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Google Scholar: <https://scholar.google.com/citations?user=-lwUSHsAAAAJ>

EXPERTISE

Biophotonics, Laser spectroscopy, Biomedical Optics, Nanophotonics, Optical Imaging, Biomedical Antennas.

UNIVERSITY EDUCATION

- 2018** **Doctoral degree in Engineering Applications of laser**, The National Institute of Laser Enhanced Sciences, Cairo University. Dissertation on “Improvement of tissue monitoring by diffuse optics using Different Analytical Methods”, Thesis advisor: Prof. Nahed H. Solouma
- 2013** **M.Sc. degree in Engineering Applications of laser**, The National Institute of Laser Enhanced Sciences, Cairo University. Dissertation on “Investigating a new technique for laser treatment of retinal disorders using a human phantom eye”, Thesis advisor: Prof. Nahed H. Solouma
- 2007** **Diploma degree in Engineering Applications of laser**, The National Institute of Laser Enhanced Sciences, Cairo University.
- 2005** **B.Sc., Systems & Biomedical Engineering Dept., Faculty of Engineering, Cairo university.**
Graduation Project: Designing 3-D Ultrasound Imaging system.
Final Grade: Very Good with honor.
Project Grade: Excellent.

PROFESSIONAL EXPERIENCE

- Nov. 2023** **Associate Professor (Full-time)**, Engineering Applications of Laser Department, The National Institute of Laser Enhanced Sciences, Cairo University.
- Feb. 2023** **Associate Professor (Part-time)**, School of Electronics, Communications and Computer Engineering, Egypt Japan University of Science and technology (EJUST). New Borg El-Arab, Alexandria, Egypt
- Sept. 2024** **Associate Professor (Part-time)**, Faculty of Engineering, October University for Modern Sciences & Arts (MSA), 6 October, Egypt
- Oct. 2018 - Oct. 2023** **Lecturer**, Engineering Applications of Laser Department, The National Institute of Laser Enhanced Sciences, Cairo University.
- Dec. 2018** **Supervisor**, The Biomedical Engineering Laboratory, Engineering Applications of Laser Department, The National Institute of Laser Enhanced Sciences, Cairo University.
- Feb. 2019 - April 2022** **Head of Unit**, Laser Safety Training Unit, Laser Technology Center "LTC", The National Institute of Laser Enhanced Sciences, Cairo University.

INSTITUTIONAL ACTIVITIES

Since 2023 to date	PhD Program Coordinator , Engineering Applications of laser Department, The National Institute of Laser Enhanced Sciences, Cairo University.
Since 2023 to date	Member , the National Institute of Laser Enhanced Sciences Committee for Research Ethics in Medical and Clinical Researches.
Summer 2023 & 2024	Organizing the summer training in the EAL department for under-graduate students of the Biomedical Engineering program, Egypt-Japan University for Science and Technology.
Academic year 2022-2023	Head of the Inventory Committee for the Biomedical Engineering Laboratory.
2021 to 2024	Membership in the Board of Directors of the Laser Technology Center, "LTC", The National Institute of Laser Enhanced Sciences, Cairo University.
Since 2020 to date	Examination Committee Member , Engineering Applications of laser Department, The National Institute of Laser Enhanced Sciences, Cairo University.
Since 2019 to date	Strategic Planning Coordinator , Quality Assurance Unit, The National Institute of Laser Enhanced Sciences, Cairo University.
2019	Membership in the organizing committee for the Institute's ICLA 10 Conference.
Academic year 2019-2020 & Dec. 2023 to date	Membership in the Council of the Department of Engineering Laser Applications, The National Institute of Laser Enhanced Sciences, Cairo University.
Academic years 2019-2020 & 2023-2024	Postgraduate Studies and Researches Committee Member , The National Institute of Laser Enhanced Sciences, Cairo University.
Academic years 2018-2019 & 2019-2020	Control Member , Engineering Applications of laser Department, The National Institute of Laser Enhanced Sciences, Cairo University.
2015	Participating in the preparation of course descriptions for EAL department courses in the 2016 internal postgraduate regulations. Participating in the establishment of the Biomedical Engineering Laboratory, Engineering Applications of Laser Department, The National Institute of Laser Enhanced Sciences, Cairo University.

