



Md. Jalal Uddin

PhD (Electronics and Convergence Engineering)
Professor, Discipline of Electrical and Electronic
Engineering



CONTACT

Present Address

School of Radio Sciences and
Engineering, KwangWoon
University, Chambit Building,
Room # 609, 20 Kwangwoon-
ro, Nowon-gu, Seoul 01897,
Republic of Korea



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[0000-0003-2533-8019](https://www.idcard.gov.bd/)

Country Address



Bathan Gachi, Bathan
Gachi-7410, Maheshpur,
Jhenaidah, Bangladesh



Department of Electrical and
Electronic Engineering (EEE),
Islamic University, Kustia-7003,
Bangladesh



Profile

I received my PhD in Electronics and Convergence Engineering in 2019, where my core research focused on “Point-of-care (PoC) microfluidic devices analyzing urine and blood for digital health” where couple of smart-biochips integrating digital strategies were designed and proposed for healthcare applications. Additionally, my research interest includes wearable devices for digital healthcare, nano-bio sensors and photovoltaic devices for bio-medical and environmental and applications. Recently, as a post-doctoral researcher I am focusing on the development of digital platform to supplant the conventional immunoassay methods enabling point-of-care clinical applications for the resource-limited communities.



Academic Qualifications

- | | |
|-----------------------------------|--|
| 2015.09.01-
2019.08.21 | Doctor of Philosophy,
School of Radio Sciences and Engineering, KwangWoon
University, Seoul, Republic of Korea (www.kw.ac.kr) |
| 2011.08.24-
2013.08.26 | Masters of Science
Nanomolecular Science, Department of Physics and
Earth Sciences, Jacobs University Bremen, Germany
(www.jacobs-university.de) |
| 1999.03.30-
2000.02.28 | Masters of Science (with thesis)
Applied Physics, Electronic and Communication
Engineering, Islamic University, Kushtia,
Bangladesh (www.iu.ac.bd) |
| 1995.02.15-
1999.03.01 | Bachelor of Science (Honors)
Applied Physics, Electronic and Communication
Engineering, Islamic University, Kushtia,
Bangladesh (www.iu.ac.bd) |
| 1993.01.01-
1994.12.31 | Higher Secondary Certificate (HSC)
Group: Science
Jessore Education Board, Bangladesh |
| 1991.01.01-
1992.12.31 | Secondary School Certificate (SSC)
Group: Science
Cantonment College, Jessore
Jessore Education Board, Bangladesh |



Research Projects

- Smartphone-based automated optofluidic device, Medical Device Development, Korea.
- Disposable lab-on-a-chip (LOC) device, Basic Science Research Program, Korea.
- Translation of conventional 96-well ELISA into active microfluidic device for point-of-care (PoC) applications, Business for Start-up Growth and Technological Development, Korea.
- Highly Educated Human Resources Development Project on Cutting-edge Sensor Technology for Sensor Industry Acceleration, Korea.
- Hybrid microfluidic device for urine analysis, Korea Health Technology R&D Project.



Research Grants

- National Research Foundation of Korea (NRF)
- Kwangwoon Research Grant
- Korea Small and Medium Business Administration
- Korea Health Industry Development Institute (KHIDI)
- Ministry of Education, Korea
- Ministry of Science & ICT, Ministry of Health & Welfare, Ministry of Food & Drug Safety, Korea
- Korea Ministry of SMEs & Startups

University Grants Commission
Funded Research Grant For
"Implementation Of Highly
Sensitive Pulse Sensor Using Bio-
Mimetically Structured
Conductive Rubber" Organized
By Islamic University, Kushtia,
Bangladesh



Career

- | | |
|-----------------------------------|---|
| 2021.07.01-
till date | Post-Doctoral Researcher (under study leave from Islamic University, Kushtia, Bangladesh),
BIO-IT Convergence Laboratory, KwangWoon University, Seoul, Republic of Korea (www.kw.ac.kr) |
| 2018.12.07-
till date | Professor
Department of Electrical and Electronic Engineering, Islamic University, Kushtia, Bangladesh (www.iu.ac.bd) |
| 2015.09.01-
2019.08.21 | Graduate Research Assistant (under study leave from Islamic University, Kushtia, Bangladesh)
BIO-IT Convergence Laboratory, School of Radio Sciences and Engineering, KwangWoon University, Seoul, Republic of Korea (www.kw.ac.kr) |
| 2018.09.15-
2014.12.06 | Associate Professor
Department of Electrical and Electronic Engineering, Islamic University, Kushtia, Bangladesh (www.iu.ac.bd) |
| 2011.08.24-
2013.08.26 | Teaching Assistant (under study leave from Islamic University, Kushtia, Bangladesh), Physics Research Laboratory, Jacobs University Bremen, Germany (www.jacobs-university.de) |
| 2004.09.15-
2007.09.14 | Lecturer
Department of Electrical and Electronic Engineering, Islamic University, Kushtia, Bangladesh (www.iu.ac.bd) |



