Abstract — A system is designed with an accurate and efficient model to detect fires, aiming to assist in fire prevention. Designing such a system poses a challenging task, as numerous aspects need to be considered, including model accuracy, parameter count, computational complexity, and more. Therefore, the research will incorporate techniques such as Image Smoothing Filtering and Contrast Adjustment to enhance the fire detection process. The primary objective is to develop a robust system that can effectively identify and detect fire occurrences. Accuracy is crucial to ensure reliable results, while efficiency plays a significant role in real-time fire detection. By implementing Image Smoothing Filtering, the system can reduce noise and enhance image quality, improving detection performance. Contrast Adjustment techniques will further contribute to the system's efficiency by emphasizing fire patterns and enhancing their visibility. The system's design encompasses careful consideration of various factors to strike a balance between accuracy, efficiency, and computational complexity. By utilizing Image Smoothing Filtering and Contrast Adjustment, the research aims to develop a comprehensive fire detection system that can aid in preventing fire incidents. This study endeavors to contribute to the advancement of fire detection technologies and pave the way for future innovations in this field.

Keywords — Image Filtering; Object Detection; CNN; Faster R-CNN