

Development of **Falling Accident** Response System for the Elderly people

TIMI-RUM

Junha Lee Daeyong You Sohee Jung Harin Seo Sowon Kim

INDEX

- Project Background
- Project Progress
- Results of Project Execution

1. Project Background

● *NECESSITY OF PROJECT*

 연합뉴스 | 2020.02.03. | 네이버뉴스

65세이상 겨울철 낙상사고 4년새 52% ↑ ... "주로 집서 일상생활중"

노인 낙상
장소별로

 전남매일 | 2019.04.24.

| 일본 "65

노년기 웰다잉(Well-Dying) 불청객 '낙상사고'

노년기 웰다잉(Well-Dying) 불청객 '낙상사고' 김영돈 광주시 소방안전본부 구조구급과장 1970년에 62.... 버킷리스트 작성, 건강 체크, 고독사 예방, 자원봉사 참여 ...

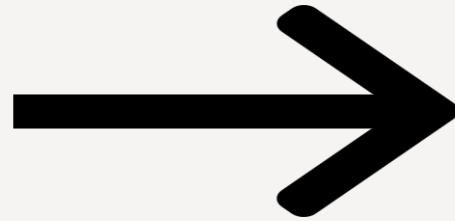
The rate of elderly people's fall accidents has increased.

However, elderly people living alone often suffer from **absence of appropriate response system** if accidents occur.

2. Project Progress



Detect falling accident



**Show the cam screen to
protector**

● *IDEA MATERIALIZATION*



Check point

IMAGE RECOGNITION

Image recognition using YOLO v3

DJANGO & REACT

Able to check the result on web page

SOUND DETECTION

Sound detection using python

STT & TTS

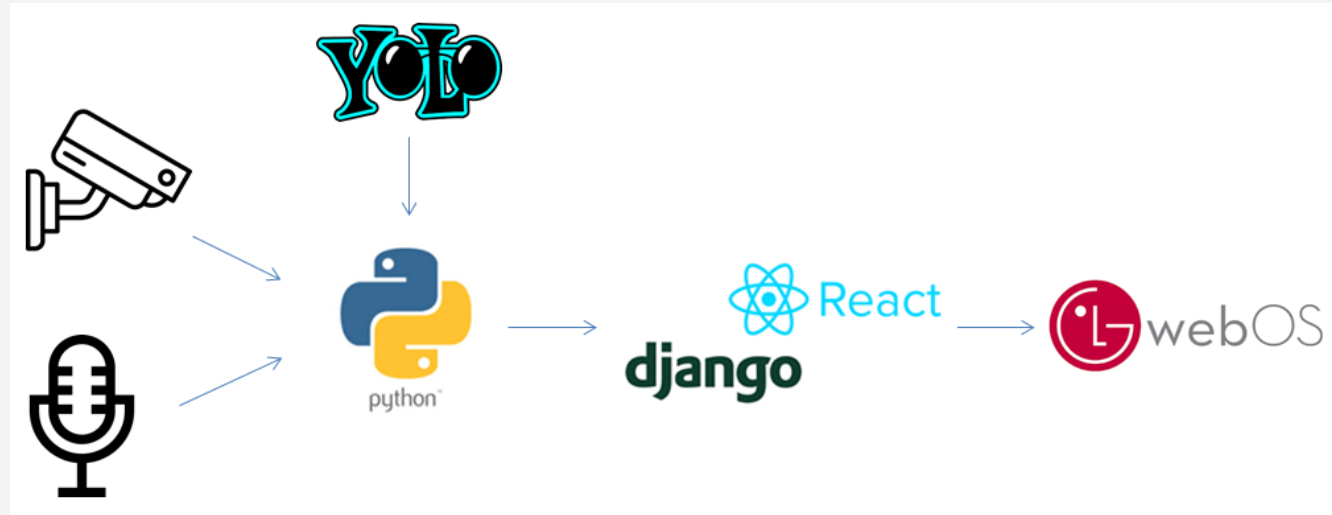
Inquiring to user about the seriousness
when falling is detected