Research Specialization

- Design and fabrication of smart-bio chip, wearable devices
- Plastic chip patterning, injection molding
- PDMS casting and bonding, UV bonding, hot embossing
- Electrochemical synthesis of metal nanowire
- Microfabrication using contact printing and photolithography
- Surface medication of silicon, Ag and Au using self-assembly and chemical etching
- Material characterization using SEM, AFM, UV-Vis, cyclic-voltammetry, impedance spectroscopy, and 4-prob method
- System operation: AI-based colorimetric analyzer, micro-plate reader, chemiluminescence, thermal evaporator, vacuum evaporator, SEM, AFM, RF sputter, probe station



Additional Professional Experience

- **Head**, Smart Sensors & Microactuators Research & Training (SMaRT) Lab, Dept. of Electrical and Electronic Engineering, Islamic University, Kushtia, Bangladesh
- **Team Leader**, BIO-IT Convergence Laboratory, Kwangwoon University, Korea
- **Former Mentor**, Dept. of Electrical and Electronic Engineering, Islamic University, Kushtia, Bangladesh
- **Former House Tutor**, Lalon Shah Student Hall, Islamic University, Kushtia, Bangladesh
- **Member**, Bangladesh Nanotechnology Society



International Journal Reviewing

- ACS Nano
- Scientific Reports
- Biosensors and Bioelectronics
- Biomedical Optics Express
- Sensors and Actuators A: Physical
- Sensors and Actuators B: Chemical
- Results in Physics
- IEEE Sensors
- Sensing and Bio-Sensing Research
- Water SA
- Micromachines
- Measurement



Journal Publications

01 **Analytical Chemistry**
93(2021)6394-6402
[DOI:10.1021/acs.analchem.0c05387](https://doi.org/10.1021/acs.analchem.0c05387)

M. Jalal Uddin, Nabil H. Bhuiyan, Jun. H. Hong, Joon S. Shim, *Smartphone-Based Fully Automated Optofluidic Device With Laser Irradiation-Induced Image Whitening.*

02 **Scientific Reports**, 2021
[DOI:10.1038/S41598-021-81433-y](https://doi.org/10.1038/S41598-021-81433-y)

M. Jalal Uddin, Nabil H. Bhuiyan, Joon S. Shim, *Fully Integrated Rapid Microfluidic Device Translated From Conventional 96-Well Elisa Kit.*

03 **RSC Advances**
10(2020)28390-28396
[DOI:10.1039/D0RA03830J](https://doi.org/10.1039/D0RA03830J)

Wonjong Jung, M. Jalal Uddin, Kak Namkoong, Wonseok Chung, Djoon-Ho Kim, Joon S. Shim, *Toward A Disposable Low-Cost Loc Device: Heterogeneous Polymer Micro Valve And Pump Fabricated By Uv/Ozone-Assisted Thermal Fusion Bonding.*

04 **Materials Research Express**
6(2019)085510
[DOI:10.1088/2053-1591/ab1e8c](https://doi.org/10.1088/2053-1591/ab1e8c)

M. K. Basher, M. Jalal Uddin, M. Khalid Hossain, M. A. R. Akand, S. Biswas, M. N. H. Mia, K. M. Shorowordi, *Effect Of Doping Profile On Sheet Resistance And Contact Resistance Of Monocrystalline Silicon Solar Cells.*

05 **Journal of Advanced Research**
15(2019)1-19
[DOI:10.1016/j.jare.2018.06.005](https://doi.org/10.1016/j.jare.2018.06.005)

Sarwar Hossen, M. Khalid Hossain, M.K. Basher, M.N.H. Mia, M.T. Rahman, M. Jalal Uddin, *Smart Nanocarrier-Based Drug Delivery Systems For Cancer Therapy and Toxicity Studies- A Review.*

06 **Analytical Chemistry**
91(2018)2686-2694
[DOI:10.1021/acs.analchem.8b04043](https://doi.org/10.1021/acs.analchem.8b04043)

M. Jalal Uddin And Joon S. Shim, *Microfluidic Adapter Converting A 96-Well Cartridge Into An Autonomous Microfluidic Device.*

