

PROJECT ABSTRACT

Inferno Alert: Wildfire Prediction System

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The United States has witnessed more than 1.8 billion acres of land getting burnt this year alone and the number is suspected to increase (CNN). These fires gulp the vegetation disturbing the ecological balance in nature and destroying everything along the way. Predicting such fires beforehand will not only reduce the cost to combat these fires by effective allocation of resources but will also save thousands of lives.

Existing fire alert applications don't alert people until the fire is ablaze. There are many options available for civilians to get live updates regarding active wildfires but unfortunately, they don't predict future instances mainly due to the fear of the loss of business in the tourism sector. Businesses will suffer a loss if such alerts are provided in advance; As in the case of Lake Tahoe: Visitors were unaware about the susceptibility of a wildfire breakout and restaurants were afraid that they would lose money if they told visitors not to come. Another reason is the fact that natural wildfires depend on weather conditions which can wildly change due to increasing risk of climate change. Traditional web applications can no longer keep up with these dynamic changes and hence, face the risk of extremely low accuracy prediction. However, the solution to this problem does exist in the form of machine learning and artificial intelligence.

The project aims to build upon the customized dataset tailored specifically from existing fire detection models and datasets to include weather information that has the most impact on the wildfire. Then, we train various ML models to analyze the data and generate patterns in order to make predictions. After testing the model's accuracy, we fabricate an application that accepts weather data from OpenWeatherMap API and alerts people nearing a fire risk zone. The project takes into consideration the environmental factors such as: wind, temperature, humidity and rain to calculate Fire Behavior Indices which are used to make as accurate a prediction as possible displaying its results on a web application.