Workshop on "Modeling and Analysis of PV Inverter using MATLAB/Simulink"

On **Tuesday, 10th October 2023**, the **IEEE IA-S AIUB Student Branch Chapter,** in collaboration with the **IEEE AIUB Student Branch WIE Affinity Group** organized a workshop titled "**Modeling and Analysis of PV Inverter using MATLAB/Simulink**" as a segment of the celebratory event of "**IEEE Day 2023**".

The workshop provided an in-depth exploration of the intricacies surrounding PV inverter modeling. It provided participants with the opportunity to gain a comprehensive understanding of the fundamental principles, engage in hands-on simulations of real-world scenarios, and conduct thorough performance analyses of these inverters across a spectrum of conditions.

The workshop was conducted by **Dr. Shameem Ahmad,** *Counselor, IEEE AIUB Student Branch; Assistant Professor, Department of EEE, Faculty of Engineering, AIUB.* Specifically, he covered a wide range of essential topics related to PV inverters and their design. Additionally, he provided valuable insights into the design of single-phase inverters using MATLAB and hardware-in-loop setups. Dr. Ahmad also emphasized the pivotal role played by digital signal processors (DSPs), microcontrollers, Arduino, and MATLAB in the design process, shedding light on their significance in creating efficient and reliable PV inverters.

Throughout the workshop, attendees gained an understanding of various crucial concepts, including the transient period in inverter operation, H-bridge inverters, the utilization of power electronic switches, pulse generation techniques, the initial stages of inverter design, component selection, gate pulse generation methods, the relationship between frequency and time in the process of converting direct current (DC) to alternating current (AC), and the importance of Total Harmonic Distortion (THD) in assessing inverter output quality. Furthermore, Dr. Ahmad provided valuable insights into filter design and the construction of LC filters, enhancing participants' comprehension of how to optimize inverter performance and reduce unwanted harmonic distortion in the output.

The workshop is closely linked to Sustainable Development Goals (SDGs) 7 and 13. Under SDG 7, which aims for Affordable and Clean Energy, the workshop delves into the understanding of PV (Photovoltaic) inverters, vital components for harnessing clean and renewable energy from solar panels, thus promoting the utilization of affordable and sustainable energy sources. Moreover, it indirectly supports SDG 13, Climate Action, by contributing to the mitigation of climate change through the promotion of renewable energy technology, emphasizing the workshop's role in advancing the adoption of clean energy practices.

The event began around **11:15 AM** and ended at **2:00 PM.** A total of 50+ participants attended the workshop.