- 07 **Advanced Functional Materials**
28(2018)1804351
[DOI:10.1002/Adfm.201804351](https://doi.org/10.1002/Adfm.201804351)
Bioelectrochemistry
122(2018)221-226
 - 08 [DOI:10.1016/J.Bioelechem.2017.11.001](https://doi.org/10.1016/J.Bioelechem.2017.11.001)
 - 09 **Lab on a Chip**
18(2018)1310-319
[DOI:10.1039/C8LC00003D](https://doi.org/10.1039/C8LC00003D)
 - 10 **Materials Science-Poland**
36(2018)93-101
[DOI: 10.1515/MSP-2017-0090](https://doi.org/10.1515/MSP-2017-0090)
 - 11 **Optik**
172(2018)801-811
[DOI:10.1016/j.ijleo.2018.07.116](https://doi.org/10.1016/j.ijleo.2018.07.116)
 - 12 **Optik**
171(2018)507-516
[DOI:10.1016/j.ijleo.2018.05.032](https://doi.org/10.1016/j.ijleo.2018.05.032)
 - 13 **Journal of Science: Advanced Materials and Devices**
2(2017)385-391
[DOI:10.1016/j.jsamd.2017.07.008](https://doi.org/10.1016/j.jsamd.2017.07.008)
 - 14 **Micromachines**
8(2017)278
[DOI:10.3390/mi8090278](https://doi.org/10.3390/mi8090278)
 - 15 **Analytical Chemistry**
89(2017)13160-s13166
[DOI:10.1021/acs.analchem.7b02612](https://doi.org/10.1021/acs.analchem.7b02612)
 - 16 **Results in Physics**
7(2017)2289-2295
[DOI:10.1016/j.rinp.2017.06.055](https://doi.org/10.1016/j.rinp.2017.06.055)
- Gyeong J. Jin, M. Jalal Uddin (contributed equally) and Joon S. Shim, *Biomimetic Cilia-Patterned Rubber Electrode Using Ultra Conductive PDMS*.
- M. Jalal Uddin, G. Jun Jin, E. Kyu Shik, K. Min Ho, J. Sub Shim, *On-Chip Signal Amplification Of Magnetic Bead-Based Immunoassay by Magnetic Bead Chains*.
- Sung Bin, M. Jalal Uddin (contributed equally), J. Gyeong Jun, J. Sub Shim, *A Disposable On-Chip Micro Valve and Pump for Programmable Microfluidics*.
- M. Khalid Hossain, M.F. Pervez, M. Jalal Uddin, S. Tayyaba, M.N.H. Mia, M.S. Bashar, M.K.H. Jewel, M.A.S. Haque, M.A. Hakim, Mubarak A. Khan, *Influence of Natural Dye Adsorption on The Structural, Morphological and Optical Properties of Tio2 Based Photoanode of Dye-Sensitized Solar Cell*.
- M.K. Basher, M. Khalid Hossain, M. Jalal Uddin, M. A. R. Akand, K. M. Shorowordi, *Effect of The Pyramidal Texturization on the optical Surface Reflectance of Monocrystalline Photovoltaic Si Solar Cell*.
- M. Khalid Hossain, A. A. Mortuza, S. K. Sena, M. K. Basher, M. W. Ashraf, S. Tayyaba, M. N. H. Mia, M. Jalal Uddin, *A Comparative Study on the Influence of Pure Anatase and Degussa-P25 Tio2 Nanomaterials*.
- M. Jalal Uddin, M. K. Hossain, W. Qarony, M. I. Hossain, M. N. H. Mia, S. Hossen, *Time and Pressure Dependent Deformation of Microcontact Printed Channels Fabricated Using Self-Assembled Monolayer of Alkanethiol on Gold (Au) and Silver (Ag)*.
- M. Javaid Afzal, S. Tayyaba, M. Waseem Ashraf, M. Khalid Hossain, M. Jalal Uddin, N. Afzulpurkar, *Simulation, Fabrication and Analysis of Silver Based Ascending Sinusoidal Microchannel (Asmc) for Implant of Varicose Veins*.
- M. Jalal Uddin, G. Jun Jin, J. Sub Shim, *Paper-Plastic Hybrid Microfluidic Device for Smartphone-Based Colorimetric Analysis of Urine*.
- M. Jalal Uddin, M. K. Hossain, M. I. Hossain, W. Qarony, S. Tayyaba, M.N.H. Mia, M. F. Pervez, S. Hossen, *Modeling of Self-Assembled Monolayers (Sams) of Octadecanethiol and Hexadecanathiol On Gold (Au) And Silver (Ag)*.

