

FiLM²: Adjust Each Film Through the **FiLM**

카메라 이미지 품질 향상 AI 경진대회

고려대학교 지능공학 연구실

Contents

Part 1. Approach: FiLM²



Part 2. Implementation Details

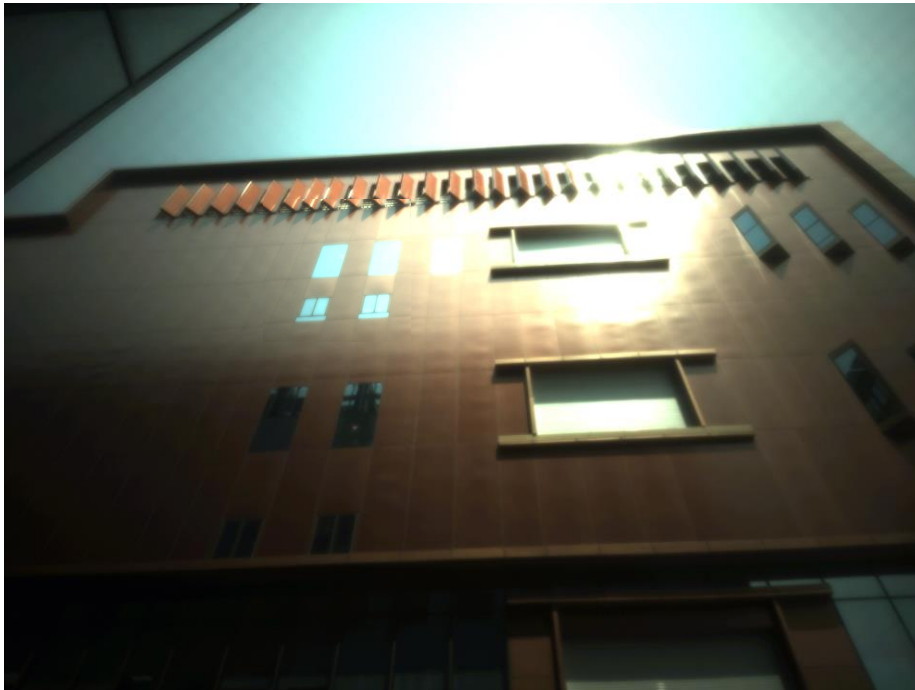


