

2020년 인공지능 학습용 데이터 교육영상 “한국인 재식별 이미지” 소개 및 활용

2021.03


한국과학기술연구원
선임연구원 조정현





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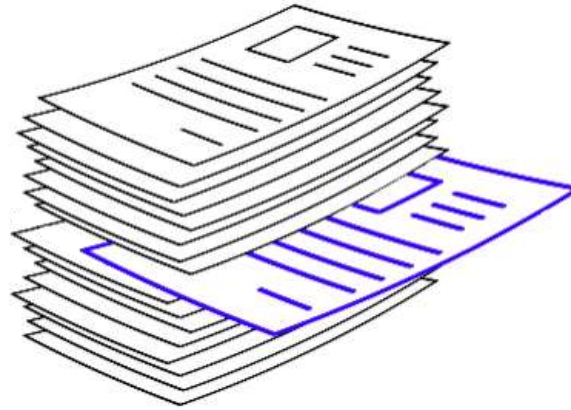


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01 한국인 재식별 이미지 데이터 소개

재식별 기술이란
(일반적 의미)

정보 1
...
정보 N



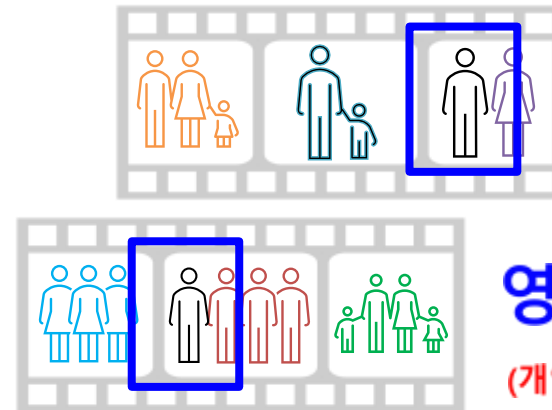
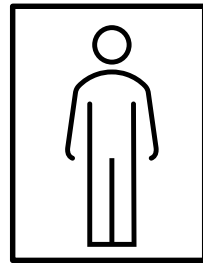
신원식별

01 한국인 재식별 이미지 데이터 소개

