Omar Abu-Ella

Contact Information

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Education

Doctor of Science in Technology (D.Sc. in Tech.) degree in Telecommunication Engineering

- Research Topic: *Interference Mitigation Using Group Decoding in Multiantenna Systems.* University of Vaasa, Vaasa, Finland; 2014
- Adviser: Professor Mohammed Elmusrati
- Opponent: Professor Markku Juntti (University of Oulu)
- Pre-examiners: Professor Riku Jäntti, Aalto University, Finland, and Professor Majdi Ashibani, Chairman of Libyan Academy for Telecom and Informatics

Professional degree in Electrical Engineering

- Research Topic: *Group Decoding*
- Adviser: Professor Xiaodong Wang
  Columbia University in The City of New York, New York, NY, USA; 01/2010-05/2012

Master's degree in Electronics and Electrical Engineering

- Thesis Topic: *Hybrid Adaptive Beamforming Techniques for Mobile Cellular Systems*
- Adviser: Professor Bashir El-Jabu
- Higher Institute of Industry, Misurata, Libya 04/2004-08/2007

Bachelor's degree in Electronics and Electrical Engineering

- Thesis Topic: *Horn and Parabolic Antenna Design*
- Adviser: Professor Bashir El-Jabu
- Academy of Aero Studies and Science, Misurata, Libya 11/1997-09/2001

Training

- Course: *ENBRAIN Building Capacity in Rentable and Sustainable Energy for Libya*, co-funded by the Erasmus+ Programme of the European Union, coordinated by Politecnico di Torino, October 2019.
- Course: *Electrical Engineering Principles and Power Systems Equipment* at TQ Education and Training Ltd., Nottingham, United Kingdom. Misurata University, March 2003.

Research Interests and Experience

Wireless and Mobile Communications, Communications Theory, Signal Processing for Communications. Especially in topics related to low UAV communications, reconfigurable intelligent surfaces, non-orthogonal multiple access (NOMA), cell-free communication systems, massive MIMO, millimeter-wave communications, low-altitude platform communications, interference mitigation, software-defined radio, group decoding, cooperative multi-point (CoMP) systems, adaptive antennas, and beamforming.

Experience in Renewable Energy

Abu-Ella proposed and established the Department of Renewable Energy at the Libyan Academy of Postgraduate Studies in Misurata in 2017. He also developed the curriculum for the department's Master's program, with highly appreciated consulting from professional faculty who are experts in this field.

Work Experience

- **Vice Dean for Academic Affairs** at the Faculty of Engineering in Misurata University, since May May/2022 - August 2025.
- **Committee Member** for Drafting the Annual Excellence Award Bylaws for Faculty Members and Staff at Misurata University.

- **Head of Electrical and Electronics Engineering Department**, Misurata University, Libya, between August 2015 and February 2017.
- **Postgraduate Committee Member** at the faculty of engineering in Misurata University since March/2019 - Feb/2022.
- **Postgraduate Coordinator** of the Electrical and Electronics Engineering Department (October 2017 to present).
- **Associate professor** at the department of electrical and electronics engineering, Misurata University, Libya, since 12/2021.
- **Assistant professor** at the department of electrical and electronics engineering, Misurata University, Libya, from 12/2017 to 11/2021.
- **Lecturer** at the Department of Electrical and Electronics Engineering, Misurata University, Libya, from 03/2013 to 12/2017.
- **Assistant Lecturer** at the Department of Electrical and Electronics Engineering, Misurata University, Libya, from 09/2007 to 03/2013.
- **Adjunct Assistant Professor** at the Libyan Academy, 03/2021-07/2021.
- **Adjunct Assistant Professor** at The College of Industrial Technology, 03/2019-06/2019, 02/2021-04/2021.
- **Adjunct Lecturer** at The Civil Aviation College, Misratah, Libya, 09/2016-01/2017.
- **Adjunct Lecturer** at The Higher Institute of Industry, Libya, 09/2007-01/2008, 09/2012-07/2013.
- **Adjunct Lecturer** at Higher Institute of Technical Trainers, Libya, 09/2007-02/2008.
- **Teaching Assistant** at the Department of Electrical and Electronics Engineering, Misurata University, Libya, 03/2003-08/2007.

Publications

Book Chapters

ch2. **Abu-Ella, Omar Ali**, and Mohammed Salem Elmusrati. "Recent Trends for Interference Mitigation in Multi-Antenna Wireless Systems." Handbook of Research on Next Generation Mobile Communication Systems, edited by Athanasios D. Panagopoulos, IGI Global, 2016, pp. 66-84. https://doi.org/10.4018/978-1-4666-8732-5.ch004

ch1. **Omar Abu-Ella** and Bashir El-Jabu, *Adaptive Beamforming Algorithm Using a Pre-filtering System,* Aerospace Technologies Advancements, Book edited by Thawar T. Arif, ISBN: 978-953-7619-96-1, Publisher: InTech, Publishing date: January 2010, https://doi.org/10.5772/7167.