HONOURS AND AWARDS

- 2022** Cairo University encouragement award 2022, Cairo University.
- 2018** Grand Prize Poster for best poster and snapshot, Hands-On Research in Complex Systems School, The Abdus Salam International Center for Theoretical Physics, ICTP, Trieste, Italy.
- 2007** Ideal Teaching Assistant, from Cairo University club.
- 2005** Ideal Female Student, Systems& Biomedical Engineering Dept. Faculty of Engineering, Cairo University

PUBLICATIONS

Peer reviewed (ISI) Journals

- 2024**
1. Ibrahim Abdelhalim, Aziza Ahmed Hassan, Salwa Abdelkawi, Salah Hassab Elnaby, Sahar Rahbar, Omnia Hamdy, ‘Solid-state laser (266 nm) as an alternative to ArF excimer laser (193 nm) for corneal reshaping: Comparative numerical study of the thermal effect’, International Journal for Numerical Methods in Biomedical Engineering, 40 (10), e3861.
 2. Rania M Abdelazeem, Omnia Hamdy, “A modified spatial frequency domain imaging configuration with reduced speckle noise images”, Journal of Optics.
 3. Zienab EL-Wasif, Tawfik Ismail, Omnia Hamdy “Optical transmission for precise discrimination of influenza A virus subtypes: a comprehensive study on light interaction and collimated transmittance”, Journal of Optics
 4. Asmaa K Abo-ELSouood, Haythem S Moharrum, Ahmed Abbas Zaky, Omnia Hamdy “Utilizing Laser-Induced Fluorescence to Evaluate the Efficiency of Carbon Dioxide and Diode Lasers in Dentin Sealing after Tooth Preparation: An in-vitro Study”, Journal of Fluorescence
 5. Ibrahim Abdelhalim, Aziza Ahmed Hassan, Salwa Abdelkawi, Salah Hassab Elnaby, Omnia Hamdy, “A modified flying-spot laser eye-surgery platform for hyperopic correction”, Optical and Quantum Electronics 56(7), 1268.
 6. Shimaa Mahdy, Omnia Hamdy, “THz radiation distribution for the identification of infiltrating ductal carcinoma in human breast model: a computational study”, Optical and Quantum Electronics 56, 831.
 7. Omnia Hamdy, Maha Nour, Sherien S Kamel, Elsayed Abdallah Eltayeb, Ahmed Abbas Zaky, Amna H Faid, “Enhanced laser-induced fluorescence and Raman spectroscopy with gold nanoparticles for the diagnosis of oral squamous cell carcinoma”, Discover Applied Sciences 6 (4), 157.
 8. Rasha Ahmed, Omnia Hamdy, Shaimaa Elattar, Amany Ahmed Soliman, “Improving human sperm motility via red and near-infrared laser irradiation: in-vitro study”, Photochemical & Photobiological Sciences 23(2), 377–385.
 9. Ashraf S Abdel Halim, Zienab Abdel-Salam, Mohamed Abdel-Harith, Omnia Hamdy, “Investigating the effect of changing the substrate material analyzed by laser-induced breakdown spectroscopy on the antenna performance”, Scientific Reports 14 (1), 1964
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- 2023**
10. Ibrahim Abdelhalim, Omnia Hamdy, Aziza Ahmed Hassan, Salwa Abdelkawi, Salah Hassab Elnaby “A modified model for laser-cornea interaction following the ablation effect in the laser eye-surgery”, Beni-Suef University Journal of Basic and Applied Sciences 12 (1), 101.
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11. Ashraf S Abdel Halim, Mohanad Mostafa, Omnia Hamdy, "Design and implementation of 3.2-GHz co-planar miniaturized antenna for s-band communication and wireless applications" *Wireless Personal Communications* 132 (3), 1887-1897.
