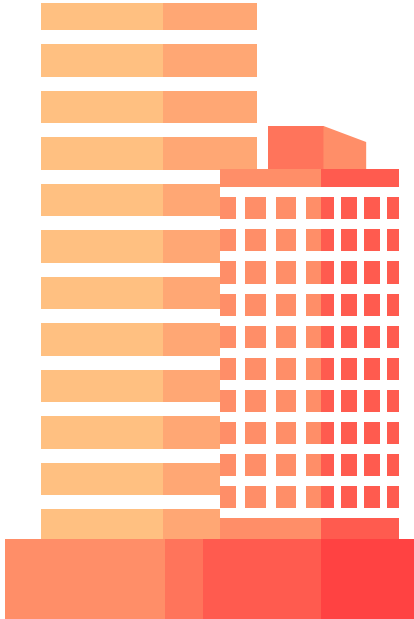


A stylized illustration of a city skyline on the left side of the slide. It features several rectangular buildings of varying heights and colors, including shades of orange and red. Each building has a grid of small white squares representing windows. In the foreground, there are two simplified trees with orange oval canopies and thin red trunks. The background is plain white.

Predicting Structural Damage from an Earthquake

-Lhamu Tsering

Business Context



- “Earthquakes don’t kill people, buildings do.”
- 2015 Nepal Earthquake
- Model purpose

Process Outline

Data Collection

2015 Nepal
Earthquake Portal



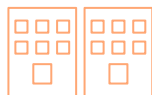
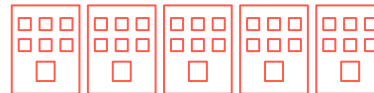
Preprocessing

