

Dr. Gul Hassan

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EDUCATION/ PROFESSIONAL TRAINING

Assistant Professor

Center for Advanced Electronics and Photovoltaic Engineering, (CAEPE), International Islamic University, Islamabad, Pakistan

Research Area: Solar Cell, Battery, Flexible Smart Electronic Devices and Sensors, Memristor and its Neuromorphic Applications, Artificial Intelligence, Nano-Generators, Nanofibers and its Applications.

Subjects: Organic Electronics, Smart Sensors Technology, Advanced Semiconductor Devices, Advanced VLSI Design, MSSD, Micro and Nano Systems

Postdoctoral

Nano Electronic Devices and Materials Engineering. College of Engineering, Division of Materials Science and Engineering, Hanyang University, Seoul, South Korea.

Research Area: Synthesis of 2D materials and its Application, Solution Processed Flexible Electronic Devices, Smart Sensors Network (AI), Memristor and its Neuromorphic Applications (AI), Nano-Generators.

Ph.D.

Towards Wearable and Printed Electronics: Fabrication and Optimization of solution Processed Electronic Devices, Ocean system Engineering, Jeju National University, South Korea.

Focus: Synthesis of 2D materials and its fabrication for different customized application, like Smart biosensors, humidity sensors, strain sensors, transparent electrode, SMOLED, Memristor, Memcapcitor, Nano-generators, electronic circuits and OLED. Research interests include wireless sensor networks (AI System)

Thesis: Towards Wearable and Printed Electronics: Fabrication and optimization of solution processed electronic devices.

EXPERIENCE

Assistant Professor.

International Islamic University, Islamabad, Pakistan.

Center for Advanced Electronics and Photovoltaic Engineering (CAEPE),

Clean Room Manager.

International Islamic University, Islamabad, Pakistan.

Center for Advanced Electronics and Photovoltaic Engineering (CAEPE),

Lab Leader OSE Lab.

Jeju National University, Korea

Appointed as the student's head of Ocean system Engineering lab.

SELECTED JOURNAL PUBLICATIONS

1. Inkjet printed self-healable strain sensor based on graphene and magnetic iron oxide nano-composite on engineered polyurethane substrate. *Scientific reports* (2020) (IF: 4.847)
2. All printed full range humidity sensor based on Fe₂O₃. *Sensors and Actuators A: Physical*, 112072 (2020) (IF: 2.923)
3. Highly sensitive wide range linear integrated temperature compensated humidity sensors fabricated using Electro hydrodynamic printing and electrospray deposition. *Sensors and Actuators B: Chemical* 308, 127680 (2020) (IF: 7.10)
4. All printed organic humidity sensor based on egg albumin. *Sensing and Bio-Sensing Research*, 100337 (2020) (IF: 1.4)
5. Highly sensitive and full range detectable humidity sensor using PEDOT: PSS, methyl red and graphene oxide materials. *Scientific reports* 9 (1), 1-10 (2019) (IF: 4.847)
6. Bio-compatible organic humidity sensor based on natural inner egg shell membrane with multilayer crosslinked fiber structure. *Scientific reports* 9 (1), 1-13 (2019) (IF: 4.847)
7. Disposable all-printed electronic biosensor for instantaneous detection and classification of pathogens. *Scientific reports* 8 (1), 1-11 (2018) (IF: 4.847)
8. Ink-jet printed stretchable strain sensor based on graphene/ZnO composite on micro-random ridged PDMS substrate. *Composites Part A: Applied Science and Manufacturing* 107, 519-528. (2018) (IF: 6.689)
9. Wide range and stable ink-jet printed humidity sensor based on graphene and zinc oxide nanocomposite. *Journal of Materials Science: Materials in Electronics* 29 (7), 5806-5813 (2018) (IF: 2.220)
10. All-printed humidity sensor based on graphene/methyl-red composite with high sensitivity. *Carbon* 105, 23-32 (2016) *Carbon* (IF: 8.821)
11. Flexible Resistive Switching Memory with a Schottky Diode Function Based on a Zinc Oxide/Methylene Blue Heterojunction. *Journal of Electronic Materials* (2020) (IF: 1.774)
12. Soft ionic liquid based resistive memory characteristics in a two terminal discrete polydimethylsiloxane cylindrical microchannel. *Journal of Materials Chemistry C* (2020) (IF: 7.059)
13. The Coexistence of Threshold and Memory Switching Characteristics of ALDHfO₂ Memristor Synaptic Arrays for Energy-Efficient Neuromorphic Computing. *Nanoscale* (2020) (IF: 6.9)