FiLM²: Adjust Each Film Through the FiLM

Contents

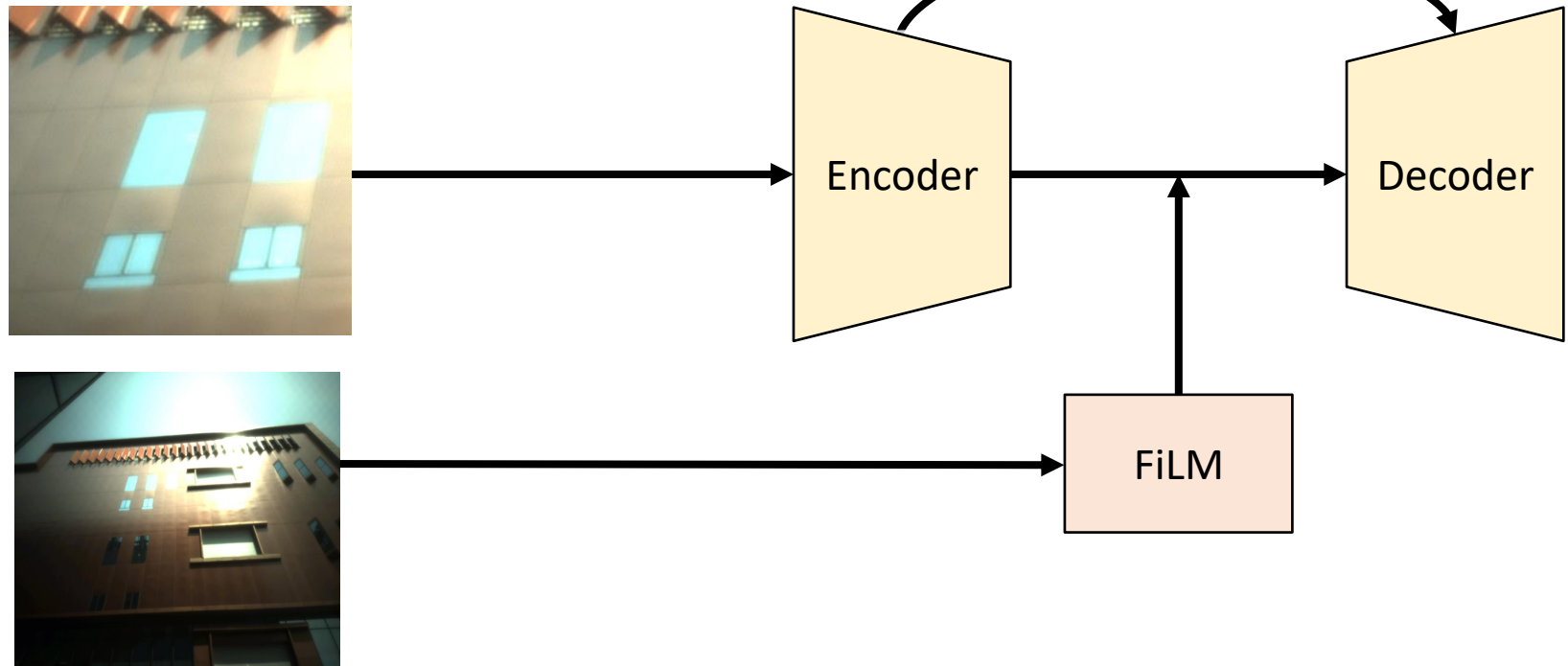
Film

FiLM



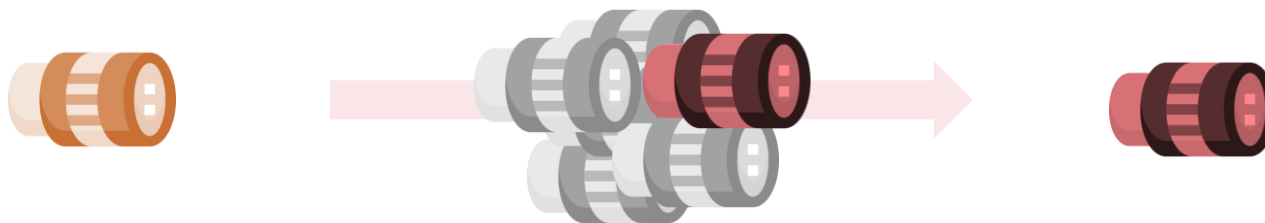
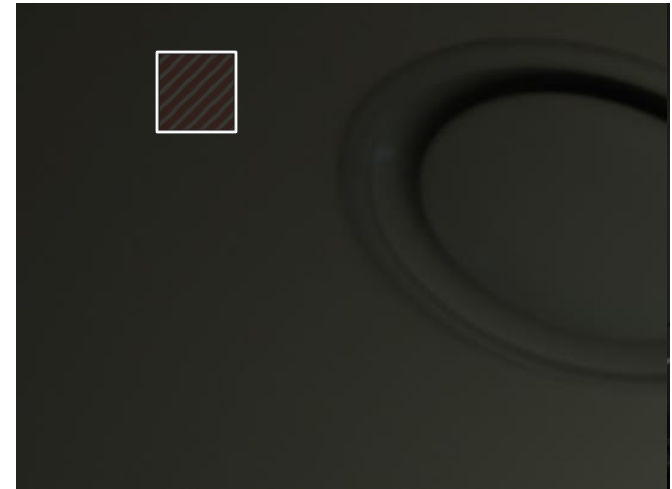
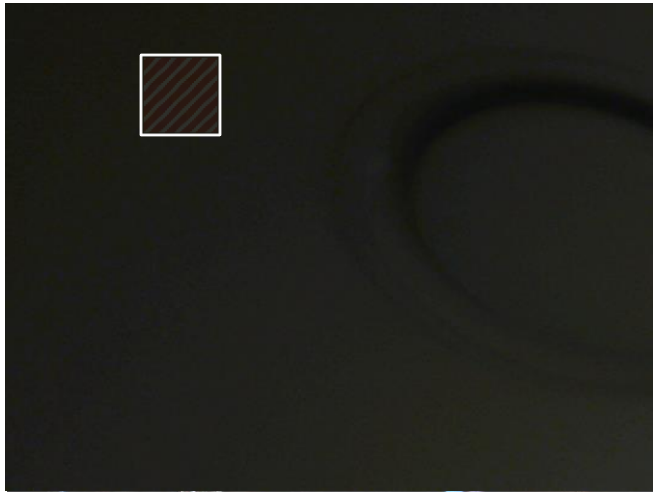
Film

