



Motorcycle Night Road

semantic segmentation

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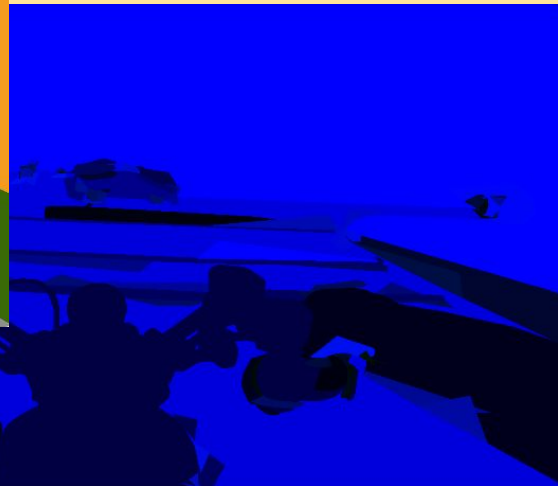
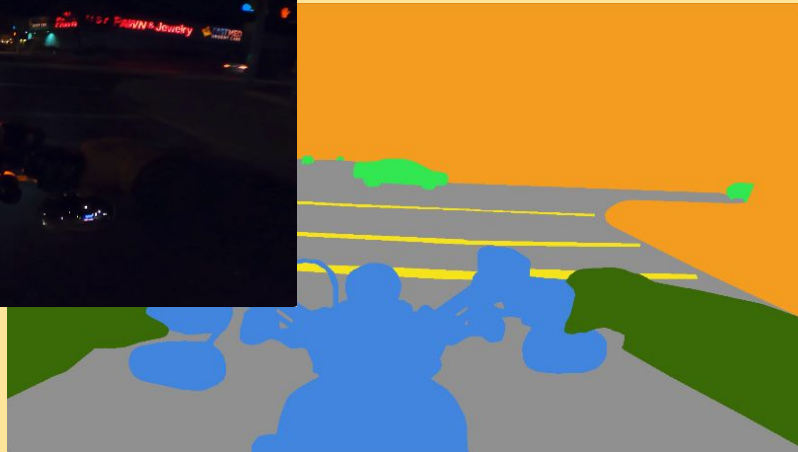
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Introduction