재식별 기술이란
(컴퓨터 비전)

정보 1
...
정보 N

+



영상식별
(개인정보식별 X)

..... 01 한국인 재식별 이미지 데이터 소개

수행 기관

KIST Human ICT **SOISOFT**

..... 01 한국인 재식별 이미지 데이터 소개

수행 기관



데이터 수량

$$(604 + 401) \times 4 \times 10^{\uparrow} \times 10 \times 10 \approx 4820000$$

01 한국인 재식별 이미지 데이터 소개

수행 기관



데이터 수량

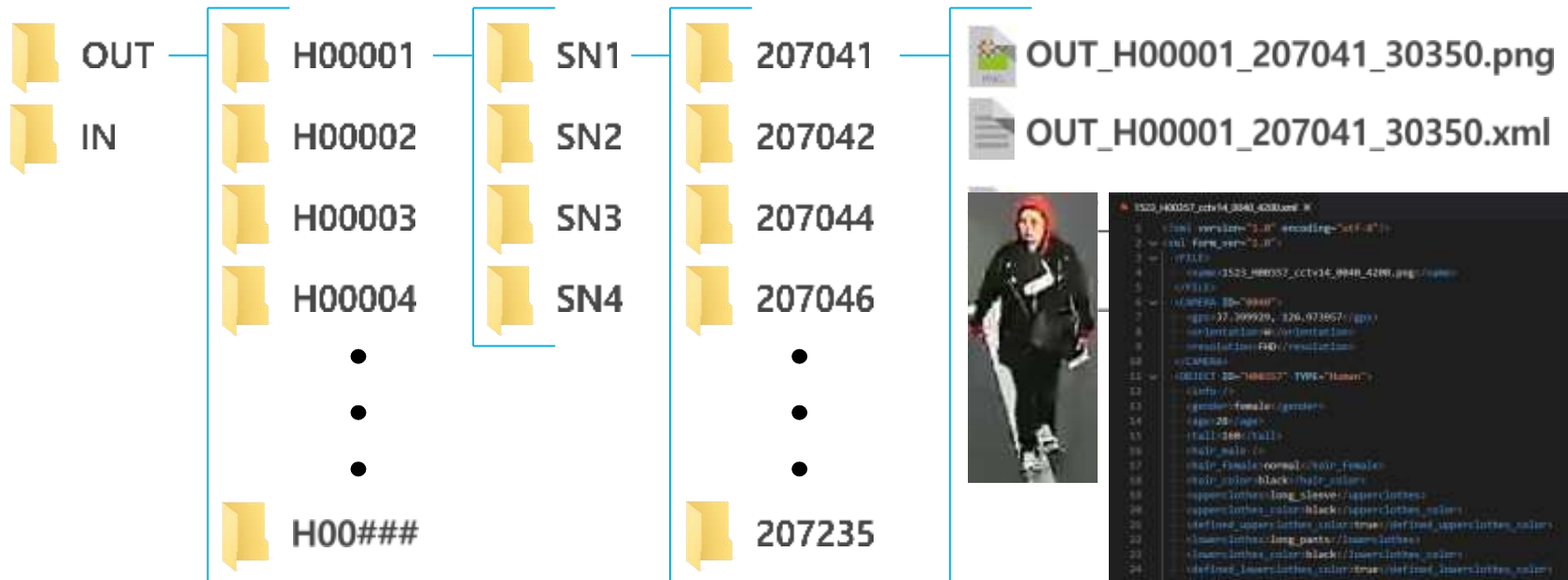
$$(604 + 401) \times 4 \times 10^4 \times 10 \times 10 \approx 4820000$$

