlay D2D Communication in Cellular Networks" IET Communications, Aug 2019 DOI: 10.1049/iet-com.2019

4. **Nizar Tayem**, K Majeed, AA Hussain**, "**Propagator Method using PARAFAC Model for Two Dimensional Source Localization" accepted for publication at Radioengineering Journal July 2018

5. A. A. Hussain, **N. Tayem**, M. O. Butt, A. Soliman, A. Alhamed and S. Alshebeili, "FPGA Hardware Implementation of DOA Estimation Algorithm Employing LU Decomposition," in *IEEE Access*, vol. 6, pp. 17666-17680, 2018.

6. **Nizar Tayem**, K Majeed, AA Hussain**, "**Parallel Factor-Based Model for Two-Dimensional Direction Estimation" International Journal of Antennas and Propagation, Volume 2017 (2017),Article ID 1813497, 12 pages

7. **Nizar Tayem "**"Cholesky Factorization Based Parallel Factor for Azimuth and Elevation Angles Estimation" accepted at Arabian Journal for Science and Engineering, June 2017

8. A Alhamed, **Nizar Tayem**, T Alshawi, S Alshebeili, A Alsuwailem, A Hussain, "FPGA-based Real Time Implementation for Direction-of-Arrival Estimation," The Journal of Engineering10.1049/joe.2017.0165 , May 2017

9. **Nizar Tayem, "**Azimuth/Elevation Directional Finding with Automatic Pair Matching" International Journal of Antennas and Propagation, Volume 2016 (2016), Article ID 5063450, 9pages

10. **Nizar Tayem,** Syed Raza, Mohammed Omer, Ahmed Abul Hussain**, "**Joint Frequency and TimeEstimation Algorithms" Arabian Journal for Science and Engineering September 2016, Volume41, Issue 9, pp 3511–3519

11. **Nizar Tayem**, Khaqan Majeed, and Ahmed A. Hussain, "Two Dimensional DOA Estimation using Cross-correlation Matrix with L-shaped Array," *IEEE* Antennas and Wireless propagationletters , October 2015

12. **N. Tayem**, "Real time implementation for DOA estimation methods on NI-PXI platform," *Progress In Electromagnetics Research B*, Vol. 59, 103-121, 2014.

13. M. Omer, **N. Tayem**, A Hussain," Two Uniform Linear Arrays for Non-Coherent and Coherent Sources for Two Dimensional Source Localization," Journal of Progress In Electromagnetics Research Letter , Vol. 47, 31-39, July 2014.

14. **N. Tayem**, M. Omer, M. El-Lakkis, S. A. Raza , J. Nayfeh," Hardware Implementation of a

Proposed QR-TLS DOA Estimation Method and Music, Esprit Algorithms on NI-PXI Platform,Journal of Progress In Electromagnetics Research C, Vol. 45, 203-221, November 2013.

15. **N. Tayem**, M. Omer, H. Gami, S. A. Raza, J. Nayfeh, M. Al-Lakkis," Joint Frequency and AngleEstimation Algorithms," Journal of Selected Areas in Telecommunications (JSAT), October 2013

16. M. M. Qasaymeh, **Tayem Nizar**, and Ahmed Musa, "An Efficient Channel Estimator for Frequency Hopping System via Propagator Method", The International Journal of Ubiquitous Systems and Pervasive Networks, Vol. 3, pp.23-27, May 2011.

17. **Nizar Tayem** and Gami Hiren, "Two Stages Time Delay and Frequency for multiple sinusoids,"Journal of Selected areas in Telecommunication (JSAT), pp. 59-63, April 2011.

18. **Nizar Tayem**, "QRC-ESPRIT method for wideband signals" ACEEE International Journal on communication, Vol.2, No.03, pp.1-5. Nov 2011

19. **Nizar Tayem** and Gami Hiren, "Two Stages Time Delay and Frequency for multiple sinusoids,"Journal of Selected areas in Telecommunication (JSAT), pp. 59-63, April 2011.

