

```
In [1]: %reload_ext autoreload
        %autoreload 2
        %matplotlib inline
```

```
In [2]: #cd under the directory of fastai#
```

```
In [3]: cd C:\Users\Teeno\fastai
        C:\Users\Teeno\fastai
```

```
In [4]: from fastai.conv_learner import *
        from fastai.transforms import *
        from fastai.conv_learner import *
        from fastai.model import *
        from fastai.dataset import *
        from fastai.sgdr import *
        from fastai.plots import *
        arch=resnext101_64
```

```
In [5]: #path that contains the train folder, test folder, and labels.csv for type cla
        ssification#
```

```
In [6]: PATH = "C:/Users/Teeno/Desktop/result/roof prediction/"
```

```
In [7]: label_csv= f'{PATH}labels.csv'
        n=len(list(open(label_csv)))-1
        val_idx = get_cv_idx(n)
```

```
In [8]: def get_data(sz,bs):
        tfms=tfms_from_model(arch, sz, aug_tfms=transforms_top_down,max_zoom=1.1)
        data=ImageClassifierData.from_csv(PATH,'train',f'{PATH}labels.csv',test_na
        me='test',num_workers=4,
        val_idx=val_idx,suffix='.jpg',tfms=tfms,bs
        =bs)
        return data if sz>300 else data.resize(340,'tmp')
```

```
In [9]: data = get_data(500,5)
        learn = ConvLearner.pretrained(arch,data,precompute=False)
```

```
In [10]: learn.load('45_top_roof_res101')
```

```
In [11]: #Path that hosts the images that need to be classified#
```

```
In [12]: PATH = "C:/Users/Teeno/Desktop/result/predict/"
```

```
In [13]: #change the name of fn#
```

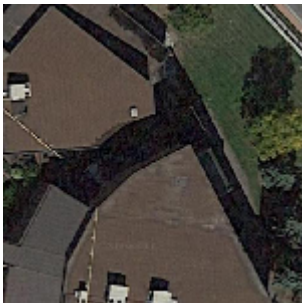
```
In [14]: fn = "com_2_1.jpg"
```

```
In [15]: PATH+fn
```

```
Out[15]: 'C:/Users/Teeno/Desktop/result/predict/com_2_1.jpg'
```

```
In [16]: Image.open(PATH+fn).resize((150,150))
```

```
Out[16]:
```



```
In [17]: trn_tfms,val_tfms=tfms_from_model(arch,500)
```

```
In [18]: ds = FilesIndexArrayDataset([fn],np.array([0]),val_tfms,PATH)
dl = DataLoader(ds)
```

```
In [19]: preds = learn.predict_dl(dl)
np.argmax(preds)
```

```
Out[19]: 0
```

```
In [ ]: #'0' means membrane; '1' means metal; '2' means shingle; '3' means tile.
```