

# 연구 현황 및 보고

증강지능연구실 황승현

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# KoGES 심뇌혈관

# KoGES 심뇌혈관

- 심뇌혈관 질환 예측 모델 개발 및 주요 인자 찾기
- 전체 데이터 9622 x 32
- 심뇌혈관 질환 있음 9335
- 심뇌혈관 질환 없음 287



# 진행상황 - 결측값 대치

- 결측값 대치(Imputation)
  - 데이터셋에서 누락된 값을 채우는 과정
- 도메인에 맞게 결측값 대치
  - Domain-based Imputation
  - Expert-driven Imputation
- sequential K-nearest neighbor

# 결측값 대치 - SKNN

- K-최근접 이웃(KNN) 알고리즘을 사용하여 반복적으로 대치
- 초기 대치: 각 결측값을 K개의 가장 가까운 이웃
- 반복 대치: 초기 대치된 값을 사용하여 다시 KNN 알고리즘을 적용합니다.
- 수렴 검사: 각 반복 단계에서 결측값 대치 결과가 수렴할 때까지 반복합니다.
- 최종 대치: 모든 결측값이 안정적으로 대치되면 반복을 종료

# 결측값 대체 - SKNN

```
# Sequential KNNImputer with exception handling for non-numeric columns
def sequential_knn_impute(df, n_neighbors=3):
    imputer = KNNImputer(n_neighbors=n_neighbors)
    df_imputed = df.copy()

    # Iterate over each column
    for column in df.columns:
        if df[column].dtype in [np.float64, np.int64]:
            subset = df_imputed[[column]]
            # Iterate until all NaNs in the specified column are filled
            while subset.isna().sum().sum() > 0:
                try:
                    subset = pd.DataFrame(imputer.fit_transform(subset), columns=[column], index=df.index)
                    df_imputed[column] = subset
                except ValueError:
                    print(f"Skipping column {column} due to incompatible data type.")
                    break

    return df_imputed
```

# 결측값 대치 - 목록

• AS1_02_GEN: AS1_MARRYA 결혼여부 <ul style="list-style-type: none"><li>◦ 6: 기타</li><li>◦ 60이거나 99999인 사람이 정상적인 결혼생활일까?</li><li>◦ AS1_MARRYAETC을 보면 부인 가출, 행방불명, 등거 이렇게 되어있다.</li><li>◦ 1(마혼) 또는 4(별거)로 대치</li></ul>
• AS1_02_GEN: AS1_JOBБ 직업종류 <ul style="list-style-type: none"><li>◦ 이걸 어떻게 해야하나</li></ul>
• AS1_02_GEN: AS1_EDUA 교육수준 <ul style="list-style-type: none"><li>◦ 이걸 어떻게 해야하나</li></ul>
• AS1_02_GEN: AS1_INCOME 월평균수입 <ul style="list-style-type: none"><li>◦ 이걸 직업종류, 교육수준과 관련 있지 않을까</li><li>◦ AS1_JOBБ, AS1_EDUA 별로 평균으로 대치</li></ul>
• AS1_03_DRSM: AS1_DRINK 음주여부 <ul style="list-style-type: none"><li>◦ <del>없는거 보나 total- / GH에서 걸러낼 듯</del></li><li>◦ ?</li></ul>
• AS1_03_DRSM: AS1_SMOKEA 흡연여부, AS1_HVSMAM 하루 흡연량 <ul style="list-style-type: none"><li>◦ 이걸 어떻게 해야하나</li><li>◦ AS1_SMOKEA가 결측이면 AS1_HVSMAM도 결측</li><li>◦ AS1_HVSMAM이 결측이면 AS1_SMOKEA가 2, 3 또는 99999</li><li>◦ AS1_SMOKEA가 2의 평균, 3의 평균으로 대치</li></ul>
• AS1_04_ACTIVE: AS1_PHYACTL, AS1_PHYACTM, AS1_PHYACTH <ul style="list-style-type: none"><li>◦ 이걸 어떻게 해야하나</li></ul>
• AS1_05_MEDIC: AS1_HEALTH 전반적인 건강상태 <ul style="list-style-type: none"><li>◦ 이걸 어떻게 해야하나</li></ul>
• AS1_05_MEDIC: AS1_TIED 최근 피곤한지 <ul style="list-style-type: none"><li>◦ 이걸 어떻게 해야하나</li></ul>
• AS1_13_SLEEP: AS1_SLPAMSF 수면시간 충분한지 <ul style="list-style-type: none"><li>◦ 이걸 어떻게 해야하나</li></ul>
• AS1_16_DIET: AS1_RGMEALFQA 하루 정규식사 횟수 <ul style="list-style-type: none"><li>◦ 대충 3끼 먹는다고 가정..?</li><li>◦ 3끼 다 챙겨먹는 사람이 결측값이 되려나</li></ul>
• 결측값 있는 놈 없애볼까? <ul style="list-style-type: none"><li>◦ GH에서 빼면-얼마나 결측값이 사라지는지 관측해야할듯<ul style="list-style-type: none"><li>▪ 이미 GH로 뺐거임..</li></ul></li><li>◦ 결측값 있는 행 중에 심뇌혈관질환이 없다면?<ul style="list-style-type: none"><li>▪ 결측값 있는 행 1028</li><li>▪ 심뇌혈관질환 있는 행 36</li><li>▪ 전체 0 9726</li><li>▪ 전체 1 301</li></ul></li></ul>
• 도메인 기반으로 값 일부 대치한 후
• SKNN 돌리기 <ul style="list-style-type: none"><li>◦ AS1_02_GEN, AS1_03_DRSM, AS1_04_ACTIVE, AS1_05_MEDIC, AS1_13_SLEEP, AS1_16_DIET</li><li>◦ 돌린 후 result 데이터프레임에 다시 집어넣기</li></ul>

