

Professional Address

Electronics and Communication Engineering Department,
Arab Academy for Science, Technology and Maritime Transport,
Smart Village, Giza, Egypt

Personal Address

Sheikh Zayed Distinct, Giza, Egypt
+20-1224442136

Mohamed Abaza
Head of Electronics and Communication
Engineering Department
(Professor, Ph.D. Digital Communications)
mohamed.abaza@aast.edu

Education

October 2012 - December 2015: Ph.D. in Digital Communications, l'Université de Bretagne Occidentale, Brest, France.

Thesis Title: Cooperative MIMO Techniques for Outdoor Optical Wireless Communication Systems.

Supervisors:

Prof. Ali Mansour, ENSTA Bretagne, Brest, France.

Dr. Raed Mesleh, German Jordanian University, Jordan.

Grade: Tres Honorable

October 2009 – March 2012: Master of Science, Electronics and Communications Engineering, Arab Academy for Science, Technology & Maritime Transport (AAST), Cairo, Egypt.

Thesis Title: Performance Analysis of Free-Space Optical Communication Systems in Turbulent Channels.

Supervisor: Prof. Moustafa Hussien, AAST, Egypt.

Grade Point Average (GPA): 4.00/4.00

September 2004 – July 2009: Bachelor of Science, Electronics and Communications Engineering, AAST, Cairo, Egypt.
Excellent with Honor, GPA 3.89/4.00

Language

- Arabic: Mother Tongue
- English: Fluent
- French: Fair

Computer Skills

- Microsoft Office and Latex.
- Maple and MATLAB/Simulink.
- Pspice

Teaching Experience

- (January 2024 – Present) **Professor: Electronics and Communications Engineering, AAST, Giza, Egypt.**
- (January 2020 – December 2023) **Associate Professor: Electronics and Communications Engineering, AAST, Giza, Egypt.**
- (January 2016 – December 2019) **Assistant Professor: Electronics and Communications Engineering, AAST, Giza, Egypt.**
- (September 2009 – December 2012) **Teaching Assistant and Research Assistant: Electronics and Communications Engineering, AAST, Cairo, Egypt.**

I. Teaching Courses Expertise (undergraduate courses)

- Optical Communications
- Measurement & Instrumentations
- Electronic Materials
- Introduction to Communication Systems
- Statistical Communication Theory
- Introduction to Digital Communications
- Advanced Communication Systems
- Signals and Systems

II. Teaching Courses Expertise (postgraduate courses)

- Optical Communications
- Advanced Digital Communications
- Communications Seminar

III. Student Projects

- Free-Space Optical Communications Hardware Demonstrator
- Smart Museum Using Visible Light Communications
- Vehicle to Vehicle Optical Communications
- Underwater Wireless Optical Communications

IV. Faculty Mobility

- Laboratoire IPCMS, Université de Strasbourg, Strasbourg, France (27-11-2017 to 1-12-2017).

- Telecommunication Department, University of Vigo, Vigo, Spain (30-9-2018 to 6-10-2018).
- ETS Ingeniería Industrial y de Telecomunicación, Universidad Pública de Navarra, Pamplona, Spain (20-1-2019 to 26-1-2019).
- Laboratoire IPCMS, Université de Strasbourg, Strasbourg, France (24-2-2019 to 2-03-2019).

Top Management Positions

- (February 2024-Present) Assistant Dean of Quality Assurance and Accreditation Center
- (November 2020-Present) Head of Electronics and Communication Engineering Department for Smart Village Campus, Giza, Egypt.
- (November 2019 – Present) Head of Quality Unit for Smart Village Campus, Giza, Egypt.
- (November 2019-February 2021) Head of Computer Engineering Department for Smart Village Campus, Giza, Egypt.

