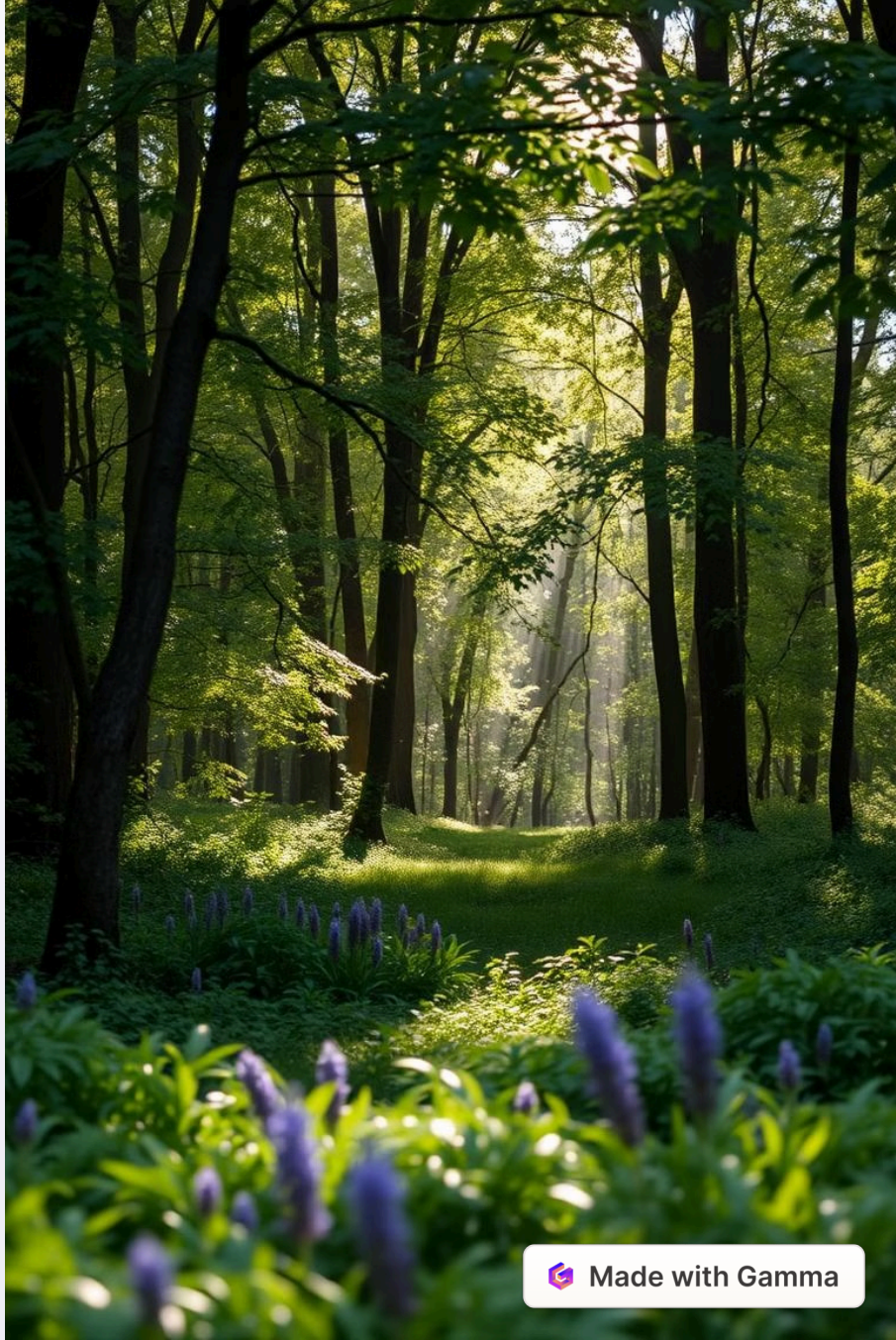
Forest Fire Detection using Deep Learning

This presentation explores how deep learning can be used for early forest fire detection. We'll cover the problem, solution, methodology, and results. Let's begin learning how to protect our forests.

