

# PLASS-NIA 인공지능학습데이터구축사업 (2021)

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4팀(김도현, 전은성)

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# 1. UCF-Crime 테스트

Fighting  
prob: 0.9283



Assault  
prob: 0.9974



Assault  
prob: 0.9955



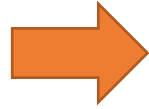
|     |          |     |              |
|-----|----------|-----|--------------|
| 848 | Fighting | 848 | prob: 0.9283 |
| 849 | Fighting | 849 | prob: 0.8914 |
| 850 | Fighting | 850 | prob: 0.8392 |
| 851 | Fighting | 851 | prob: 0.7551 |
| 852 | Fighting | 852 | prob: 0.6435 |
| 853 | Fighting | 853 | prob: 0.5080 |
| 854 | Assault  | 854 | prob: 0.6144 |
| 855 | Assault  | 855 | prob: 0.7251 |
| 856 | Assault  | 856 | prob: 0.8206 |
| 857 | Assault  | 857 | prob: 0.8791 |
| 858 | Assault  | 858 | prob: 0.9272 |
| 859 | Assault  | 859 | prob: 0.9535 |
| 860 | Assault  | 860 | prob: 0.9676 |
| 861 | Assault  | 861 | prob: 0.9752 |

-장면 전환과 함께 종목도 전환

## 2. AI-Hub 학습데이터

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Assault.avi



- Assault동영상에서 추출한 이미지
- 이미지를 이용해 학습을 하여 평가

## 2. AI-Hub 학습데이터

```
Assault/10-1_cam03_assault03_place07_night_winter 0
Assault/11-2_cam01_assault01_place08_night_spring 0
Assault/12-1_cam01_assault01_place09_day_spring 0
Assault/13-1_cam01_assault02_place08_day_spring 0
Assault/2-1_cam01_assault01_place04_night_spring 0
Assault/22-2_cam03_assault01_place07_night_spring 0
Assault/24-2_cam01_assault01_place09_night_spring 0
Burglary/237-1_cam02_burglary01_place02_night_spring 1
Burglary/457-1_cam02_burglary02_place04_day_summer 1
Burglary/468-1_cam01_burglary01_place09_night_spring 1
Burglary/54-1_cam01_burglary01_place01_day_spring 1
Burglary/55-1_cam01_burglary02_place02_night_spring 1
Burglary/56-3_cam01_burglary02_place03_day_spring 1
Burglary/57-1_cam01_burglary01_place04_day_spring 1
Datefight/183-1_cam01_datefight02_place06_night_spring 2
Datefight/184-1_cam01_datefight01_place01_night_spring 2
Datefight/185-1_cam01_datefight01_place02_night_spring 2
Datefight/186-1_cam01_datefight01_place03_day_spring 2
Datefight/187-1_cam01_datefight01_place02_night_spring 2
Datefight/188-1_cam01_datefight01_place01_day_spring 2
Datefight/189-1_cam01_datefight01_place09_night_spring 2
```

trainlist.txt (83개)