색인 정보

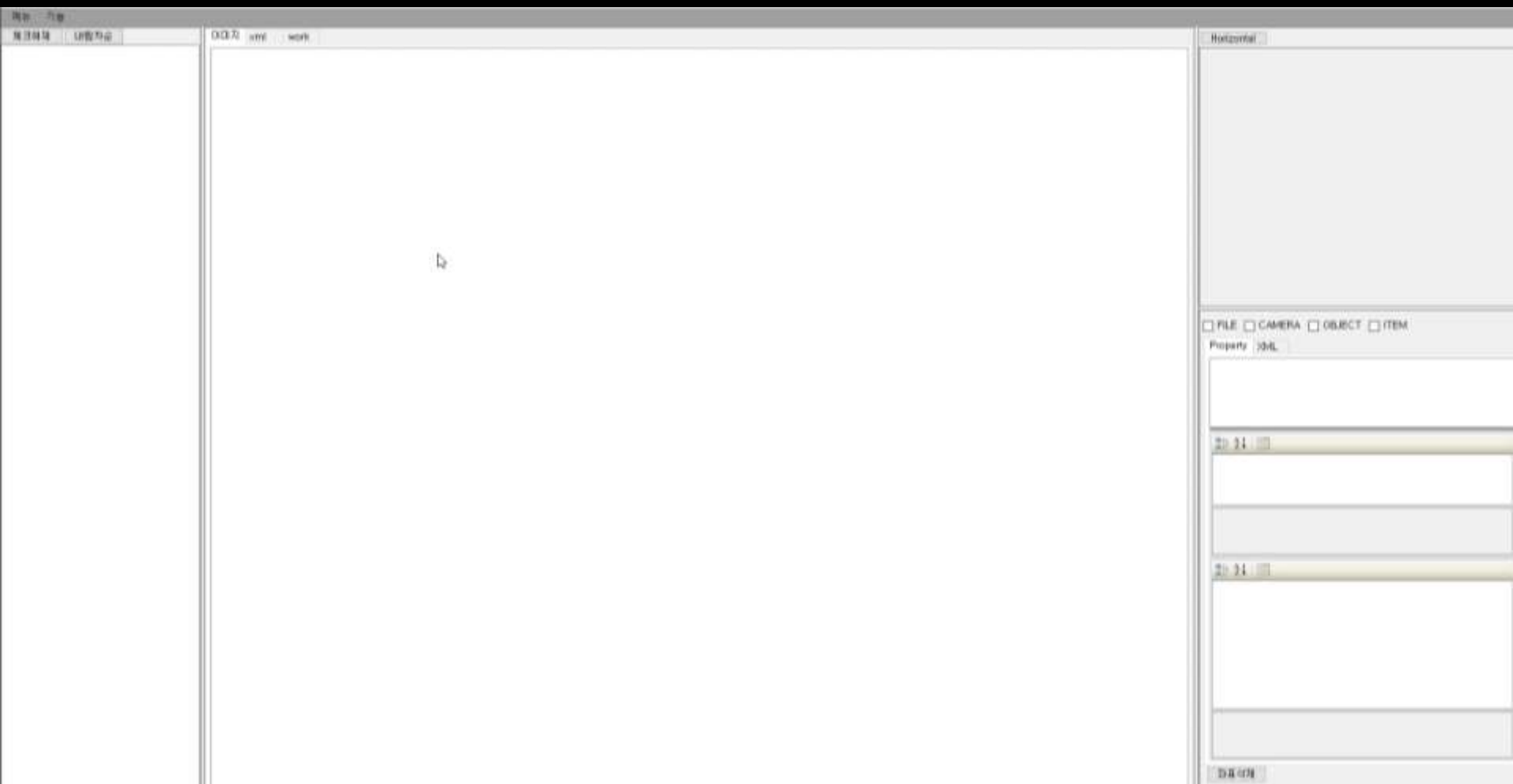
ID, CCTV, 성별/나이 대/키, 머리카락/상하의 색, 소지품 정보

02 저작도구 활용법

재식별 데이터 폴더 구조



```
1520_H00057_reviv4_0040_000000 W
1 <!-- version="2.0" encoding="utf-8" -->
2 <xsl:form-version="2.0" />
3 <?xml?
4 <!-- name="1525_H00057_cctv14_9940_4200.png" name=
5 <?xml?
6 <!-- name="ID="9940" -->
7 <!-- age="37,999929, 326,973957" />
8 <!-- sex="male" />
9 <!-- result="F40" />
10 <!-- result="F40" />
11 <!-- OBJECT_ID="100057", TYPE="Human" -->
12 <!-- />
13 <!-- gender="female" />
14 <!-- age="28" />
15 <!-- height="160" />
16 <!-- hair="black" />
17 <!-- hair_color="black" />
18 <!-- upperclothes="long_sleeve" />
19 <!-- upperclothes_color="black" />
20 <!-- upperclothes_color="black" />
21 <!-- lowerclothes="long_pants" />
22 <!-- lowerclothes_color="black" />
23 <!-- lowerclothes_color="black" />
24 <!-- lowerclothes_color="black" />
25 <!-- />
26 <!-- />
27 <!-- ITEM_ID="100057", TYPE="ITEM" -->
28 <!-- />
29 <!-- ITEM_ID="100057", TYPE="ITEM" -->
30 <!-- />
31 <!-- ITEM_ID="100057", TYPE="ITEM" -->
32 <!-- />
33 <!-- ITEM_ID="100057", TYPE="ITEM" -->
34 <!-- />
35 <!-- />
36 <!-- />
```

