

FLARE: Fire Likelihood and Risk Estimation

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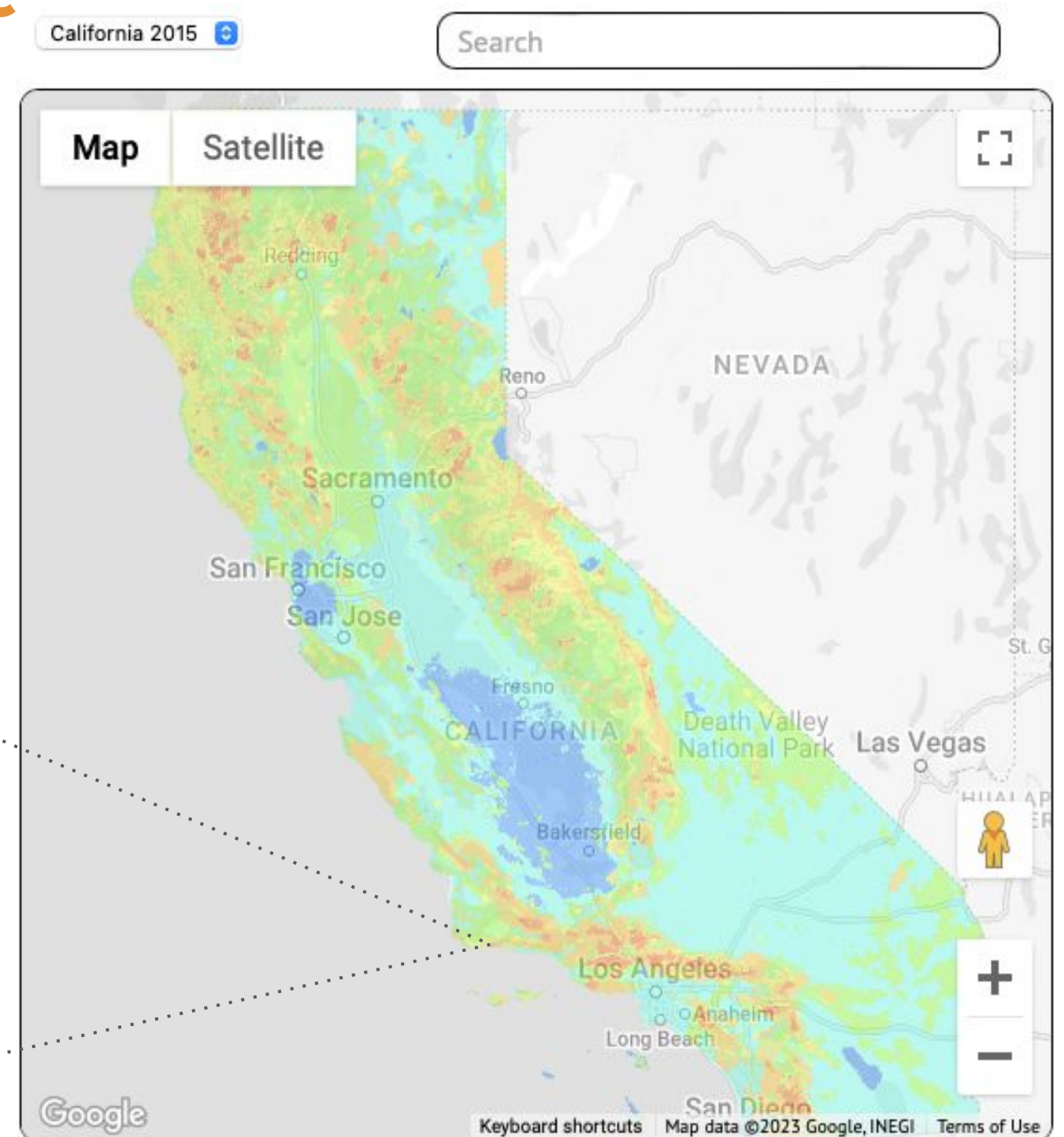
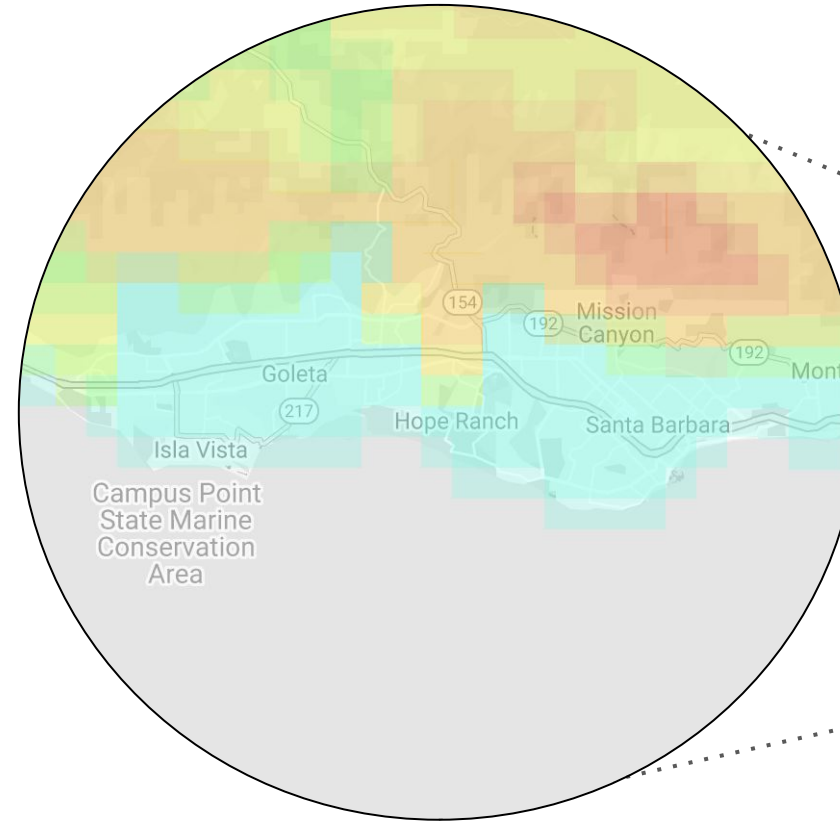
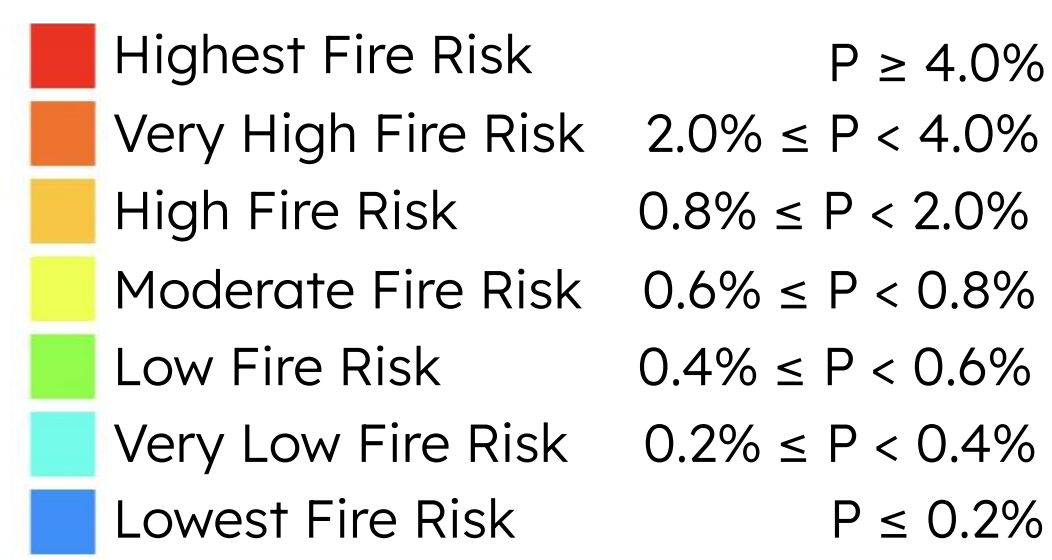
Motivation

