

# Predicting Fire Incidents in San Diego

## CS229 Project Proposal

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**Abstract**—By predicting details of future fires such as type, location, and intensity we can provide a way for firefighters to better allocate their resources and save more lives.

**Keywords**—machine learning; emergency events;

### I. MOTIVATION

Each year, emergency responders assist in millions of critical events across the country. In 2015, 1.3M of these events were fires, resulting in over 15,700 civilian injuries and \$14.3B in estimated property damage [1]. The size of a fire response can scale from a single fire truck to multi-state crews fighting large fires. As emergency events, the time it takes first responders to arrive on scene is critical, with minutes often making the difference between life and death. Because of these factors, standard staffing and resource use is very high to make sure enough responders are available at any given time. These factors make emergency response an important potential application for optimizations based on predictions. Thus, a model that can learn and make predictions on the location, frequency, and intensity of these events would be extremely useful to government and department management in making staffing and resource allocation decisions.

### II. APPROACH

#### A. Goals

Our goal is to use historic fire incident in a specific geographic region to predict where future fires might occur, and of what type and intensity. We will frame this application as a supervised learning problem where training examples will be drawn from historic data on fires for the region as well as relevant weather, geographical, structural,

and demographic features. This will allow our model to learn the incident likelihood over our region of interest which can then be subsequently turned into a prediction.

#### B. Data Sources

One source of historic fire incidents is that of the San Diego Open Data Portal which provides every fire incident responded to in the last year. This dataset is comprised of the type, location, date and time, and category of severity for approximately 150,000 incidents [2]. Historic fire data will be supplemented with weather [3], geographic [4], and demographic data [5] corresponding to the region of interest.

#### C. Similar Applications

A similar application of machine learning to help emergency responders was done by Bayes Impact. They analyzed Seattle police report data in order to determine ways in which Seattle could better deploy officers with the goal of minimizing serious and violent crime [6].

### REFERENCES

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