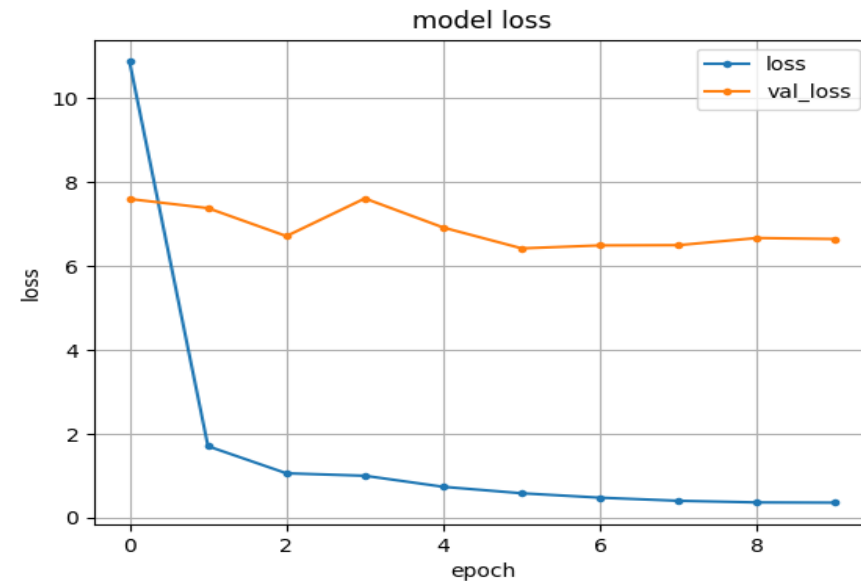
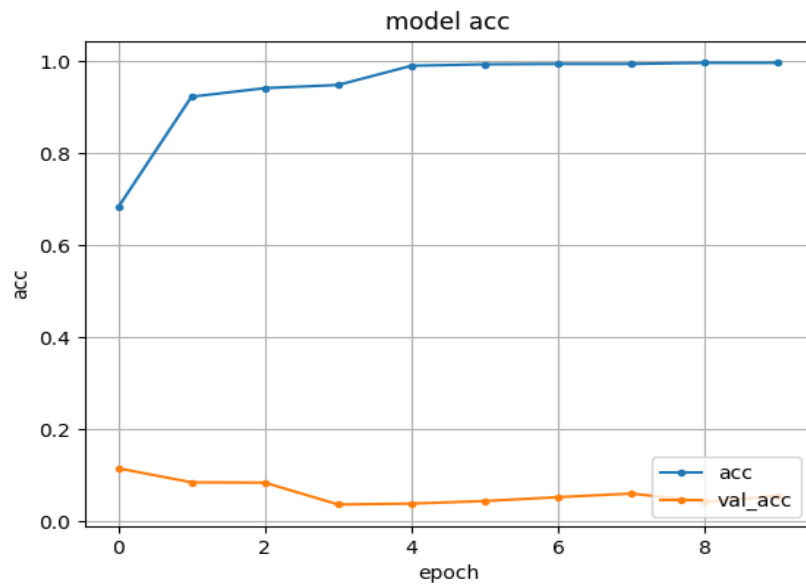
```
Assault/26-2_cam01_assault01_place01_night_spring 0
Assault/4-1_cam01_assault01_place01_day_spring 0
Assault/407-2_cam01_assault01_place04_day_spring 0
Burglary/58-1_cam01_burglary01_place02_day_spring 1
Burglary/67-1_cam01_burglary01_place10_night_spring 1
Burglary/70-1_cam01_burglary02_place02_night_spring 1
Datefight/191-1_cam01_datefight01_place04_night_spring 2
Datefight/194-1_cam01_datefight02_place02_night_spring 2
Datefight/588-1_cam01_datefight01_place01_day_spring 2
Drunken/212-1_cam01_drunken03_place03_night_spring 3
Drunken/214-1_cam01_drunken04_place02_night_spring 3
Drunken/217-1_cam01_drunken04_place03_night_spring 3
Dump/171-1_cam01_dump02_place01_day_spring 4
Dump/558-1_cam01_dump02_place01_day_spring 4
Dump/564-1_cam01_dump02_place02_day_spring 4
Fight/26-6_cam01_fight01_place01_night_spring 5
Fight/28-1_cam01_fight01_place02_night_spring 5
Fight/37-1_cam01_fight01_place02_night_spring 5
```

testlist.txt (36개)

```
1 1 Assault
2 2 Burglary
3 3 Datefight
4 4 Drunken
5 5 Dump
6 6 Fight
7 7 Kidnap
8 8 Robbery
9 9 Swoon
10 10 Trespass
11 11 Vandalism
12 12 Wander
```

Index.txt (12개)