FILE CAMERA OBJECT ITEM

Property URL

0001.xml

0001.xml

Done

03 데이터 학습 방법 및 시연

학습 데이터 준비

Market-1501 Dataset



Zheng et al., Scalable Person Re-identification: A Benchmark, ICCV 2015

03 데이터 학습 방법 및 시연

학습 데이터 준비

DukeMTMC Dataset

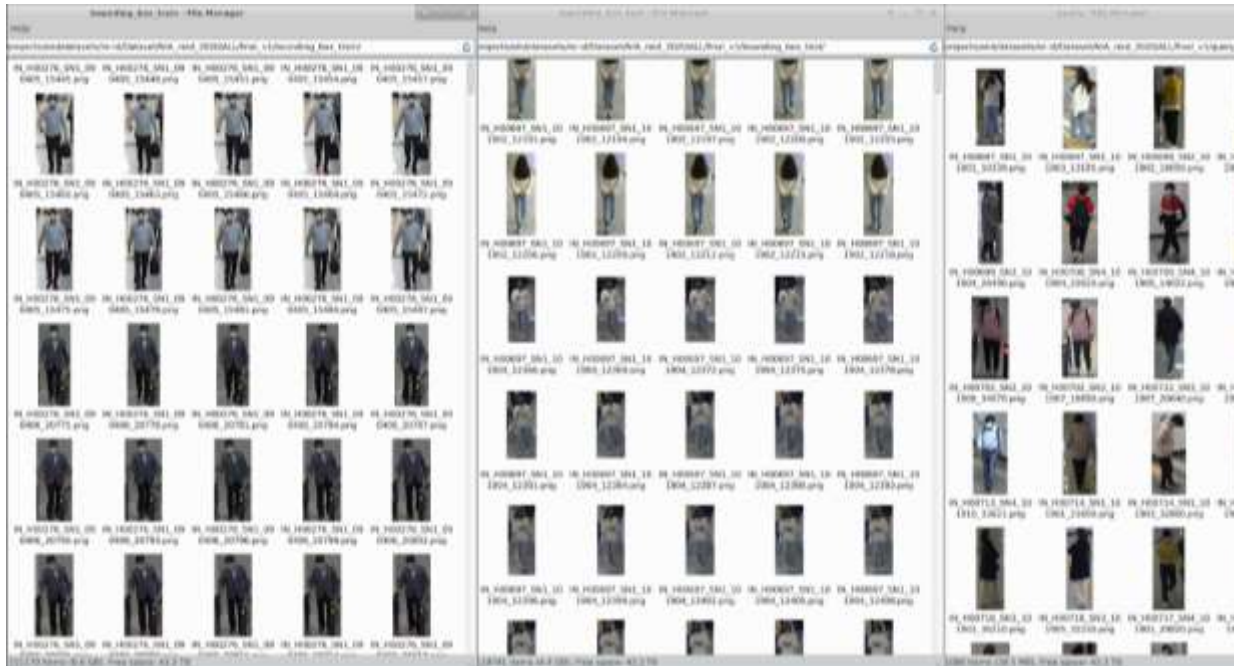


Ristani et al., Performance Measures and a Data Set for Multi-Target, Multi-Camera Tracking, ECCV 2016

03 데이터 학습 방법 및 시연

학습 데이터 준비

KREID Dataset



03 데이터 학습 방법 및 시연

학습 데이터 준비

 Dataset > NIA_reid_2020 > ALL > final_v1 > bounding_box_train $505 \times 10 \times \sim 30$

03 데이터 학습 방법 및 시연

학습 데이터 준비

 Dataset > NIA_reid_2020 > ALL > final_v1 > bounding_box_train 505 × 10 × ~ 30

환경 설정

```
$ pip install -r requirements.txt
```

```
certifi==2020.6.20
cffi==1.14.0
chardet==3.0.4
click==7.1.2
cyclr==0.10.0
h5py==2.10.0
idna==2.10
joblib==0.16.0
kiwisolver==1.2.0
matplotlib==3.3.0
nltk==3.5
numpy
olefile==0.46
opencv-python==4.3.0.36
pyparsing==2.4.7
python-dateutil==2.8.1
regex==2020.7.14
requests==2.24.0
scikit-learn==0.23.1
scipy==1.5.1
sklearn
threadpoolctl==2.1.0
torch==1.2.0
torchvision==0.4.0
tqdm==4.48.0
urllib3==1.25.10
```