Administrative Skills

- I. IEEE AAST Smart Village Student Branch Counselor (Jan 2018-Present)
- II. Abet Coordinator for the College of Engineering and Technology-Arab Academy-Smart Village (June 2020-Present)
- III. Head of Schedule Committee of the Campus
- IV. Head of Supreme Council Committee of the Campus
- V. Head of Website Development of the Campus
- VI. Head of Training Committee of the College of Engineering and Technology
- VII. Quality Assurance Committee Expertise
 - Apply and Confirm ABET Standards
 - Apply and Confirm Supreme Council of Egyptian Universities Standards
 - Apply and Confirm Strategic Plan of my University
- VIII. Student Academic Advisor
- IX. Development of Department Labs
- X. Course Coordinator of Communications and Computer Engineering Courses
- XI. Reviewer for the strategic plan for 6th October University in 2021.
- XII. Head of the Electronics and Communications Engineering Master Program

Research Interests

- Multiple-input multiple-output systems
- Relay-assisted cooperative communications
- Optical wireless communications
- Digital Communications

Publications

Books & Book Chapters

- [1] **M. Abaza**, R. Mesleh, A. Mansour, and H. Aggoune, "Cooperative MIMO and Multi-Hop Relaying Techniques for Free-Space Optical Communications: A Survey" Chapter in an IOP/Abook " Advanced Secure Optical Image Processing for Communications", Apr. 2018.
- [2] **M. Abaza**, N. Azzam, and M. Aly, Free-Space Optical Communication Systems in Turbulent Channels, Lambert Academic Publishing, Saarbrucken, Germany, May 2012.

Journals

- [1] H. Sadat , **M. Abaza**, A. Mansour and A. Alfalou,, "Performance Analysis of Power Allocation and User-Pairing Techniques for MIMO-NOMA in VLC Systems," photonics, vol. 11, no. 3, 2024.
- [2] Yasser Sobhy Farag, **Mohamed Abaza**, Ahmed Fawzy Daw "A Novel of Metamaterial Ultra Compact Reconfigurable Phase Shifter Based on Dual Composite Right Left Handed Structure (D-CRLH)," Progress In Electromagnetics Research M, vol. 123, Jan. 2024.
- [3] Suzan M El-Garhy, Ashraf AM Khalaf, **Mohammed Abaza**, Moustafa H Aly "Intelligent transportation system using wireless optical communication: a comparative study," Optical and Quantum Electronics, vol. 56, Feb. 2024.
- [4] M. ElShabasy, **M. Abaza**, M. F. Abo Sree, and A. Fawzy "EC-MAC: Energy-Aware Cooperative MAC Protocol in Wireless Sensor Network," Journal of Advanced Research in Applied Sciences and Engineering Technology, accepted.

- [5] A. Refaai, F. Newagy, M. F. Abo Sree, H. Elhennawy, M. H Aly and **M. Abaza** “Cooperative relay orbital satellite optical communication under turbulent channels: Performance analysis,” *Optics & Laser Technology*, vol. 161, June 2023.
- [6] A. Refaai, F. Newagy, M. F. Abo Sree, H. Elhennawy, M. H Aly and **M. Abaza** “Uplink serial relay laser satellite communication over turbulent channel: performance analysis,” *Optical and Quantum Electronics*, vol. 55, December 2022.
- [7] S. M. EL-Garhy, A. A. M. Khalaf, M. H Aly and **M. Abaza**, “Intelligent transportation: a hybrid FSO/VLC-assisted relay system,” *Opto-Electronics Review*, vol. 30, no. 4, December 2022.
- [8] I. Zakaria, **M. Abaza**, M. Fedawy, and M. H Aly, “Performance analysis of hybrid free space optical and visible light communications for underwater applications using spatial diversity,” *Optical and Quantum Electronics*, vol. 54, August 2022.
- [9] R. Ali, H. Eassa, H. H. Aly, **M. Abaza** and S. M. Eisa, “Low Power FPGA Implementation of a Smart Building Free Space Optical Communication System,” *Photonics*, vol. 9, no. 6, 2022.
- [10] A. Refaai, F. Newagy, M. F. Abo Sree, H. Elhennawy, M. H Aly and **M. Abaza** “Performance analysis of serial relay orbital satellite optical communication over turbulent channels,” *Optics Letter*, vol. 47, no. 11, pp. 2887-2890, June 2022.
- [11] A. S. Alatawi, Albashir A. Youssef, **M. Abaza**, M. Ammad Uddin and A. Mansour, “Effects of Atmospheric Turbulence on Optical Wireless Communication in NEOM Smart City,” *Photonics*, vol. 9, no. 4, 2022.
- [12] H. Sadat , **M. Abaza**, A. Mansour and A. Alfalou,” A Survey of NOMA for VLC Systems: Research Challenges and Future Trends,” *Sensors*, vol. 22, no. 4, 2022.
- [13] A. A. Youssef, **M. Abaza**, and A. S. Alatawi, “LDPC Decoding Techniques for Free-Space Optical Communications,” *IEEE Access*, vol. 9, Sep. 2021.
- [14] M. M. Tawfik, M. F. Abo Sree, **M. Abaza**, and H. H. M. Ghouz,” Performance Analysis and Evaluation of Inter-Satellite Optical Wireless Communication System (IsOWC) from GEO to LEO at Range 45000 Km,” *IEEE Photonics Journal*, vol. 13, no. 4, Aug. 2021.

