Pix2pix 모델을 사용한

흑백 적외선 영상 채색

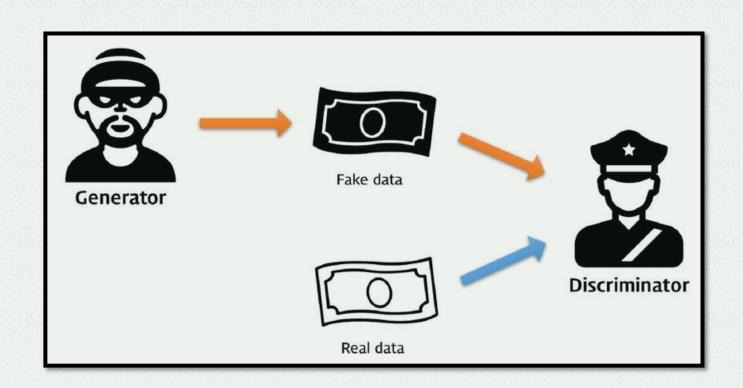
AE

컴퓨터과학과 201733005 김신영 컴퓨터과학과 201733032 허현범

목차

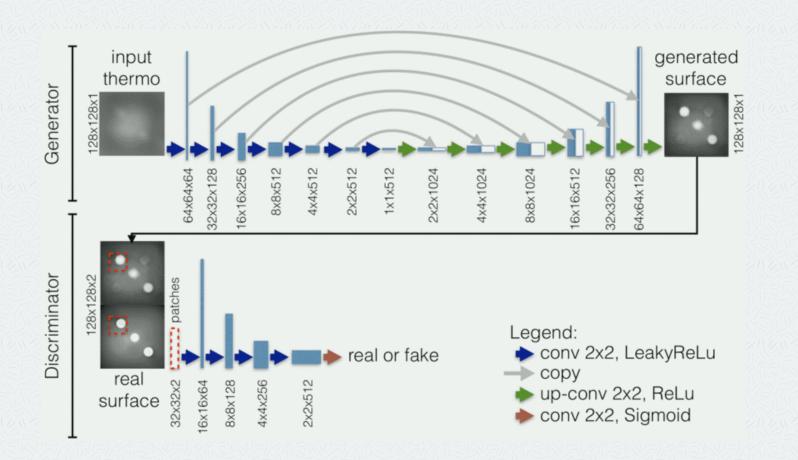
- 모델의 소개
- 모델 제작의 시행착오
- 결과

GAN 기반의 PIX2PIX 모델



GAN

생산적 적대 신경망



pix2pix

UNET



WHY?

pix2pix



Instance-aware Image Colorization

Jheng-Wei Su

National Tsing Hua University

Hung-Kuo Chu

National Tsing Hua University

CVPR 2020

Jia-Bin Huang

Virginia Tech



모델이 복잡하여,

채색의 속도가 너무 느리다. (실시간성 보장)

정확한 색상보다는, 구분의 용이성이 우선

데이터셋의 구축

실제 적외선 카메라





야간에 플래시를 켜 찍은사진







IMG_3687



IMG_3695



IMG_3663

IMG_3671

IMG_3680



IMG_3664

IMG_3672

IMG_3681



IMG_3665

IMG_3673

IMG_3682



IMG_3666















데이터셋의 구축

IMG_3667



IMG_3676



IMG_3684



IMG_3668

IMG_3677

IMG 3693



IMG_3669

IMG_3678

IMG 3694



IMG_3688

IMG_3696



IMG_3697





IMG_3698



IMG_3699



IMG_3

종류: JPG 파일 형식의 모든 파일

위치: C:\Users\hyunb\Desktop\makedataset≤

크기: 2.26GB (2,431,281,405 바이트)

디스크 할당 크기: 2.26GB (2,432,724,992 바이트)



1000

1200

1400

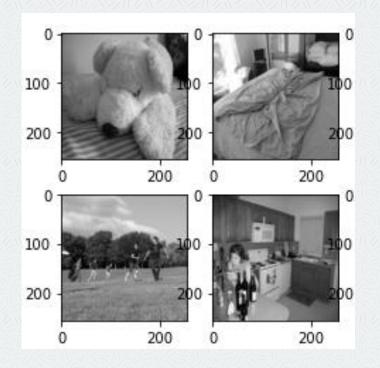
200 -

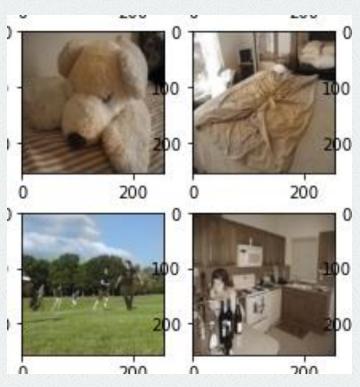
순탄치 않은 과정

tennis racket water-other water surfboard waterdrops skateboard baseball glove baseball bat sea sports river foa ground-other playingfield platform sports ball snowboard skis frisbee railroad ground pavement suitcase road tie handbag eye glasses shoe gravel mud dirt accessory snow umbrella sand backpack hat solid-other solid giraffe zebra mountain stone outdoor outdoor bear rock animal sky elephant wood sky-other clouds cow sheep horse plant-other dog cat bird straw plant moss branch bench flower outdoor parking meter stop sign leaves bush street sign fire hydrant traffic light tree grass structural-other structural boat truck railing net vehicle cage fence building-other train airplane building motorcycle roof car tent person bicycle bridge skyscraper house food-other vegetable salad person hair brush toothbrush hair drier things stuf food indoor teddy bear fruit scissors vase clock book blender textile-other banner pillow blanket textile appliance curtain cloth clothes napkin towel refrigerator sink toaster oven microwave cell phone keyboard remote mat electronic rug furniture-other mouse stairs light laptop tv door toilet counter furniture cupboard cabinet shelf indoor desk indoor furniture window dining table table mirror window bed door potted plant window-other couch window-blind chair floor-other floor cake floor-stone floor-marble pizza hot dog floor-wood food floor-tile ceiling carpet ceiling-other ceiling-tile wall-other carrot broccoli orange sandwich apple wall-concrete banana wall-stone bowl wall-brick spoon knife fork wall-wood kitchen wall-panel wall-tile cup wine glass plate bottle rawmaterial metal plastic paper cardboard