20. Qasaymeh M.M, Gami Hiren, **Tayem Nizar**, Ravi Pendse, and M. E. Sawan "Joint Time Delayand Frequency Estimation with Propagator Method" IEEE Signal Processing Letter March. Vol.16, No. 5, pp.422-425, May 2009.

21. **Nizar Tayem** and Hyuck M. Kwon, "Reply to Comment on "L-Shape 2-Dimensional Arrival Angle Estimation with Propagator Methods," IEEE Transactions on Antennas & Propagation, Vol. 56, No. 5, pp. 1503-1506, May 2008.

22. **Nizar Tayem** and Hyuck M. Kwon, "Reply to Comment on "Conjugate ESPRIT (C-SPRIT)," IEEE Transactions on Antennas & Propagation, Vol. 55, No. 2, pp. 512 - 513, February 2007.

23. **Nizar Tayem** and Hyuck M. Kwon, "Azimuth and Elevation Angle Estimation with No Failureand No Eigen Decomposition," Elsevier Signal Processing Journal, Volume 86, Issue 1, Pages 8-16, January 2006.

24. **Nizar Tay**em and Hyuck M. Kwon, "L-Shape 2-Dimensional Arrival Angle Estimation with Propagator Method," IEEE Transactions on Antennas and Propagation, Vol. 53, No. 5, pp. 1622-1630, May 2005.

25. **Nizar Tayem** and Hyuck M. Kwon, "Conjugate ESPRIT (C-SPRIT)," IEEE Transactions on Antennas and Propagation, Vol. 52, No. 10, pp. 2618-2624, October 2004.

CONFERENCE PUBLICATIONS

1. A. A. Hussain, N. Tayem and A. -H. Soliman, "Computationally Efficient Forward/backward Averaged DOA Estimation of Coherent Sources in Pairs," *2021 IEEE 94th Vehicular Technology Conference (VTC2021-Fall)*, 2021, pp. 1-7, doi: 10.1109/VTC2021-Fall52928.2021.9625061.

2. M. Khory, I. A. Zuwaid, A. A. Motawa, A. A. Hussain, N. Tayem and S. El-Nakla, "IoT-based Farming Robot," *2021 4th International Symposium on Advanced Electrical and Communication Technologies (ISAECT)*, 2021, pp. 1-6, doi: 10.1109/ISAECT53699.2021.9668370

3.

4. **Nizar Tayem**, Ahmed A Hussain, Vinay Reddy Veramareddy, and Soliman Abdel-Hamed ,

"Propagator Rooting Method Direction of Arrival Estimation Based on Real Data," IEEE MILCOM 2021,San Diego, CA, November 28-Decmber 2.

5. **Nizar Tayem**, Srdan Budimir , Vinay Reddy Veramareddy, and Ahmed A Hussain, "Capon Root-MUSIC-like Direction of Arrival Estimation Based on Real Data," 93th IEEE Vehicular Technology Conference , 27 - 30 September 2021.

6. Ahmed A Hussain, **Nizar Tayem**, and Soliman Abdel-Hamed, "Computationally Efficient Forward/backward Averaged DOA Estimation of Coherent Sources in Pairs," 93th IEEE Vehicular Technology Conference, 27 - 30 September 2021.

7. A. A. Hussain, **N. Tayem** and A. -H. Soliman, "FPGA Hardware Implementation of Computationally Efficient DOA Estimation of Coherent Signals," The 2021 IEEE 10th International Conference on Radar, Antenna, Microwave, Electronics and Telecommunications (ICRAMET) , November 23rd - 24th, 2021

8. **Nizar Tayem**, "QR decomposition and Parallel Factor-based Model for Two-Dimensional Direction of Arrival Angle Estimation", IEEE Asilomar Conference on Signals, Systems, and Computers, November 1-4, 2020, California, USA.