14. Highly bendable asymmetric resistive switching memory based on zinc oxide and magnetic iron oxide heterojunction. *Journal of Materials Science: Materials in Electronics* 31 (2), 1105-1115 (2020) (IF: 2.220)
15. Resistive switching memory utilizing water and titanium dioxide thin film Schottky diode. *Journal of Materials Science: Materials in Electronics* 30 (20), 18744-18752 (2019) (IF: 2.220)
16. PVA/TEOS crosslinked membranes incorporating zinc oxide nanoparticles and sodium alginate to improve reverse osmosis performance for desalination. *Journal of Applied Polymer Science* 136 (22), 47559 (2019) (IF: 2.52)
17. Non-volatile resistive switching based on zirconium dioxide: poly (4-vinylphenol) nano-composite. *Applied Physics A* 125 (6), 378 (2019) (IF: 1.810)
18. Resistive switching device based on water and zinc oxide heterojunction for soft memory applications. *Materials Science and Engineering: B* 246, 1-6 (2019) (IF: 4.652)
19. Schottky diode based resistive switching device based on ZnO/PEDOT: PSS heterojunction to reduce sneak current problem. *Journal of Materials Science: Materials in Electronics* 30 (5), 4607-4617 (2019) (IF: 2.220)
20. Bio-realistic synaptic characteristics in the cone-shaped ZnO memristive device. Acknowledgment. *NPG Asia Materials*. (2019) (IF: 9.157)
21. Study of in Situ Silver Migration in Amorphous Boron Nitride CBRAM Device. Acknowledgment *ACS Appl. Mater. Interfaces* (2019). (IF: 8.758)
22. Solution-processed flexible non-volatile resistive switching device based on poly [(9,9-di-n-octylfluorenyl-2,7-diyl)-alt-(benzo[2,1,3]thiadiazol-4, 8-diyl)]: poly vinyl pyrrolidone composite and its conduction mechanism *Applied Physics A* 125 (1), 18 (2019) (IF: 1.810)
23. Bipolar resistive switching device based on N, N'-bis (3-methylphenyl)-N, N'-diphenylbenzidine and poly (3, 4-ethylenedioxythiophene): poly (styrene sulfonate)/poly (vinyl alcohol) bilayer stacked structure. *Applied Physics A* 124 (10), 726 (2018) (IF: 1.810)
24. Ink-jet printed transparent and flexible electrodes based on silver nano particles. *Journal of Materials Science: Materials in Electronics* 29 (1), 49-55 (2018) (IF: 2.220)
25. Flexible frequency selective passive circuits based on memristor and capacitor. *Organic Electronics* 51, 119-127 (2017) (IF: 3.310)
26. Inkjet-printed antenna on thin PET substrate for dual band Wi-Fi communications. *Microsystem Technologies* 23 (8), 3701-3709 (2017) (IF: 1.737)
27. A flat-panel-shaped hybrid piezo/triboelectric nanogenerator for ambient energy harvesting. *Nanotechnology* 28 (17), 175402 (2017) (IF: 3.540)
28. Flexible resistive switching device based on poly (3,4-ethylenedioxythiophene):poly(styrene sulfonate) (PEDOT:PSS)/ poly(4-vinylphenol) (PVP) composite and methyl red heterojunction. *Applied Physics A* 123 (4), 256 (2017) (IF: 1.810)

CONFERENCE PAPERS

1. All Printed Humidity Sensor Based on Graphene/ZnO Nanocomposite. International Conference on Flexible and Printed Electronics, 2017, Shela Hotel, Jeju Island; 09/2017
2. All Printed Strain Sensor Depositing Graphene on Polyurethane Substrate. International Conference on Flexible and Printed Electronics, 2017, Shela Hotel, Jeju Island; 09/2017

3. Transparent and Flexible Electrodes Based on Silver Nanoparticles. International Conference on Flexible and Printed Electronics, 2017, Shela Hotel, Jeju Island; 09/2017
4. PEDOT: PSS/PVP Composite and Methyl red based Heterojunction Memristor. Joint Symposium of Jeju National University and Nagasaki University on Science and Technology, Jeju National University, South Korea, Jeju Island; 05/2017. **(Best paper Award)**
5. FSK modulation based on pedot: pss and methyl red heterojunction memristor. iserd International Conference, Rawalpindi, Pakistan, Rawalpindi, Pakistan; 03/2017
6. High Stretchable Strain Sensor fabricated on Micro-Randomly Ridged PDMS Substrate Using Graphene/ZnO Composite. Global Engage Printed and Flexible Electronics Congress 2017, London, UK; 02/2017
7. All-Printed Organic and Oxide Hetero-Structure Device with Photoconductivity. The 23rd optoelectronics and communication Conference, ICC Jeju, South Korea, July 2-6, 2018
8. Joint Symposium of Jeju National University and Nagasaki University on Science and Technology, Jeju National University, South Korea, Jeju Island; 05/2017
9. Memristor-capacitor passive filters to tune both cut-off frequency and bandwidth. 25th International Conference on Optical Fiber Sensors; 04/2017, DOI:10.1117/12.2264963
10. Microfluidics-based tunable printed coplanar waveguide monopole sensor. iserd International Conference, Rawalpindi, Pakistan, Rawalpindi, Pakistan; 03/2017
11. Flexible Light Emitting Device based on Resistive Switching to Memorize light State. Global Engage Printed and Flexible Electronics Congress 2017, London, UK; 02/2017
12. Light controllable LED circuit based on memristive switching. 2017, 8th International Conference on Mechatronics and Manufacturing (ICMM 2017) , Tokyo, Japan
13. Multi Stacked Nanogenerator for Electric Power Increment. 7th International Conference on Clean and Green Energy (ICCGE 2018), Paris, France, Feb 7-9, 2018
14. Inkjet printed organic-inorganic bilayer photoconductive sensor. The 23rd optoelectronics and communication Conference, ICC Jeju, South Korea, July 2-6, 2018
15. All-Printed Stretchable Photo-Conductive Device Fabricated on Engineered PDMS Substrate. The 23rd optoelectronics and communication Conference, ICC Jeju, South Korea, July 2-6, 2018.
16. Voltage Induced Complementary and Bipolar Switching in Low Temperature Solution Processed Rutile TiO₂ Thin Film. ENGE 2018, Ramada Plaza, Jeju Island, South Korea, November 11- 14, 2018.
17. Compatible organic humidity sensor for environment sensing using egg white, 4th International Conference on Composite Materials and Material Engineering (ICCMME) Tokyo, Japan, January 2019. **(Best paper Award)**
18. Liquid Capacitor Based on Hafnium Oxide , 4th International Conference on Composite Materials and Material Engineering (ICCMME) Tokyo, Japan, January 2019