• AS1_MARRYA 38	
• AS1_JOBБ 40	
• AS1_EDUA 53	
• AS1_INCOME 133	
• AS1_DRINK 37	
• AS1_SMOKEA 84	
• AS1_HVSMAM 140	
• AS1_PHYACTL 130	AS1_PHYACTM 195
AS1_PHYACTH 156	
• AS1_HEALTH 28	
• AS1_TIED 99	
• AS1_SLPAMSF 50	
• AS1_RGMEALFQA 63	



# 결측값 대치 - 목록

- 새로 만든 데이터
  - 고혈압여부: HAS\_HYPERTENSION
  - 당뇨병여부: HAS\_DIABETES
  - 고지혈증: HAS\_HYPERLIPIDEMI
  - LDL: LDL
  - HOMA\_IR: HOMA\_IR
  - 허리둘레: WAIST\_AVG
  - BMI: BMI
- 데이터 만들 때 사용한 변수도 결측값을 모두 대치한 다음 사용하자
  - 결측값있는 가공데이터 목록
    - HOMA\_IR 280
    - WAIST\_AVG 8
    - BMI 4
    - RC 3
    - AI 2
  - HOMA\_IR
    - AS1\_18\_BIOCHEM['AS1\_GLU0\_TR']
    - AS1\_18\_BIOCHEM['AS1\_INS0']
  - WAIST\_AVG
    - AS1\_19\_ANTHRO[['AS1\_WAIST1', 'AS1\_WAIST2', 'AS1\_WAIST3']].mean(axis=1)
  - BMI
    - AS1\_19\_ANTHRO['AS1\_HEIGHT']
    - AS1\_19\_ANTHRO['AS1\_WEIGHT']
  - RC, AI (AS1\_18\_BIOCHEM)
    - AS1\_18\_BIOCHEM['AS1\_TCHL\_TR']
    - AS1\_18\_BIOCHEM['AS1\_HDL\_TR']
    - AS1\_18\_BIOCHEM['AS1\_LDL\_TR']
    - AS1\_18\_BIOCHEM['AS1\_TG\_TR']
- AS1\_18\_BIOCHEM, AS1\_19\_ANTHRO 두 데이터프레임을 통째로 impute

- HOMA\_IR 280
  - AS1\_18\_BIOCHEM['AS1\_GLU0\_TR']
  - AS1\_18\_BIOCHEM['AS1\_INS0']
- WAIST\_AVG 8
  - AS1\_19\_ANTHRO[['AS1\_WAIST1', 'AS1\_WAIST2', 'AS1\_WAIST3']].mean(axis=1)
- BMI 4
  - AS1\_19\_ANTHRO['AS1\_HEIGHT']
  - AS1\_19\_ANTHRO['AS1\_WEIGHT']
- RC, AI 3, 2
  - AS1\_18\_BIOCHEM['AS1\_TCHL\_TR']
  - AS1\_18\_BIOCHEM['AS1\_HDL\_TR']
  - AS1\_18\_BIOCHEM['AS1\_LDL\_TR']
  - AS1\_18\_BIOCHEM['AS1\_TG\_TR']