Feature-wise Linear Modulation

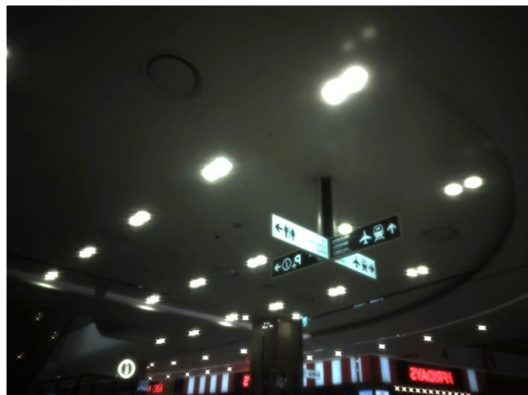


Motivation: Problem Reduction

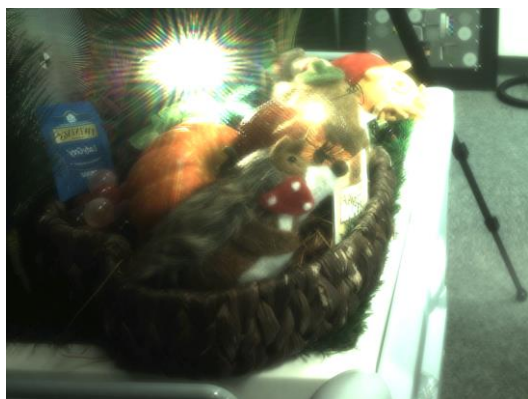
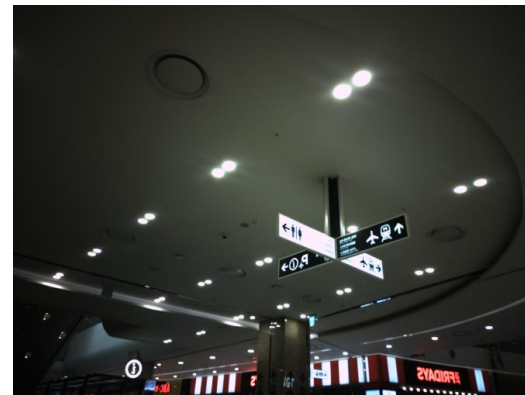
빛번짐으로 저하된 이미지 품질 향상 => 더 적합한 렌즈 찾기 문제