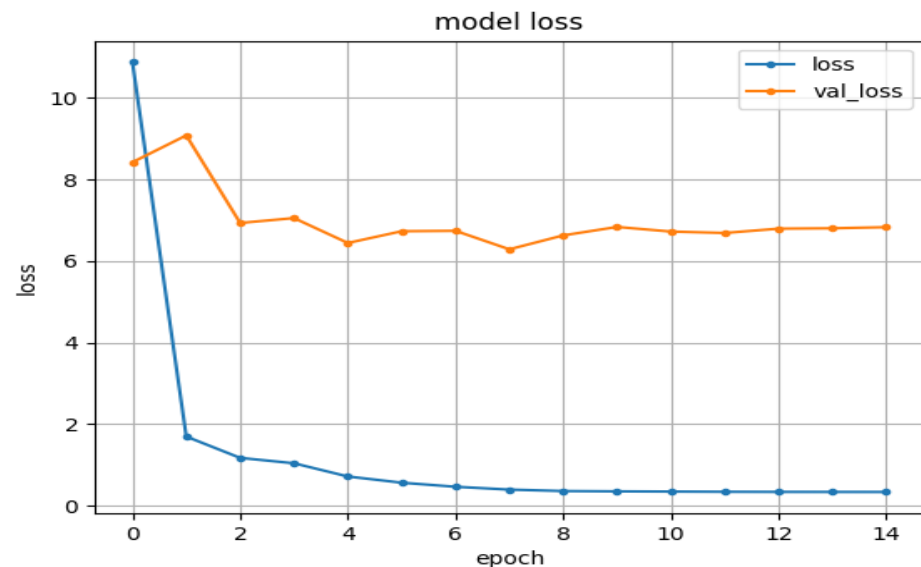
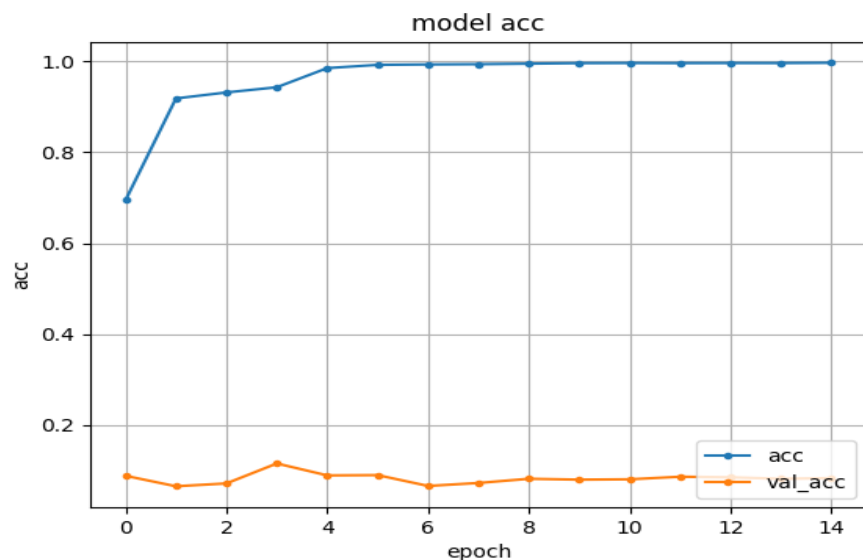
### 3. 모델 학습 (10번)



| 1  | epoch | loss                | acc                | val_loss           | val_acc              |
|----|-------|---------------------|--------------------|--------------------|----------------------|
| 2  | 0     | 10.875428952993257  | 0.6826309893140297 | 7.6017721676253975 | 0.11522075910147173  |
| 3  | 1     | 1.7079982832973064  | 0.9233023095484316 | 7.383912474678802  | 0.08481797056545314  |
| 4  | 2     | 1.062593943659333   | 0.942002757669769  | 6.716281154375498  | 0.08404337722695585  |
| 5  | 3     | 1.0039069582083766  | 0.9489400206825233 | 7.614925793766698  | 0.03650271107668474  |
| 6  | 4     | 0.7405952971912754  | 0.9907359531196139 | 6.920725639987417  | 0.038536018590240126 |
| 7  | 5     | 0.5864953176394203  | 0.9939029644950017 | 6.4242241262558535 | 0.044054996127033307 |
| 8  | 6     | 0.4813125191249341  | 0.9946354705274043 | 6.49516376684471   | 0.05247869868319133  |
| 9  | 7     | 0.40738482595065345 | 0.9946354705274043 | 6.501276226028927  | 0.06032145623547638  |
| 10 | 8     | 0.3682347090233609  | 0.9971130644605308 | 6.671572199909378  | 0.04250580945003873  |
| 11 | 9     | 0.36284852740847623 | 0.9970484315753189 | 6.646864696032866  | 0.055286599535243994 |
| 12 | 10    | 0.36284852740847623 | 1.0000000000000000 | 6.646864696032866  | 0.05286599535243994  |