9. Ahmed A. Hussain, **Nizar Tayem**, Jamal Nayfeh, Samir El Nakla," Undergraduate Engineering Program Assessment, Evaluation, and Continuous Improvement Process: A Case Study," Engineering Engineering Education (E3): Innovations in the Classroom and Beyond" April 2020

10. Ahmed A Hussain, **N Tayem**, C Yahya, S Alhuwaidi, J Nayfeh," Quality Assurance of Capstone Senior Design Projects: A Case Study," American Society for Engineering Education (ASEE) Virtual Conference, July 2020

11. **N. Tayem**, Nadar Sawalhi, Suri Ganriwala," Harmonic Estimation Employing QR factorization and Power Spectral Density for fault detection in Induction Motor," Machineryfailure Prevention technology 2018, Virginia beach, Virginia

12. Ahmed A. Hussain**, N. Tayem**, Abdel-Hamid Soliman "LDL Decomposition-based Real-time FPGA Implementation of DOA Estimation." Accepted at IEEE Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, November 2018.

13. **N. Tayem**, "Partial Data Matrix DOA Estimation without Eigenvalue Decomposition", International Conference on Digital Signal Processing Kuala Lumpur, Malaysia April 17-19, 2017

14. Nadar Sawalhi, **N. Tayem**, Suri Ganriwala,"Fault detection and health monitoring using motorcurrent signature analysis Compared to Vibration Analysis ," Machinery failure Prevention technology 2018, Virginia beach, Virginia

15. **N. Tayem**, M. Omer, A. Abul Hussain , "DOA Estimation Method using R Matrix of the QR Factorized Data and its Prototype Implementation on NI-PXI Platform," IEEE MILCOM 2014,Baltimore, MD

16. **N. Tayem**, M. Omer, A. Abul Hussain , "Hardware Implementation of MUSIC and ESPRIT onNI-PXI Platform," IEEE MILCOM 2014, Baltimore, MD

17. Syed A. Raza and **Nizar Tayem**, *"Direct and Parallel QR Based Subspace Decomposition Methods for System Identification"*, International Conference on Industrial Automation, Information and Communications Technology, Bali, 28-30th August 2014.

18. **N. Tayem**, M. Omer, H. Gami, Jamal Nayfeh "QR-TLS ESPRIT for Source Localization and Frequency Estimations." IEEE Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, November 2013.

19. **N. Tayem**, M. Omer , S. A. Raza, J. Nayfeh, Mohamed El-Lakkis, " Parallel TSQR-TLS and

QR-TLS factorization for Joint Time Delay and Frequency Estimation." IEEE Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, November 2013

20. **Nizar Tayem**, "2 D DOA estimation for multiple coherent sources using a new antenna array configuration," IEEE Military communication conference, Orlando, Florida, November. 2012

21. **Nizar Tayem**, " QRC-ESPRIT for Wideband Signals, Second International Conference on Advances in Information and Communication Technologies, Amsterdam, Netherlands, Dec 2011.

22. **Nizar Tayem** ,Champike attanaayake, and Ayodele Abatan, " Range and Bearing Estimation for Near-Field Sources," IEEE Vehicular Technology Conference Fall, Ottawa , Canada, September 2010.

23. Gami H., Qasaymeh M., **Tayem N.**, R. Pendse, M. Sawan, "Efficient Structure-Based Carrier Offset Estimator for OFDM System," IEEE Vehicular Tech. Conf., Barcelona, Spain, Apr 26-29, 2009.

24. Qasaymeh M., Gami H., **Tayem N.**, R. Pendse, M. Sawan, "Time Delay Estimator for Frequency Hopping System without Eigen Decomposition," IEEE Vehicular Tech Conf, Barcelona, Spain,Apr 26-29, 2009.

25. Qasaymeh M., Gami H., **Tayem N.**, R. Pendse, M. Sawan, "Rank Revealing QR Factorization for Jointly Time Delay and Frequency Estimation," IEEE Vehicular Tech Conf, Barcelona, Spain, Apr 26-29, 2009.

26. Gami H., Qasaymeh M., **Tayem N.,** R. Pendse, M. Sawan, "Subspace-Based Blind CFO Estimation for OFDM by Exploiting Used Carriers," IEEE Sarnoff Sym., Princeton, NJ, Mar 30-Apr 1, 2009.