Dummy Variables,
Class Imbalance,
standardizing



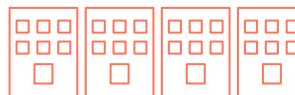
Model Evaluation/ Model Selection

Evaluation Metrics
Confusion Matrix



Cleaning and EDA

Data cleaning,
Exploration and
visuals

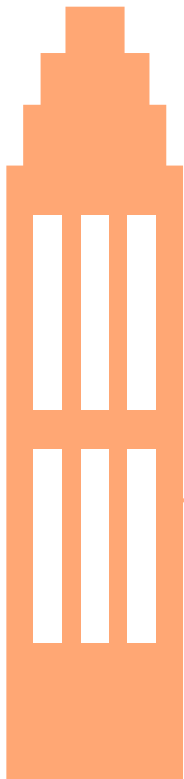


Multiclass Classification Models

Data Introduction

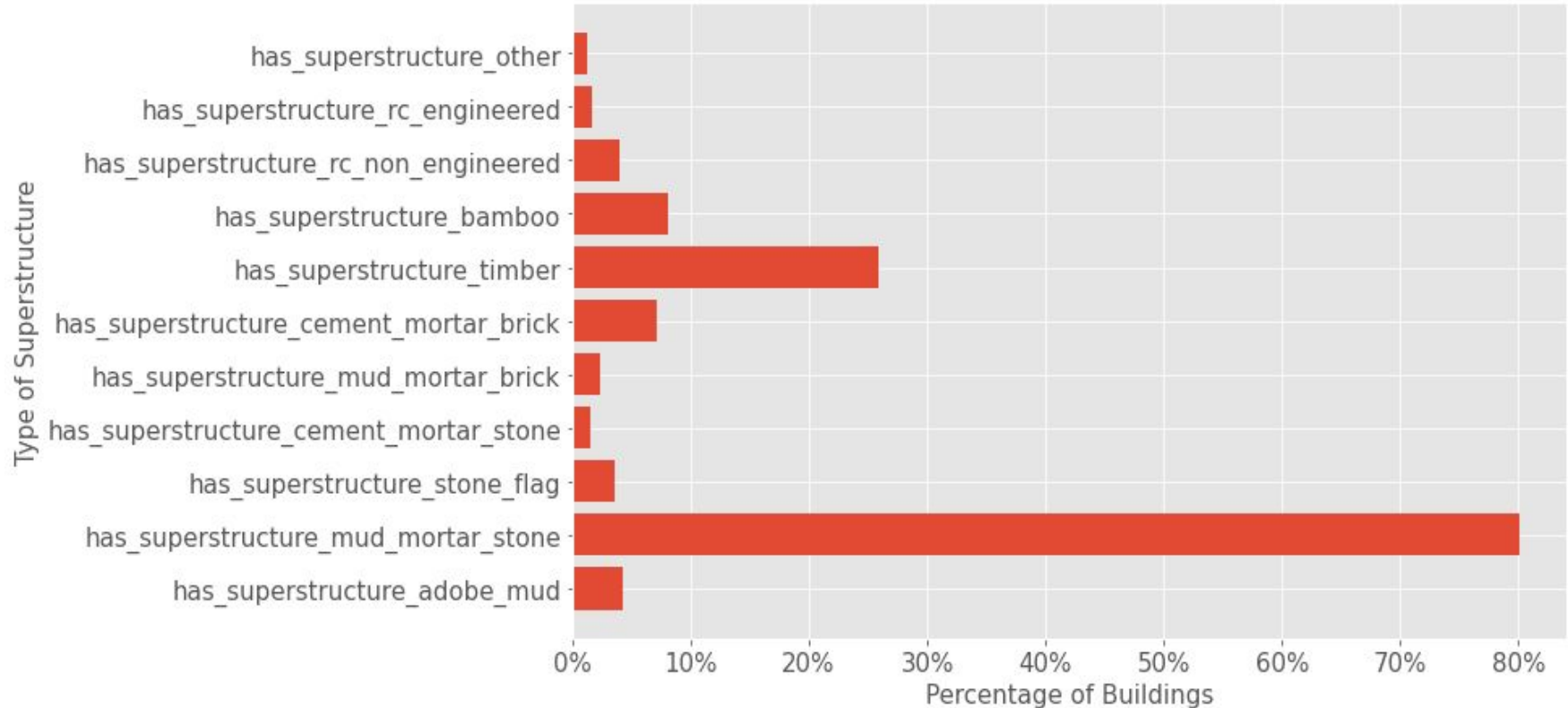
2015 Earthquake Nepal Data Portal

- Raw survey data (post 2015 eq)
 - 11 worst hit districts
 - 762106 buildings
-
- Building Use (762106, 17)
 - Building Structure (762106, 31)
 - Building Damage(762106, 12)