# 진행상황 - 데이터 가공

- 고혈압여부: HAS\_HYPERTENSION
- 당뇨여부: HAS\_DIABETES
- 고지혈증: HAS\_HYPERLIPIDEMI
- LDL 콜레스테롤: LDL
- HOMA\_IR: HOMA\_IR
- 허리둘레: WAIST\_AVG
- BMI: BMI
- Remnant cholesterol: RC
- Atherogenic Index: AI

# 향후 목표

- 사망률 데이터 원격 열람
- 모델 성능 개선

```
↔ Confusion Matrix:  
[[50  0]  
 [50  0]]  
[[TP  FN]  
 [FP  TN]]  
  
Accuracy: 0.500  
Precison: 1.000  
Recall   : 0.000  
F1 Score: 0.000
```

# SIGGRAPH ASIA 2024 XR

CovidHunter

# 제출 준비 중

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SA2024 XR CovidHunter

Review Share Submit History Layout Chat

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197 % headers. Often, this list is too long, and will overlap  
198 % other information printed in the page headers. This command allows  
199 % the author to define a more concise list  
200 % of authors' names for this purpose.  
201 \renewcommand{\shortauthors}{Hwang et al.}  
202  
203 %  
204 % The abstract is a short summary of the work to be presented in the  
205 % article.  
206 % \begin{abstract}  
207 % A clear and well-documented \LaTeX\ document is presented as an  
208 % article formatted for publication by ACM in a conference proceedings  
209 % or journal publication. Based on the "acmart" document class, this  
210 % article presents and explains many of the common variations, as well  
211 % as many of the formatting elements an author may use in the  
212 % preparation of the documentation of their work.  
213 % \end{abstract}  
214  
215 % A "teaser" image appears between the author and affiliation  
216 % information and the body of the document, and typically spans the  
217 % page.  
218  
219 \begin{abstract}  
220 CovidHunter is an augmented reality defense game set against a miniature diorama  
replicating the real world on a smaller scale. Developed during the COVID-19 pandemic,  
CovidHunter aims to convey a message of hope that difficult times can be overcome while  
raising awareness about disease prevention measures. To facilitate the critical  
interaction between the real and virtual worlds' inherent to augmented reality,  
CovidHunter incorporates various elements, including game objects obscured behind the  
miniature diorama.  
221  
222 To experience CovidHunter, users require a smartphone, tablet PC, or augmented reality  
device like the HoloLens. Additionally, the miniature diorama serving as the game's  
stage is essential. Upon launching CovidHunter, the camera activates, and as soon as  
the camera (player's viewpoint) faces the miniature diorama, successful 3D tracking  
initiates the game.  
223  
224 The gameplay and interface proceed as follows: Players must eliminate randomly  
appearing viruses, equip unmasked individuals with masks, and defend the village for a

CovidHunter

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Figure 1: Player and the game screen of CovidHunter.