27. Shatnawi H., Gami H., Qasaymeh M., **Tayem N.**, M. Sawan, R. Pendse, "High Resolution JointTime Delay and Frequency Estimation," IEEE Sarnoff Sym., Princeton, NJ, Mar 30-Apr 1, 2009.

28. Gami H., Qasaymeh M., **Tayem N.**, R. Pendse, M. Sawan, "Semiblind Multiuser MIMO Channel Estimators using PM and RRQR methods," IEEE Conf on Comm. Network & ServicesResearch, New Brunswick, Canada, May 11-15, 2009.

29. Gami H., Qasaymeh M., **Tayem N.**, R. Pendse, M. Sawan, "Carrier Frequency Offset Estimatorfor Multicarrier Systems using Matrix Pencil Method", IEEE International conf. on Telecommunications, Marrakech, Morocco, May 25-27, 2009.

30. Qasaymeh M.M, Gami Hiren, **Tayem Nizar**, Ravi Pendse, and M. E. Sawan "Joint Time Delay and Frequency Estimation without Eigen-Decomposition" accepted in 42nd Annual Asilomar Conf. Signals, Systems Computers, Pacific Grove, CA Oct. 2008

31. Kareem Al Jabr, Hyuck M. Kwon, and **Nizar Tayem**, "Modified UCA-ESPRIT for EstimatingDOA of Coherent Signals Using One Snapshot," IEEE Vehicular Technology Conference, , Marina Bay, Singapore, 11–14 May 2008

32. Qasaymeh M., Gami H., **Tayem N.**, M. Sawan, R. Pendse, "Propagator Method for Joint Time Delay and Frequency Estimation," IEEE Conference on Signal, System & Computers, Pacific Grove, CA, Oct. 2008.

33. **N. Tayem** and M. Naraghi-Pour, " Unitary MUSIC algorithm for Source bearing estimation," IEEE Vehicular Technology Conference, Baltimore, MD, 30 September 3 October 2007

34. **N. Tayem** and M. Naraghi-Pour, "Propagator Method and Triangular Factorization for Source

Bearing Estimation," IEEE Military Communications Conference, Orlando, Florida, October 29-31 2007.

35. **N. Tayem** and M. Naraghi-Pour, "Fast algorithm for source localization in multipath environments," SPIE (The International Society for Optical Engineering) April 2007.

36. **Nizar Tayem** and M. Naraghi-Pour, "Unitary Root MUSIC and Unitary MUSIC with Real-Valued Rank Revealing Triangular Factorization," accepted at IEEE Military CommunicationsConference, Orlando, Florida, October 29-31 2007

37. A. Salameh **and N. Tayem**, "Conjugate MUSIC for non-circular signals" IEEE International Conference on Acoustics, Speech and Signal Processing 2006, Toulouse, France 14-19 May 2006.

38. **Nizar Tayem**, A. Salameh, and Hyuck M. Kwon, "Toeplitz based matrix Pencil for Non-Circular Signals" IEEE Vehicular Technology Conference 2006, Montréal, Canada, 25 – 28 September 2006.

39. **Nizar Tayem** and Hyuck M. Kwon, "Covariance Matrix Differencing for Coherent Sources DOA Estimation under Unknown Noise Field " IEEE Vehicular Technology Conference 2006,Montréal, Canada, 25 – 28 September 2006.

40. **N. Tayem** and A. Salameh, "DOA Estimation for non-circular sources under correlated noise field," ICT 13th International Conference on Telecommunications 2006, Funchal, Madeira Island, Portugal, 9-12 May 2006.

41. A. Salameh and **N. Tayem**,"Angle of Arrival Estimation for Non-Circular Signals" IEEE Sarnoff Symposium 2006, Princeton, New Jersey, 27-28 March 2006.

42. **Nizar Tayem** and Hyuck M. Kwon, Seunghyun Min and Donghee Kang, "Root MUSIC Transform Covariance Differencing for Correlated Sources under Unknown Symmetric ToeplitzNoise," International ITG - IEEE Workshop on Smart Antennas 2006, Reisensburg near Ulm, 13-14 March 2006.