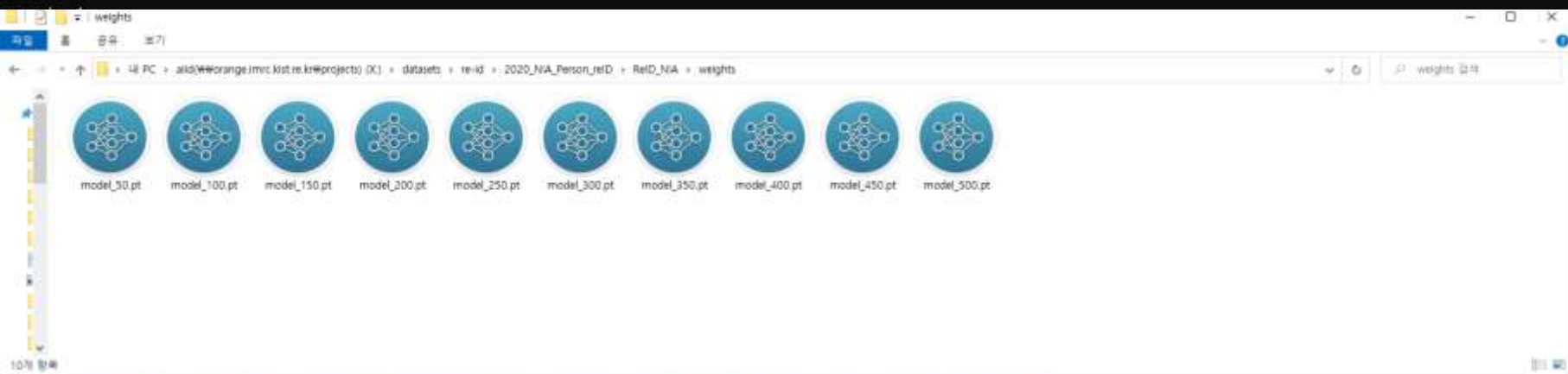
```
(KIST) seungho.chae@fig:/projects/aiid/datasets/re-id/2020_NIA_Person_reid/ReID_NIA$ pip install -r requirements.txt
(KIST) seungho.chae@fig:/projects/aiid/datasets/re-id/2020_NIA_Person_reid/ReID_NIA$ ls /projects/aiid/datasets/re-id/Dataset/NIA_reid_
2020/ALL/final_v1
bounding_box_test bounding_box_train query
(KIST) seungho.chae@fig:/projects/aiid/datasets/re-id/2020_NIA_Person_reid/ReID_NIA$ _
```



```
(KIST) seungho.chae@fig:/projects/aiid/datasets/re-id/2020_NIA_Person_reID/ReID_NIA$ pip install -r requirements.txt
(KIST) seungho.chae@fig:/projects/aiid/datasets/re-id/2020_NIA_Person_reID/ReID_NIA$ ls /projects/aiid/datasets/re-id/Dataset/NIA_reid_2020/ALL/final_v1
bounding_box_test bounding_box_train query
(KIST) seungho.chae@fig:/projects/aiid/datasets/re-id/2020_NIA_Person_reID/ReID_NIA$ python main.py --mode train --data_path /projects/aiid/datasets/re-id/Dataset/NIA_reid_2020/ALL/final_v1
```

epoch 1


```
(KIST) seungho.chae@fig:/projects/aid/datasets/re-id/2020_NIA_Person_reID/ReID_NIA$ pip install -r requirements.txt
(KIST) seungho.chae@fig:/projects/aid/datasets/re-id/2020_NIA_Person_reID/ReID_NIA$ ls /projects/aid/datasets/re-id/Dataset/NIA_reid_2020/ALL/final_v1
bounding_box_test bounding_box_train query
(KIST) seungho.chae@fig:/projects/aid/datasets/re-id/2020_NIA_Person_reID/ReID_NIA$ python main.py --mode train --data_path /projects/aid/datasets/re-id/Dataset/NIA_reid_2020/ALL/final_v1
```



```
(KIST) seungho.chae@fig:/projects/aid/datasets/re-id/2020_NIA_Person_reID/ReID_NIA$ ls weights/
model_100.pt model_200.pt model_300.pt model_400.pt model_500.pt
model_150.pt model_250.pt model_350.pt model_450.pt model_50.pt
(KIST) seungho.chae@fig:/projects/aid/datasets/re-id/2020_NIA_Person_reID/ReID_NIA$
```

04 학습된 모델 결과 확인 방법 및 시연

학습 데이터 준비

Dataset > NIA_reid_2020 > ALL > final_v1 > bounding_box_train $505 \times 10 \times \sim 30$

테스트 데이터 준비

Dataset > NIA_reid_2020 > ALL > final_v1 > bounding_box_test

Dataset > NIA_reid_2020 > ALL > final_v1 > query

$500 \times 10 \times \sim 25$
(train과 중복 X)

500×2
(test와 중복 X)