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Data Preprocess

```
import numpy as np

# 랜덤 시드 설정
np.random.seed(1004)

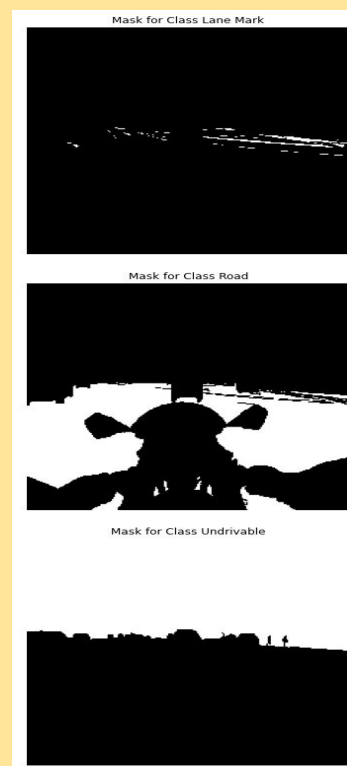
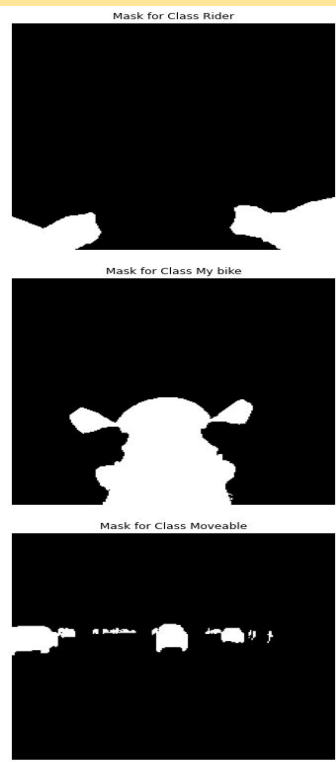
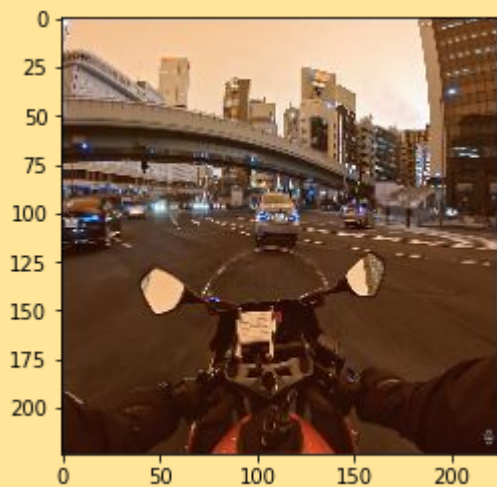
# 데이터 인덱스 생성
image_idx = list(range(1,201)) # 데이터의 인덱스 리스트

# 데이터를 train과 test로 나누기
test_ratio = 0.2 # 테스트 세트의 비율 (예: 20%)
num_test = int(len(image_idx) * test_ratio) # 테스트 세트의 크기
test_idx = np.random.choice(image_idx, size=num_test, replace=False) # 테스트 세트의 인덱스 선택

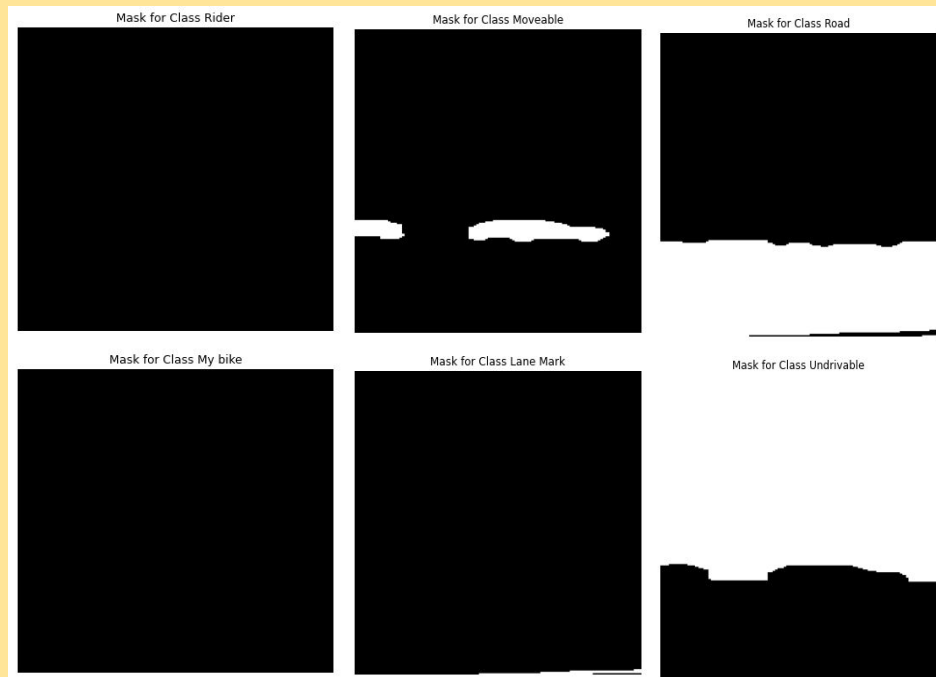
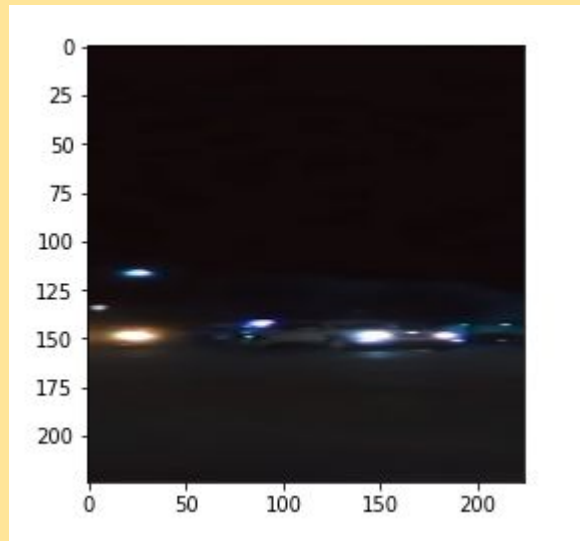
# 나머지 인덱스는 훈련 세트로 사용
train_idx = np.setdiff1d(image_idx, test_idx)

# int type 의 list로 변환
train_idx = train_idx.astype('int32').tolist()
test_idx = test_idx.astype('int32').tolist()
```