43. A. Salameh, **Nizar Tayem**, and Hyuck M. Kwon, "Improved 2-D Root MUSIC for Non-CircularSignals"Fourth IEEE Workshop on sensor array and multi-channel processing 2006, Waltham, Massachusetts, 12-14 July 2006.

44. **Nizar Tayem** and Hyuck M. Kwon, and Yong H. Lee, "DOA Estimation for Coherent Sources with Spatial Smoothing without Eigendecomposition under Unknown Noise Field," IEEE GLOBECOM Conference 2005, St Louis, MO, November 28-December 2, 2005.

45. **Nizar Tayem** and Hyuck M. Kwon, "Transform Covariance Differencing Method for Correlated Sources under Unknown Symmetric Toeplitz Noise," IEEE Military Communications Conference, Atlantic City, New Jersey, October 17-20, 2005.

46. **Nizar Tayem**, Hyuck M. Kwon, and Yong H. Lee, "2-D DOA Estimation with No Failure," IEEE Vehicular Technology Conference 2005 Fall, Dallas, TX, September 25-28, 2005.

47. **Nizar Tayem** and Hyuck M. Kwon, Seunghyun Min and Donghee Kang, "FOA and 2-D DOA Estimation with Propagator Method," IEEE Vehicular Technology Conference 2005 Fall, Dallas, TX, September 25-28, 2005.

48. **Nizar Tayem**, Hyuck M. Kwon, "Arrival Angle Estimation of Correlated Sources with Unknown, Spatially Uncorrelated and Nonstationary Noise," IEEE AP-S International Symposium on Antennas and Propagation and USNC/URSI National Radio Science Meeting, paper number 2583, Washington, DC, USA on July 3-8, 2005.

49. **Nizar Tayem**, Hyuck M. Kwon, "Arrival Angle Estimation of Correlated Sources under

Unknown Noise of Hermitian Covariance Matrix," IEEE AP-S International Symposium on Antennas and Propagation and USNC/URSI National Radio Science Meeting, paper number 2905, Washington, DC, USA on July 3-8, 2005.

50. **Nizar Tayem** and Hyuck M. Kwon, "Angle Estimation with Propagator Method for CorrelatedSources under Unknown Symmetric Toeplitz Noise," The 18th Annual Canadian Conference on Electrical and Computer Engineering (CCECE05), Session TM22 Digital Signal Processing 3, Saskatoon Inn Saskatoon, Saskatchewan, Canada, May 1-4, 2005.

51. **Nizar Tayem** and Hyuck M. Kwon, "2-D DOA Estimation with Propagator Method for Correlated Sources under Unknown Symmetric Toeplitz Noise," IEEE Vehicular Technology Conference 2005-Spring, Stockholm, Sweden, May 30 -June 2, 2005.

52. **Nizar Tayem** and Hyuck M. Kwon, "L-Shape 2-Dimmensional Arrival Angle Estimation withPropagator Method," IEEE Vehicular Technology Conference 2005-Spring, Stockholm, Sweden, May 30 - June 2, 2005.

53. **Nizar Tayem** and Hyuck M. Kwon, "2-D Directional of Arrival Angle Estimation Non-Based on the Eigen Structure Approach," IEEE Vehicular Technology Conference 2004-Fall, Los Angeles, CA, September 26-29, 2004.

54. **Nizar Tayem** and Hyuck M. Kwon, "CONJUGATE ESPRIT (C-SPRIT)," IEEE Military Communications Conference, Boston, MA, pp. 1155 - 1160, Vol. 2, October 13-16, 2003.

