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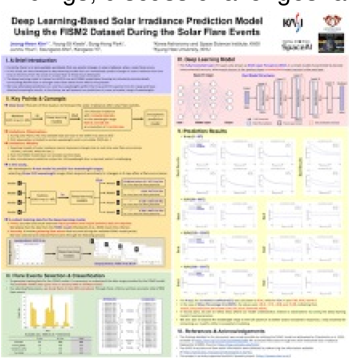
In this study, we address the challenge of predicting solar irradiance changes triggered by solar flares, which are crucial for understanding the ionospheric disturbances that affect the stratified regions of Earth's atmosphere. Solar flares markedly amplify the Sun's radiance, leading to increased photo-ionization within the ionosphere, particularly affecting the D and E layers, and disrupting ground-to-satellite communications. Current space weather surveillance systems are inadequate in providing timely predictions of these changes in irradiance following flare incidents. Our approach involves developing a predictive model based on deep learning techniques that estimate solar irradiance across the spectrum from X-ray to EUV wavelengths, targeting a prediction window of about three hours following a solar flare event. We utilize observational data reconstructed since 2003, based on the FISM2 model framework. We have curated a dataset of solar flare events classified as M-class and above, spanning from 2003 to the current day, collecting 964 events. For training, the model processes 90 data points at one-minute intervals, starting 1.5 hours before the flare's peak, focusing on the 0.1nm to 0.8nm X-ray wavelength range. The output comprises 180 data points with one-minute intervals, from the flare's peak to three hours into the recovery phase, across four wavelength bins, including X-ray and EUV spectra. Our dataset, divided in an 8:1:1 ratio for training, validation, and testing sets, employs a simple multi-layer perceptron (MLP) for initial deep learning methodology. This research is a part of KASI's SpaceAI project. In this presentation, we will share our preliminary findings, discuss challenges faced, and outline future directions for this predictive model's development.



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