Journal Articles

j18. **Omar Abu Ella**, *A Hybrid Multi-Agent Reinforcement Learning Framework for Robust and Scalable RIS Control in 6G Networks*, to be submitted.

j17. **Omar Abu Ella**, *Performance Analysis of the Reconfigurable Intelligent Surfaces Systems with Imperfect Phase-Shift*, to be submitted.

j16. Fatma Balto and **Omar Abu Ella**, *Unmanned Aerial Vehicles Base Station: Performance Analysis in Wireless Communications*, to be submitted.

j15. **Omar Abu Ella**, *Performance Analysis of Double Reconfigurable Intelligent Surfaces Communication Systems*, submitted to Transactions on Emerging Telecommunications Technologies journal.

j14. Esra Alarbah, Saja Joha, Mona Abolifa, and **Omar Abu Ella**, *Performance evaluation of wireless communication systems assisted by intelligent reflecting surfaces*, (in Arabic: taqyim ada anzimat alaitisalat allaasilkiat almadeumat bitiqniat al'astuh aleakisat aldhakia), 2025. The International Journal of Engineering & Information Technology (IJEIT), 13(2), 27-31. https://doi.org/10.36602/ijeit.v13i2.539.

j13. **Omar Abu Ella**, *Performance analysis of the reconfigurable intelligent surfaces communication systems*, in Journal of Communications and Information Networks, vol. 9, no. 2, pp. 184-191, June 2024, doi: 10.23919/JCIN.2024.10582831.

j12. **Omar Abu Ella**, *On the capacity of multiple antenna systems*, Annals of Telecommunication, 79, 437–446 (2024). https://doi.org/10.1007/s12243-023-01000-6.

j11. **Omar Abu Ella**, *Exact capacity of downlink NOMA system*, Internet Technology Letters, 2022, ISSN:2476-1508, John Wiley & Sons, Ltd., e342, doi:10.1002/itl2.342.

j10. **Omar Abu Ella**, Khawla A. Alnajjar, *Mitigation Measures for Windfarm Effects on Radar Systems*, International Journal of Aerospace Engineering, vol. 2022, Article ID 1083717, 9 pages, 2022. https://doi.org/10.1155/2022/1083717.

j9. **Abu Ella, O.**, Elmusrati, M. *Achievable rate approximation for massive MIMO with limited number of interfering clients*, Telecommunication Systems 79, 463–479 (2022). https://doi.org/10.1007/s11235-021-00871-1.

j8. Fatema Baltu and **Abu-Ella, O.A.**, *Introduction to cell-free communication systems with massive MIMO*, The International Journal of Engineering and Information Technology, Vol. 8, No. 1, pp. 26-32, October 2021, ISSN 2410-4256.

j7. Mohammed Shabsheb, Majd Al-Islam Shabseb, and **Abu-Ella, O.A.**, *Challenges and Solutions for Next Generation of Millimeter Communication* (in Arabic), Almadar Journal for Communications, Information Technology, and Applications, Vol. 2, No. 1, pp. 8-17, April 2016, ISSN 2411-3344.

j6. Ahmed Aljerrai, Ismail Ehtibah, and **Abu-Ella, O.A.**, *Interference Alignment for Multi-User MIMO Systems* (in Arabic), Almadar Journal for Communications, Information Technology, and Applications, Vol. 1, No. 1, pp. 36-44, April 2015, ISSN 2411-3344.

j5. **Abu-Ella, O.A.**; Elmusrati, M., *Recent Techniques to Cancel and Mitigate Interference in Wireless Communication Systems* (in Arabic), Almadar Journal for Communications, Information Technology, and Applications, Vol. 1, No. 1, pp. 9-19, April 2015, ISSN 2411-3344.

j4. **Abu-Ella, O.A.**; Elmusrati, M., *Interference Mitigation Using Optimal Successive Group Decoding for Interference Channels*, Almadar Journal for Communications, Information Technology, and Applications. July 2014, 1:1, pp. 37-54.

j3. **Abu-Ella, O.A.**; Wang, X., *Large-scale multiple-input–multiple-output transceiver system*, IET Communications, Vol. 7, Issue 5, 26 March 2013, pp. 471-479, doi: 10.1049/iet-com.2012.0471.

j2. Gong, C.; **Abu-Ella, O.A.**; Wang, X.; Tajer, A., *Constrained Group Decoder for Interference Channels,* Journal of Communications, Vol. 7, No. 5 (2012), pp. 382-390, May 2012, doi:10.4304/jcm.7.5.382-390.

j1. **Abu-Ella, O.A.**; El-Jabu, B., *Increasing capacity of blind mobile system using pre-filtering technique,* Microwaves, Antennas and Propagation, IET, Vol. 2, No. 5, pp. 459-465, August 2008.

