Paper ID: 80853
oral
student

IAF EARTH OBSERVATION SYMPOSIUM (B1)
Interactive Presentations - IAF EARTH OBSERVATION SYMPOSIUM (IP)

Author: Dr. Gumru Sharafkhanova
NASA, Azerbaijan

ADVANCING GLOBAL ENVIRONMENTAL MONITORING: INNOVATIVE STRATEGIES IN EARTH OBSERVATION SYSTEMS

Abstract

In an era where climate change and environmental degradation pose significant challenges, the role of advanced Earth Observation Systems (EOS) is more critical than ever. This paper presents innovative strategies for enhancing global environmental monitoring through cutting-edge EOS technologies. Our multidisciplinary approach combines the latest advancements in satellite imagery, artificial intelligence, and big data analytics to provide unprecedented insights into Earth's changing ecosystems. We introduce a novel satellite architecture that leverages high-resolution multispectral imaging capabilities to monitor environmental parameters with enhanced precision. This architecture is supported by a robust AI framework capable of processing vast amounts of data to detect subtle changes in land use, vegetation health, and water quality. Additionally, our system integrates İOT sensors for real-time ground truth validation, enriching the satellite data with precise local observations. A significant focus of our research is on the democratization of EOS data. We propose an open-access platform that enables researchers, policymakers, and communities worldwide to access and utilize our data for various applications, from climate research to disaster response. This platform is designed to be user-friendly and supports a range of analytical tools tailored to different user needs. Our findings demonstrate the potential of our EOS system in various case studies, including tracking deforestation in the Amazon, monitoring melting ice caps in the Arctic, and assessing urban air quality. These applications highlight the system's versatility and its impact on both local and global scales. In conclusion, our paper argues for the critical importance of innovative EOS in addressing global environmental challenges. By harnessing the power of advanced technology and fostering open data access, we can achieve a more sustainable and informed approach to environmental stewardship.