Data Loader



Augmentation



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Experiments

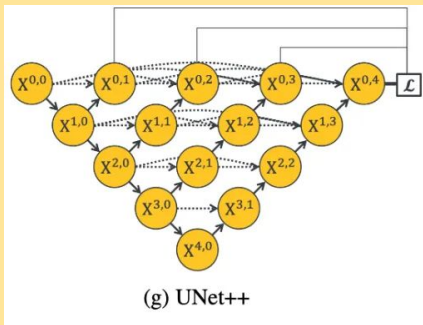
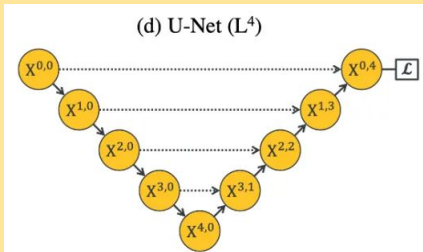
1. U-Net epoch 100 with augmentation
2. U-Net epoch 150 with augmentation
3. U-Net++ epoch 150 with augmentation
4. U-Net epoch 150 without augmentation



Experiments(Hidden)

1. FCN
2. DeepLabV3+
3. MobileNetV2
4. Etc..

Build Models



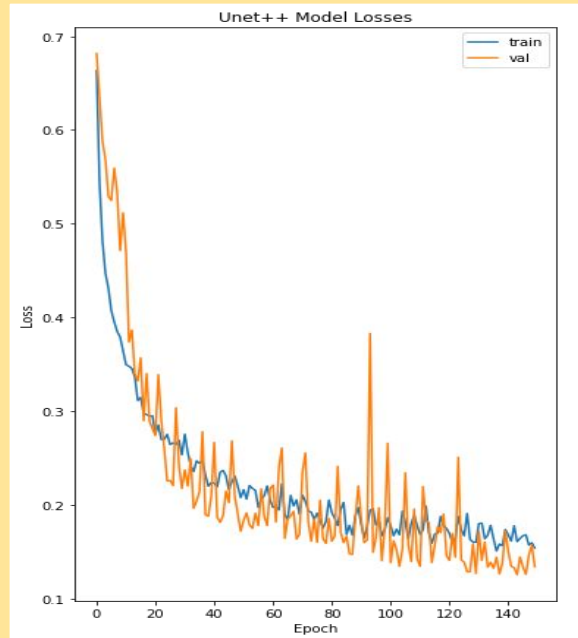
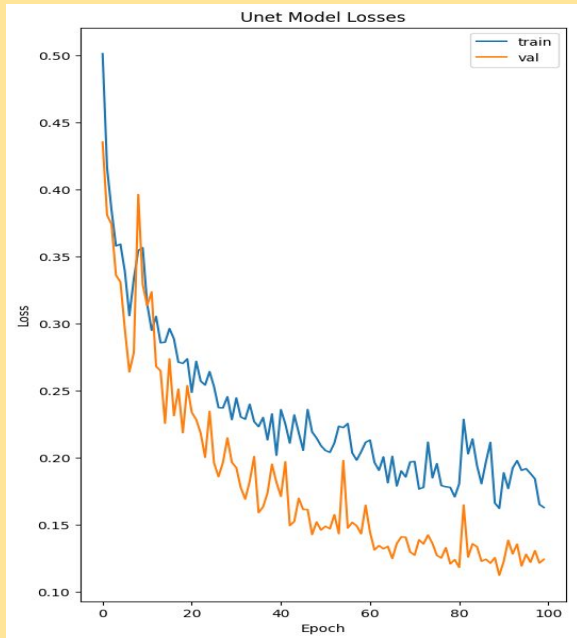
Model: "U-Net"

Layer (type)	Output Shape	Param #	Connected to
input_1 (InputLayer)	[(None, 224, 224, 3 0)]		[]
...
conv2d_22 (Conv2D)	(None, 224, 224, 6)	390	['conv2d_21[0][0]']
Total params: 31,032,070			
Trainable params: 31,032,070			
Non-trainable params: 0			