•모델의 정확도와 손실

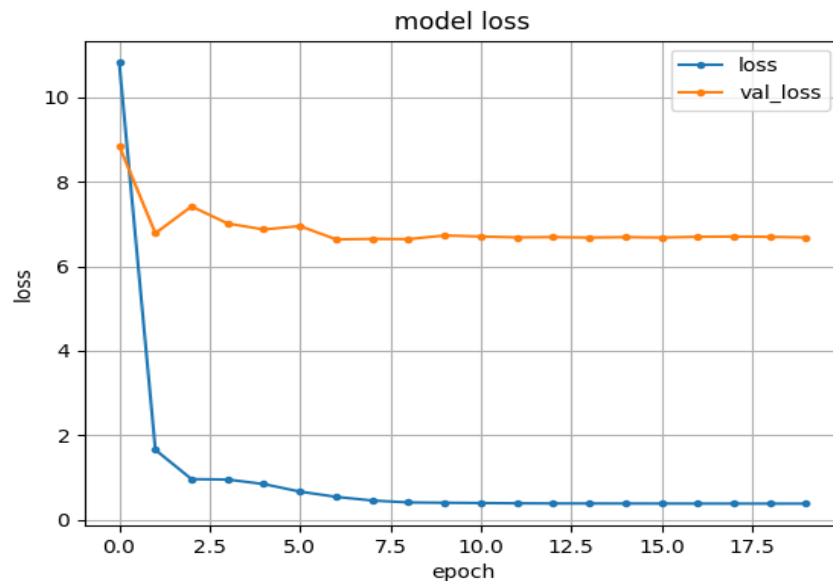
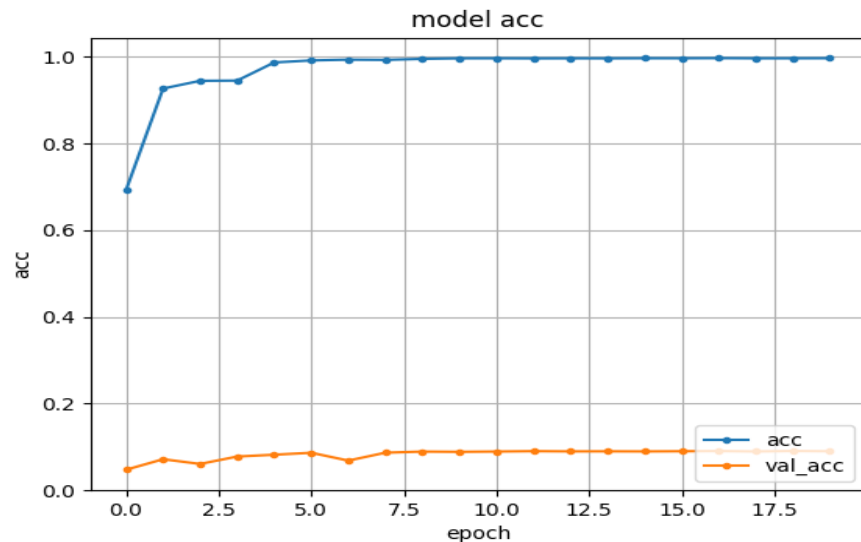
### 3. 모델 학습 (15번)



| 1  | epoch | loss                | acc                | val_loss           | val_acc             |
|----|-------|---------------------|--------------------|--------------------|---------------------|
| 2  | 0     | 10.880942584563435  | 0.6948250603240262 | 8.426352235349365  | 0.08844887683965919 |
| 3  | 1     | 1.6995711653695276  | 0.9186487418131679 | 9.085150245176001  | 0.06540472501936484 |
| 4  | 2     | 1.1761966847584437  | 0.931833850396415  | 6.937584399068937  | 0.07164988381099922 |
| 5  | 3     | 1.0440862657324441  | 0.943230782488797  | 7.0570620386107406 | 0.1155596436870643  |
| 6  | 4     | 0.7198546290068905  | 0.985392967942089  | 6.446481729089337  | 0.08932029434546863 |
| 7  | 5     | 0.567383818854878   | 0.9925241296104792 | 6.734827685042188  | 0.08994965143299767 |
| 8  | 6     | 0.4678122152422511  | 0.9934289900034471 | 6.744642621135638  | 0.06613090627420604 |
| 9  | 7     | 0.39834119009174423 | 0.994010685970355  | 6.2911939905374945 | 0.07266653756777691 |
| 10 | 8     | 0.3630589903613199  | 0.9951525336091003 | 6.632587180037908  | 0.08191324554608831 |
| 11 | 9     | 0.35557816931396796 | 0.9963374698379869 | 6.839778722856139  | 0.07997676219984508 |
| 12 | 10    | 0.350117917083042   | 0.9965960013788349 | 6.726735315426295  | 0.08075135553834237 |
| 13 | 11    | 0.3448394771815579  | 0.9963805584281282 | 6.692085838244     | 0.0864155693261038  |
| 14 | 12    | 0.34213517463975673 | 0.9965529127886935 | 6.797927508882364  | 0.08515685515104571 |
| 15 | 13    | 0.34104429494097743 | 0.9964882799034815 | 6.807225224401118  | 0.08186483346243223 |
| 16 | 14    | 0.340222166246975   | 0.9970915201654602 | 6.833863847113506  | 0.08331719597211464 |



