Dr. Shahinur Rahman

Summary

Over 8 years of research and teaching experience with nuclear science and technology, signal processing, nuclear engineering, radiation detection and protection, energy and mining technology, particle accelerator operation, nuclear detector, regulation of nuclear materials through the state system of nuclear accountancy and control, plasma applications, instrumentation and control, data science, engineering design, material physics, power system, project management, stakeholder engagement, development of course curriculum and teaching material, lecturing and lab demonstration, student consultation, preparation and delivery of seminars, publishing scientific papers, research grant applications, and work health and safety.

Education

Doctor of Philosophy (Applied Nuclear Science and Technology)   2022 (top 10%, Grade A)
UNSW Sydney (Stationed at the ANU, Canberra, Australia)
*Thesis title: "**Optimization of Scintillator Performance for the Development of Large-Scale Scintillation Detector",** link at: https://doi.org/10.26190/unsworks/24456*

ANU X-ray Machines (Ionizing Radiation- WHS018)   July 2018
ANU and Australian Government.   Result: 88 %

Master of Engineering in Nuclear and Energy Engineering   February 2014 to February 2016
Jeju National University, South Korea.   CGPA 3.95 out of 4.30 (95.5/100)
*Thesis title: "**Tribological and Physico-Chemical Properties of Electron Beam Irradiated Co-polymer".***

Bachelor of Science (Hons.) in Electrical and Electronic Engineering   2012
Thesis title: *"Analysis of Renewable Hybrid Energy in Coastal Areas of Bangladesh"* at BUET

Scholarships, Awards and Research Funds

1. 1st prize (Medal) for the best nuclear reactor design (Small Modular Reactor (SMR)) at IYNC2020 congress, Sydney, Australia organized by ROSATOM, Russia, ANSTO and Australian Government.
2. The IEEE NSS/MIC 2020 (MIT, America) conference award ($1500) for innovative research in nuclear and radiation science.
3. Australian Government Research Training Program (RTP) scholarship award to pursue PhD degree at UNSW.
4. ARC research project fund 10,000 AUD was used for nuclear physics research at the Department of Nuclear Physics and Accelerator Applications, ANU.
5. UNSW HDR funding ($6000) for conference and research projects.
6. Brain of Korea (BK21+) scholarship award by Korean Govt. to pursue master degree in Nuclear and Energy Engineering.
7. Departmental award for academic excellence in Bachelor degree program.

Professional Experiences

1. Post-doctoral Researcher (Nuclear Science and Energy Technology)   2021 to present
The Research School of Physics and Engineering, ANU, Canberra, Australia

Key Responsibilities:
- Liquid scintillation detector development for radiation measurements with optimum sensitivity and energy resolution.
- Particle accelerator operation, calibration and maintenance for materials physics and nuclear science applications.
- Nuclear electronics and data acquisition system setup for radiation measurements.
- Radiation detectors' data analysis using Python programming and decision making.
- Understanding of nuclear physics and reactions using various detectors, radioisotopes, particle accelerator, data acquisition and Python programming for applications in nuclear science and technology.
- Applications of nuclear science and technology in mining industry for mineralogy analysis.
- Managing industry and Australian government funded projects as a project coordinator.
- Maintaining close relations and collaborations between the industry and academic partners to solve real life nuclear science and material physics problems using updated expertise.
- Tutoring, lab demonstration and supervision of undergraduate and master students.
- Preparation of the funding applications and technical reports of different engineering projects.

2. Postgraduate Researcher (Nuclear Science and Technology)   2017 to May 2021
The University of New South Wales (UNSW Sydney)

Key Responsibilities:
- Optimization of nuclear recoil energies of scintillator crystals using ANU 15 MV Tandem Particle Accelerator for ANSTO, ANU and Australian Government funded projects.
- Pulse shape discrimination to understand different radioactive events with Python for SABRE dark matter detection project in Australia.
- Gamma spectroscopy with different radioisotopes for energy calibration.
- Scintillation light yield measurements in radiation detectors such as NaI(Tl) for ANSTo project.
- Liquid scintillator development for radiation detector development.
- Report writing of project outcome and publishing research outcomes in top notch journal.
- Lecturing, tutoring and lab demonstration in physics and mathematics subjects for undergraduate students as a casual academic.
- Exam paper marking and exam invigilator duties for physics and mathematics subjects.
- Compatibility analysis of materials in radiation and liquid scintillator environment for an underground detector (2.6m x 2.6 m) development.

