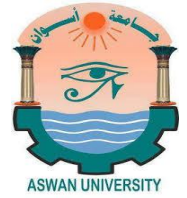




Samia Heshmat Hassan Abdelwahab
Associate Professor, Electrical Engineering Department,
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Personal Data:

Date of Birth: 13 October 1981
Nationality: Egyptian
Sex: Female
Marital Status: Married

Education:

- B.Sc.** Electrical engineering with an accumulative average grade “Very Good with honors’ degree”, Aswan Faculty of Engineering, **South Valley University**, Egypt (2003).
Thesis title: “Digital image compression based on object extraction”
- M.Sc.** Quantum and Science of Engineering Division, Graduate School of Engineering, **Hokkaido University, Japan** (2010).
Thesis title: “Development of Accurate Phase Unwrapping Algorithm for Noisy Image Obtained by Interferometer.”
- Ph.D.** Quantum and Science of Engineering Division, Graduate School of Engineering, **Hokkaido University, Japan** (2014).
Thesis title: “Efficient and Accurate Phase Unwrapping Algorithms for Noisy Images within Fringe Patterns”

Academic Qualification:

- Teaching Assistant** : 2005 - 2012, Electrical Engineering Department,
Faculty of Engineering, Aswan University, Aswan, Egypt
- Lecturer** : 2012 - 2014, Electrical Engineering Department,
Faculty of Engineering, Aswan University, Aswan, Egypt
- Assistant Professor** : 2014 - 2022, Electrical Engineering Department,
Faculty of Engineering, Aswan University, Aswan, Egypt
- Associate Professor** : 2022 - present, Electrical Engineering Department,
Faculty of Engineering, Aswan University, Aswan, Egypt
- Postdoctoral fellow** : 2014, 2022, and 2025, Quantum and Science of Engineering Division,
Graduate School of Engineering, Hokkaido University, Sapporo, Japan

Academic Experience:

● **August 2005 – present: Electrical Engineering Department, Faculty of Engineering, Aswan University, and Arab Academy for Science, Technology & Maritime Transport (AASTMT), Aswan, Egypt**

- Teaching many undergraduate and graduate courses, such as:

- | | |
|--|--|
| ✧ Analysis of Communications Networks Circuits | ✧ Digital Image Processing |
| ✧ Electronic Circuits | ✧ Advanced Digital Image Processing |
| ✧ Electrical testing | ✧ Image and Video Coding |
| ✧ Digital Communication | ✧ Programming and Implementation of Digital Signal Processor |
| ✧ Introduction to Multimedia | ✧ Computer Network Design |
| ✧ Introduction to Computer | ✧ Electronics 1,2,3 |
| ✧ Computer and Society | ✧ Satellite Communication and Design |
| | ✧ Microwave circuits |

● **October 2008 – March 2014: Division of Quantum and Science of Engineering, Graduate School of Engineering, Hokkaido University, Sapporo, Japan**

- Joined as a Principal Researcher at the Division of Quantum Science and Engineering, Laboratory of Light-wave Instrumentation, Graduate School of Engineering, Hokkaido University, in October 2008, for a collaborative study on the Development of accurate phase unwrapping algorithms for noisy images obtained from various applications.
- After finishing the master's study successfully and being awarded a master's degree in September 2010. Start a doctor study from October 2010 to March 2014 to investigate the problem of phase unwrapping and improving the quality and time cost of the proposed algorithms for noisy images.

● **2014: Quantum and Science of Engineering Division, Graduate School of Engineering, Hokkaido University, Sapporo, Japan**

- Postdoctoral fellow with the main target to apply more image processing algorithms in the field of optical measurements and phase unwrapping.
- Conduct research work and publish Journal and conference papers.

● **2022: Quantum and Science of Engineering Division, Graduate School of Engineering, Hokkaido University, Sapporo, Japan**

- Postdoctoral fellow with the main target to propose a new phase measurement algorithm for shear interferometric data, conducting research work, and writing a scientific paper.

● **2025: Quantum and Science of Engineering Division, Graduate School of Engineering, Hokkaido University, Sapporo, Japan**

- Postdoctoral fellow with the main target to utilize lateral shearing interferometry for analyzing the effects of cold plasma treatment on cell morphology for applications in Egyptian healthcare and writing a scientific paper.