### 3. 모델 학습 (20번)



| 1  | epoch | loss                | acc                | val_loss           | val_acc              |
|----|-------|---------------------|--------------------|--------------------|----------------------|
| 2  | 0     | 10.824848763493167  | 0.6923690106859703 | 8.853207082179607  | 0.047104957397366386 |
| 3  | 1     | 1.6522059603133559  | 0.9266416752843847 | 6.782666544688939  | 0.07135941130906275  |
| 4  | 2     | 0.9574649081851482  | 0.9444157187176836 | 7.4188636123072165 | 0.060466692486444616 |
| 5  | 3     | 0.9480966863365923  | 0.9449543260944502 | 7.013986297211473  | 0.07755615801704105  |
| 6  | 4     | 0.8406997206128083  | 0.9867933471216822 | 6.8727759760909075 | 0.08176800929512006  |
| 7  | 5     | 0.6617959097967769  | 0.9914684591520165 | 6.953256643252443  | 0.08627033307513556  |
| 8  | 6     | 0.5374506984916649  | 0.9932135470527405 | 6.637167838633661  | 0.06816421378776143  |
| 9  | 7     | 0.45105679211473515 | 0.9926749396759738 | 6.649223419236731  | 0.0864155693261038   |
| 10 | 8     | 0.40564475572959835 | 0.9951094450189589 | 6.644308315885796  | 0.08898140975987606  |
| 11 | 9     | 0.3976185464809698  | 0.9963374698379869 | 6.730179503756286  | 0.08840046475600309  |
| 12 | 10    | 0.3911686292067761  | 0.9964236470182696 | 6.705681239792213  | 0.0891266460108443   |
| 13 | 11    | 0.3851933352230582  | 0.9961651154774216 | 6.685438259177943  | 0.08999806351665375  |
| 14 | 12    | 0.3813772148015128  | 0.9963374698379869 | 6.692268185796523  | 0.08946553059643687  |
| 15 | 13    | 0.3808544896381224  | 0.9962512926577043 | 6.6805907891389475 | 0.08961076684740511  |
| 16 | 14    | 0.3799153516638571  | 0.9964882799034815 | 6.69092146026174   | 0.08936870642912471  |
| 17 | 15    | 0.37888867638925566 | 0.9964451913133402 | 6.681475350323063  | 0.08980441518202943  |
| 18 | 16    | 0.37793122631071024 | 0.9967468114443295 | 6.699002039515631  | 0.09028853601859024  |
| 19 | 17    | 0.37759930802517533 | 0.9963374698379869 | 6.70530940321044   | 0.08927188226181255  |
| 20 | 18    | 0.37701918017819025 | 0.9963805584281282 | 6.697800125473696  | 0.09043377226955848  |
| 21 | 19    | 0.3767088389076146  | 0.9965529127886935 | 6.683168793721868  | 0.08980441518202943  |



## 4. 모델 테스트 (10번)



704-1\_cam01\_kidnap02\_place02\_night\_spring.mp4

|      |         |              |
|------|---------|--------------|
| 4477 | Drunken | prob: 0.9798 |
| 4478 | Drunken | prob: 0.9806 |
| 4479 | Drunken | prob: 0.9813 |
| 4480 | Drunken | prob: 0.9819 |
| 4481 | Drunken | prob: 0.9822 |
| 4482 | Drunken | prob: 0.9825 |
| 4483 | Drunken | prob: 0.9823 |
| 4484 | Drunken | prob: 0.9821 |
| 4485 | Drunken | prob: 0.9812 |
| 4486 | Drunken | prob: 0.9801 |
| 4487 | Drunken | prob: 0.9780 |
| 4488 | Drunken | prob: 0.9758 |