12. Rasha Ahmed, Omnia Hamdy, Refaat Mostafa Awad, "Diagnostic efficacy of systemic immune-inflammation biomarkers in benign prostatic hyperplasia using receiver operating characteristic and artificial neural network", *Scientific Reports* 13 (1), 14801.
13. Ibrahim Abdelhalim, Omnia Hamdy, Mohamed A Khattab, Salwa Abdelkawi, Salah Hassab Elnaby, Aziza Ahmed Hassan, "Evaluating the efficacy of Nd: YAG fourth harmonic (266 nm) in comparison with ArF excimer (193 nm) in laser corneal reshaping: ex vivo pilot study", *International Ophthalmology* 43 (9), 3087-3096.
14. Nahed Solouma, Omnia Hamdy, "Ex Vivo Optical Properties Estimation for Reliable Tissue Characterization", *Photonics* 10 (8), 891.
15. Zienab El-Wasif, Tawfik Ismail, Omnia Hamdy, "Design and optimization of highly sensitive multi-band terahertz metamaterial biosensor for coronaviruses detection", *Optical and Quantum Electronics* 55 (7), 604.
16. Omnia Hamdy, Haitham S Mohammed, "Post-heating Fluorescence-based Alteration and Adulteration Detection of Extra Virgin Olive Oil", *Journal of Fluorescence* 33 (4), 1631-1639.
17. Dina Arabi, Omnia Hamdy, Mahmoud SM Mohamed, Zienab Abdel-Salam, Mohamed Abdel-Harith, "Discriminating two bacteria via laser-induced breakdown spectroscopy and artificial neural network", *AMB Express* 13 (1), 61.
18. Ahmed H Sheet, Omnia Hamdy, Mohamed Abdel-Harith, "Scattering and absorption properties modification of optically cleared skeletal muscles: an ex vivo study", *JOSA A* 40 (6), 1042-1050.
19. Nawroz Ismael Hassan, Yousif Maulood Hassan, Twana Ahmad Mustafa, Omnia Hamdy, "Modeling optical fluence and diffuse reflectance distribution in normal and cancerous breast tissues exposed to planar and Gaussian NIR beam shapes using Monte Carlo simulation", *Lasers in Medical Science* 38 (1), 96.
20. Shima Mahdy, Omnia Hamdy, Mohamed AA Eldosoky, Mohammed A Hassan, "Influence of Tumor Volume on the Fluence Rate Within Human Breast Model Using Continuous-Wave Diffuse Optical Imaging: A Simulation Study", *Photobiomodulation, Photomedicine, and Laser Surgery* 41 (3), 125-132.
21. Ahmed H Sheet, Rania M Abdelazeem, Omnia Hamdy, Mohamed Abdel-Harith, "Influence of laser beam aberrations compensation and spot size on the transmittance in native and optically cleared skeletal muscles", *Optik* 274, 170596.
22. Hala S Abuelmakarem, Omnia Hamdy, Mahmoud A Sliem, Jala El-Azab, Wafaa A Ahmed, "Early cancer detection using the fluorescent Ashwagandha chitosan nanoparticles combined with near-infrared light diffusion characterization: in vitro study", *Lasers in Medical Science* 38 (1), 37.
23. Mohamed Abdel-Harith, Rania M Abdelazeem, Omnia Hamdy, Zienab Abdel-Salam, "Adaptive optics-based wavefront-enhanced laser-induced fluorescence (WELIF) for improved analytical performance", *Analytical Methods* 15 (2), 212-220.
- 2022 24. Maha Nour, Omnia Hamdy, Amna H Faid, Elsayed Abdallah Eltayeb, Ahmed Abbas Zaky, "Utilization of gold nanoparticles for the detection of squamous cell carcinoma of the tongue based on laser-induced fluorescence and diffuse reflectance characteristics: an in vitro study", *Lasers in Medical Science* 37 (9), 3551-3560.
25. Omnia Hamdy, Zienab Abdel-Salam, Mohamed Abdel-Harith, "Utilization of laser-induced breakdown spectroscopy, with principal component analysis and artificial neural networks in revealing adulteration of similarly looking fish fillets", *Applied Optics* 61 (34), 10260-10266.