● **Participating in activities and tasks of the Quality and Accreditation Unit, Faculty of Engineering, and Qualification Development Center, Aswan University, Aswan, Egypt**

- Attending many workshops in the Quality and Accreditation unit
- TOT Certification Course, Endorsed by the Supreme Council of Universities.
- Methods of scientific research training

- Effective communication skills training
- Academic publishing training
- Quality standards in the teaching process training
- Scientific research ethics training
- Examination systems and student evaluation training

● **Participating in and attending many scientific conferences and workshops**

- The 26th International Middle East Power Systems Conference (MEPCON), Aswan, Egypt (December 2025)
- 3rd Young Researchers Conference, Aswan University, (April 2025)
- 7th Upper Egypt in Action Conference, Aswan, Egypt (April 2025)
- Aswan Cybersecurity Workshop: Defending Digital Systems & Countering Cyber Threats in the UEA7 conference (April 2025)
- Workshop on Cybersecurity Essentials: Protecting Yourself in the Digital Age (February 2025)
- The "Ambassadors of the Nation" Training Program: Empowering Faculty for Global Missions, Cairo, Egypt (January 2025)
- Seventh Arab Conference on Communication and Public Relations: "Strategies for Localizing Artificial Intelligence Technologies to Enhance Effective Institutional Communication," Aswan, Egypt (December 2024)
- Comprehensive Training Program for Aspiring Trainers, Certified by the Supreme Council of Universities, Aswan, Egypt (November 2024)
- Women Lead in the Egyptian Governorates Training by the National Training Academy (NTA) in partnership with the Ministry of Planning and Economic Development, Aswan, Egypt (November 2023)
- Workshop on the sources of information available in the Egyptian Knowledge Bank (October 2023)
- 6th Upper Egypt in Action Conference, Aswan, Egypt (May 2022)
- International Conference on Document Analysis and Recognition, Lausanne, Switzerland (September 2021)
- The International Conference of Innovative Trends in Computer Engineering – ITCE`2018, ITCE`2019, and ITCE`2020
- 1st Young Researchers Conference at Aswan University, Egypt (June 2019)
- 5th Upper Egypt in Action Conference, Aswan, Egypt (June 2019)
- Research Quality & Performance and Research Funding & Collaboration Workshops organized by Egyptian Knowledge Bank and Clarivate Analytics, Aswan University (November 2018)
- Google Developers, Roadshow MENA, Aswan, Egypt (September 2018)
- 4th Upper Egypt in Action Conference, Aswan, Egypt (April 2018)
- 7th International Workshop on Advanced Optical Imaging and Metrology, Germany (September 2013)
- 7th International Conference on Laser Induced Breakdown Spectroscopy, Luxor, Egypt, (October 2012)
- 5th International Conference on Speckle Metrology, Vigo, Spain (September 2012)
- 1st International Laser Display Conference, Yokohama, Japan, (April 2012)
- Japan society of applied physics, Hiratsuka, Japan, (March 2010)
- 27th Annual meeting of Atomic Energy Society of Japan, Hokkaido branch, Sapporo, Japan, (Dec. 2009)

● **Participating and attending many workshops, activities, and online meetings for the USAID Center of Excellence for Energy's Program (CoE for Energy), operated by Arizona State University**

- University Entrepreneurship and Venture Development Seminar (Feb 2024)

- Foundations of Entrepreneurship Incubation Program Online Workshop (Oct 2023)
- Attending and guiding a meeting between Arizona State University's academic staff and the academic staff of the Engineering Faculty and the Energy Engineering faculty at Aswan University to evaluate teaching methods for the Engineering and Energy Engineering faculties, Aswan University, Egypt (May 2023)
- The Innovative Teaching Methods Workshop to advance the utilization of active learning and inclusive teaching. Center of Excellence for Energy, Ain-Shams University, Egypt (May 2023)
- Center of Excellence for Energy Strategy Session: Work-plan and Roadmap, Nile-Ritz Carlton, Cairo, Egypt (May 2023)
- COE pre-strategic planning meeting and discussion online meeting (April 2023)
- Exchange Working Group online meetings for student internships (March 2023)
- Interview committee to examine Students who have applied for internships, Aswan University, Egypt (March 2023)
- Energy Transition workshop, Center of Excellence for Energy, Ain-Shams University, Egypt (March 2023)

Research Interesting:

Digital image processing, Artificial Intelligence, Machine learning, Deep learning, Cybersecurity, Phase unwrapping, Phase extraction, Digital Holography, Interferometer measurements, Fourier transform profilometry, Optical image processing, and Plasma diagnostics

Awards and Honors:

- **Fourth place in the entrepreneurship competition** for a sustainable energy project (\$1,000 prize), Center of Excellence for Energy's Program - 2024
- **Best Scientific Journal Paper Award** from Aswan University - 2023
- **Awarded the shield of** the National Institute of Communications for Distinguished Scientific Supervision for the Institute's headquarters in Aswan, 2023
- **Best Scientific Journal Paper Award** introduced by Aswan University - 2022
- **Best Scientific Journal Paper Award** introduced by Aswan University - 2021
- **Graduation Project Grant** from ITIDA (ITAC program) in 2022.
- **Graduation Project Grant** from the Academy of Scientific Research & Technology, Information Technology Industry Development Agency (STDF) in 2018.
- **Graduation Project Grant** from the National Telecommunications Regulatory Authority (NTRA) 2018.
- **Best Scientific Journal Paper Award** introduced by Aswan University, -2017
- **Best PhD Dissertation Award** introduced by the Egyptian Engineers Syndicate - 2014
- **JASSO Honors Scholarship**, Japan (Oct. 2013 to March 2014).
- **Hokkaido University Grant**, Hokkaido University, 2013.
- The Japanese Government (**MEXT – Monbukagakusho**) Scholarship (Oct.2008 to Sep. 2013).

Graduation Projects Committee:

- **Be a supervisor and/or judgment member of the graduation projects committee for undergraduate students in the faculty of Engineering, Aswan University; the projects' titles are as follows:**
 1. AI-EnergySync: Uniting for Sustainable Power and Climate Resilience - 2024
 2. Web-Based System for Precision Agriculture Applications in 5 G-based Internet of Things - 2023
 3. Smart implementation and Performance Evaluation of the network of the Faculty of Engineering - 2022

4. Servatic: Semi-Automated Customer Service - 2019
5. Smart Parking Management System - 2018
6. Digital data transmissions using Li-Fi technology - 2017.
7. Driver aid tools – 2016
8. Implementation and performance analysis of UW-OFDM in time varying channels – 2016
9. RF power harvesting for low power application - 2015

Administrative positions:

- **The administrative positions in the Faculty of Engineering, Aswan University, are as follows:**
 1. **Executive manager** of the Information and Technology (IT) unit, 2017
 2. **Co-Founder of the CAIR** (Computer Artificial Intelligence Research) center, 2022
 3. **Member of Cultural Relations Committee - Postgraduate and Research Affairs**, 2024-2025
 4. **Member of Electrical Engineering Department Council**, 2015 - 2016, and from 2023
 5. **Member of Environmental and Community Affairs Committee**, 2022 -2024
 6. **Member of Graduate Studies Committee**, 2020 - 2022
 7. **Member of Libraries Affairs Committee**, 2015 - 2018.
 8. **Supervisor of electronics and communications laboratory**, 2014 – 2015.
 9. **Member of the Consultation Committee**, Engineering Studies, and Consultations Center from 2014

Services and membership:

- **A session chairman** at the 26th International Middle East Power Systems Conference (MEPCON), Aswan, Egypt (December 2025)
- **Co-PI of Aswan University for the Empowering Women in Cyber Security project** in cooperation with Glasgow Caledonian University, UK, funded by the British Council (Jan. 2025 to Jan. 2026)
- **Research Committee Member** of the Center of Excellence for Energy program operated by Arizona State University (from March 2023 to September 2023)
- **Scientific Advisor** at National Telecommunication Institute (NTI) for the Aswan branch (from Feb. 2023)
- **Protocol representative** for the Aswan University side in the signed protocol between Aswan University and the National Telecommunication Institute (NTI) for training students and youth graduations in the field of information technology (from March 2022)
- **Certified AI Instructor** in Huawei Academy – Aswan University branch (from May 2019)
- **A Track Chair** at the International Conference of Innovative Trends in Computer Engineering – **ITCE`2018** and **ITCE`2019**
- **A reviewer** at the International Conference of Innovative Trends in Computer Engineering – **ITCE`2019** and **ITCE`2020**
- **Member of the Organization Committee** of the International Conference of Innovative Trends in Computer Engineering – **ITCE`2019** and **ITCE`2020**
- **Member of the Egyptian Engineers Syndicate** (from 2003)
- **Member of the JSAP**, Japanese Society of Applied Physics (from 2009 to 2014)

Publication List:

● Referred Journal Publications

- Aya Bakr and **Samia Heshmat**, "Automatic Diagnosis of Cardiovascular Diseases Through Analysis of Heart Sound Signals Using CNN Models: A Survey," *International Journal of Applied Energy Systems*, Vol. 8, No. 1 (2026)
- Reda Badry, Ghada Abozaid, Mostafa Abba, and **Samia Heshmat**, "Survey on Phase Unwrapping Algorithms: Strengths, Limitations, and Future Directions," *International Journal of Applied Energy Systems*, Vol. 8, No. 1 (2026)
- Sara. Khaled, Doaa. Abdelhameed, M. H. E. Ali, H. G. Zaini, S. Elnazer, and **Samia. Heshmat**, "NOMA Channel State Estimation: Deep Learning Approaches," in *IEEE Access*, Vol. 13, P 159774-159795 doi: 10.1109/ACCESS.2025.3608136. (2025)
- Mostafa Eid, Mokhtar Aly, Emad A. Mohamed, Adel Fathy, and **Samia Heshmat**, "Analysis and Design of Frequency Regulation Controllers Considering Communication Delays and Environmental Effects of Renewable Energy Microgrids", *Aswan University Journal of Environmental Studies*, Vol. 5, No. 3, P 262-294, (2024)
- Satoshi Tomioka, Naoki Miyamoto, Yuji Yamauchi, Yutaka Matsumoto, and **Samia Heshmat**, "Wavefront restoration from lateral shearing data using spectral interpolation ", *Applied Optics Journal*, DOI: 10.1364/AO.500453, (2023)
- **Samia Heshmat**, Satoshi Tomioka, Shusuke Nishiyama, and Arata Hirokami, "Localized compensator phase unwrapping algorithm based on flux conservable solver", *Journal of Computational Science*, vol. 62,101752, DOI: 10.1016/j.jocs.2022.101752, (2022).
- Arata Hirokami, **Samia Heshmat**, and Satoshi Tomioka, "Accurate numerical method to solve flux distribution of Poisson's equation", *Mathematics and Computers in Simulation Journal*, Vol 190, pp. 329-342, (2021)
- Fatma Gamal, Mostafa Soliman, and **Samia Heshmat**, "A parallel implementation of the rotational compensator phase unwrapping algorithm," *Neural Parallel and Scientific Computations* vol. 29, No. 1, pp 21-38, DOI: 10.46719/NPSC20212912 (2021)
- Satoshi Tomioka, Shusuke Nishiyama, Naoki. Miyamoto, Daichi Kando, and **Samia Heshmat**, "Weighted reconstruction of three-dimensional refractive index in interferometric tomography", *Applied Optics Journal (Optical Society of America)*, Vol. 56, No. 24, pp. 6755, (2017).
- Satoshi Tomioka, Shusuke Nishiyama, and **Samia Heshmat**, "Carrier peak isolation from a single Interferogram using the spectrum shift technique," *Appl. Opt.*, Vol. 53, pp. 5620-5631 (2014).
- **Samia Heshmat**, Satoshi Tomioka, and Shusuke Nishiyama, " Performance evaluation of phase unwrapping algorithms for noisy phase measurements," *International Journal of Optomechatronics* Vol. 8, No. 4, pp. 260-274. (2014).
- **Samia Heshmat**, Satoshi Tomioka, and Shusuke Nishiyama, "Phase extraction and unwrapping using rotational and direct compensators for digital hologram," *Opt. Eng.*, Vol. 52 pp. 101910.1 –101910.8 (2013).
- **Samia Heshmat**, Satoshi Tomioka, and Shusuke Nishiyama, "Phase unwrapping algorithm based on singularity compensation for 3D shape measurement," *Opt. Review*, Vol. 19, 444 – 450 (2012).
- **Samia Heshmat**, Satoshi Tomioka, and Shusuke Nishiyama, "Reliable phase unwrapping algorithm based on rotational and direct compensators," *Appl. Opt.* Vol. 50, 6225–6233 (2011).
- Satoshi Tomioka, **Samia Heshmat**, Naoki. Miyamoto, and Shusuke Nishiyama, "Phase unwrapping for noisy phase maps using rotational compensator with Virtual Singular Points," *Appl. Opt.* Vol. 49, 4735–4745 (2010).