- 훈련된 모델에서의 평가 결과
- Kidnap동영상에서의 AI-Hub종목 판별과 프레임별 정확도

## 4. 모델 테스트 (15번)



|    |                      |
|----|----------------------|
| 8  | Drunken prob: 0.9910 |
| 9  | Drunken prob: 0.9910 |
| 10 | Drunken prob: 0.9910 |
| 11 | Drunken prob: 0.9911 |
| 12 | Drunken prob: 0.9911 |
| 13 | Drunken prob: 0.9911 |
| 14 | Drunken prob: 0.9911 |
| 15 | Drunken prob: 0.9912 |
| 16 | Drunken prob: 0.9911 |
| 17 | Drunken prob: 0.9911 |
| 18 | Drunken prob: 0.9911 |
| 19 | Drunken prob: 0.9911 |
| 20 | Drunken prob: 0.9910 |

|      |                      |
|------|----------------------|
| 4477 | Drunken prob: 0.9877 |
| 4478 | Drunken prob: 0.9875 |
| 4479 | Drunken prob: 0.9873 |
| 4480 | Drunken prob: 0.9870 |
| 4481 | Drunken prob: 0.9867 |
| 4482 | Drunken prob: 0.9864 |
| 4483 | Drunken prob: 0.9860 |
| 4484 | Drunken prob: 0.9855 |
| 4485 | Drunken prob: 0.9850 |
| 4486 | Drunken prob: 0.9845 |
| 4487 | Drunken prob: 0.9839 |
| 4488 | Drunken prob: 0.9834 |



## 4. 모델 테스트 (20번)



```
8   Drunken prob: 0.4517
9   Drunken prob: 0.4511
10  Drunken prob: 0.4507
11  Drunken prob: 0.4514
12  Drunken prob: 0.4528
13  Drunken prob: 0.4549
14  Drunken prob: 0.4575
15  Drunken prob: 0.4602
16  Drunken prob: 0.4627
17  Drunken prob: 0.4640
18  Drunken prob: 0.4647
19  Drunken prob: 0.4647
```

```
4478 Drunken prob: 0.8454
4479 Drunken prob: 0.8408
4480 Drunken prob: 0.8327
4481 Drunken prob: 0.8224
4482 Drunken prob: 0.8096
4483 Drunken prob: 0.7918
4484 Drunken prob: 0.7712
4485 Drunken prob: 0.7495
4486 Drunken prob: 0.7286
4487 Drunken prob: 0.7061
4488 Drunken prob: 0.6837
```



## 4. 모델 테스트 (그 외)

Date Fight

|     |       |              |
|-----|-------|--------------|
| 119 | Fight | prob: 0.9071 |
| 120 | Fight | prob: 0.9206 |
| 121 | Fight | prob: 0.9295 |
| 122 | Fight | prob: 0.9322 |
| 123 | Fight | prob: 0.9327 |
| 124 | Fight | prob: 0.9345 |
| 125 | Fight | prob: 0.9334 |
| 126 | Fight | prob: 0.9316 |
| 127 | Fight | prob: 0.9274 |
| 128 | Fight | prob: 0.9225 |
| 129 | Fight | prob: 0.9167 |
| 130 | Fight | prob: 0.9085 |

Dump

|     |       |              |
|-----|-------|--------------|
| 200 | Swoon | prob: 0.9100 |
| 201 | Swoon | prob: 0.9213 |
| 202 | Swoon | prob: 0.9311 |
| 203 | Swoon | prob: 0.9410 |
| 204 | Swoon | prob: 0.9503 |
| 205 | Swoon | prob: 0.9585 |
| 206 | Swoon | prob: 0.9642 |
| 207 | Swoon | prob: 0.9687 |
| 208 | Swoon | prob: 0.9727 |
| 209 | Swoon | prob: 0.9761 |
| 210 | Swoon | prob: 0.9791 |
| 211 | Swoon | prob: 0.9819 |
| 212 | Swoon | prob: 0.9844 |
| 213 | Swoon | prob: 0.9866 |
| 214 | Swoon | prob: 0.9883 |

Swoon

|    |           |              |
|----|-----------|--------------|
| 49 | Datefight | prob: 0.9998 |
| 50 | Datefight | prob: 0.9998 |
| 51 | Datefight | prob: 0.9998 |
| 52 | Datefight | prob: 0.9998 |
| 53 | Datefight | prob: 0.9998 |
| 54 | Datefight | prob: 0.9998 |
| 55 | Datefight | prob: 0.9998 |
| 56 | Datefight | prob: 0.9997 |
| 57 | Datefight | prob: 0.9997 |
| 58 | Datefight | prob: 0.9997 |
| 59 | Datefight | prob: 0.9997 |
| 60 | Datefight | prob: 0.9997 |
| 61 | Datefight | prob: 0.9997 |
| 62 | Datefight | prob: 0.9997 |
| 63 | Datefight | prob: 0.9997 |
| 64 | Datefight | prob: 0.9997 |
| 65 | Datefight | prob: 0.9997 |
| 66 | Datefight | prob: 0.9997 |
| 67 | Datefight | prob: 0.9997 |

