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Predicting forest fire in Indonesia using remote sensing data

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Over the last decades we are seeing an increase in forest fires due to deforestation and climate change. In Southeast Asia, tropical peatland forest fires are a major environmental issue having a significant effect on the climate and causing extensive social, health and economical impacts. As a result, forest fire prediction has emerged as a key challenge in computational sustainability. Existing forest fire prediction systems, such as the Canadian Forest Fire Danger Rating System (Natural Resources Canada), are based on handcrafted features and use data from instruments on the ground. However, data from instruments on the ground may not always be available. In this work, we propose a novel machine learning approach that uses historical satellite images to predict forest fires in Indonesia. Our prediction model achieves more than 0.86 area under the receiver operator characteristic(ROC) curve. Further evaluations show that the model's prediction performance remains above 0.81 area under ROC curve even with reduced data. The results support our claim that machine learning based approaches can lead to reliable and cost-effective forest fire prediction systems.