- Wildfires are a major threat globally to ecosystems, health, and infrastructure
- Traditional wildfire prediction methods have accuracy and speed limitations.
- Deep learning models can improve wildfire prediction

Solution

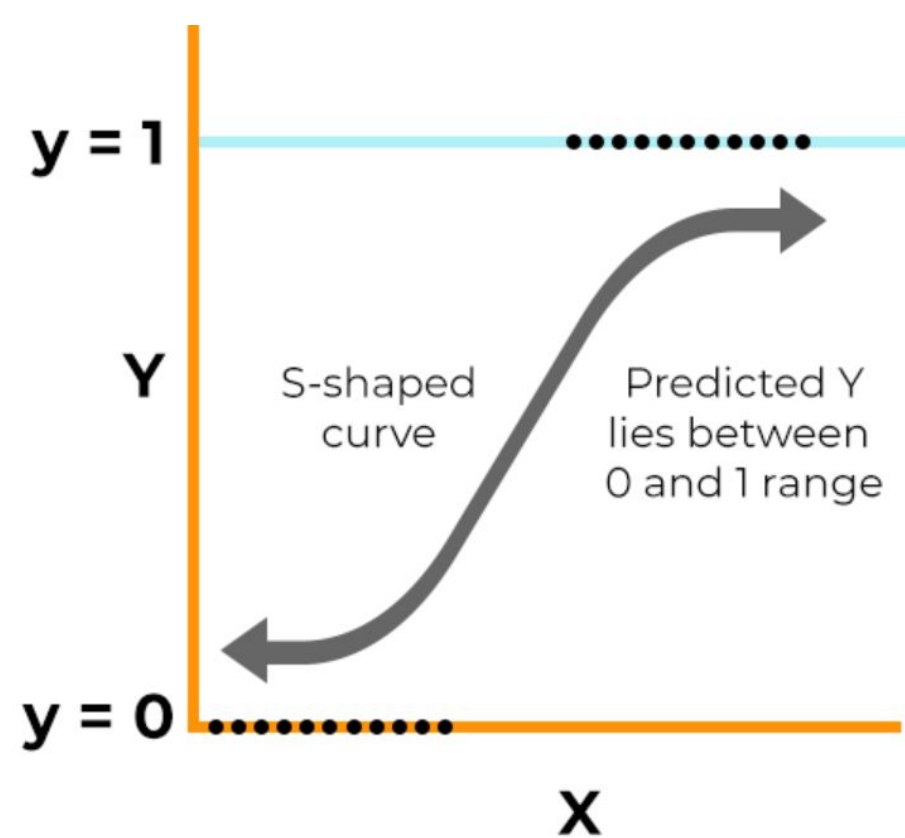
- Analysis** of multiple deep learning architectures to identify effective models for predicting wildfires
- Development** of a user-friendly webpage for visualizing model predictions and evaluating risk

