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Business Domain
GIS and Geospatial solutions, AI

Project Type
Web app

A Predictive Algorithm for Upcoming Wildland Fire Conditions and Improved Current Fire Perimeter Map With 84% Predictive Accuracy for a US Tech Company

Client

WTVIII, Inc. is an innovative leader in system integration, consulting, and software development, with 20+ years of experience helping customers streamline operations through automation.

Project

Creating a model to predict how the fire will spread further in fire-affected areas with Computer Vision. Refactoring and enhancing a web portal that provides critical wildland fire information to public consumers.

Objective

The Client needed to enhance interactive fire and smoke maps of current wildland fire conditions using content from Google, USGS, NIFS, as well as promote a nation-wide data exchange to enable interoperable wildland fire operations and assess the fire danger level throughout the USA. Besides, a history dataset for all reported wildland fires in the USA and 1-9 day forecasts for fire incidents were to be established.

Team Reinforcement

The Client required a highly experienced Remote In-Sourcing® Team to develop industry-specific ML algorithms to solve the Objectives.

Challenge

WTVIII, Inc. is an innovative leader in system integration, consulting, and software development that delivers world-class solutions to public and private clients with 95%+ Dunn and Bradstreet client satisfaction scores.

The project's technical objectives were:
- To store public data feeds with current conditions of fire and smoke spreading
- To assess fire perimeter risk
- To predict smoke conditions, intensity and direction
- To deliver website integration and component prototype.

The Client didn't have the required in-house expertise, so they looked for a reliable partner to implement the solution at reduced costs, without risk of failure, and in time.

Quick Facts

✔ 84% predictive accuracy

✔ 30% budget savings during development

✔ Delivered the project in 3 months instead of 5

Technologies

Web Server: Nginx 1.18 / Language: PHP 8 / Framework: Laravel tabase: PostgeSQL 12 / Gis extention: PostGIS 3 / CRON Jobs / TypeScripr / ReactJS / react-leaflet / NPM 8.15 / React 18.2 / Leaflet 1.8 / Python

Solution

★ 01

Fire forecasts decrease negative affects on human health through smoke emissions and safety risks, as well as allow for better forest resource management and planning for wildland fire evacuations.

★ 02

The ML model forecasts fire and smoke spreading with an industry-leading accuracy of 84%.

★ 03

AI allows users to click anywhere on the map to get a prediction on how many days it will take to extinguish a fire, if one takes place at the chosen area. History data is also accessible.

★ 04

The data was collected from various sources and visualized for the end user on a map. It is presented in GeoJSON format and raster images.

★ 05

Delegating the task to the Remote In-Sourcing® team allowed WTVIII, Inc. to complete the project 2 month faster than required and to reduce the development costs by 30%.
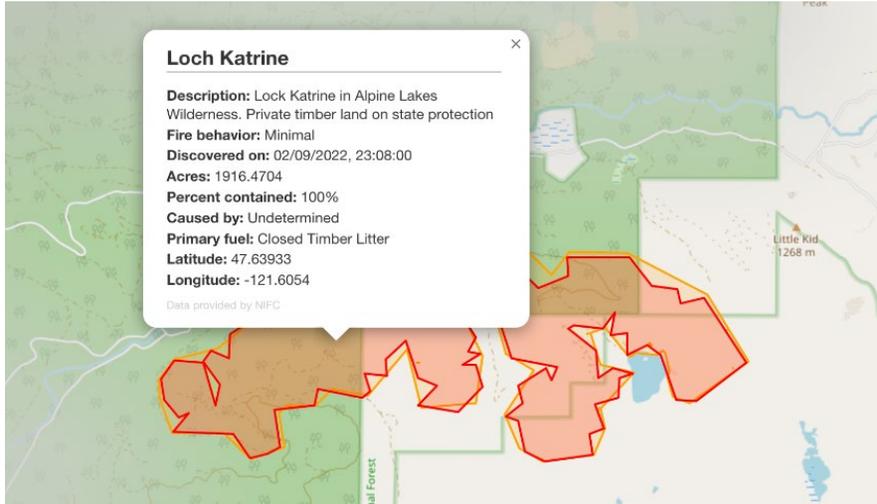
Client Reference

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We would like to highlight the professional work of the team, which not only efficiently completed the short-term initial tasks before the specified deadline but also expanded the project by proactivity, ideas, self-organization, and predictions. Throughout the project journey, they proposed new solutions, which were successfully implemented in the deliverables. It allows us to form our business plan, and the work on the project continues.

Benefits and Results

★ The out-of-the-box solutions with thought-through technical details allowed for improved fire and smoke maps with enhanced predictive algorithm.

★ The Client successfully implements ready-made project solutions on their side and clearly understands what needs the product should cover.

★ The AI/ML models are being enhanced by the best practices within the domain and are becoming more sophisticated every day, facing the most creative challenges.

★ 80% of deliverables were ready in 3 months instead of the projected 5 months. The Remote In-Sourcing® team proposed several ways to continue developing the Client's business, so the cooperation is still ongoing.

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Techstack:

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Team: 5

Project Manager,
ML engineer,
Frontend engineer,
Backend engineer,
QA