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This study tackles the significant challenge of space weather forecasting by detecting Coronal Mass Ejections (CMEs), critical solar events with profound impacts on Earth's technological infrastructure. We introduce a deep learning framework to identify CMEs in C2 and C3 coronagraph imagery efficiently. Our methodology is structured into three phases: dataset compilation, model training, and performance evaluation. Initially, we utilized web scraping to compile an 11-year dataset of C2 images from Solar Cycle 23, tailored for deep learning analysis. We then assessed the performance of three state-of-the-art convolutional neural network (CNN) models to determine the most effective approach for CME detection. This evaluation led to a detailed comparison of the models, highlighting the challenges and limitations inherent in dataset curation and the training process. Our findings culminate in developing an automated pipeline for detecting CMEs, employing CNN models to streamline the process and enhance space weather forecasting accuracy.

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