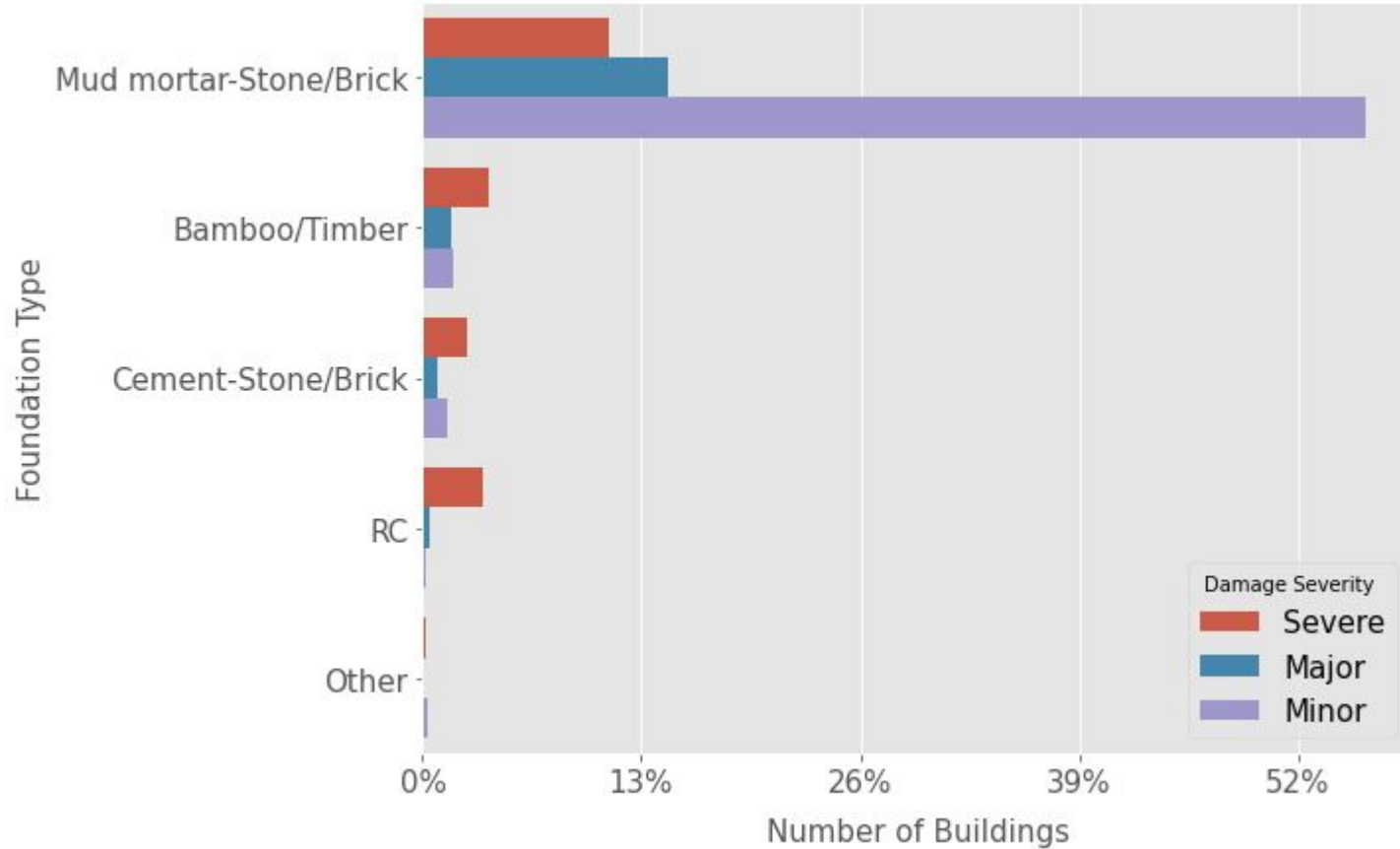
Building Superstructure

Distribution of Building Superstructure Composition