Conference Papers

c17. **Omar Abu Ella**, *Massive MIMO: In which Side Should It Be to Achieve The Highest Capacity?,* IEEE 2nd International Maghreb Meeting of the Conference on Sciences and Techniques of Automatic Control and Computer Engineering (MISTA 2022), Sabratha, Libya, May 2022.

c16. Saifeleslam Meftah, Ibrahim Almsimit, **Abu-Ella, O.A.**, *Evaluation of the performance of non-orthogonal multiple access (NOMA) technology in the downlink*, (in Arabic), The Fourth International Conference on Technical Science, Tripoli, Libya, 2021.

c15. **Abu-Ella, O.A.**, *New Design Rules to Improve Helical Antenna Performance*, 2021 IEEE Microwave Theory and Techniques in Wireless Communications (MTTW), Riga, Latvia, 2021, pp. 248-252. doi: 10.1109/MTTW53539.2021.9607134.

c14. **Abu-Ella, O.A.**, A. Anairia, and M. Zubia, *Pathloss Modelling for Next Generation of Millimeter-Wave Communications,* 2021 IEEE 1st International Maghreb Meeting of the Conference on Sciences and Techniques of Automatic Control and Computer Engineering MI-STA, Tripoli, Libya, 2021, pp. 776-781. doi: 10.1109/MI-STA52233.2021.9464521.

c13. Mohammed Almagrhy and **Abu-Ella, O.A.**, *Low Altitude Platform Communications (in Arabic)*, International Conference on Technical Science (ICTS2019), 4-6 March 2019, Tripoli, Libya.

c12. Anas Iwhida, Mohamed Kablan, and **Abu-Ella, O.A.**, *Massive MIMO Modeling for the Next Generation Wireless Communication Systems*, Libyan International Conference on Electrical Engineering and Technologies (LICEET 2018), 4-6 March 2018, Tripoli, Libya.

c11. Ahmed Anairia, Mohammed Zubia, and **Abu-Ella, O.A.**, *Pathloss Modeling for 5G Millimeter Wave Communications (in Arabic)*, Libyan International Conference on Electrical Engineering and Technologies (LICEET 2018), 4-6 March 2018, Tripoli, Libya.

c10. **Abu-Ella, O.A.**; Elmusrati, M., *Impact of Imperfect Channel Estimation on Successive Group Interference Cancellation Techniques*, The 2nd World Symposium On Computer Networks and Information Security 2015, (WSCNIS'2015), 19-21 Sep 2015, Hammamet, Tunisia.

c9. **Abu-Ella, O.A.**; Elmusrati, M., *Capacity Approximation of Massive MIMO with Optimal Successive Group Decoding System.* 2014 Eighth International Conference on Next Generation Mobile Applications, Services, and Technologies. University of Oxford, Oxford, UK. Sep 2014, pp. 254-259.

c8. **Abu-Ella, O.A.**; Elmusrati, M., *Optimal Successive Group Decoding to Mitigate Interference in Wireless Systems.* Distributed Computing in Sensor Systems (DCOSS), 2014 IEEE International Conference on. Marina Del Rey, CA, USA. May 2014, pp. 322-326.

c7. **Abu-Ella, O.A.**; Elmusrati, M., *Partial Constrained Group Decoding: A New Interference Mitigation Technique for the Next Generation Networks.* New Technologies, Mobility, and Security (NTMS), 2014 6th International Conference on. Zayed University, Dubai, UAE. March 2014, pp. 1-5.

c6. **Abu-Ella, O.A.**; Wang, X., *Interference Mitigation via Constrained Partial Group Decoding for Uplink Multicell MIMO Systems*, International Conference on Electronics and Communication Engineering (ICECE 2013), World Academy of Science, Engineering and Technology, Issue 78, 20-21 June 2013, Istanbul, pp. 1810-1813.

c5. **Abu-Ella, O.A.**; El-Jabu, B., *Optimal Robust Adaptive LMS Algorithm without Adaptation Step-Size,* Millimeter Waves, 2008, GSMM 2008, Global Symposium on, pp. 249-251, 21-24 April 2008.