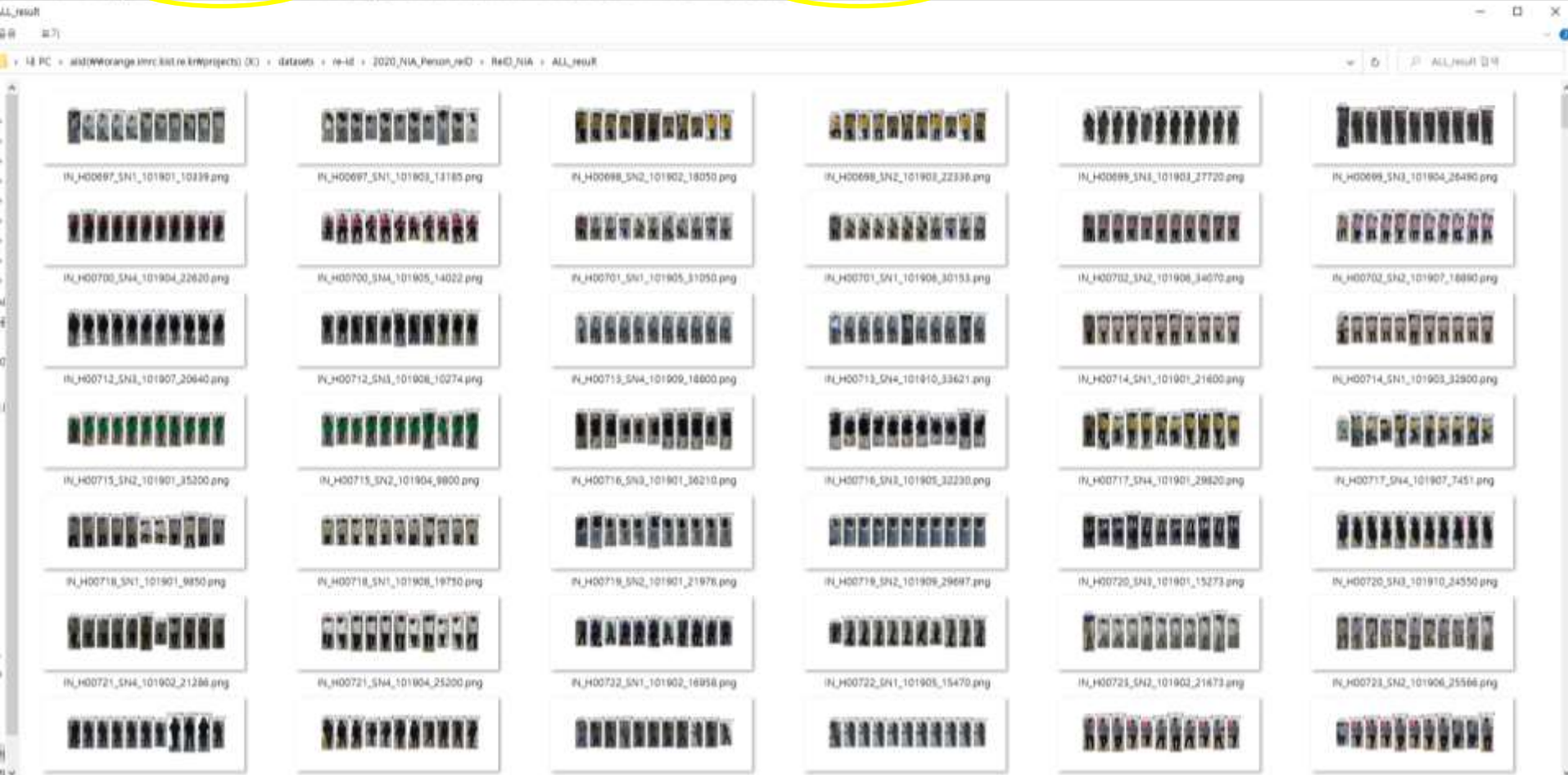


(KIST) seungho.chae@fg:/projects/all/datasets/re-id/2020_NIA_Person_reID/ReID_NIA\$ _




```
(KIST) seungho.chae@fig:/projects/aiid/datasets/re-id/2020_NIA_Person_reID/ReID_NIA$ python main.py --mode vis_all --data_path /project
s/aiid/datasets/re-id/Dataset/NIA_reid_2020/ALL/final_v1 --weight weights/model_500.pt
```

```
visualize all
extract features, this may take a few minutes
100% | 32/32 [00:15<00:00, 2.08it/s]
100% | 3742/3742 [39:29<00:00, 1.58it/s]
[Rank, mAP, rank1: 0.9680 rank3: 0.9750 rank5: 0.9780 rank10: 0.9840 mAP: 0.8649
```