26. Omnia Hamdy, Zienab Abdel-Salam, Mohamed Abdel-Harith, "Optical characterization of biological tissues based on fluorescence, absorption, and scattering properties", *Diagnostics* 12 (11), 2846.
27. Ethar Ahmed Mosilhy, Eman E Alshial, Mennatullah Mohamed Eltaras, Mona Mamdouh Abdel Rahman, Hagar Ismail Helmy, Abdelaziz Habib Elazoul, Omnia Hamdy, Haitham S Mohammed, "Non-invasive transcranial brain modulation for neurological disorders treatment: a narrative review", *Life Sciences* 307, 120869.
28. Omar Mahmoud Solyman, Omnia Hamdy, Salwa Ahmed Abdelkawi, Aziza Ahmed Hassan, "Investigating the light emitting diode (LED) flashlight characteristics of a sample of smartphones for its safety in indirect retinal photography", *Pan African Medical Journal* 43 (1).
29. Ashraf S Abdel Halim, Mohanad Mostafa, Omnia Hamdy, "Miniaturized antenna verified with diffuse optical measurements for native and boiled adipose tissue differentiation", *Scientific Reports* 12 (1), 15035.
30. Rania M Abdelazeem, Omnia Hamdy, "Utilizing the spatial frequency domain imaging to investigate change in optical parameters of skin exposed to thermal-hydrotherapy: Ex-vivo study", *International Journal of Imaging Systems and Technology* 32 (5), 1661-1672.
31. Alaa Sabeeh Shanshool, Ekaterina Nikolaevna Lazareva, Omnia Hamdy, Valery Victorovich Tuchin, "Optical properties and fluence distribution in rabbit head tissues at selected laser wavelengths", *Materials* 15 (16), 5696.
32. Shimaa Mahdy, Omnia Hamdy, Mohammed A Hassan, Mohamed A Eldosoky, "Numerical analysis of the optical fluence rate at the scalp for noninvasive brain tumor detection", *JOSA A* 39 (4), 587-593.
33. Dina S Arabi, Omnia Hamdy, Zienab A Abdel-Salam, Mahmoud SM Mohamed, Mohamed Abdel-Harith, "Utilization of spectrochemical analysis and diffuse optical techniques to reveal adulteration of alike fish species and their microbial contamination", *Food Analytical Methods* 15 (4), 1062-1073.
34. Ahmed H Sheet, Omnia Hamdy, Zienab Abdel-Salam, Mohamed Abdel-Harith, "Combining laser-irradiation and glycerol immersion of skeletal muscles to improve their optical transparency", *Optics & Laser Technology* 148, 107760.
35. Shimaa Mahdy, Omnia Hamdy, Mohammed A Hassan, Mohamed AA Eldosoky, "A modified source-detector configuration for the discrimination between normal and diseased human breast based on the continuous-wave diffuse optical imaging approach: a simulation study", *Lasers in Medical Science* 37 (3), 1855-1864.
36. Omnia Hamdy, Haitham S Mohammed, "Variations in tissue optical parameters with the incident power of an infrared laser", *PLoS One* 17 (1), e0263164

- 2021**
37. Omnia Hamdy, Nahed H Solouma, “Distant-detector versus integrating sphere measurements for estimating tissue optical parameters: a comparative experimental study”, *Optik* 247, 167981.
 38. Ibrahim Abdelhalim, Omnia Hamdy, Aziza Ahmed Hassan, Salah Hassab Elnaby, “Nd: YAG fourth harmonic (266-nm) generation for corneal reshaping procedure: an ex-vivo experimental study”, *Plos one* 16 (11), e0260494.
 39. Ibrahim Abdelhalim, Omnia Hamdy, Aziza Ahmed Hassan, Salah Hassab Elnaby, “Assessing the local temperature of human cornea exposed to surface ablation by different laser refractive-surgery devices: a numerical comparative study”, *Lasers in Medical Science* 36 (8), 1725-1731.
 40. Omnia Hamdy, Haitham S Mohammed, “Investigating the transmission profiles of 808 nm laser through different regions of the rat’s head”, *Lasers in Medical Science* 36 (4), 803-810.
 41. Ibrahim Abdelhalim, Omnia Hamdy, Aziza Ahmed Hassan, Salah Hassab Elnaby, “Dependence of the heating effect on tissue absorption coefficient during corneal reshaping using different UV lasers: A numerical study”, *Physical and Engineering Sciences in Medicine* 44, 221-227.