- [15] Y. Osman, M. Fedawy, **M. Abaza**, M. H. Aly ,” Optimized CIGS based solar cell towards an efficient solar cell: impact of layers thickness and doping,” *Optical and Quantum Electronics*, vol. 53, no. 253, Apr. 2021.
- [16] A. Jaiswal, **M. Abaza**, M. R. Bhatnagar and R. Mesleh,” Multipoint-to-Multipoint Cooperative Multiuser SIM Free-Space Optical Communication :A Signal-Space Diversity Approach,” *IEEE Access*, vol. 8, Aug. 2020.
- [17] H. Sadat , **M. Abaza**, S. Gasser and H. ElBadawy ,” Performance Analysis of Cooperative Non-Orthogonal Multiple Access In Visible Light Communication,” *Applied Sciences*, vol. 9, no. 19, Sep. 2019.
- [18] M. Taher, **M. Abaza**, M. Fedawy and M. H. Aly,” Relay Selection Schemes for FSO Communications over Turbulent Channels,” **Applied Sciences**, vol. 9, no. 7, Mar. 2019.
- [19] M. Elbawab, **M. Abaza**, and M. H. Aly,” Blind Detection for Serial Relays in Free Space Optical Communication Systems,” **Applied Sciences**, vol. 8, no. 11, Oct. 2018.
- [20] A. Jaiswal, **M. Abaza**, M. R. Bhatnagar, and V. K. Jain,” An Investigation of Performance and Diversity Property of Optical Space Shift Keying Based FSO-MIMO System,” **IEEE Transactions on Communications**, vol. 66, no. 9, pp. 4028 - 4042, Sep. 2018.
- [21] A. Refaai, M. Abaza, M. S. El-Mahallawy, and M. H. Aly,” Performance analysis of multiple NLOS UV communication cooperative relays over turbulent channels,” **Optics Express**, vol. 26, no. 16, pp. 19972-19985, Aug. 2018.
- [22] A. Mansour, R. Mesleh, and **M. Abaza**, "New Challenges in Wireless & Free Space Optical Communications," **Optics and Lasers in Engineering**, vol. 89, pp. 95–108, Feb. 2017.
- [23] **M. Abaza**, R. Mesleh, A. Mansour, and E.-H. M. Aggoune, “Performance analysis of space shift keying over negative exponential and log-normal FSO channels,” **Chinese Optics Letters**, vol. 13, no. 5, May 2015.

- [24] **M. Abaza**, R. Mesleh, A. Mansour, and E.-H. M. Aggoune, "Performance Analysis of MISO Multi-Hop FSO Links Over Log-Normal Channels with Fog and Beam Divergence Attenuations," **Elsevier Optics Communications**, vol. 334, pp. 247–252, Jan. 2015.
- [25] **M. Abaza**, R. Mesleh, A. Mansour, and E.-H. M. Aggoune, "Diversity techniques for a free-space optical communication system in correlated log-normal channels," **SPIE Optical Engineering**, vol. 53, no. 1, pp. 1–6, Jan. 2014.
- [26] A. Tamam, M. Ben-Esmael and **M. Abaza**, "Current feedback op-amp utilizes new current cell to enhance the CMRR", **Journal of Circuits, Systems and Computers**, vol. 21, no. 5, May, 2012.
- [27] **M. Abaza** and K. Kiasaleh, "Erratum to Performance of APD-Based, PPM Free-Space Optical Communication Systems in Atmospheric Turbulence", **IEEE Transactions on Communications**, vol. 59, no. 9, pp. 2638-2639, September 2011.
- [28] N. Mohammed, **M. Abaza**, and M. Aly, "Improved Performance of M-ary PPM in Different Free-space Optical Channels due to Reed Solomon Code Using APD", **International Journal of Scientific & Engineering Research**, vol. 2, no. 4, pp. 82-85, April 2011.