Foundation Type

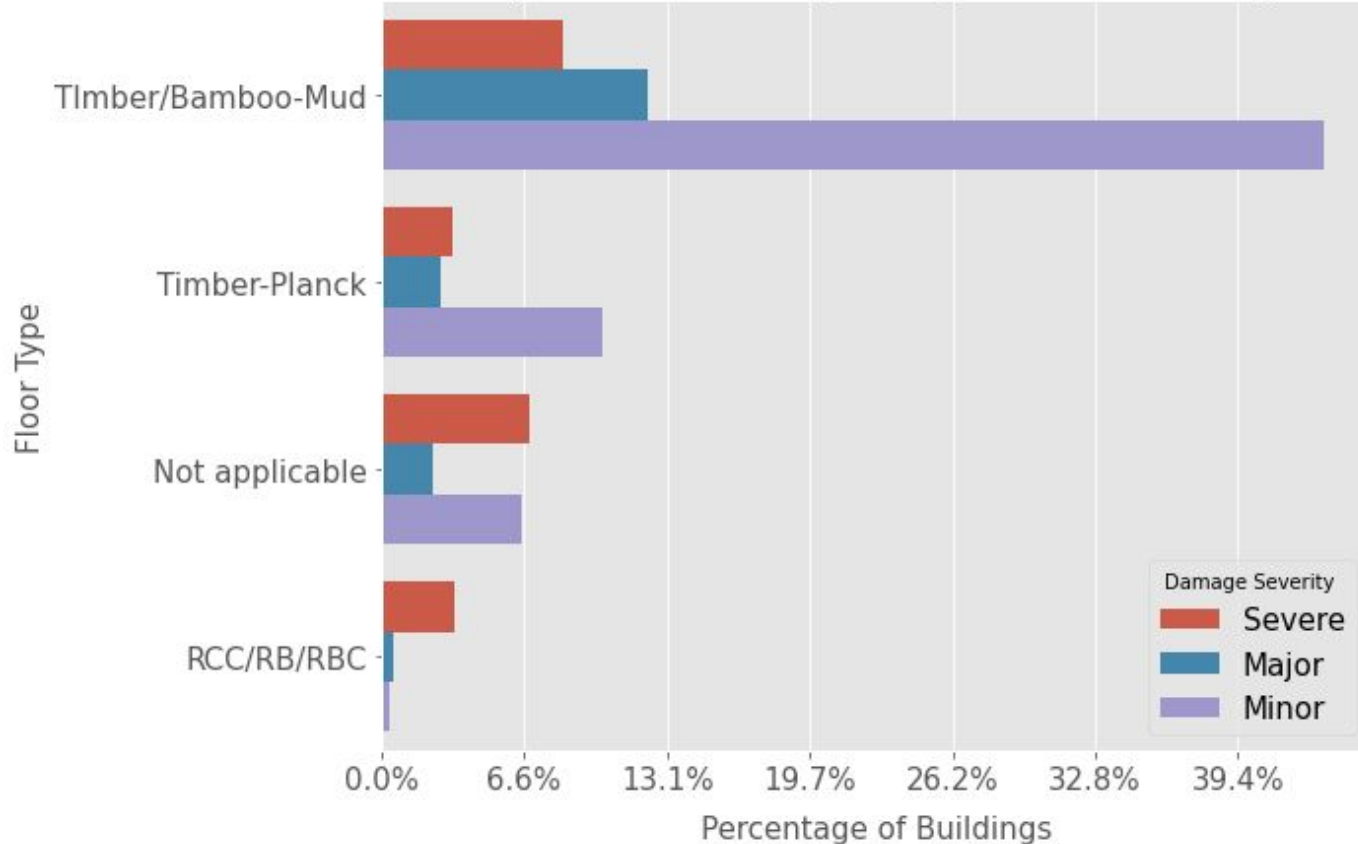
Comparison on building damage based on Foundation Type