Motivation: Film adjustment



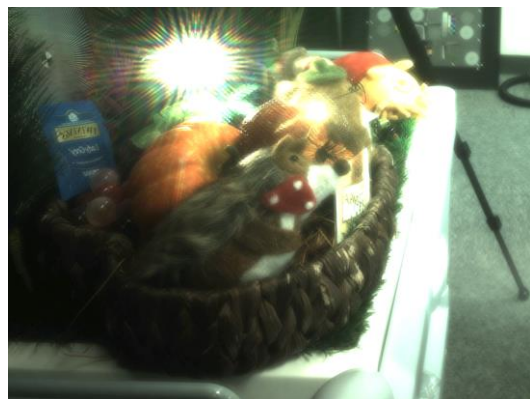
film adjustment



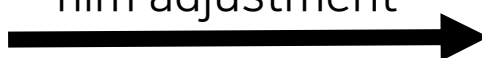
film adjustment



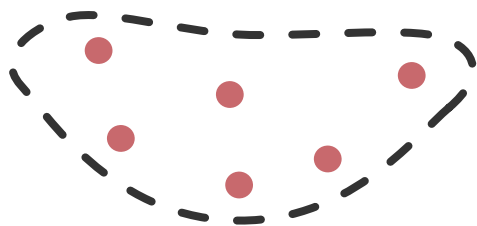
Motivation: Film adjustment in Representation Space