Corresponding author

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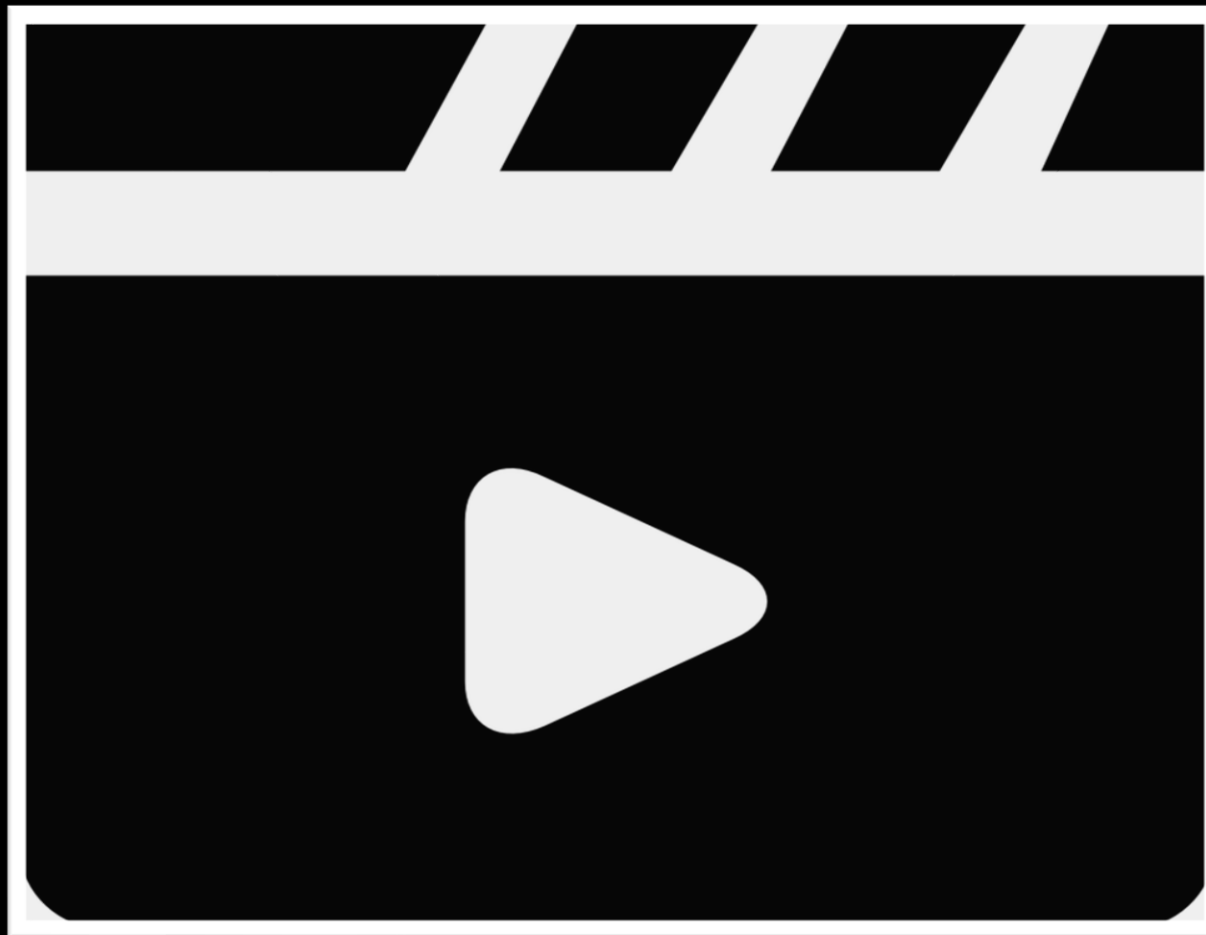
ABSTRACT

CovidHunter is an augmented reality defense game set against a miniature diorama replicating the real world on a smaller scale. Developed during the COVID-19 pandemic, CovidHunter aims to raise awareness about disease prevention measures. To facilitate the critical interaction between the real and virtual worlds' inherent to augmented reality, CovidHunter incorporates various elements, including game objects obscured behind the miniature diorama.

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# 허밍버드

SKT FLY AI 4기

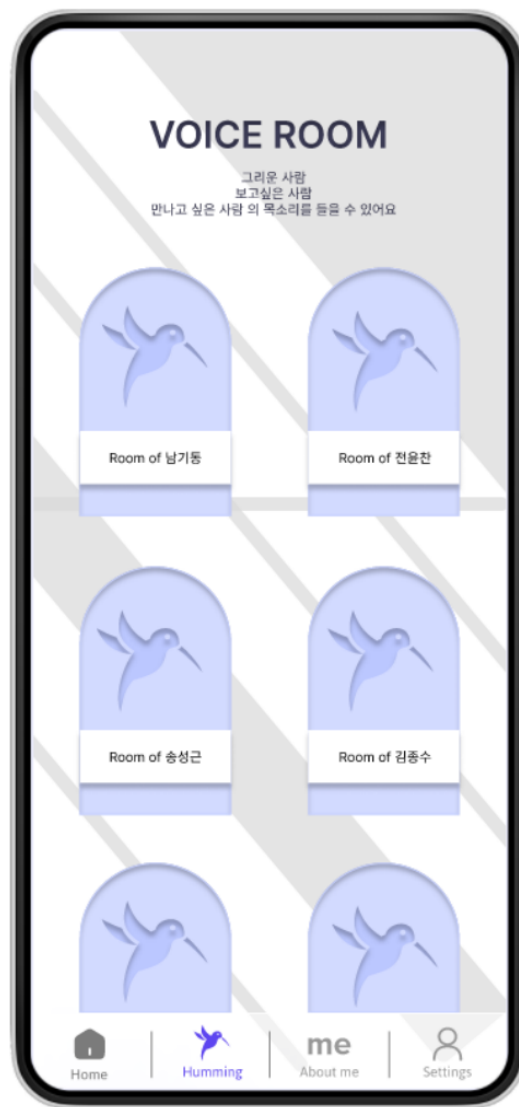
# HUMMINGBIRD



# persona



 **AI VOICE MODEL VITS**





# 학술대회 발표 예정

- 제70회 한국컴퓨터정보학회  
하계학술대회
- 장소: 제주대학교
- 일시: 07-11 - 07-13
- Deadline: 06-17
- 참석여부 미정