RC foundation
type buildings
faced least
damages

Floor Type

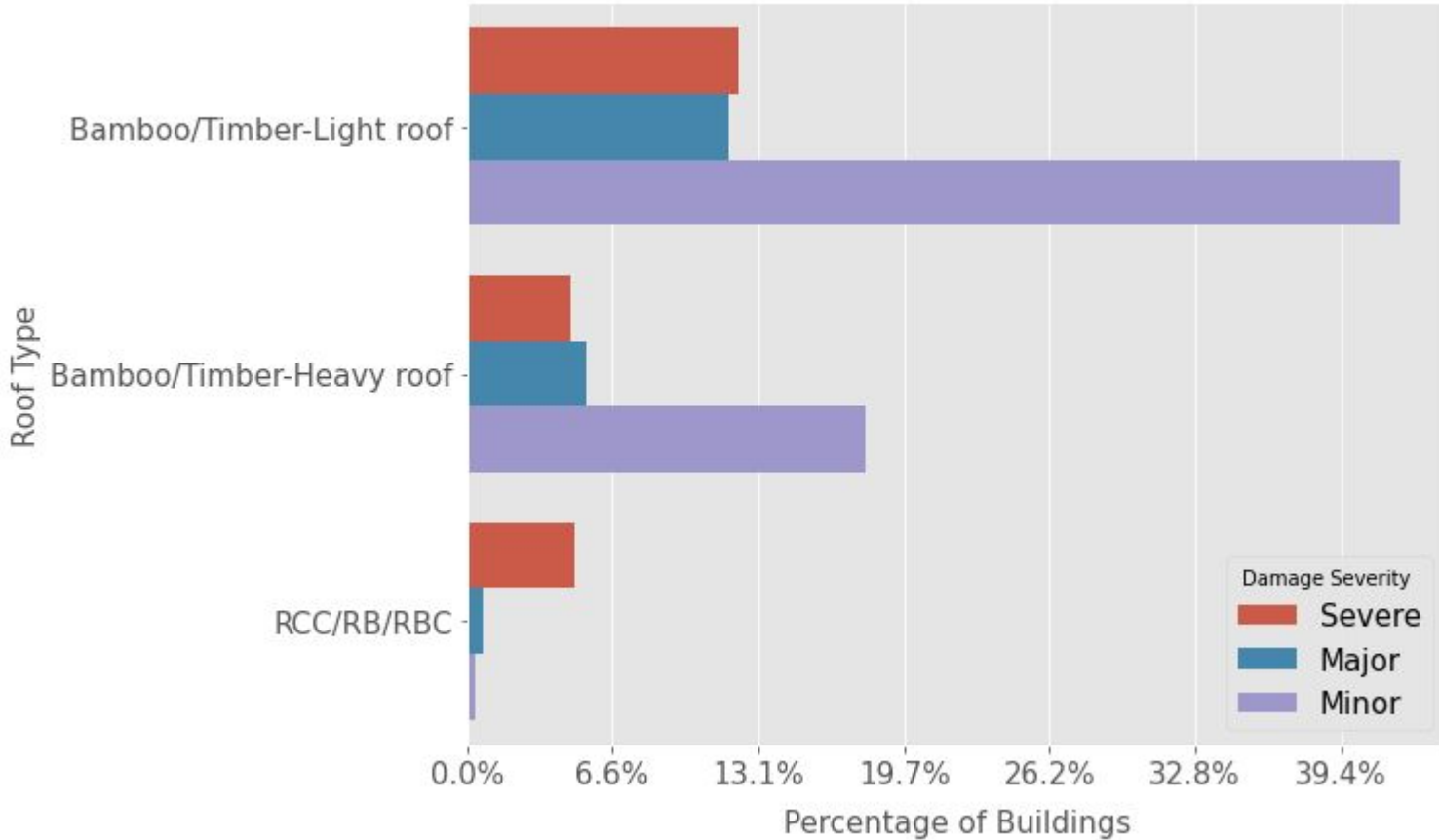
Comparison on building damage based on floor type