Risk Estimation Webpage

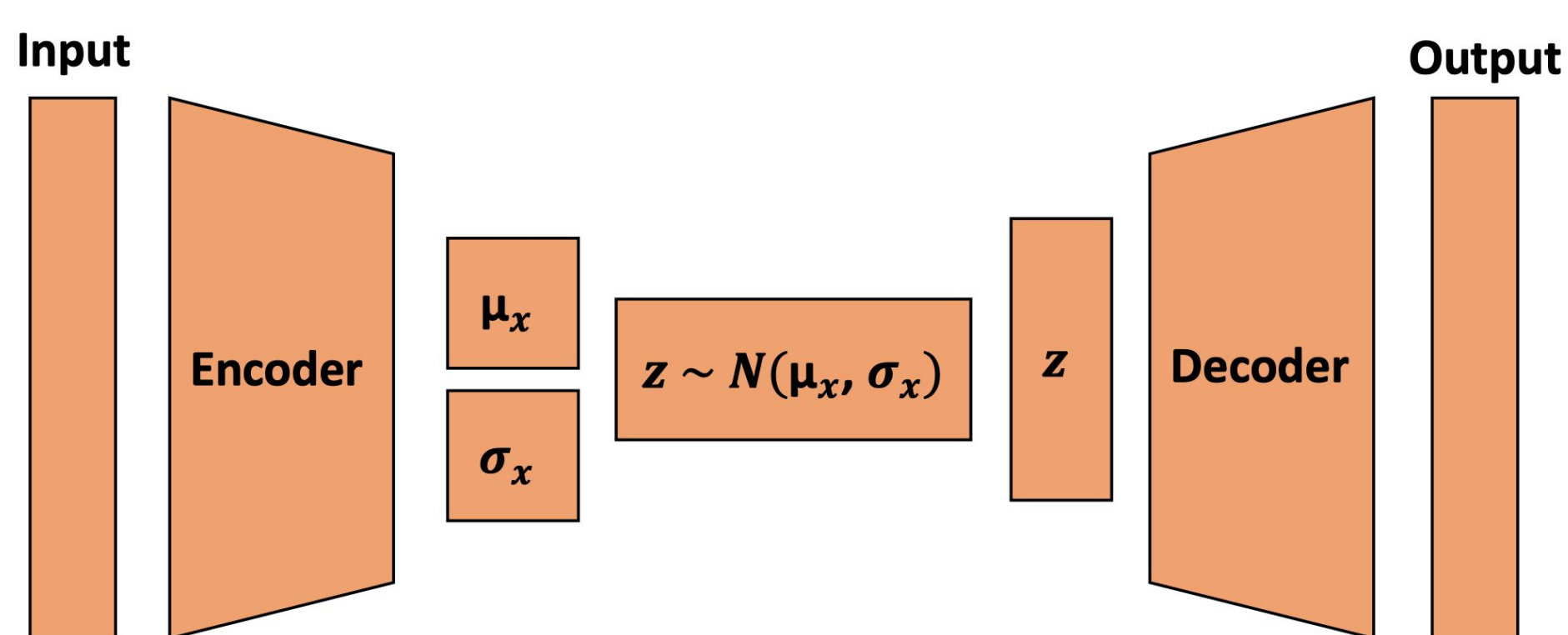


Methods

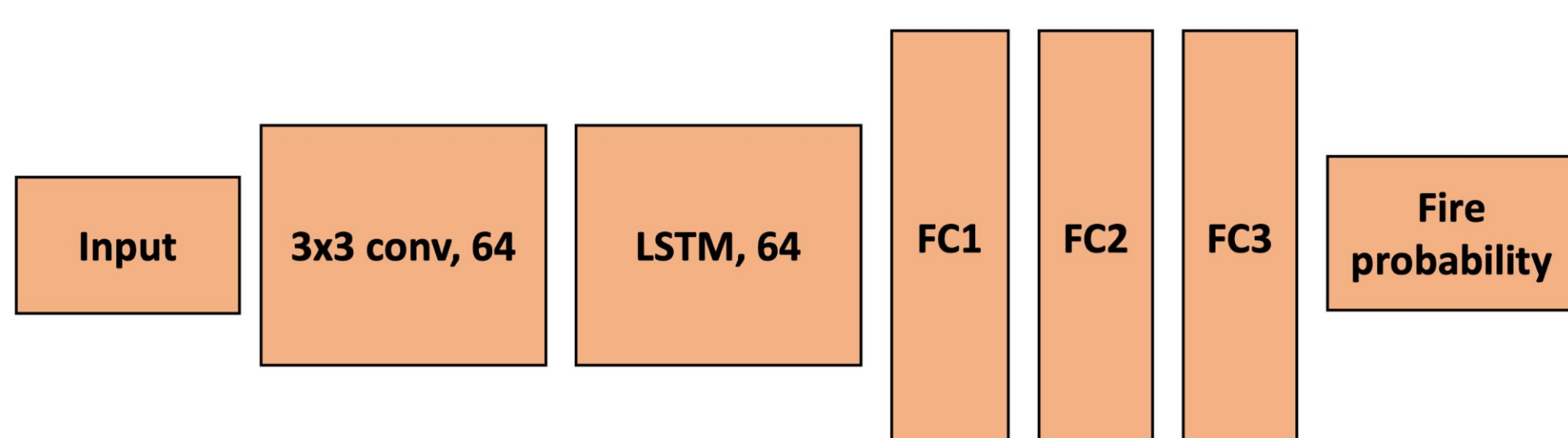
Logistic Regression