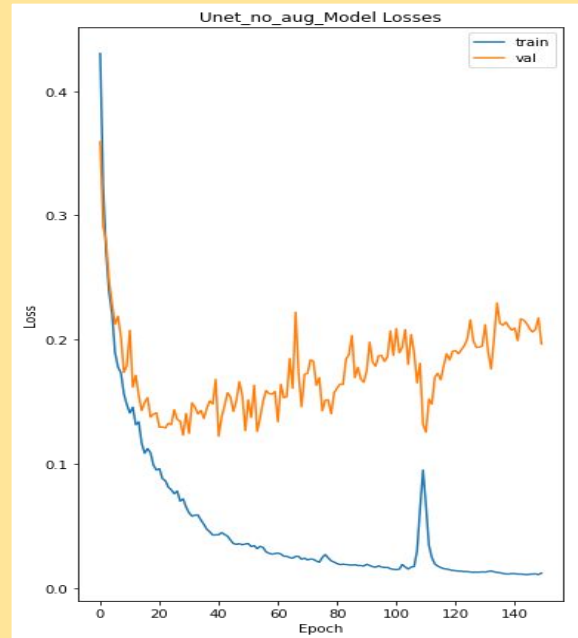
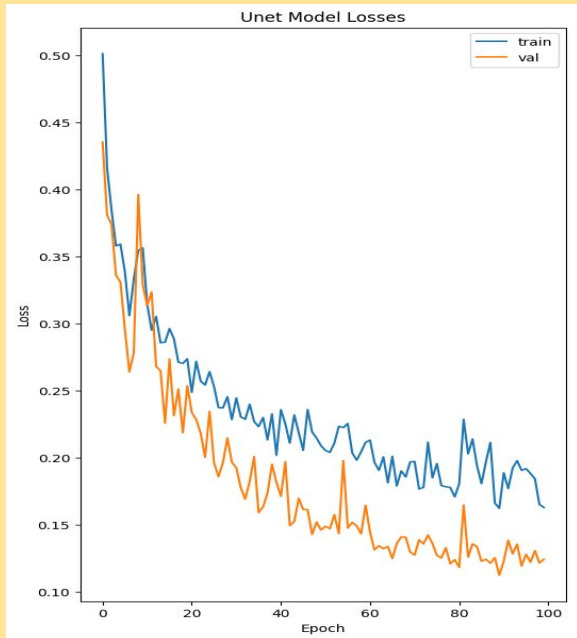
Model: "U-NetPP"

Layer (type)	Output Shape	Param #	Connected to
input_2 (InputLayer)	[(None, 224, 224, 3 0)]		[]
...
conv2d_56 (Conv2D)	(None, 224, 224, 6)	390	['activation_29[0][0]']
Total params: 32,739,206			
Trainable params: 32,725,894			
Non-trainable params: 13,312			