Non-ISI Journals

- 2024**
1. Zienab Elwasif, Omnia Hamdy, Tawfik Ismail “A High Sensitive Refractive Index-Based Terahertz Biosensor for Virus Detection”, *Journal of Laser Science and Applications*
- 2020**
2. Omnia Hamdy, Rania M. Abdelazeem “Toward Better Medical Diagnosis: Tissue Optical Clearing”, *Journal of Public Health International* 2 (1), 13-21

Conference proceedings (SCOPUS-Indexed)

- 2024**
1. Fatma N. Heikl, Omnia Hamdy, Jala El-Azab, Tawfik Ismail, “Machine Learning-Driven Thermal Imaging for Classifying Skin Response to Infrared Laser Irradiation”, 6th Novel Intelligent and Leading Emerging Sciences Conference NILES2024, IEEE.
 2. Omnia Hamdy, Zienab Abdel-Salam, Mohamed Abdel-Harith, “Laser-Induced Fluorescence Combined with Artificial Neural Network for the Identification of Liver Tissue Coagulation”, *Optica Biophotonics Congress: Biomedical Optics 2024 (Translational, Microscopy, OCT, OTS, BRAIN), Technical Digest Series (Optica Publishing Group, paper JD6A.7. DOI: [10.1364/TRANSLATIONAL.2024.JD6A.7](https://doi.org/10.1364/TRANSLATIONAL.2024.JD6A.7)*
- 2023**
3. Ashraf S Abdel Halim, Omnia Hamdy, Mohamed Fathy Abo Sree, “Verification of a Multiband Antenna for Monitoring Liver Coagulation Using Steady-State Optical Diffuse Reflectance”, *Frontiers in Optics, JM7A. 26, DOI: [10.1364/FIO.2023.JM7A.26](https://doi.org/10.1364/FIO.2023.JM7A.26)*
 4. Rasha Ahmed, Omnia Hamdy, Shaimaa Elattar, “Utilizing Near-Infrared Laser (980 nm) to Increase Sperm Motility: In-vitro study”, *Frontiers in Optics, FD6. 3, DOI: [10.1364/FIO.2023.FD6.3](https://doi.org/10.1364/FIO.2023.FD6.3)*
 5. Omnia Hamdy, Zienab Abdel-Salam and Mohamed Abdel-Harith, “Monitoring liver tissue photocoagulation using spatially-resolved diffuse reflectance and laser-induced fluorescence spectroscopy”, *AIP Conference Proceedings* 2620, 050002, 2023. DOI: [10.1063/5.0119931](https://doi.org/10.1063/5.0119931)
- 2022**
6. Ahmed H. Sheet, Omnia Hamdy, and Mohamed Abdel Harith "Increasing the optical transparency of skeletal muscles via irradiation with IR lasers", *Proc. SPIE 12147, Tissue Optics and Photonics II, 121470P DOI: [10.1117/12.2621954](https://doi.org/10.1117/12.2621954)*
 7. Rania Abdelazeem and Omnia Hamdy "Speckle noise reduction of modulated images generated by spatial frequency domain imaging technique based on interferometric approach", *Proc. SPIE 12147, Tissue Optics and Photonics II, 121470E, DOI: [10.1117/12.2619996](https://doi.org/10.1117/12.2619996)*