..... 05 서비스 개발 시 학습된 모델 활용 방법

응용 서비스



OUTDOOR → 실종자 동선추적 서비스



INDOOR → 우범여행자 동선추적 서비스

-
-
-



이메일주소

비밀번호

로그인

(KIST) seungho.chae@lg:/projects/ai/datasets/re-id/2020_NIA_Person_reID/ReID_NIA\$ _



1

```
(KIST) seungho.chae@ig:/projects/aiid/datasets/re-id/2020_NIA_Person_reID/ReID_NIA$ python main.py --mode vis --query_image /projects/aiid/datasets/re-id/Dataset/NIA_reid_2020/ALL/final_v1/query/IN_H00697_SN1_101901_10339.png --data_path /projects/aiid/datasets/re-id/Dataset/NIA_reid_2020/ALL/final_v1 --weight weights/model_500.pt
```

```
(KIST) seungho.chae@flg:/projects/aiid/datasets/re-id/2020_NIA_Person_reid/ReID_NIA$ python main.py --mode vis --query_image /projects/aiid/datasets/re-id/Dataset/NIA_reid_2020/ALL/final_v1/query/IN_H00697_SN1_101901_10339.png --data_path /projects/aiid/datasets/re-id/Dataset/NIA_reid_2020/ALL/final_v1 --weight weights/model_500.pt
```

visualize
extract features, this may take a few minutes

```
100% | 1/1 [00:00<00:00, 4.80it/s]  
100% | 3742/3742 [37:09<00:00, 1.68it/s]
```

Top 10 images are as follow:

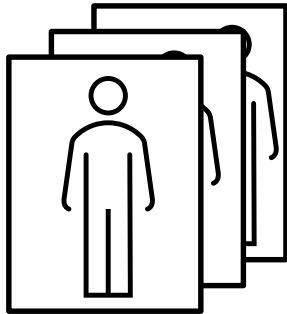
- /projects/aiid/datasets/re-id/Dataset/NIA_reid_2020/ALL/final_v1/bounding_box_test/IN_H00697_SN1_101910_11774.png
- /projects/aiid/datasets/re-id/Dataset/NIA_reid_2020/ALL/final_v1/bounding_box_test/IN_H00697_SN1_101910_11768.png
- /projects/aiid/datasets/re-id/Dataset/NIA_reid_2020/ALL/final_v1/bounding_box_test/IN_H00697_SN1_101910_11771.png
- /projects/aiid/datasets/re-id/Dataset/NIA_reid_2020/ALL/final_v1/bounding_box_test/IN_H00697_SN1_101910_11777.png
- /projects/aiid/datasets/re-id/Dataset/NIA_reid_2020/ALL/final_v1/bounding_box_test/IN_H00697_SN1_101908_10268.png
- /projects/aiid/datasets/re-id/Dataset/NIA_reid_2020/ALL/final_v1/bounding_box_test/IN_H00697_SN1_101908_10265.png
- /projects/aiid/datasets/re-id/Dataset/NIA_reid_2020/ALL/final_v1/bounding_box_test/IN_H00697_SN1_101908_10295.png
- /projects/aiid/datasets/re-id/Dataset/NIA_reid_2020/ALL/final_v1/bounding_box_test/IN_H00697_SN1_101908_10259.png
- /projects/aiid/datasets/re-id/Dataset/NIA_reid_2020/ALL/final_v1/bounding_box_test/IN_H00697_SN1_101908_10283.png
- /projects/aiid/datasets/re-id/Dataset/NIA_reid_2020/ALL/final_v1/bounding_box_test/IN_H00697_SN1_101908_10304.png

result saved to show.png



06 관련 법 · 제도 및 맺음말

관련 법 · 제도



개인정보보호법 [2020.8.5 시행, 2.4 개정]
생명윤리법 [2020.9.12 시행, 타법 개정]

참고 링크

- AI·로봇연구소 <http://airi.kist.re.kr>
- 인공지능연구단 <https://cai.kist.re.kr>
- 시각지능연구그룹 <https://vig.kist.re.kr>
- KFACE 데이터셋 <https://kface.kist.re.kr>

감사합니다

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선임연구원 조정현

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