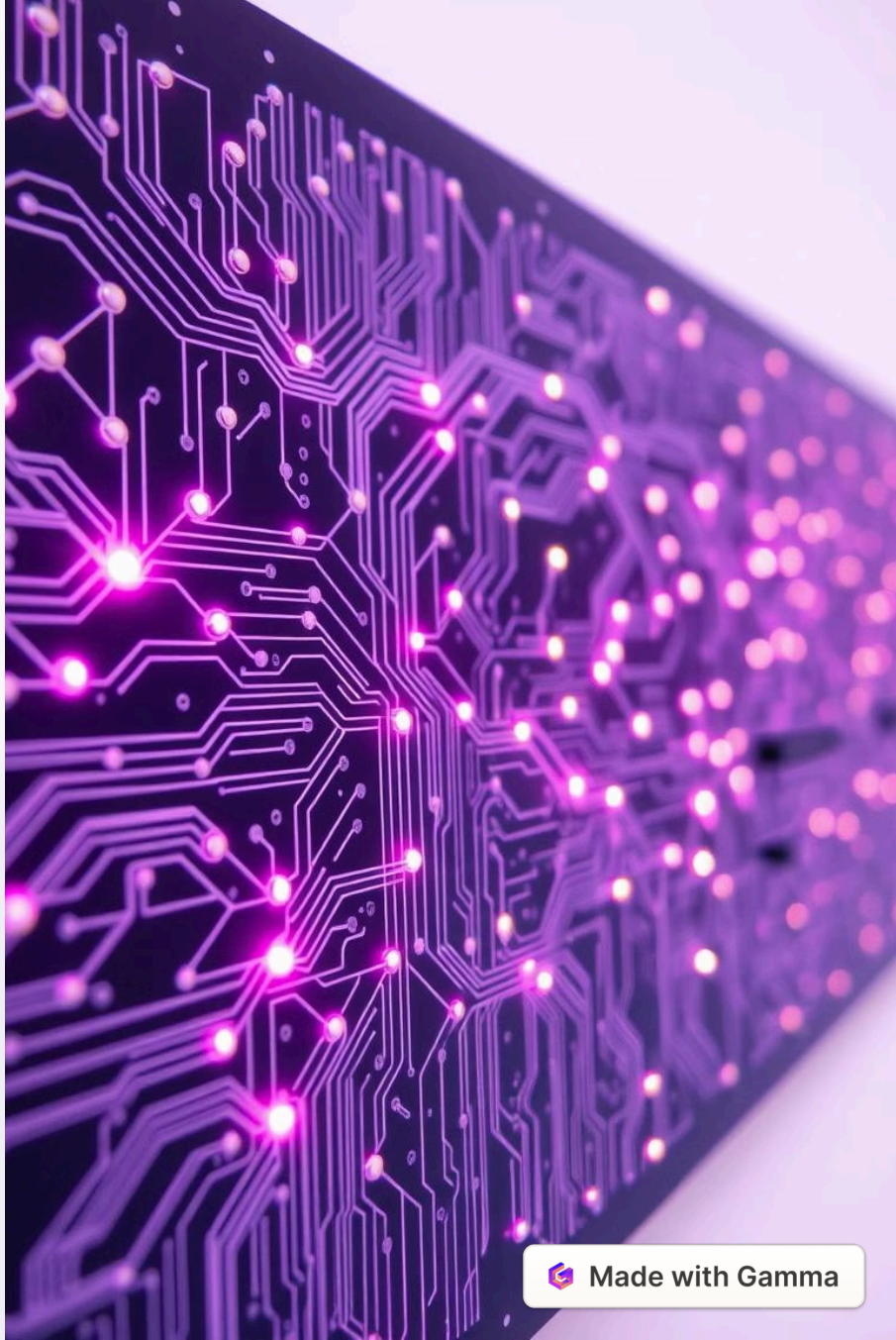


Problem Statement

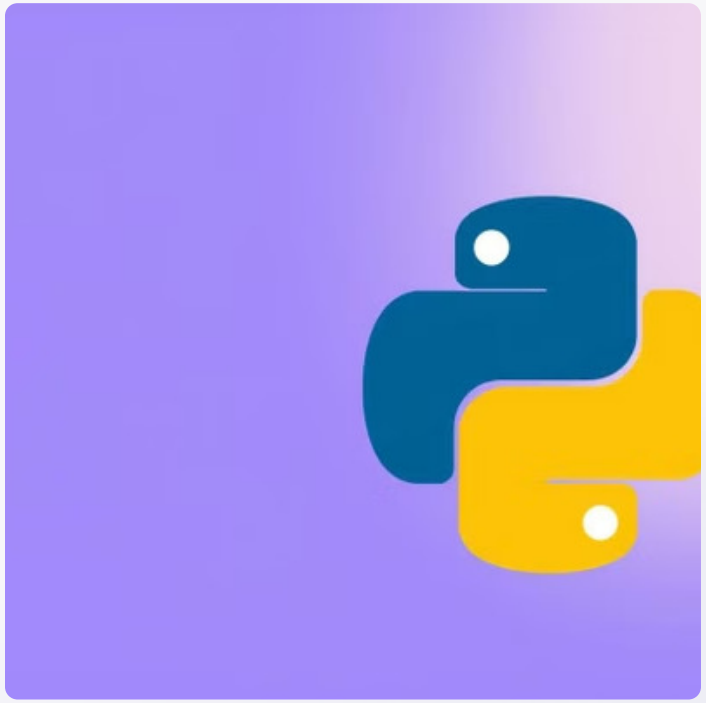
Rapid forest fire detection is crucial. Traditional methods are slow and expensive. Climate change increases fire risk. In 2023, 2.5 million acres burned in the US.