8. Ibrahim Abdelhalim and Omnia Hamdy, "A Low-Cost and Easy-to-Use Laser Corneal Reshaping Device for Educational, Research and Training Purposes", Proceedings of the 2022 Design of Medical Devices Conference, DMD 2022; DOI: [10.1115/DMD2022-1009](https://doi.org/10.1115/DMD2022-1009)
- 2021**
9. Omnia Hamdy, Ibrahim Abdelhalim and Tawfik Ismail, "Qualitative Concentration Analysis of Glucose in a Solution Using Spectroscopic Measurement", Frontiers in Optics + Laser Science 2021, OSA Virtual Event. DOI: [10.1364/FIO.2021.JTh5A.90](https://doi.org/10.1364/FIO.2021.JTh5A.90)
10. Ibrahim Abdelhalim and Omnia Hamdy, "An Optical Prototype for Simulating the Laser Delivery Method in a Typical LASIK Device", Education and Training in Optics and Photonics Conference, ETOP 2021, OSA Virtual Event. DOI: [10.1364/ETOP.2021.F2A.8](https://doi.org/10.1364/ETOP.2021.F2A.8)
11. Omnia Hamdy and Ahmed Sheet, "Simulating Red and Near-Infrared Light Diffusion in Myometrium and Leiomyoma Uterus Tumors", Biophotonics Congress: Optics in the Life Sciences 2021 (BODA,BRAIN,NTM,OMA,OMP), OSA. DOI: [10.1364/BODA.2021.JTu4A.4](https://doi.org/10.1364/BODA.2021.JTu4A.4)
12. Rania M. Abdelazeem, Mahmoud M.A. Ahmed and Omnia Hamdy "Monitoring the Optical Diffuse Transmittance of Skin during Thermo-Hydrotherapy via Spatial Frequency Domain Imaging: A Pilot Study", Biophotonics Congress: Optics in the Life Sciences 2021 (BODA,BRAIN,NTM,OMA,OMP), OSA. DOI: [10.1364/BODA.2021.JW1A.9](https://doi.org/10.1364/BODA.2021.JW1A.9)
- 2020**
13. Omnia Hamdy and Walid Tawfik, "The Effect of Temperature on the Optical and Analytical Properties of PET Polymer Used in Drinking Water Bottles", J. Phys.: Conf. Ser. **1472** 012004, DOI: [10.1088/1742-6596/1472/1/012004](https://doi.org/10.1088/1742-6596/1472/1/012004)
14. Hala S. Abuelmakarem, Omnia hamdy, Mahmoud A. Sliem, Jala El-Azab, Om-Hashem M.A. , Wafaa A. Ahmed, "Colonic Carcinoma Diagnosis using Chitosan Nanoparticles Based on the Optical Properties", J. Phys.: Conf. Ser. **1472** 012001, DOI: [10.1088/1742-6596/1472/1/012001](https://doi.org/10.1088/1742-6596/1472/1/012001)
- 2019**
15. Omnia Hamdy and Tawfik Ismail, "Study of Optical Power Variations in Multi-layer Human Skin Model for Monitoring the Light Dose", Novel Intelligent and Leading Emerging Sciences conference, NILES 2019. DOI: [10.1109/NILES.2019.8909332](https://doi.org/10.1109/NILES.2019.8909332)
16. Omnia Hamdy and Jala El-Azab, "Investigating the Ability of Spatial Frequency Domain Technology in Tissue Differentiation", The 16th IEEE International Conference on Smart Cities: Improving Quality of Life Using ICT, IoT and AI, HONET-ICT 2019. DOI: [10.1109/HONET.2019.8908095](https://doi.org/10.1109/HONET.2019.8908095)
17. Omnia Hamdy, Mahmoud F. Hassan, Jala El-Azab and Nahed H. Soluma, "Diffuse Reflectance Based Tissue Characterization Using Spatial Frequency Domain Imaging", Imaging and Applied Optics 2019 (COSI, IS, MATH, pcAOP), OSA Technical Digest (Optical Society of America, 2019), paper ITh4B.5. DOI: [10.1364/ISA.2019.ITh4B.5](https://doi.org/10.1364/ISA.2019.ITh4B.5)
- 2018**
18. Omnia Hamdy, Doaa Youssef, Jala El-Azab and Nahed H. Soluma, "Detection of Breast Diseases using Numerical Study of Light Propagation," 2018 9th Cairo International Biomedical Engineering Conference (CIBEC), Cairo, Egypt, 2018, pp. 53-56., IEEE. DOI: [10.1109/CIBEC.2018.8641819](https://doi.org/10.1109/CIBEC.2018.8641819)
- 2016**
19. Omnia Hamdy, Jala El-Azab, Nahed H.Solouma, Mahmoud Fathy, and Tarek A. Al-Saeed, "The Use of Optical Fluence Rate Distribution for the Differentiation of Biological Tissues," 8th Cairo International Biomedical Engineering Conference (CIBEC), Cairo, Egypt, 2016, IEEE. DOI: [10.1109/CIBEC.2016.7836129](https://doi.org/10.1109/CIBEC.2016.7836129)