c4. El-Jabu, B.A.; Srar, J.A.; **Abu-Ella, O.A.**, *Beamforming in Tight Specifications Environment using Generalized Minimum Mean Error (GMME) Algorithm,* Aerospace Conference, 2007 IEEE, pp. 1-7, 3-10 March 2007.

c3. Srar, J.A.; **Abu-Ella, O.A.**; El-Jabu, B.A., *Beamforming in Tight Specifications Environment,* Aerospace Conference, 2007 IEEE, pp. 1-6, 3-10 March 2007.

c2. **Abu-Ella, O.A.**; El-Jabu, B.A., *Performance Improvement of Blind Adaptive Beamforming Algorithms Using Pre-filtering Technique,* Aerospace Conference, 2007 IEEE, pp. 1-4, 3-10 March 2007.

c1. Jebril Eljaroshi; **Abu-Ella, O.A.**, *The Strategic Importance of Technological Cities to Developing Countries and Their Role in Supporting and Settling Advanced Technologies* (in Arabic), Technical Cities Symposium, The National Office of Research and Development, Qaser Ben Ghashir, Tripoli, Libya, 6-7 October 2003.

Awards & Honers

- Top of class (1999/2000 & 2000/2001)
- Libyan Ministry of Higher Education Scholarship (2007)
- Recognized for contributions to establishing the Faculty of Engineering, Misurata University (2005)
- Honored (Aug 2025) for leadership achievements as Vice Dean (2022–2025).

Professional Affiliations

- Was IET, Member, 2007.
- Member of the American Association for Science and Technology (AASIT, 2015)
- IEEE, Member for more than ten years, 2006.

Service

Editorial Board membership: Almadar Journal for Communications, Information Technology, and Applications (AJCITA, ISSN 2313- 156X).
TPC member: ISWTA2012, ISWTA2014.
Reviewer: IEEE Transaction on Wireless Communications, IEEE Transaction on Vehicular Technology, IEEE Journal of Selected Areas on Communications, IEEE Communications Letters, IEEE Wireless Communications Letters, IEEE Antennas and Wireless Propagation Letters, IEEE Transactions on Vehicular Technology, IET Communications, IET Networks, International Journal of Physical Sciences (IJPS), Wireless Networks (WINE), IET Electronics Letters.
Several Conferences: IEEE ISWCS, IEEE JSTSP, IEEE VTC, ICC, ICASSP, ICSPCS, ISWPC, ISWCS, SPAWC, MILCOM, WCNC, MIC-CCA, TCOM-TPS, ISWTA.

Teaching Experience

Lecturing: Undergraduate

- Signals and Systems
- Communication Systems
- Communication Systems: Simulation and Modeling, Computer Lab.
- Communication Theory I
- Computer Application and Design Laboratory
- Wireless Communications
- Optical Fiber Communications
- Electromagnetic Fields I
- Antenna Theory
- Electrical Measurements and Instrumentation
- Physics II
- Numerical Analysis
- MATLAB Basics

Lecturing Postgraduate

- Next Generation of Wireless Systems
- Multiple Antenna Systems
- Numerical Analysis

Teaching Assistant

- Mathematics I
- Numerical Analysis Using MATLAB
- Linear Systems
- Electronics II
- Automatic Control
- Simulation of Communication Systems Lab.

Training Courses

- Instructor of several intensive MATLAB courses for faculty members, graduate students, and undergraduate students in several institutions.

Master's Thesis Supervision

- Next Generation Communication Systems with Unmanned Aerial Vehicles (UAV)
- Deep Learning-Aided Reconfigurable Intelligent Surfaces (RIS)
- Service-Oriented Network Slicing for The Next Generation of Mobile Networks (NGMN)
- Cell-Free Massive Multiple Input Multiple Output (CF mMIMO) for Next Generation of Wireless Communications
- Reconfigurable Intelligent Surfaces (RIS) for Next Generation of Wireless Communications
- Low Earth Orbit Satellite (LEOs) in Next Generation of Communications
- Study and Development of Long-Range Radars: P18 as An Example

Activities

- Member of the organizing committee of the Engineering Day Event at the Engineering Faculty at Misurata University for several years.
- Coordinator of the election committee of the engineering faculty syndicate at Misurata University, 2016.
- Chair of Electrical and Electronics Engineering Symposium (EEES-2016), Misurata University, Libya.
- Member of the organizing committee of several local and national engineering conferences in Libya.
- Member of the Telecommunication Research Team in the Engineering College, Misurata University.
- Member of the Adaptive Antenna Research Team in the College of Industrial Technology.
- Member of several academic curriculum development committees.
- Member of several examination committees.

References

Available upon request