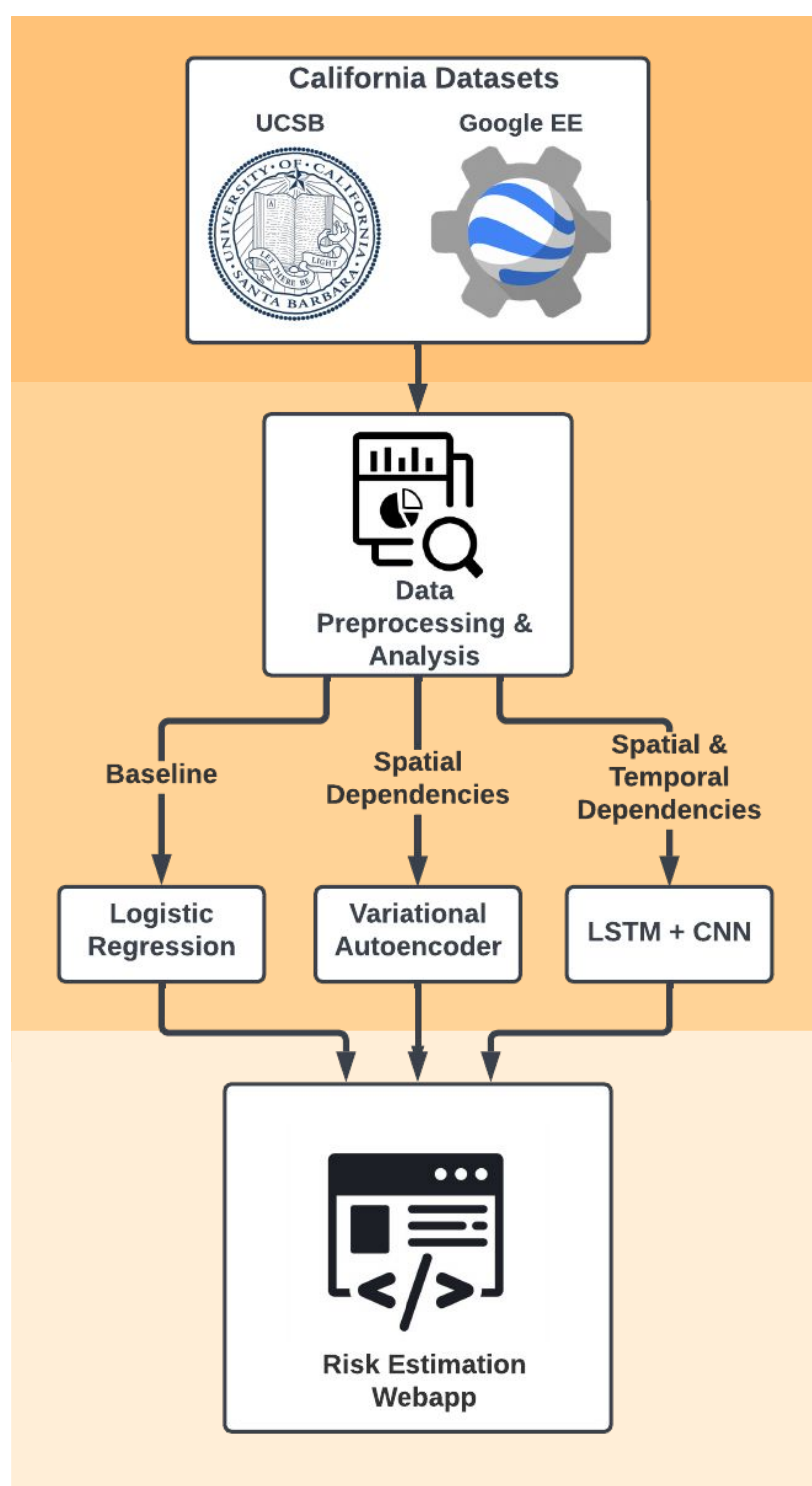
Variational Autoencoder (VAE)



Long Short-Term Memory (LSTM) + Convolutional Neural Network Hybrid (CNN)