Solution: Deep Learning

Leverage CNNs for real-time image analysis. Analyze satellite and drone imagery. Distinguish smoke and fire from environmental features.

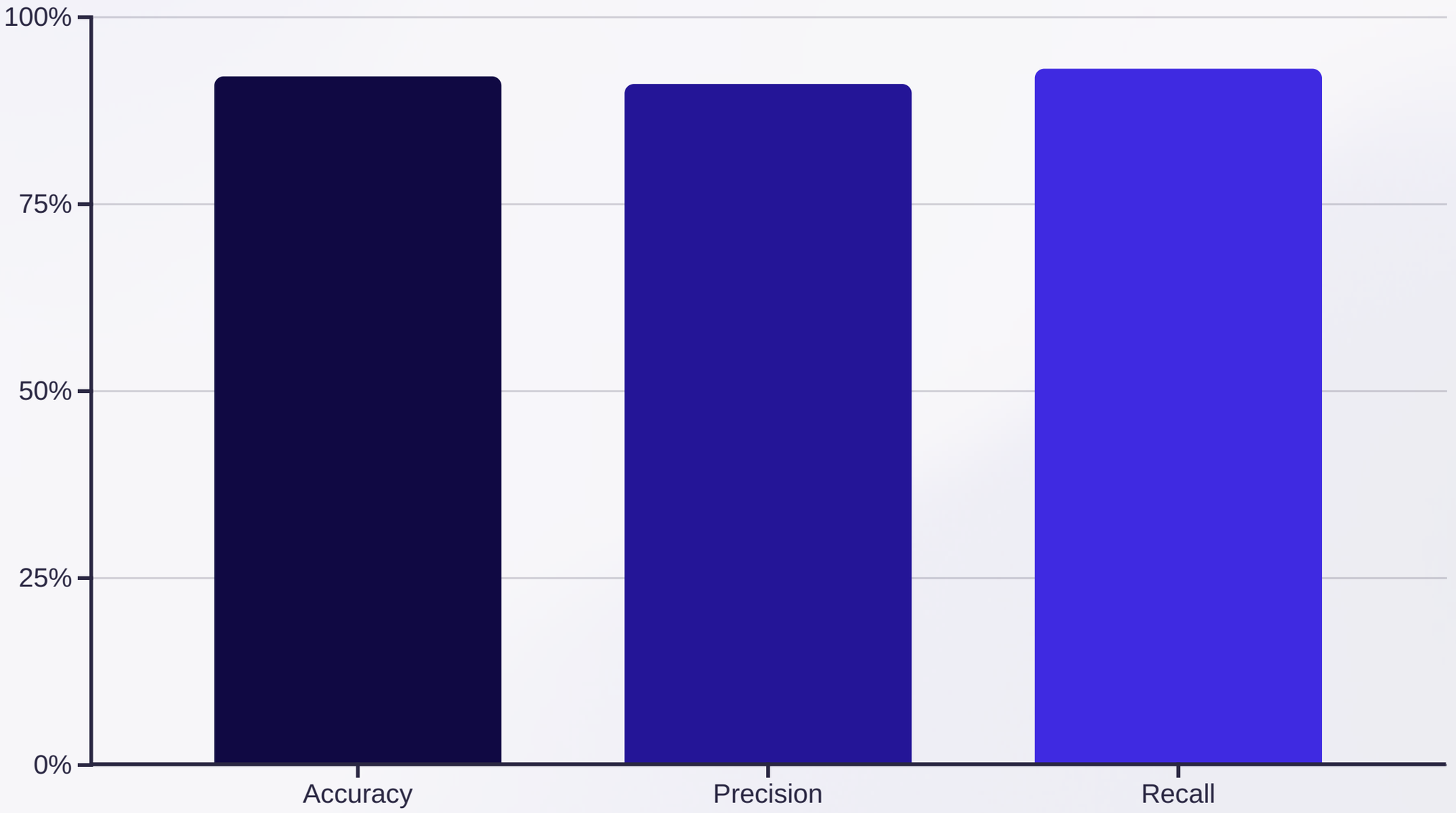


Tools and Technologies



Deep learning framework: TensorFlow/Keras. Programming language: Python. Cloud platform: AWS/Google Cloud for scalability. Public satellite imagery, drone footage.