Conferences

- [1] H. Sadat, **M. Abaza**, A. Mansour and A. Alfalou, " Power Allocation Techniques for Non-orthogonal Multiple Access Based MIMO Visible Light Communication Systems," 2023 8th International Conference on Signal and Image Processing (ICSIP), Wuxi, China, Jul. 8-10, 2023, pp. 930-934.
- [2] N. A El-Baz, **M. Abaza**, M. K Shehata, M. S El Mahallawy, " Car to Car hybrid Radio Frequency and Visible Light Communication Through Multi-hop Relaying," 4th Global Power, Energy and Communication Conference (GPECOM), Nevsehir, Turkey, Jun. 14-17, 2022, pp. 591-595, doi: 10.1109/GPECOM55404.2022.9815613.
- [3] M. M. Tawfik, M. F. A. Sree, **M. Abaza** and H. H. M. Ghouz, "Inter-Satellite Optical Wireless Communication (IsOWC) System Analysis for Optimizing Performance

between GEO and LEO Satellites," 2021 International Telecommunications Conference (ITC), Alexandria, Egypt, Jul. 13-15, 2021, pp. 1-4, doi: 10.1109/ITC-Egypt52936.2021.9513901.

- [4] M. M. Tawfik, M. F. A. Sree, **M. Abaza** and H. H. M. Ghouz, "Performance Investigation of an Intersatellite Optical Wireless Communication (IsOWC) link Between Geostationary Orbit and Low Earth Orbit Satellites at Different Distances," Alexandria, Egypt, 2021 International Telecommunications Conference (ITC-Egypt), Jul. 13-15, 2021, pp. 1-4, doi: 10.1109/ITC-Egypt52936.2021.9513954.
- [5] Y. Osman, M. Fedawy, **M. Abaza** and M. H. Aly, "Solar Cell Performance Enhancement with Optimized CIGS Absorber Bandgap and Buffer Layer," in **Proceedings of 4th International Conference on Advanced Technology and Applied Sciences**, Cairo, Egypt, Sep. 10-12, 2019, pp. 510-518.
- [6] **M. Abaza**, R. Mesleh, A. Mansour, and E.-H. M. Aggoune, "Relay selection for full-duplex FSO relays over turbulent channels," in **Proceedings of 16th IEEE International Symposium On Signal Processing and Information Technology**, Limassol, Cyprus, Dec. 12–14, 2016, pp. 103–108.
- [7] **M. Abaza**, R. Mesleh, A. Mansour, and E.-H. M. Aggoune, "The performance of space shift keying for free-space optical communications over turbulent channels," in **Proceedings of SPIE OPTO**, San Francisco, USA, Feb. 7–12, 2015.
- [8] **M. Abaza**, R. Mesleh, A. Mansour, and E.-H. M. Aggoune, "Spatial diversity for FSO communication systems over atmospheric turbulence channels," in **Proceedings of IEEE Wireless Communications and Networking Conference**, WCNC'14, Istanbul, Turkey, Apr. 6–9, 2014, pp. 382-387.
- [9] **M. Abaza**, R. Mesleh, A. Mansour, and E.-H. M. Aggoune, "Spatial diversity and multi hop in FSO communication over turbulence channels," in **Proceeding of 2nd Symposium on Wireless Sensor and Cellular Networks**, WSCN'13, Jeddah, Saudi Arabia, Dec. 13–16, 2013.
- [10] **M. Abaza**, R. Mesleh, A. Mansour, and A. Alfalou, "MIMO techniques for high data rate free space optical communication system in log-normal channel", in

Proceeding of the international conference on Technological Advances in Electrical, Electronics and Computer Engineering, TAECE, pages 1-5, Konya, Turkey, May 9-11, 2013.