Loss Graphs - U-Net vs U-Net++



Loss Graphs - Aug vs No Aug





Results

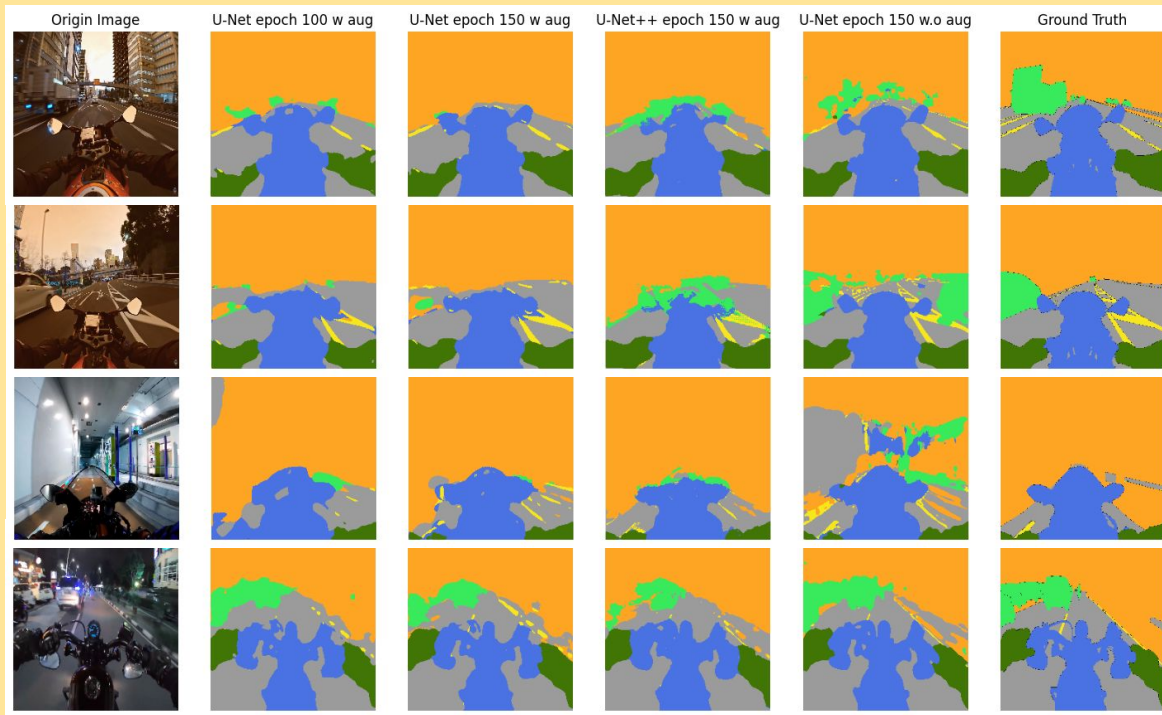
모델을 불러와서 prediction 진행

test generator에서 batch 하나를 가져와 시각화

json 파일의 categories 속 color값이 정상적이지 않음

→ 직접 colormap 생성

Semantic Segmentation





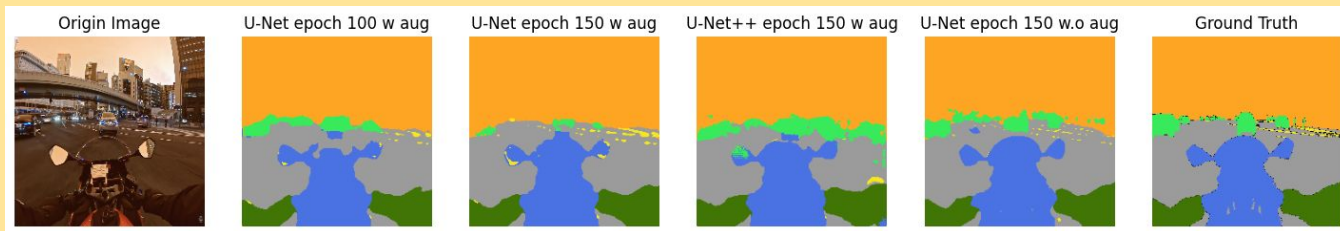
Intersection over Union

IoU를 클래스별로 구해서 비교했다

내일 업로드 예정!!

수식 추가하기 (코드를 넣던지~)

Intersection over Union



Index 0 of Batch					
U-Net epoch 100 w aug IoUs					
IoU of Rider : 0.8907	IoU of My bike : 0.8654	IoU of Moveable : 0.4382	IoU of Lane Mark : 0.0633	IoU of Road : 0.7994	IoU of Undrivable : 0.9617
Total IoU : 0.8665					
U-Net epoch 150 w aug IoUs					
IoU of Rider : 0.9425	IoU of My bike : 0.9175	IoU of Moveable : 0.1107	IoU of Lane Mark : 0.2183	IoU of Road : 0.8877	IoU of Undrivable : 0.9472
Total IoU : 0.8891					
U-Net++ epoch 150 w aug IoUs					
IoU of Rider : 0.8866	IoU of My bike : 0.8802	IoU of Moveable : 0.3265	IoU of Lane Mark : 0.0000	IoU of Road : 0.6797	IoU of Undrivable : 0.9538
Total IoU : 0.8248					
U-Net epoch 150 w.o aug IoUs					
IoU of Rider : 0.9619	IoU of My bike : 0.9599	IoU of Moveable : 0.5083	IoU of Lane Mark : 0.2807	IoU of Road : 0.9057	IoU of Undrivable : 0.9560
Total IoU : 0.9155					



Conclusion

Kyu:

Bong:

Na:



Q&A

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