Books & Book Chapters

- 1- Ashraf S. Abdel Halim, Mohanad Mostafa and Omnia Hamdy Biomultiband Antenna for Medical Diagnostic Applications, in book: Encyclopedia of Green Materials Publisher: Springer, Singapore 2022.
- 2- Omnia Hamdy, Nahed H.Solouma, Mahmoud Fathy. New Technique for Laser Treatment of Retinal Disorders. 2016, Deutschland/Germany: Scholar's Press, ISBN: 978-3-659-83848.

SUPERVISION OF POSTGRADUATE STUDENTS

- 1- Master thesis entitled “Optimizing Laser-Activated Dental Bleaching: A Comprehensive Investigation of Wavelengths, Time Intervals, and Energy Levels (In-vitro study)”. Still running (Registration data, May 2024).
- 2- Master thesis entitled “Macroscopic Diffuse Reflectance Imaging Assisted by Machine Learning for Biological Tissue Characterization”. Still running (Registration data, March 2024).
- 3- Master thesis entitled “Comparative evaluation between carbon dioxide laser and diode laser for dentin sealing after tooth preparation. Still running (Registration data, December 2021).
- 4- Master thesis entitled “Tissue characterization using spatial frequency domain imaging)”. Still running (Registration data, 5-12-2020).
- 5- Master thesis entitled “Detection of carcinoma of the tongue using spectrophotometer and gold nanoparticles)”. (Degree awarded, December 2023).
- 6- Master thesis entitled “Evaluation of gold nanoparticles for the detection of oral squamous cell carcinoma using Raman spectroscopy)”. (Degree awarded, May 2023).
- 7- Master thesis entitled “Evaluation of fluoride uptake in dentine treated with silver diamine fluoride using frequency doubled Nd:YAG 532 nm and diode laser 980 nm: in vitro study”. Still running (Registration data, 21-11-2021).
- 8- Master thesis entitled “Investigating the application of different UV lasers on corneal tissue phantoms for LASIK operation purposes”. (Degree awarded data, 4-11-2021).
- 9- PhD Thesis entitled “Improvement of tissue imaging and spectroscopy utilizing the concept of photothermal and physical optical clearing”. (Degree awarded, Sept. 2023).
- 10- PhD Thesis entitled “Development of nanophotonic metamaterial structures for ultrasensitive biosensing applications”. Still running (Registration data, 14-12-2021)
- 11- PhD Thesis entitled “Design and implementation of a system based on Nd:YAG (266 nm) for laser corneal reshaping compared with the existing technology with ArF excimer laser (193 nm)”. Still running (Registration data, 18-1-2022).
- 12- PhD Thesis entitled “Laser utilization to monitor some physical properties for agriculture crops during drying stages”. Still running (Registration data, 13-7-2015).

PEER-REVIEW OF SCIENTIFIC THESES

- 1- **PhD Thesis**, “Design and implementation of a system based on Nd:YAG (266 nm) for laser corneal reshaping compared with the existing technology with ArF excimer laser (193 nm)”, October 2024.

PEER REVIEW OF GRADUATION PROJECTS

- 1- Peer-review of graduation projects for the specialized tracks of engineering profession, Faculty of Engineering, Cairo University, 2024
- 2- Peer-review of graduation project titles “Microwave Based Sensors for Non-Invasive Blood Clotting Detection”, Faculty of Engineering, Ain-Shams University, 2024.