## 4. 모델 테스트 (그 외)

Fight

|      |      |              |
|------|------|--------------|
| 1572 | Dump | prob: 0.9009 |
| 1573 | Dump | prob: 0.9024 |
| 1574 | Dump | prob: 0.9038 |
| 1575 | Dump | prob: 0.9052 |
| 1576 | Dump | prob: 0.9067 |
| 1577 | Dump | prob: 0.9080 |
| 1578 | Dump | prob: 0.9095 |
| 1579 | Dump | prob: 0.9110 |
| 1580 | Dump | prob: 0.9128 |
| 1581 | Dump | prob: 0.9143 |
| 1582 | Dump | prob: 0.9157 |
| 1583 | Dump | prob: 0.9165 |
| 1584 | Dump | prob: 0.9169 |
| 1585 | Dump | prob: 0.9167 |

|     |       |              |
|-----|-------|--------------|
| 86  | Fight | prob: 0.9020 |
| 87  | Fight | prob: 0.9053 |
| 88  | Fight | prob: 0.9073 |
| 89  | Fight | prob: 0.9096 |
| 90  | Fight | prob: 0.9113 |
| 91  | Fight | prob: 0.9131 |
| 92  | Fight | prob: 0.9150 |
| 93  | Fight | prob: 0.9179 |
| 94  | Fight | prob: 0.9199 |
| 95  | Fight | prob: 0.9215 |
| 96  | Fight | prob: 0.9221 |
| 97  | Fight | prob: 0.9219 |
| 98  | Fight | prob: 0.9210 |
| 99  | Fight | prob: 0.9190 |
| 100 | Fight | prob: 0.9174 |
| 101 | Fight | prob: 0.9146 |
| 102 | Fight | prob: 0.9103 |
| 103 | Fight | prob: 0.9043 |

Robbery

|     |       |              |
|-----|-------|--------------|
| 133 | Swoon | prob: 0.9219 |
| 134 | Swoon | prob: 0.9219 |
| 135 | Swoon | prob: 0.9213 |
| 136 | Swoon | prob: 0.9212 |
| 137 | Swoon | prob: 0.9202 |
| 138 | Swoon | prob: 0.9197 |
| 139 | Swoon | prob: 0.9184 |
| 140 | Swoon | prob: 0.9174 |
| 141 | Swoon | prob: 0.9165 |
| 142 | Swoon | prob: 0.9161 |
| 143 | Swoon | prob: 0.9154 |
| 144 | Swoon | prob: 0.9149 |
| 145 | Swoon | prob: 0.9147 |
| 146 | Swoon | prob: 0.9146 |
| 147 | Swoon | prob: 0.9153 |
| 148 | Swoon | prob: 0.9163 |
| 149 | Swoon | prob: 0.9175 |
| 150 | Swoon | prob: 0.9186 |
| 151 | Swoon | prob: 0.9197 |
| 152 | Swoon | prob: 0.9210 |

|      |         |              |
|------|---------|--------------|
| 4194 | Robbery | prob: 0.8010 |
| 4195 | Robbery | prob: 0.8111 |
| 4196 | Robbery | prob: 0.8212 |
| 4197 | Robbery | prob: 0.8313 |
| 4198 | Robbery | prob: 0.8392 |
| 4199 | Robbery | prob: 0.8433 |
| 4200 | Robbery | prob: 0.8469 |
| 4201 | Robbery | prob: 0.8497 |
| 4202 | Robbery | prob: 0.8517 |
| 4203 | Robbery | prob: 0.8535 |
| 4204 | Robbery | prob: 0.8552 |
| 4205 | Robbery | prob: 0.8573 |
| 4206 | Robbery | prob: 0.8584 |
| 4207 | Robbery | prob: 0.8581 |

## 5. 향후 계획

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- AIHUB 문제 원인 찾기
- 개선 사항 수정
- 테스트 결과 확인



# 감사합니다

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4팀(김도현, 전은성)