FireZero: Fire Risk Visualization for UC Davis Infrastructure

Project Overview

In recent years, California has seen a dramatic increase in wildfire frequency and severity, underscoring the urgent need for proactive infrastructure planning. Many university buildings and public facilities lack accessible, centralized assessments of fire vulnerability. Our project, FireZero, was developed with the CalGovOps hackathon challenge in mind. It aims to empower planners and administrators with a scalable tool that identifies potential fire risks before disaster strikes, combining open data, AI-driven insights, and an emphasis on equity and resilience.

Methods and Data Sources

We compiled and cross-referenced multiple open datasets from UC Davis, including the Annual Fire Safety Report (pg. 69-79) and Campus Energy Education Dashboard (CEED). Key data points included:

- Gas and electricity usage (indicators of fire load)
- Water consumption (used as a proxy for fire suppression capability)
- Building fire safety features (e.g., sprinkler coverage, alarm systems)
- Historical fire incident reports

Each building was assigned a composite fire risk score ranging from 0 (not susceptible to fire) to 100 (very susceptible to fire). The score was generated by weighing missing safety data, abnormal utility usage, and prior fire events. For each building, we also generated natural language summaries and safety recommendations using the Google Gemini API, enhancing interpretability and accessibility.

Conclusion

FireZero demonstrates the potential of open data and generative AI to drive smarter, more equitable infrastructure planning. With further development, this platform could scale to serve municipalities, school districts, and state agencies, helping California build resilience against its growing wildfire threat.