3. Tutoring   2019 to present
Learnmate Australia

Key Responsibilities:
- Tutoring in Learnmate Tutoring Pty Ltd., Australia in Physics and Mathematics for high school and primary school students for lesson preparation and assignment help.
- Contributes to student learning, growth, and advancement.
- Facilitates problem-solving with a curious mind and critical thinking skills.

- Designs and facilitates differentiated and personalized learning goals and activities that follow a coherent sequence, are aligned to instructional goals.

4. Graduate Researcher (Nuclear Fusion and Plasma Applications)   February 2014 to July 2017
Department of Nuclear and Energy Engineering, Jeju National University, South Korea.

Key Responsibilities:

- Plasma based cleaning of Nuclear Fusion reactor's First Mirror.
- Laser alignment and operations for nuclear and material science applications.
- Surface modification of complex materials by Ion Implantation and plasma etching.
- Electron beam dose irradiation for tribological and physico-chemical properties improvement of complex materials.
- Nuclear detector and reactor simulations for industry projects.
- Thin film coating using DC and RF Magnetron Sputtering for printed electronic and medical devices applications.
- Materials characterizations using SEM-EDS, Raman, FTIR, 3D Nano Surface profiler, AFM, Water contact angle, Tribometer, 4 Point probe, GC-MS, UV-Vis and laser systems.
- X-ray and/or allied spectroscopic measurements for crystal structure, phase identification, compound, and elemental composition analysis.
- Underwater capillary plasma discharge setup for bacterial growth inhibition.
- Lecturing, tutoring, lab demonstration and supervision of undergraduate students in nuclear engineering projects.

5. Lecturer   June 2012 to December 2013

IUBAT, Dhaka, Bangladesh.

Key responsibilities:
- Lecturing in Solid State Physics, Electro-magnetism, Digital Electronics, Electrical Engineering, Power Electronics, Power System and Instrumentation for bachelor degree students.
- Lab demonstration and prepare reports in power system, digital electronics and solid-state physics.

6. Electrical Engineer (Industrial Process Plant)   April 2012 to January 2014
Akij Group of Companies (a largest conglomerate), Dhaka, Bangladesh

Key responsibilities:

- Support day to day operations of production plant including preparation of production plans, assignment of customer consignments and managing shipping schedules.
- Lead the engineering team with necessary recommendations to resolve identified issues.
- Liaise with customer on an ongoing basis to determine requirements, provide progress updates and resolve complaints and issues.
- Operation and maintenance of Tracer programmable machines, PLC (Siemens, Omron, Schenider electric) and HMI programmable machines, 500 KVA diesel generator and Compressor (Atlas Copco GA37+).

Training, Certification and Professional Membership

- Completed training on "managing supervisor and student relationship and expectations" organized by the Australian National University on 2nd September 2022.
- Completed short course on "Machine Learning and Neuromorphic Computing in Nuclear Science" organized by the 2020 IEEE Nuclear Science and Plasma Society, Boston, America.
- Certification on "Integrated Circuits and Radiation Hardened Design for Nuclear Measurements", IEEE, Boston, America.
- Certification in Ionizing Radiation Safety – Machines (WHSO18) provided by the Australian National University (ANU) collaborated with ARPANSA (Australian Govt.) to operate 14UD Tandem Heavy Ion Accelerator and work with ionizing radiation measurements.
- Completed one day training in "Radioactive Decay Calculations" on 09/10/2020 organized by the Society for Radiological Protection, UK.
- Occupational Radiation Exposure for Medical Facilities by ARPANSA, Australian Government.
- Certification in industrial automation control systems (PLC, HMI programming and logic controller etc.).
- Certification in Plasma devices applications and sputtering techniques organized by Korean Vacuum Society, Busan, Korea.
- Data Analysis with Python by IBM, America.
- Python for Data Science, AI and Development by IBM, America.
- Certification on "Project Leadership" by the Project Management Institute, America.
- Work Health and Safety Training by UNSW Canberra and ANU.
- Member (ID No: 96699610) of The Institute of Electrical and Electronics Engineers (IEEE).
- Member of IEEE Nuclear and Plasma Sciences Society, America.

Technical and Professional skills:

- Python, C/C++, MATLAB, Geant4
- Work Health and Safety
- Ionizing Radiation Safety
- PLC, HMI, SCADA
- Linux OS, Office 365, AutoCAD, PSpice
- Data Science, Security frameworks
- Plasma Applications
- Risk management framework
- Excellent in problem identification, analysis, and solving skills
- Experience in database management and API implementation
- Gamma spectroscopy and analysis
- Experience with statistical analysis tools, machine learning techniques
- Experience in project management, project reporting, and timely work practice
- Experience in team management, diplomacy, adaptability, conflict resolution, and leadership