● Conference Presentations

- Aya Bakr and **Samia Heshmat**, "Automatic Diagnosis of Cardiovascular Diseases Through Analysis of Heart Sound Signals Using CNN Models: A Survey, " 3rd Young Researchers Conference, Aswan University, 25-27 April (2025)
- Reda Badry, Ghada Abozaid, Mostafa Abba, and **Samia Heshmat**, "Survey on Phase Unwrapping Algorithms: Strengths, Limitations, and Future Directions, " 3rd Young Researchers Conference, Aswan University, 25-27 April (2025)
- **Samia Heshmat** and Mohamed AbdelNafaa, "Aolah databases for new Arabic online handwriting recognition algorithm", *International Conference on Document Analysis and Recognition – ICDAR 2021 Workshops: Lausanne, Switzerland, September 5–10, 2021, Proceedings, Part I, September 2021, Pages 294–311* https://doi.org/10.1007/978-3-030-86198-8_21 (September 2021)
- Mohamed AbdelNafaa and **Samia Heshmat**, "Novel databases for Arabic online handwriting recognition system stroke", *International Conference on Innovative Trends in Computer Engineering - ITCE, Proceedings of IEEE*, pp. 263-267, doi: 10.1109/ITCE48509.2020.9047778. (Feb. 2020)

- Somaia SerElkhetm and **Samia Heshmat**, "A Survey study on joint image compression - encryption methods", International Conference on Innovative Trends in Computer Engineering - ITCE, Proceedings of IEEE, pp. 222-226, doi: 10.1109/ITCE48509.2020.9047777 (Feb. 2020)
- Mohamed AbdelNafaa and **Samia Heshmat**, "Efficient preprocessing algorithm for online handwritten Arabic strokes", International Conference on Innovative Trends in Computer Engineering - ITCE, Proceedings of IEEE pp 64 - 69 (Feb. 2019)
- Ahmed Youssef and **Samia Heshmat**, "3D Holographic compression methods for real-time applications", International Conference on Innovative Trends in Computer Engineering - ITCE, Proceedings of IEEE 136 – 1 V. 1 (Feb. 2018)
- Satoshi Tomioka, Shusuke Nishiyama, **Samia Heshmat**, Yasuhiro Hashimoto, and Kodai Kurita, " Three-dimensional gas temperature measurements by computed tomography with incident angle variable interferometer", Proceedings of SPIE, IS&T/SPIE Electronic Imaging: Computational Imaging X 9401 - 17 V. 1 (Jan. 2015).
- **Samia Heshmat**, Satoshi Tomioka, and Shusuke Nishiyama, " Performance evaluation of phase unwrapping algorithms for noisy phase measurements," Fringe 2013: 7th International Workshop on Advanced Optical Imaging and Metrology, publisher Springer Berlin Heidelberg, 155-160 (September 2013).
- **Samia Heshmat**, Satoshi Tomioka, and Shusuke Nishiyama, "Investigation of phase unwrapping process for Laser induced Plasma interferometry", 7th International Conference on Laser Induced Breakdown Spectroscopy, Luxor, Egypt, (October 2012).
- **Samia Heshmat**, Satoshi Tomioka, and Shusuke Nishiyama, "Rotational and direct compensation for digital hologram phase unwrapping," Proc. SPIE 8413, Speckle 2012: V International Conference on Speckle Metrology, 84130S (September 2012).
- **Samia Heshmat**, Satoshi Tomioka, and Shusuke Nishiyama, "Phase unwrapping algorithm based on compensation for 3D shape measurement," the 1st International Laser Display Conference, Yokohama, Japan, LDCp7-20, (April 2012).
- **Samia Heshmat**, Shusuke Nishiyama, and Satoshi Tomioka, "Two-dimensional phase unwrapping using virtual residues", Japan Society of Applied Physics, Hiratsuka, Japan, 19aJ8 (March 2010).
- **Samia Heshmat**, Shusuke Nishiyama, and Satoshi Tomioka, "Direct compensation phase unwrapping algorithm for interferometric application", 27th Annual meeting of Atomic Energy Society of Japan Hokkaido branch, Sapporo, Japan, pp 24-25 (December 2009)

● Research Projects and Thesis

- **Samia Heshmat**, "Efficient and accurate phase unwrapping algorithms for noisy images within fringe patterns," Doctor Dissertation, Hokkaido University, Sapporo, Japan, March 2014
- **Samia Heshmat**, "Development of an accurate phase unwrapping algorithm for noisy image obtained by interferometer," master's Thesis, Hokkaido University, Sapporo, Japan, September 2010
- **Samia Heshmat**, "Digital image compression based on object extraction" Graduation Thesis, South Valley University, Aswan, Egypt, June 2003.

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