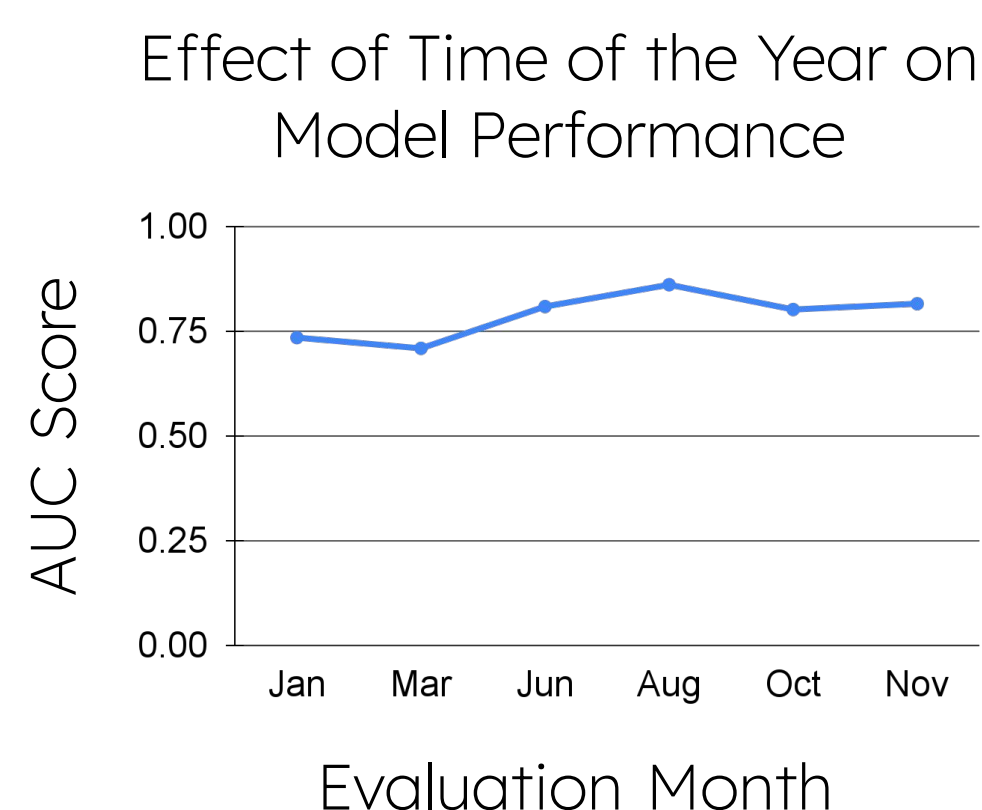
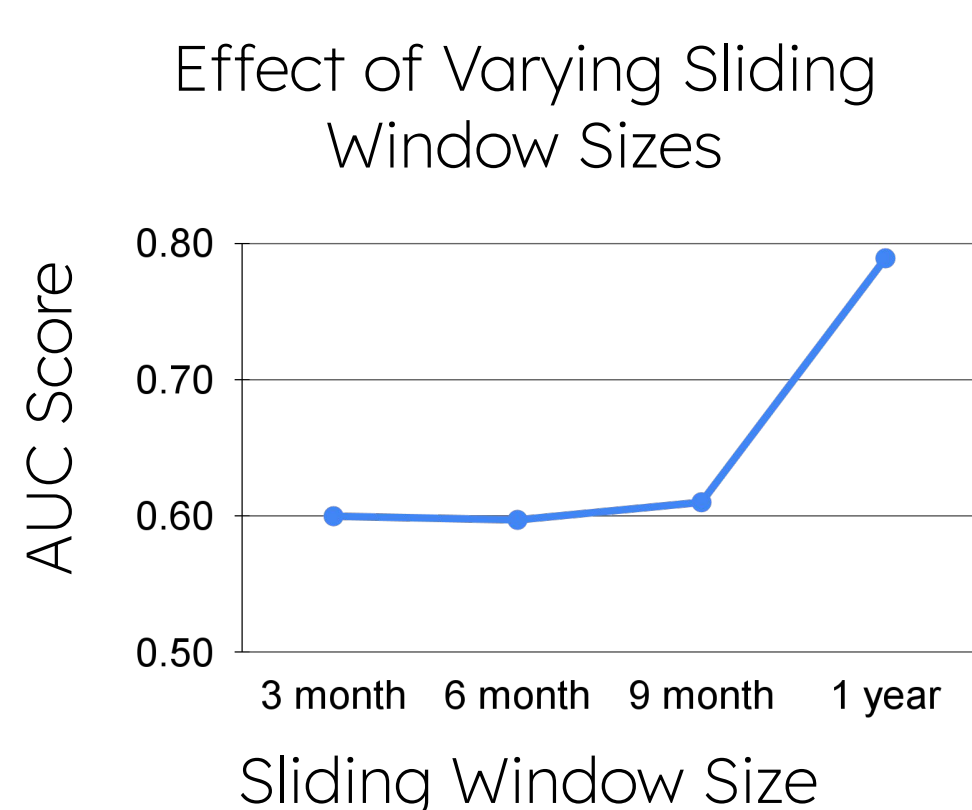


Workflow



Results

Model	Average AUC
Logistic Regression	0.68
VAE	0.75
LSTM + CNN	0.79



- 2.6% increase in performance compared to existing model.
- Spatial and temporal dependencies are crucial.
- 1 year of prior data improves model performance significantly.