

COMPUTER VISION TECHNIQUES FOR FIRE DETECTION AND LOCALIZATION

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From droughts, earthquakes, tornadoes, winter storms and wildfires, communities in Kansas have weathered significant damage over the past. During 2016, 2017 and 2021, record breaking wildfires burned thousands of acres in Kansas and placed significant demands on state's local fire department. In December 2021, Four County Fire had burned an area approximately close to 96,000 acres. Strong winds in Kansas made these wildfires uncontrollable burning down houses and businesses on its path. Strikes, arson, sparks from vehicles, or prescribed burns escaping control are causes for wildfires to burn down houses, barns and fences resulting in both human and animal deaths. Many wildfires remain small and are easily contained, but some grow rapidly and require significant suppression efforts and resources. While fire fighters try to control fast spreading fires, smoke travels miles causing health concerns. Windstorm and wildfires cause millions worth of damage in Kansas. As global climate gets warmer, probability and intensity of forest fires will gradually increase, therefore it is important to intelligently monitor forest fires. To meet the needs of hazard monitoring drones and helicopters, multi-spectral light weight deep learning algorithms have proven to be very effective in early detection of fire in images captured from drones with an accuracy of 97.70%.