Univ.AI

Classifying buildings Post Hurricane

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Motivation and About the Project

After a hurricane, damage assessment is vital to the relief helpers and first respondants so that resources and help can be planned and allocated appropriately. Sometimes it takes days to identify the damaged areas where majority of the resources should be provided. We have come up with a solution to this problem as we have been able to create a model that is 90% percent accurate in classifying the house or building as damage or no damage by passing the image of the building through the model which can create a huge difference in managing the resources and providing help and can save those crucial extra hours.

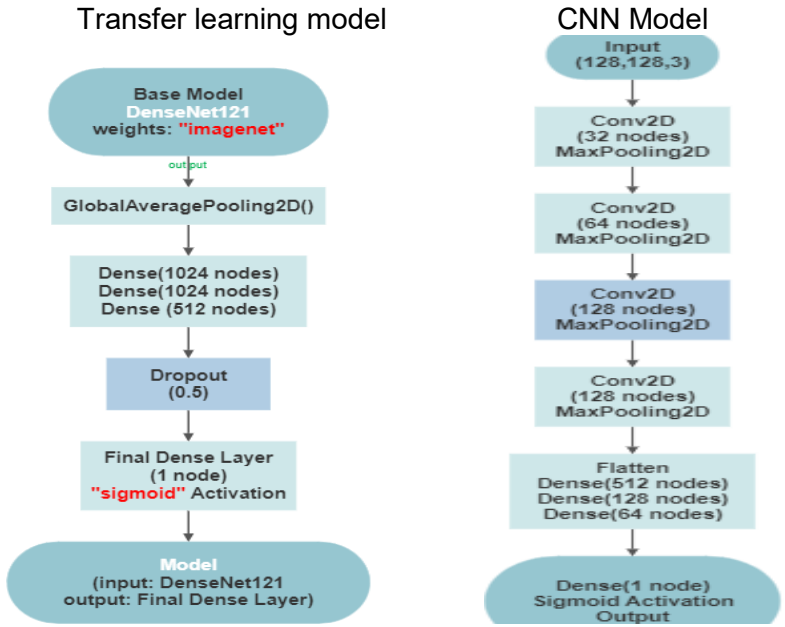
Data and Labels

	Damage	No Damage
Train	5000	5000
Validation	1000	1000
Test -1	1000	1000
Test -2	8000	1000

References

- **Kaggle**
- **Stack Overflow**
- **Tensorflow documentation**
- **Saliency and Gradcam**

Model



Conclusion and Future Work

- The RGB image model performed better than grayscale model - colour information in images helps the network to learn better features.
- The network did not perform well on the balanced test set of sharpened images.
- But it performed very well on the unbalanced test dataset of sharpened images.
- CNN model performed better for original RGB images in both balanced and unbalanced test set.
- We can train our model with images of areas affected by other natural calamities like earthquake, tsunami, forest fire and then use the model to predict the damaged and no damage areas

Results

	Unsharpened Image	Sharpened Image	CNN Model	Transfer Learning Model
No. of Parameters	73,41,121	73,41,121	45,09,633	73,41,121
Training Accuracy	**95.93%**	93.93%	**96.06%**	95.93%
Balanced test set accuracy	**95.43%**	93.18%	**97.37%**	95.43%
Unbalanced test set accuracy	92.31%	**97.25%**	**95.62%**	92.31%