- [11] **M. Abaza**, N. Mohammed, and M. Aly, “BER Performance of M-ary PPM Free-Space Optical Communications with Channel Fading”, in **Proceeding of the 8th international Conference on High Capacity Optical Networks & Enabling Technologies**, HONET 2011, Riyadh, Saudi Arabia, December 2011, pp. 111–115.

Graduates PhD Students

1. **Student Name:** Eng. Ali Mohamed Ali Refaai (Ain Shams University)
Thesis Title: Cooperative Optical Satellite Communication
Supervisors:
Prof. Hadia El Hennawy, Ain Shams University, Egypt
Prof. Dr. Moustafa Hussein Aly, AAST, Egypt.
Dr. Mohamed Fathy Abo Sree, AAST, Egypt.
Dr. Fatma Newagy, Ain Shams University, Egypt
Date: 9-10-2023
2. **Student Name:** Eng. Suzan ELGarhy (Minia University)
Thesis Title: ITS Application Using Visible Light Communication: Design and Performance Evaluation
Supervisors:
Prof. Dr. Moustafa Hussein Aly, AAST, Egypt.
Prof. Ashraf A.M. Khalaf, Minia University, Egypt.
Date: 25-1-2024

Graduates MSc Students

1. **Student Name:** Eng. Ali Mohamed Ali Refaai
Thesis Title: Performance Analysis of Multiple NLOS UV Communication Cooperative Relay Over Turbulent Channels
Supervisors:
Prof. Dr. Moustafa Hussein Aly, AAST, Egypt.
Prof. Dr. Mohamed S. El-Mahallawy, AAST, Egypt.
Date: 27-12-2018
2. **Student Name:** Eng. Mohamed Rabie Khalil Ibrahim Elbawab
Thesis Title: Blind Detection for Serial Relays in Free Space Optical Communication Systems
Supervisors:
Prof. Dr. Moustafa Hussein Aly, AAST, Egypt.
Date: 12-2-2019

3. **Student Name:** Eng. Menna Allah Mostafa Mahmoud
Thesis Title: Relay Selection Schemes for FSO Communications over Turbulent Channels
Supervisors:
Prof. Dr. Moustafa Hussein Aly, AAST, Egypt.
Dr. Mostafa Hassan Fedawy, AAST, Egypt.
Date: 5-8-2019
4. **Student Name:** Eng. Yasmina Hossam Ahmed Abdallah Osman
Thesis Title: Optimized Copper-Indium-Gallium-Diselenide Based Solar Cell Towards High Efficiency
Supervisors:
Prof. Dr. Moustafa Hussein Aly, AAST, Egypt.
Dr. Mostafa Hassan Fedawy, AAST, Egypt.
Date: 10-9-2019
5. **Student Name:** Hesham Sadat
Thesis Title: Performance Analysis of Cooperative Non-Orthogonal Multiple Access in Visible Light Communication
Supervisors:
Prof. Dr. Hesham ElBadawy, NTI, Egypt.
Dr. Safa Gasser, AAST, Egypt.
Date: 24-12-2019
6. **Student Name:** Mohamed Mohsen Tawfik Omar
Thesis Title: Performance Analysis and Evaluation of Inter-Satellite Optical Wireless Communication System (IsOWC) from GEO to LEO at Distance 45000 Km
Supervisors:
Prof. Dr. Hussein Ghouz, AAST, Egypt.
Dr. Mohamed Fathy Abo Sree, AAST, Egypt.
Date: 13-4-2022
7. **Student Name:** Rehab Ali Yehia
Thesis Title: FPGA-Based Implementation of an Optical Communication System for Smart Buildings
Supervisors:
Assoc. Prof. Saleh Eisa, AAST, Egypt.
Dr. Hesham Hamdy, AAST, Egypt.
Date: 16-7-2022

8. **Student Name:** Islam Zakaria Hussein Aly
Thesis Title: Performance Analysis of Hybrid System Free Space Optic with Fiber Optic link and Underwater Optical Wireless Communication Using Spatial Diversity over Underwater Turbulence
Supervisors:
Prof. Dr. Moustafa Hussein Aly, AAST, Egypt.
Dr. Assoc. Prof. Mostafa Fedawy, AAST, Egypt.
Date: 18-10-2022
9. **Student Name:** Nancy Elbaz
Thesis Title: Car to Car Hybrid Radio Frequency and Visible Light Communication Through Multi-Hop Relaying
Supervisors:
Prof. Dr. Mohamed El Mahallawy,, AAST, Egypt.
Dr. Assoc. Prof. Mohamed Shehata, AAST, Egypt.
Date: 26-10-2023

