RECENT GROWTH ADVANCEMENT IN DEFENCE TECHNOLOGY (RGADT 2024) DAY 1- :

The collaboration between the IEEE VSSUT Student Branch and IEEE Com Soc Chapter ITR, DRDO Chandipur, brought forth the enlightening RGADT-2024 workshop on April 10th and 11th, 2024, drawing in over 200 eager participants. Esteemed Scientists Dr. Pradipta Roy, Mr. Amiya Kumar Das, and Dr. Arun Kumar Ray illuminated the audience with valuable insights into defense technology advancements. The event started with Prof. Banshidhar Majhi's welcoming words, marking the beginning of two days packed with learning and building connections.

Day one commenced with a dynamic lecture on RF target tracking by Dr. A.K. Ray. This comprehensive presentation covered a wide range of topics, including air defense systems, air-to-air trials, multi-missile multi-target scenarios, and dual missiles launched from different complexes. Dr. Roy also delved into the intricacies of multi-missile single-target engagement in salvo mode. The vision behind this lecture was to present a state-of-the-art perspective on missile technology, weapon systems, and test ranges.

The second lecture of the day, presented by Mr. A.K. Das, focused on "Communication in Test Range." The session was both joyful and informative, sparking a lively exchange of questions from the eager participants. Queries ranged from understanding how the system handles obstructions that may block the RF signal temporarily to inquiries about the choice of a horn antenna as a feed for a parabolic antenna. Students were also keen to learn about software preferences for antenna design analysis and simulation within DRDO. Mr.A.K Das patiently addressed each question, providing clear explanations and insights. The discussion further delved into the concept of boresight setup, its calculation, function block diagram, and design features, followed by an exploration of phased array radar. Throughout the lecture, Mr. Das shared his vast experience and knowledge, ensuring participants gained a comprehensive understanding of the complex topics discussed.

The final session of the day, led by Dr. Pradipta Roy, delved into "AI and ML in Defence Services," covering topics from face recognition to discriminating birds from aircraft using AI and ML techniques. Dr. Roy, honored with an award from Dr. APJ Abdul Kalam, answered questions about the reliability and robustness of these algorithms in critical defense operations. The discussion then shifted to RF communication networks, including fiber optics at ITR Chandipur, radio links, satellite links, and IP networks. Dr. Roy addressed queries on signal propagation, interference management, and the challenges of IP-based communication systems. Questions also touched on circuit-switched network limitations, LAN topology in DRDO, and cybersecurity concerns related to RF communication. Throughout, Dr. Roy maintained an engaging, joyful atmosphere, helping students understand complex topics and ending the day with a lively and fun-filled session.

DAY – 2 :

Day 2 kicked off with a bang as Dr. A.K. Ray presented on "Dynamic RF Target Tracking." He guided participants through essential processes to enhance the target signal, covering topics like signal integration, correlation, filtering, and spectrum analysis. The session seamlessly transitioned into signal processing block diagrams, discussing A/D converters, storage, spectrum analysis, and the use of pulse compression. Dr. Roy's teaching spanned from basic to advanced concepts, enriching participants with a wealth of knowledge and setting a strong educational tone for the rest of the day.

Following Dr. A.K. Ray's session on "Dynamic RF Target Tracking," Dr. Pradipta Roy took over to explore "AI and ML in Defense Services." He delved into image processing, formation, sampling, and quantization, shedding light on image histograms and equalization. Discussing electro-optics and optical fibers, Dr. Roy illustrated system-level block diagrams of electro-optical tracking systems and their advantages. He also covered the electromagnetic spectrum, emitted radiation basics, and infrared radiation laws. Infusing humor throughout, Dr. Roy made the complex topics engaging and memorable, adding depth to participants' understanding while keeping the atmosphere lively.

The day's lecture session continued with Mr. A.K. Das presenting on "RF Communication in Test Range." Mr. Das educated the audience on satellite communication, starting with its pioneering efforts and the EPEO Belt, India's first Satcom program. He then delved into the basics of Satcom systems, discussing space segment orbits, followed by an in-depth look at lower earth orbits and geostationary orbit satellites. As the day concluded, participants were left with lasting memories and a wealth of knowledge on RF communication and satellite systems.


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