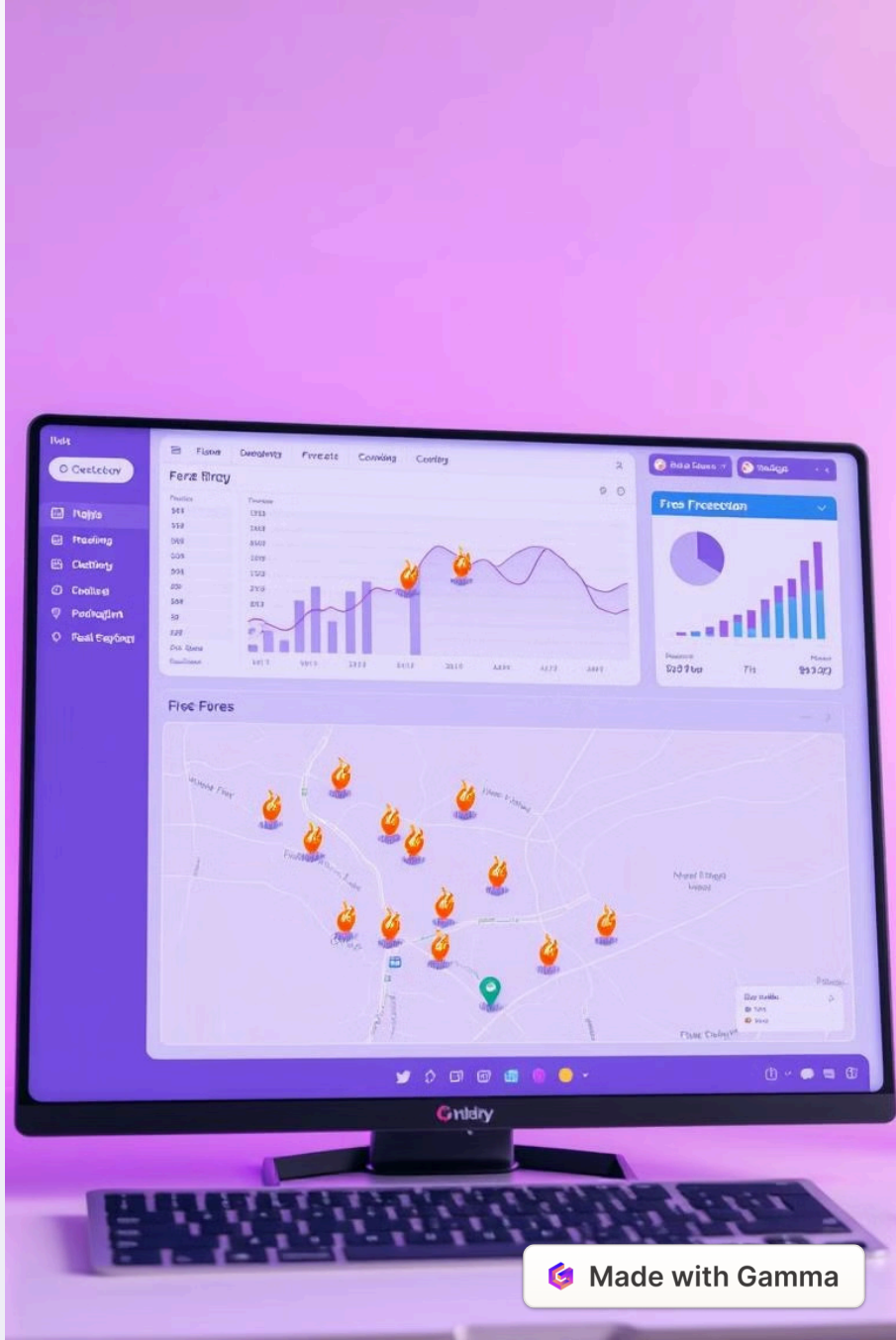
Methodology



Collect and preprocess data by labeling fire/no-fire images. Train the model using a CNN architecture, such as ResNet. Aim for >90% accuracy.

Output: Real-time System

The system flags potential fires. Location data and alerts are sent automatically. Monitor fire risk areas with a dashboard.



Results and Benefits

Faster detection times.

Reduced response times.

Improved resource allocation.

Cost-effective monitoring.

30% faster detection in California pilot program.

Conclusion

Deep learning offers a solution. It has the potential for significant environmental impact. Future work: Integrate weather data and improve model robustness.