총 11만 8천개의 이미지로 구성된

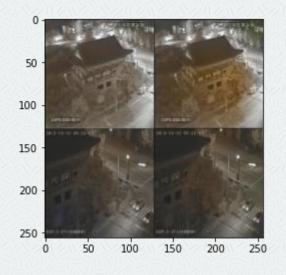
COCO stuff 데이터셋

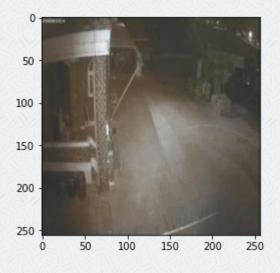




과적합과 만나다







과적합과 만나다

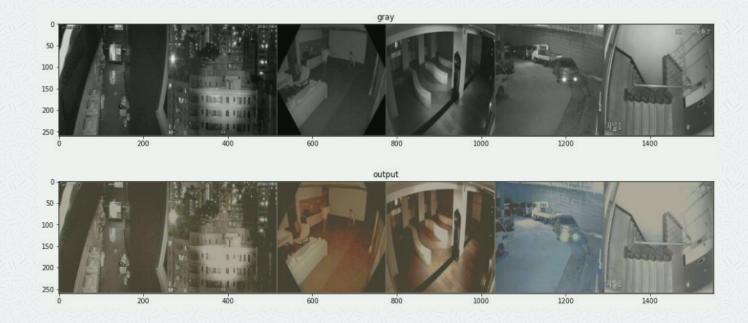
97ay 100 150 200 200 400 600 800 1000 1200 1400

실수



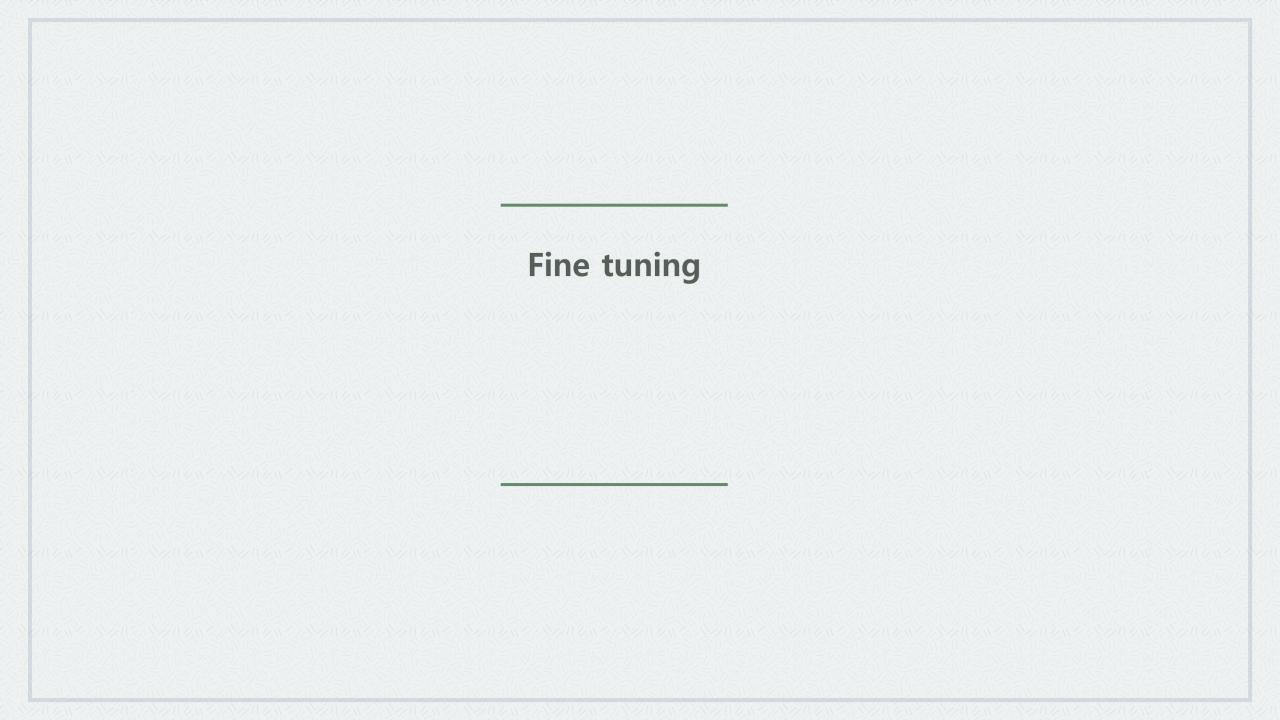
잘못된 평균과 표준편 차를 통한 정규화

기존의 **저조도 환경의 수치**로 정규화를 해서 grayscale 값이 0에 가까운 부분에 **문제 발생**



ImageNet[©]

수많은 이미지의 평균과 표준편차 사용하여 정규화 후 다시 학습시킨 결과



↓ 단순 영상 채색 모델 (낮처럼 채색하려 한다)







↓적외선 영상에 특화된 모델 (야간에 어울리도록 채색한다)











기본 pix2pix

야간사진에 특화된 모델

전처리 후처리

Demonstration

Thank you