PROJECTS

- 1- **Project Title:** Optical fiber reflections combined with artificial intelligence for smart motion sensing. **Project ID:** GP2024.R19.240. **Funded by:** Information Technology Industry Development Agency (ITIDA). **Date:** July 2024.
- 2- **Project Title:** Measurement and monitoring of glucose concentration using an optical-based system and deep learning. Project ID: GP2024.R19.424. **Funded by:** Information Technology Industry Development Agency (ITIDA). **Date:** July 2024.
- 3- **Project Title:** Integrating Optical Diffuse Imaging and Spectroscopic Techniques for Reliable Tissue Characterization. **Funded by:** Annual Funding, the Deanship of Scientific Research (DSR), Vice Presidency for Graduate Studies and Scientific Research, King Faisal University (KFU), Ministry of Education, Saudi Arabia. **Project number:** AN000282. **Date:** 01/01/2022 to 01/07/2022.

EDITORIAL/REVIEWER BOARD

Editor, PlosOne

Editor, Journal of Public Health International, Open Access Pub.

Editor, Journal of Biomedical Engineering Research, Vivid Open Access LLC

Reviewer, Scientific Reports, Nature.

Reviewer, Photochemical & Photobiological Sciences, Springer Nature.

Reviewer, Applied Optics, OPTICA Publishing group

Reviewer, Optics Express, OPTICA Publishing group

Reviewer, Annals of Biomedical Engineering (ABME), Springer Nature.

Reviewer, Optical and Quantum Electronics, Springer Nature.

Reviewer, Optics and laser technology, Elsevier.

Reviewer, Lasers in Medical Sciences, Springer Nature.

Reviewer, Journal of Biomedical Optics, SPIE.

Reviewer, Physical and Engineering Science in Medicine, Springer Nature.

Reviewer, International Journal of Imaging Systems and Technology, Wiley.

Reviewer, Journal of Physics D: Applied Physics, IOP.

Reviewer, BMC Medical Imaging, Springer Nature.

Reviewer, Diagnostics, MPDI.

Reviewer, Applied Sciences, MPDI.

Reviewer, Symmetry, MPDI.

Reviewer, Sensors, MPDI.

Reviewer, Turkish Journal of Physics.

Reviewer, 2020 IEEE 17th International Conference on Smart Communities: Improving Quality of Life Using ICT, IOT & AI

Reviewer, 2021 IEEE 18th International Conference on Smart Communities: Improving Quality of Life Using ICT, IOT & AI

INTERNATIONAL PARTICIPATIONS

- 2024** School on Synchrotron Light Sources and Their Applications, the Abdus Salam International Center for Theoretical Physics, ICTP, Trieste, Italy.
- 2023** ICTP Winter College on Optics: Terahertz Optics and Photonics, the Abdus Salam International Center for Theoretical Physics, ICTP, Trieste, Italy.
- 2019** Career Development Workshop for Women in Physics, the Abdus Salam International Center for Theoretical Physics, ICTP, Trieste, Italy.
- 2018** Hands-On Research in Complex Systems School, the University of Texas Austin, The Abdus Salam International Center for Theoretical Physics, ICTP, Trieste, Italy.

PROFESSIONAL ACTIVITIES

- Membership in the Advisory Committee of the Electrical Engineering Division of the Egyptian Engineers Syndicate.
- Participating in the Egypt Science Leadership Program (E-SLP) for Early Career Researchers, Zewail City for Science, Technology and Innovation.
- Collaborative scientific publication with researchers from and outside Cairo University, as well as with researchers from regional and international universities.

NATIONAL & INTERNATIONAL MEMBERSHIPS

- Member in the Egyptian Biomedical Engineering Society (EBMES).
- Member in the Egyptian society of optical science and applications.
- Member in OPTICA (Formerly OSA, the optical society of America).
- Member in IEEE (The Institute of Electrical and Electronics Engineers) from Jan. 2023 to Jan. 2024
- Member in SPIE (The international society for optics and photonics) from Jan. 2022 to Jan. 2024.
- Member in European Physical Society (EPS) from Jan. 2017 to Jan. 2019.

SOCIAL ACTIVITIES

- Academic mentoring program for Egypt Scholars inc.
- Volunteering member of the Egyptian STEM Her-Up Association to educate and mentor girls in the fields of science, technology, engineering, and mathematics (STEM).