film adjustment

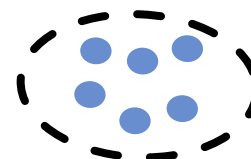


Representation Space



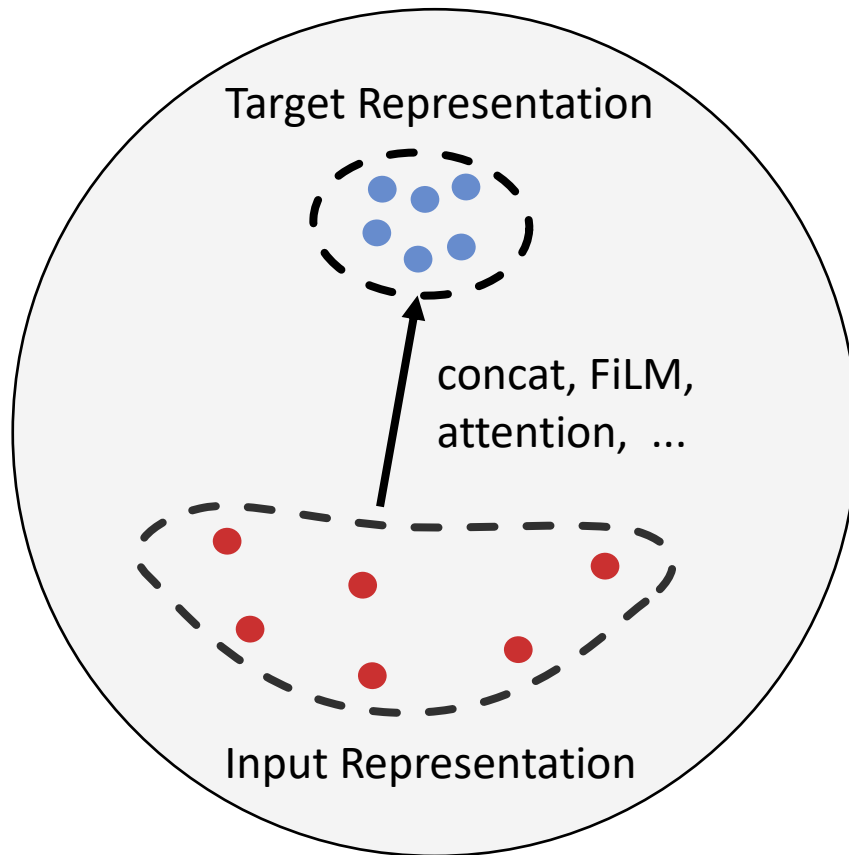
input representation

feature modulation

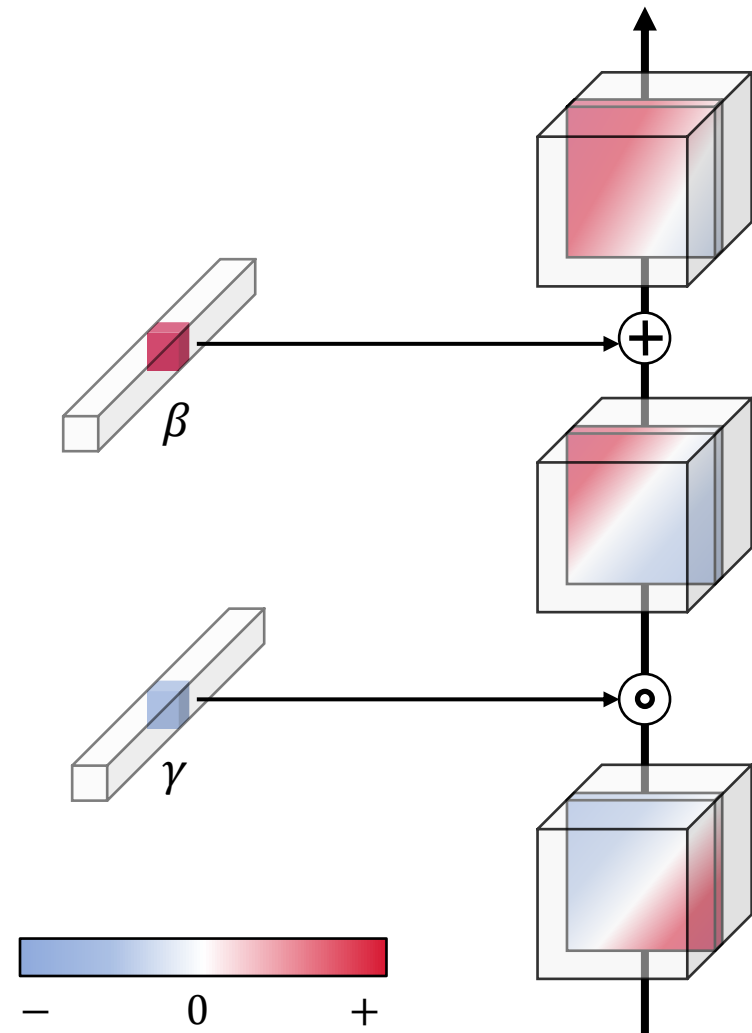


target representation

Motivation: Modeling Film adjustment with FiLM

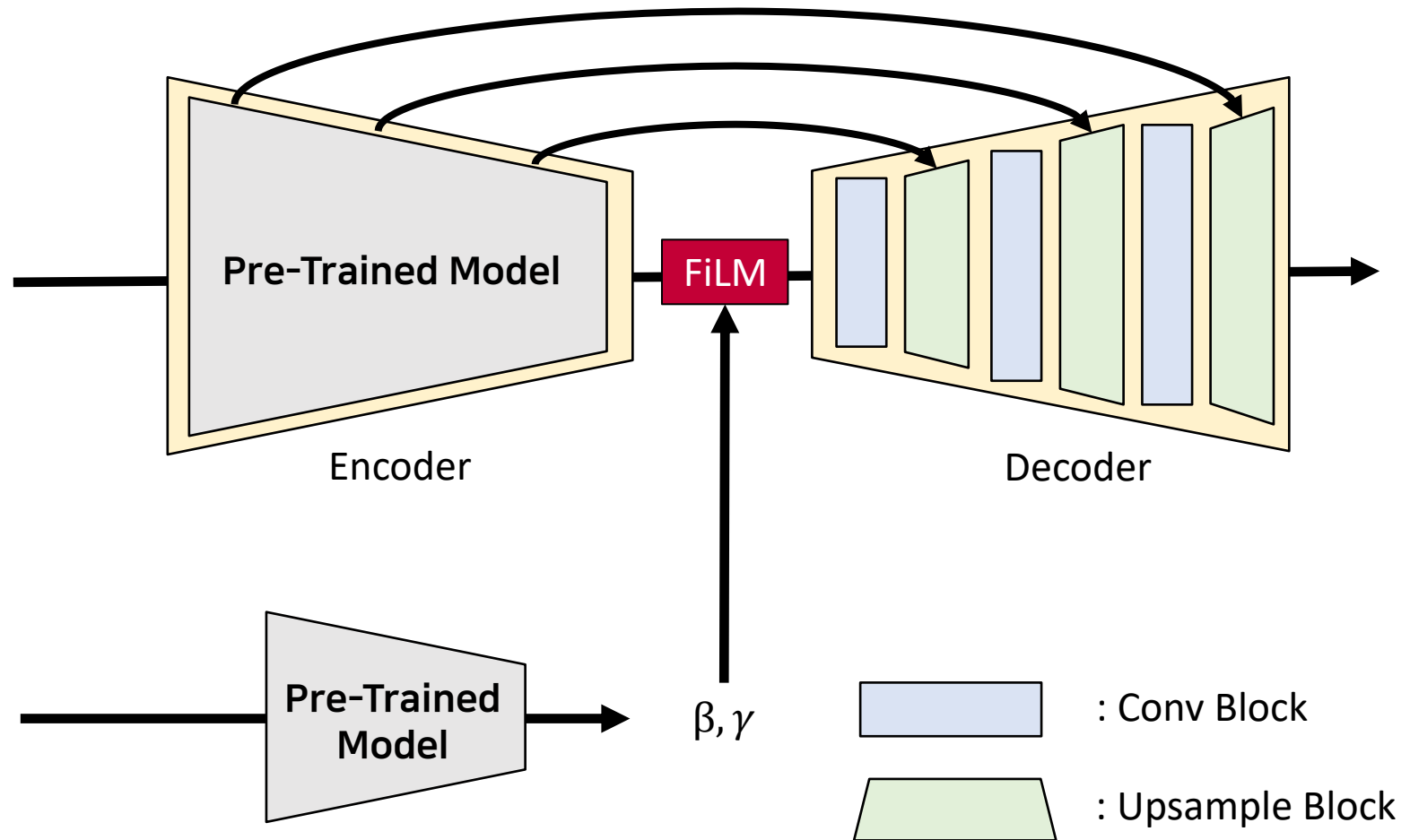
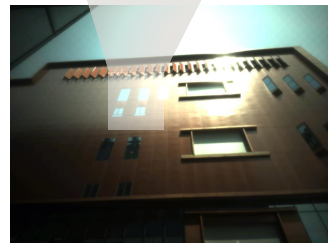


Feature Modulation



FiLM: Feature-wise Linear Modulation

Model Architecture



Contents

Part 1. Approach: FiLM²



Part 2. Implementation Details



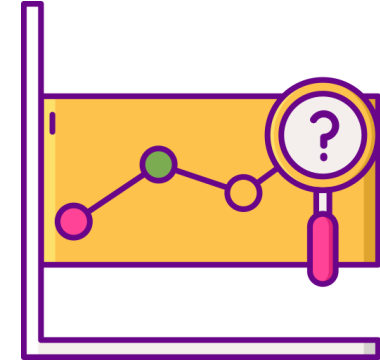
Implementation Details



Data Preprocessing



Experiments



Inference

Data Preprocessing

1. Patch Size



동일 조건에서 Patch Size의 변화를 주며 실험을 진행함.

Image Size	Valid (PSNR)
(128, 128)	29.769
(256, 256)	31.886
(512, 512)	31.611

2. [Augmentation](#) Method

- 문제의 특성을 고려하여 밝기 및 색상과 관련된 augmentation 제외
- Flip, Rotation, Random Resized, Elastic Transform의 비교 실험을 sweep으로 진행.
- 최종적으로 Flip과 Rotation 적용

Experiments

1. FiLM² Architecture



- Adopting ImageNet Pre-Trained
 - ResNet (50,101)
 - Wide-ResNet (50, 101)
 - **ResNext 101** ✓
 - DenseNet
- Based on Deblurring Model
 - Pyramidal
 - MPRNet
 - HINet