Awards

- Listed in Marquis Who's Who in the world 2012, 2014 and 2019.
- PhD project is funded by Sensor Networks and Cellular Systems (SNCS) Research Center, Tabuk University, Tabuk, Kingdom of Saudi Arabia 2012 and AAST, Egypt.
- AAST award for publishing in high ranked journals (2012 & 2017 & 2018 & 2019 & 2020 & 2021).
- Final Project Participation with Students: Design and Implementation of an Encryption Algorithm for SDR on an FPGA. (Selected by Information Technology Industry Development Agency (ITIDA) to be funded) (2010).
- AAST Master Degree tuition award (2009).

Posters

- a. D. Gamal, K. Shalaby, M. Sherif, S. Mohamed and **M. Abaza**. Testbed for Underwater Wireless Optical Communications. 36th National Radio Science Conference (NRSC2019), Port Said, Egypt, Apr. 9, 2019.

- b. **M. Abaza**, R. Mesleh and A. Mansour. Cooperative MIMO techniques for Indoor and Outdoor Wireless Optical Communication Systems. Telecom Bretagne, Brest, France, Jul. 4, 2013.
- c. **M. Abaza**, R. Mesleh, A. Mansour, and A. Alfalou. Free-Space Optical Communication Systems in Turbulent Channels. In Proceeding of WSCN, Tabuk, KSA, Dec. 15-18, 2012.

Research Experience

- **(December 2012 – August 2015) Research Assistant: Sensor Networks and Cellular Systems (SNCS) Research Center, University of Tabuk, Kingdom of Saudi Arabia.**
 - Organization Committee of the symposium of WSCN 2012, Tabuk, KSA from 15-18 December 2012.
 - Organization and technical Committee of the WSCN 2013, Jeddah, KSA from 13-16 December 2013.
 - Member of visible light communication research group.

Reviewer

He is serving as a reviewer for IEEE, SPIE, OSA, Elsevier and Hindawi Communication Society's journals. He is also a reviewer for many IEEE conferences. He has participated as an external reviewer for the regular competition of national fund for scientific and technological development (FONDECYT) of the Chilean national commission for scientific and technological research (CONICYT) of 2015. Dr. Abaza was selected as an outstanding reviewer for the ELSEVIER OPTICS COMMUNICATIONS in 2016.

Google Scholar

<https://scholar.google.com/citations?user=MNfgt0YAAAAJ&hl=en>

Publons

<https://publons.com/researcher/1556757/m-abaza/>

Membership

- | | |
|--|--------------|
| • Senior Member (2019), IEEE (USA). | ID: 90528174 |
| • Member, OSA (USA). | ID: 1020277 |
| • Egyptian Engineering Syndicate Member. | ID: 79/07298 |

References

1. **Prof. Moustafa Aly**
Professor of Engineering and Technology
AAST, Alexandria, Egypt
Tel: +20 (0) 100 6639 473
Email: moustafa.Hassan@aast.edu
2. **Prof. Ali Mansour**
Professor of IT communication lab
ENSTA Bretagne, Brest, France
Mobile: +33(0)750407150
Email: ali.mansour@ensta-bretagne.fr
3. **Prof. el-Hadi Aggoune**
Director of Sensor Networks & Cellular Systems (SNCS) Research Center
University of Tabuk, Kingdom of Saudi Arabia
Tel: +966 (0)543715777 & +966 (0)144261225
Email: haggoune@ut.edu.sa
4. **Prof. Raed Mesleh**
Dean, School of Electrical Engineering and Information Technology
Professor, Electrical and Communication Engineering Department
German--Jordanian University (GJU)
Tel: +962 (0) 796952199
Email: raed.mesleh@ieee.org
5. **Prof. Mona Fouad**
Academic Dean
Professor of Engineering and Technology
AAST, Smart Village, Egypt
Tel: +20 (0) 1001234411
Email: mona.moussa@aast.edu