Department of Electrical and Electronic Engineering
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Dr. Md. Arafat Hossain
Professor
Research Area Photonics and optical engineering 3D printing and technologies for sensing applications; 3D printing in photonics; 3D bio-printing

Biography

Md Arafat Hossain is Professor of Electrical and Electronic Engineering and Chairman of the Central Computer Centre & ICT Cell of the Khulna University of Engineering and Technology (KUET) and a member of IEEE, OSA, SPIE and IEB. He received a PhD on smart sensing and instrumentation from The University of Sydney in 2017 and later an Australian Award of Endeavour Fellowship for his postdoctoral research in smart sensing. Throughout this period, Dr. Hossain has conducted the cutting-edge research in the interdisciplinary area of smart sensing and sensor systems and generated some ground-breaking results which have been reported and featured in a number of reputed journals and news including the Nature Photonics News. Among them, smartphone spectrometers and smartphone laser beam profiler are particularly well-recognized. He is also an expert member of 3D printing & technologies and was responsible to establish the facilities at the interdisciplinary Photonics Laboratories (Sydney), when he also helped to develop technologies for some biomedical start-ups at Sydney. Dr. Hossain is also serving as a Review Editor of Frontiers in Sensors journal. He has received a number of awards and honors including the 2016 Hitachi Social Innovation Award, 2014 ResMed Award, two Best Paper Awards, Australian Govt. IPRS scholarship, Norman I Price Award, Australian Award Scholarship and UGC small grant. He has authored 1 book, 25 journals and more than 35 conferences papers, and filed 2 provisional patents in the area of smart sensing and photonics.

Career Highlights

- 8+ years experience in designing, 3D modeling, and hardware prototyping of sensor instruments and working in an interdisciplinary space for sensing in renowned photonics lab & start up
- 5+ years in establishment and operation of 3D printing & extrusion facilities with FDM and SLA printers
- Fabrication, processing and characterization of polymer optical fibers
- Experienced with pulsed 193 nm ArF exciplex and CW 244 nm Ar ion lasers facilities for FBG fabrications
- 1 year experience in characterization and testing of metal ion sensing in a renowned analytical chemistry lab
- Analytical instruments operation and maintanace : spectrofluorometer, UV/Vis spectrometers, FTIR, microscopes, laser beam profilers
- Smartphone application (app) development in Android platform
- Programming with embedded devices and microcontroller boards (Arduino), C++, MATLAB, MIT App Inventor
- Simulation & Optimization tools: COMSOL, Optiwave, AutoCAD
- Student supervision: PhD (2), MSc (3) and Honors (>25)
- Publications: book (1), journals (24), conferences and workshops (>40)
- Editorial role and services: Guest Editor, Applied Sciences Special Issue on Photonic Devices and Applications, Review Editor in Frontiers in Sensors (Physical Sensors), Organizing Secratary of 6th International Conference on Electrical Information and Communication Technology, 7-9 December, 2023 KUET, Khulna, Bangladesh, TPC Member, 2024 IEEE Opto-Electronics and Communications Conference (OECC) Jun. 30 - Jul 04, 2024, Melbourne, Australia, Assistant Organizing Secratary, 4th International Conference on Electrical Information and Communication Technology, 21-23 December, 2019, KUET, Khulna, Bangladesh

Education

Doctor of Philosophy in Electrical and Information Engineering
The University of Sydney,Australia(2013-2017)
Thesis Title: **Lab-in-a-Phone for Smart Sensing**
Supervisors: Prof. John Canning and Prof. Abbas Jamalipour
Master of Science in Electrical & Electronic Engineering
Khulna University of Engineering & Technology (KUET),Bangladesh(2009-2012)
Bachelor of Science in Electrical & Electronic Engineering
Khulna University of Engineering & Technology (KUET),Bangladesh(2005-2009)

Service Records

- **Deputy Manager**
  More Enrerpreneual Life at Bangladeshi Universities@EU Erasmus+ *From to*
  Responsibility:Promoting entrepreneurship activities in Bangladeshi university culture by sensitization, training and coaching programs for students.
- **Professor**
  Department/Section: Electrical and Electronic Engineering
  Department of Electrical and Electronic Engineering (EEE), KUET *From to*
  Working Area:Sensors and instrumentation, optics and photonics
- **Associate Professor**
  Department of Electrical and Electronic Engineering (EEE), KUET *From to*
- **Lecturer**
  Department of Electrical and Electronic Engineering (EEE), KUET *From to*
- **Assistant Professor**

Department of Electrical and Electronic Engineering (EEE), KUET *From to*

- **Postgraduate Researcher (PhD)**
  Wireless Networking Group (WiNG)and interdisciplinary Photonics Laboratories (iPL), The University of Sydney *From to*
- **Casual Academic (Undergraduate Tutor)**
  The University of Technology Sydney (UTS) *From to*
- **Casual Academic (Undergraduate Tutor)**
  School of Electrical and Information Engineering, The University of Sydney *From to*
- **Research Fellow**
  Department/Section: Electrical and Information Engineering
  The University of Sydney *From 2017-09-04 00:00:00to2018-02-10 00:00:00*
  Working Area:Smart Sensing & Instrumentation

Research Interest

Photonics and optical engineering

Smart sensing, devices and materials are increasingly underpinned by the need for new photonic technologies to create, outperform, improve and transform ubiquitous systems of the future across industry and society. Dr Hossainâ€™s research focuses on new device and sensing technologies making smarter use of them to detect our physical and chemical environments. In particular, Dr. Hossain and his team, is working on harnessing the attributes of many smart device technologies (smartphone, smart wearables etc.) to develop of low-cost scientific instruments aiming to serve in those areas where traditional instruments are limited by their size, cost and connectivity. This includes smartphone colorimetric, microscopic, spectroscopic, SPR, and many fiber-optic based devices. 3D fabrication of new materials and devices will enable new directions to open up. The cross-disciplinary nature means the team investigates interests across science and engineering. The ultimate aim is to create a powerful network of sensing technologies that will determine the shape of the next generation internet-of-everything to come.

3D printing and technologies for sensing applications; 3D printing in photonics; 3D bio-printing

Publication

Books

1Hossain,M. A. and Jamalipour,A. (2019) ," Smartphone Instrumentation for Public Health Safety", ***Smartphone Instrumentation for Public Health Safety*** , ISBN:978-3-030-02095-8,Springer International Publishing, vol1