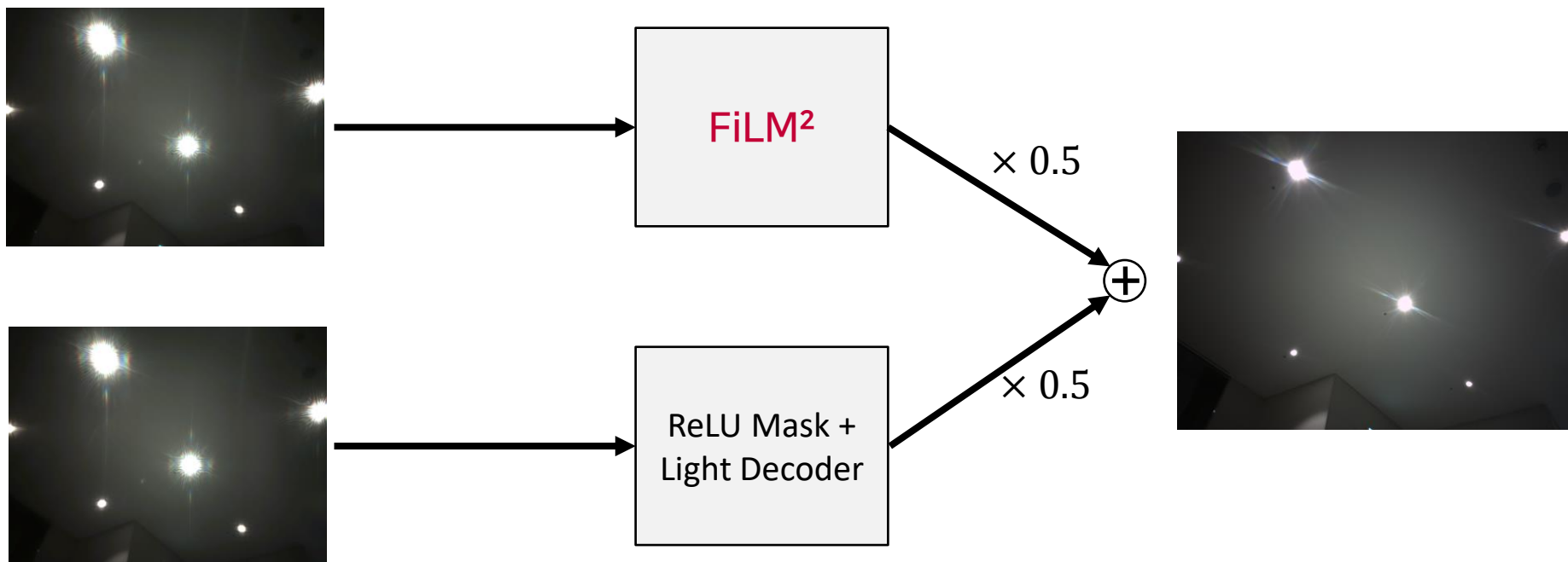
2. Supplementary Architecture: ReLU Mask + Light Decoder

- ReLU Mask를 생성하는 방법론과 모델을 간소화 하기 위한 실험을 진행함
- 실험 결과 비교적 가벼운 모델의 경우 ReLU Mask를 적용시 성능이 향상되는 것을 확인
- **FiLM²** 와 앙상블을 적용 시 best 성능 달성 ✓

Inference



- 추론 단계에서는 Fully Convolution model의 특성을 고려해 전체 이미지를 입력.
- 각 모델의 결과 값은 0.5의 가중치로 앙상블됨.



Q & A

Appendix

팀원 소개



최우성

고려대학교
컴퓨터학과 박사과정

Code Refactoring

ws_choi@korea.ac.kr



김민석

고려대학교
컴퓨터학과 박사과정

Development

rlaalstjr47@korea.ac.kr



김진성

고려대학교
컴퓨터학과 석사과정

Project Management

onedas@korea.ac.kr



정영석

고려대학교
컴퓨터학과 석사과정

Development

dnfkdi1995@korea.ac.kr

Data Augmentation Sample