RCC/RB/RBC
roof type
buildings
faced least
damages

Roof Type

Comparison on building damage based on Roof Type

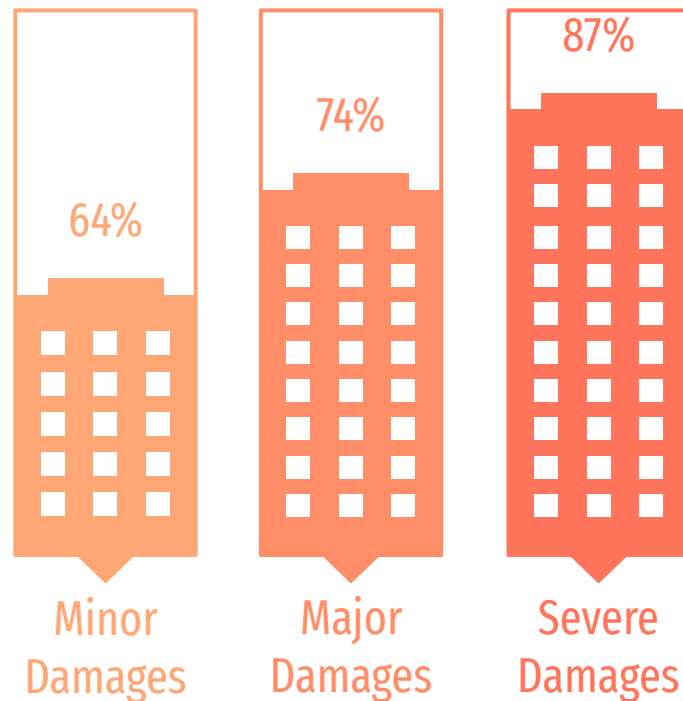


RCC/RB/RBC
roof type
buildings
faced least
damages

Model Results

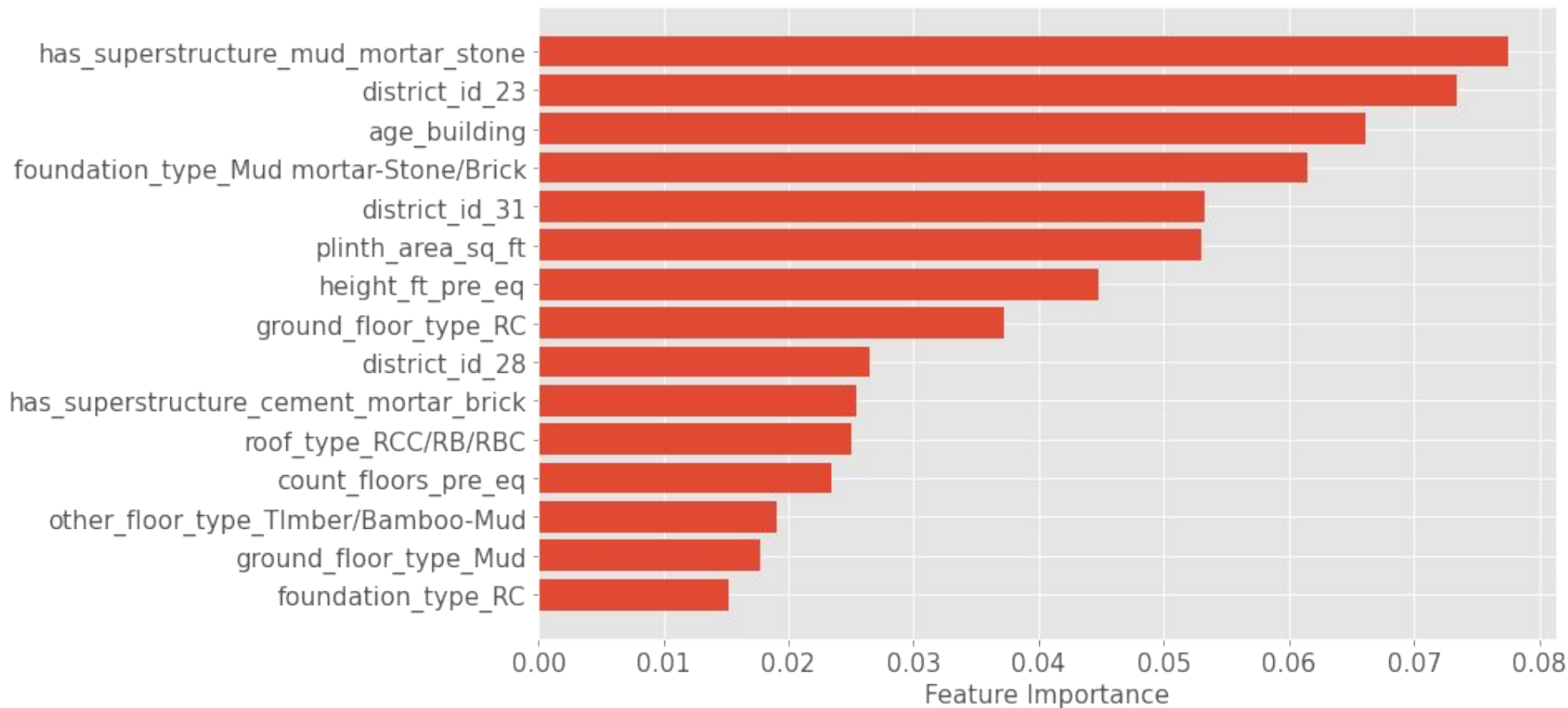
Model	Recall Score	F1 Score
Baseline Logistic Regression	0.6732	0.594
Random Forest Classifier	0.724	0.7263

Accurately Predicted Classes



Feature importance

Top 15 Important Features



Conclusion & Next Steps

Eq safe buildings are built for strength and ductility

Other data on building structure and earthquake

Enforcement of seismic design construction

Other studies related to topic

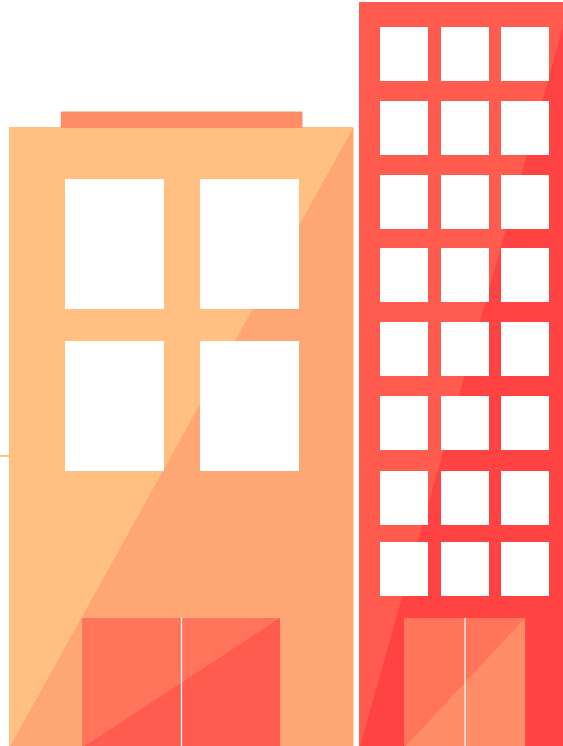


Thank You!



GitHub Repo

<https://github.com/Yeshi341/structural-damage-from-earthquake>



Contact

boutlhamu@gmail.com

slides template credit:
www.slidesgo.com