- 17 **Results in Physics**
7(2017)2683-2691
[DOI:10.1016/j.rinp.2017.07.047](https://doi.org/10.1016/j.rinp.2017.07.047)
 - 18 **Biomedical Optic Express**
8(2017)3317-3328
[DOI:10.1364/BOE.8.003317](https://doi.org/10.1364/BOE.8.003317)
 - 19 **Results in Physics**
7(2017)4287-8293
[DOI:10.1016/j.rinp.2017.09.030](https://doi.org/10.1016/j.rinp.2017.09.030)
 - 20 **Materials Science-Poland**
35(2017)816-823
[DOI:10.1515/msp-2017-0086](https://doi.org/10.1515/msp-2017-0086)
 - 21 **Applied NanoScience**
7(2017)489-497
[DOI:10.1007/s13204-017-0582-y](https://doi.org/10.1007/s13204-017-0582-y)
 - 22 **Materials Science-Poland**
35(2017)868-877
[DOI:10.1515/msp-2017-0082](https://doi.org/10.1515/msp-2017-0082)
 - 23 **Sensors and Actuators B: Chemical**
239(2017)52-59
[DOI:10.1016/j.snb.2016.07.159](https://doi.org/10.1016/j.snb.2016.07.159)
 - 24 **Journal of Bangladesh Electronics and Informatics Society**
15(2015)39-45
http://beis.org.bd/issue_content_vol_15_1_2
 - 24 **International Journal of Material and Mechanical Engineering (IJMME)**
4(2015)55-65
[DOI:10.14355/IJMME.2015.04.009](https://doi.org/10.14355/IJMME.2015.04.009)
- M.N.H. Mia, M.F. Pervez, M. Khalid Hossain, M. Reefaz Rahman, M. Jalal Uddin, M.A. Al Mashud, H.K. Ghosh, Mahbubul Hoq, Influence of Mg content on tailoring optical bandgap of Mg-doped ZnO thin film prepared by sol-gel method
- M. Jalal Uddin, K. Sang Chan, J. Sub Shim, *Histogram Analysis for Smartphone-Based Rapid Hematocrit Detection.*
- W. Qarony, M. I. Hossain, M. Khalid Hossain, M. Jalal Uddin, A. Haque, A.R. Saad, Yuen Hong Tsang, *Efficient Amorphous Silicon Solar Cells Characterization, Optimization, and Optical Loss Analysis.*
- M. Khalid Hossain, M.F. Pervez, S. Tayyaba, M. Jalal Uddin, A.A. Mortuza, M.N.H. Mia, M.S. Manir, M.R. Karim, Mubarak A. Khan, *Efficiency enhancement of natural dye sensitized solar cell by optimizing electrode fabrication parameters.*
- M. I. Hossain, W. Qarony, M. Khalid Hossain, M. K. Debnath, M. Jalal Uddin, Yuen Hong Tsang, *Effect Of Back Reflectors On Photon Absorption In Thin-Film Amorphous Silicon Solar Cell.*
- M. Khalid Hossain, M. F. Pervez, M. N. H. Mia, S. Tayyaba, M. Jalal Uddin, R. Ahamed, R. A. Khan, M. Hoq, Mubarak A. Khan and F. Ahmed, *Annealing temperature effect on structural, morphological and optical parameters of mesoporous TiO₂ film photoanode for dye-sensitized solar cell application.*
- K. Sang Chan, M. Jalal Uddin, I. Sung Bin, K. Sungho, J. Sub Shim, *A Smartphone-Based Optical Platform for Colorimetric Analysis of Microfluidic Device.*
- M. Mahbub Alom, M. Abdul Momin, M. Jalal Uddin, M. Islam, *Structural And Optical Evaluation of Cadmium Sulfide (CdS) Nanoparticles Synthesized By Chemical Route.*
- M. Jalal Uddin, M. Abdul Momin, M. Abdur M. A. Razzaque, M. Shahinuzzaman, M. Khairul Islam, W. Qarony, M. I. Hossain, *A Review on The Influence of Applied Potential on Different Electrical Properties of Self-Assembled Monolayers (SAMs) of Alkanethiols on Gold (Au) Surface,*



Conference Papers/Posters

- 01 **Biosensor 2021-Online**
31th Anniversary Congress on
Biosensors
July 26-29, 2021
<https://www.elsevier.com/events/conferences/world-congress-on-biosensors>