CO-ADVISOR PH.D. DISSERTATIONS

- Hiren Gami Ph.D., employed at Miami University Middletown, Ohio
- Mahmoud M. Qasaymeh Ph.D., employed at Tafila Technical University, Jordan
- Ahmed Abul Hussain, currently Ph.D. student at Staffordshire University

RESEARCH CITATIONS

My publications have been **cited 991 times**, according to information on the Google scholar website: **https://scholar.google.com/citations?user=R9Z-glOAAAAJ&hl=en**

INDUSTRIAL CASE STUDIES

National Instruments published my case studies on their website:

- **Nizar Tayem ,** Ahmed Abul Hussain**,** "Real-time Implementation for DOA Estimation Methods on NI-PXI Platform**,** July 2015**,** http://sine.ni.com/cs/app/doc/p/id/cs-17309?nisrc=RSS-pxi-en
- **Nizar Tayem**, Ahmed Abul Hussain ,Abdel-Hamid Soliman" FPGA Hardware Implementation and Experimental Verification of Direction-of-Arrival Estimation Algorithm Using LU Decomposition, July 2018, http://sine.ni.com/cs/app/doc/p/id/cs-17700
- **Nizar Tayem**,"FPGA-Based Real-Time Implementation for Direction of Arrival Estimation Algorithm Using QR Decomposition, October 2017 http://sine.ni.com/cs/app/doc/p/id/cs-17614#

INTERNATIONAL PATENTS

1. **Nizar Tayem,** Kwon Hyuck, Min Seung Hyun, Kang Dong Hee,: Antenna apparatus for estimating direction of arrival and frequency of arrival and estimating method thereof, using threearray antennas. Samsung Electronics July 2007: KR 1020060000682
2. Kwon Hyuck Moon,**Nizar Tayem**, Min Seung Hyun, Kang Dong Hee,: Method and an apparatus for estimating a DOA of a coherent source, to obtain a difference between forward/backward spatial smoothing and backward spatial smoothing covariance matrixes. Samsung Electronics September 2008: KR 1020070028560.

TECHNICAL REPORTS

- ☐ **Nizar Tayem**, Raja Balakrishnan, and Hyuck M. Kwon, "Smart Antenna for Future US Army Frequency-Hopping Communications Systems," US Army – DEPSCoR Final Progress Report,June 7, 2005, 263 pages
- ☐ **Nizar Tayem** and Mort Naraghi-Pour, "Unitary Root Music and Unitary Music with real valuedRank Revealing Triangular factorization," Wright-Patterson Air Force Base, OH 45433-7320, AFRL-RY-WP-TP-2010-1213, June 2010

RESEARCH FUND:

- ☐ GAR initiative Award 2022
- ☐ Member of First Responder UAS Triple Challenge research 2021 ($ 7500)
- ☐ AFRL Beyond 5G Challenge 2022/2023 ($ 6000 equipment)
- ☐ AFRL Beyond 5G Challenge 2021/2022 ($ 6000 equipment)
- ☐ Member of First Responder UAS Triple Challenge research 2021 ($ 7500)
- ☐ **Nizar Tayem (PI),** 56,750 (SAR).' Real Time implementation of proposed QR decomposition DOA estimation method on NI-PXI platform and FPGA. Prince Mohammed bin Fahd University.
- ☐ **Nizar Tayem (PI),** 70,000 (SAR).' Hardware Implementation of Two-Dimensional Azimuth andElevation Angles Using Dual Polarized Antennas. Prince Mohammed bin Fahd University.
- ☐ **Nizar Tayem (PI),** 70,000 (SAR).' Wind Turbine Electricity Power System Analysis for Power Quality and Harmonics Estimation Using Signal-Processing Methods. Prince Mohammed bin Fahd University.

SIGNAL PROCESSING AND COMMUNICATION SYSTEMS RESEARCH LAB

This Lab covers a wide range of topics in Communications such as analog communication systems, digital communication systems, and Wireless and RF communications

Lab Link:

http://www.pmu.edu.sa/profiles/ntayem/Wireless-Communication-Signal-Processing-Research-Lab.html

Projects completed:

- Implemented Proposed Direction of Arrival Estimation (DOA) using NI PXI Platform hardware and LabVIEW software
- FPGA LabVIEW implementation for proposed Novel DOA Algorithms for Mobile communications, radar, and sonar applications
- Simulate and prototype advance wireless and RF communication systems