- 02 **Biosensor 2021-Online**
31th Anniversary Congress on
Biosensors
July 26-29, 2021
<https://www.elsevier.com/events/conferences/world-congress-on-biosensors>

- 03 **The 10th International Symposium on
Microchemistry and Microsystems**
June 19-21, 2018, Busan, Korea

- 04 **Mechanics**
Aberdeen, UK
July 9-12, 2018
<https://mechanics.nscj.co.uk/>

- 05 **The 48th KIEE Summer Conference**
1462-1463, 2017
https://www.dbpia.co.kr/journal/articleDetail?nodeId=NODE07232610&language=ko_KR

- 06 **μTAS Conference 2015**
Gyeongju, Korea
October 25-29, 2015
<https://nanobio.kaist.ac.kr/members/microTAS2015.htm>

- 07 **German Physical Society (DPG)Spring
Conference**
Regensburg, Germany
March 10-15, 2013
<https://regensburg13.dpg-tagungen.de/>

- 08 **XV International Workshop on the
Physics of Semiconductor Devices
(IWPSD)**
Mumbai, India
December 15-19, 2009
https://iwpsd2.rssing.com/channel/11919039/all_p1.html

- 09 **XV International Workshop on the
Physics of Semiconductor Devices
(IWPSD)**
Mumbai, India
December 15-19, 2009
https://iwpsd2.rssing.com/channel/11919039/all_p1.html

M. Jalal Uddin, Nabil H. Bhuiyan, Joon S. Shim, *Fully Configurable Sample-to-Answer Microfluidic Device Translated from Conventional 96-Well Elisa Kit.*

Nabil H. Bhuiyan, Jun. H. Hong, M. Jalal Uddin, Joon S. Shim, *A Smartphone-Based Fully Automated Optofluidic Device by Laser-Irradiation Induced Image Whitening.*

Jun H. Hong, Mu K. Yo, M. Jalal Uddin, Sung I. Bin, Gyeong J. Jin, Joon S. Shim, *A Disposable On-Chip Micro Valve and Pump for Programmable Microfluidics.*

M. Jalal Uddin, M. Khalid Hossain, W. Qarony, M. I. Hossain, S. Hossen, *Time and Pressure Dependent Deformation of Microcontact Printed Channels Fabricated Using Self-Assembled Monolayers of Alkanethiol on Gold.*

Gyeong J. Jin, M. Jalal Uddin, Joon S. Shim, *Hematocrit measurement using smartphone-based histogram analysis technique.*

M. Jalal Uddin, G. Jun Jin, E. Kyu Shik, K. Min Ho, and J. Sub Shim, *On-chip signal amplification of magnetic bead-based immunoassay by magnetic bead chains.*

M. Jalal Uddin, Nivedita Yumnam, Veit Wagner, *Density Analysis of 1-Octadecanethiol and 1-Hexadecanethiol Self-Assembled Monolayers (SAMs) on Au and Ag by Impedance Spectroscopy.*

M. Jalal Uddin, Roksana Parvin, Momtazul Islam, Md Abdul Momin, and Zahid Hasan Mahmood, *Room temperature synthesis and characterization of CuO, Ag and Au nanoparticles.*

Mrs. Roksana Pervin, M. Jalal Uddin, M. Abdul Momin and Momtazul Islam, *Synthesis and optical evaluation of copper oxide (CuO) nanoparticles.*

Scholarships & Awards

2015 - 2019 : Graduate Research Scholarship, Kwangwoon University, Republic of Korea.

2011 - 2013: Nanomolecular Science Program Grants, Jacobs University, Bremen, Germany.

1996-2000 : Merit Scholarship, Islamic University, Kushtia, Bangladesh

Personal Information

- Date of Birth: November 02, 1977
- Place of Birth: Jhenaidah, Bangladesh
- Marital status: Married
- Height: 167 cm
- Blood group: O+

Software skills

- Design: Auto Cad/Corel Draw, 3ds Max (3d drawing)
- PROGRAMMING: MATLAB, C/C++

References

Prof. Dr. Joon S. Shim
Dept. of Electronic Convergence Engineering,
Kwangwoon University, Seoul, Republic of Korea
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Telephone: +82 2 9264 5046

Prof. Dr. Veit Wagner
School of Engineering and Science, Jacobs
University Bremen, Germany
E-mail: v.wagner@jacobs-university.de
Telephone: +49 421 200-3225

Declaration of Authenticity

I do hereby declare that all the information here is true to the best of my knowledge. If required and where applicable, this document can be supported by appropriate authentic certificates/papers.



01 September, 2021