● *SYSTEM OVERVIEW DIAGRAM*

✓ Falling image

✓ Falling sound



● IMPLEMENTATION PLAN



Labeling

Labeling two posture (general, falling)
using YOLO-MARK



General



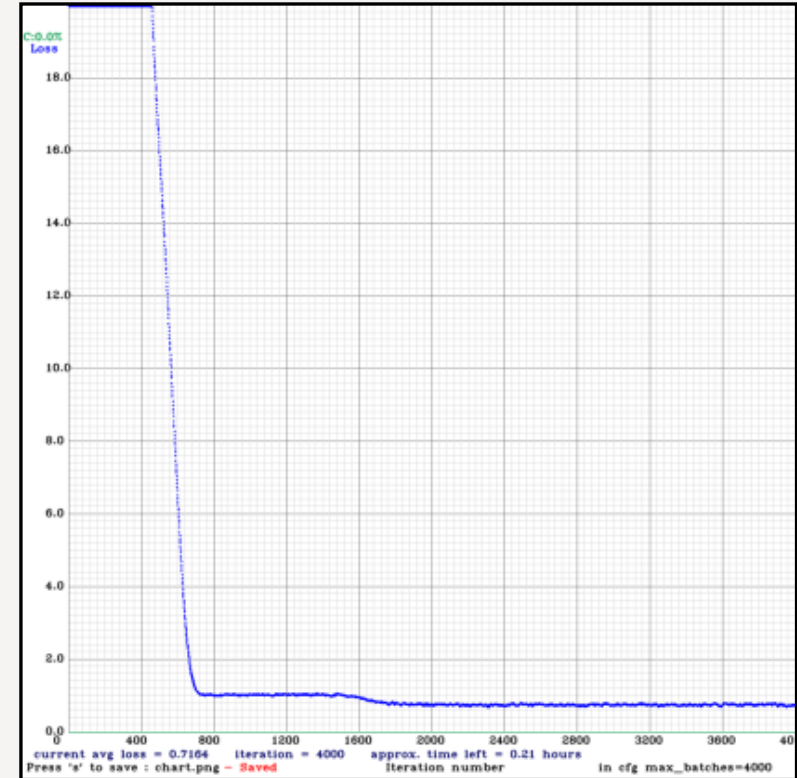
Falling

● IMPLEMENTATION PLAN

Training

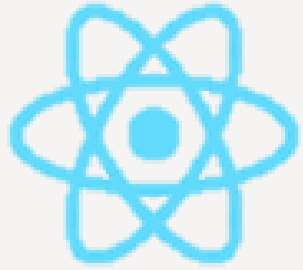
Training dataset using YOLO v3

Dataset is composed to 20,000 labeled photo



Loss Graph

● *USAGE OF WEBOS COMPONENT*



REACT.JS

For web
implementation



**CAMERA
MODULE**

For image recognition
& sound detecting

3. Results of Project Execution

TRAINING RESULT

The image displays a Jupyter Notebook environment running a Python script for object detection. The notebook interface includes a menu bar (File, Edit, View, Insert, Cell, Kernel, Widgets, Help) and a toolbar with icons for file operations, running, and code execution. The code in the notebook is as follows:

```
def makeThreads():  
    global sound_val  
  
    t1=threading.Thread(target = sound)  
    t2=threading.Thread(target = webcam_detect)  
    # t3=threading.Thread(target = sound_service)  
  
    t1.start()  
    t2.start()  
    # t3.start()  
  
    t1.join()  
    t2.join()  
    # t3.join()  
  
makeThreads()  
  
c.close()  
cv2.destroyAllWindows()  
  
pygame 2.0.1 (SDL 2.0.14, Python 3.8.5)  
Hello from the pygame community. https://www.pygame.org/contribute.html  
Detect!  
Detect!  
Detect!  
Detect!  
Detect!  
Detect!  
Detect!
```

Below the code cell, there are three input prompts: `In []:`, each followed by an empty text box.

To the right of the notebook, a video feed window titled "Image" is visible. It shows a person standing in a classroom, with a green bounding box around them, indicating successful object detection. The background of the video feed is a blue desktop with two "index.html" icons.

TIMI-RUM

[Home](#) [Result](#)

Falling Accident Response System for the Elderly people

As the number of single-person elderly households increases these days, there are many cases in which the situation worsens as appropriate measures are not taken in the event of falls.

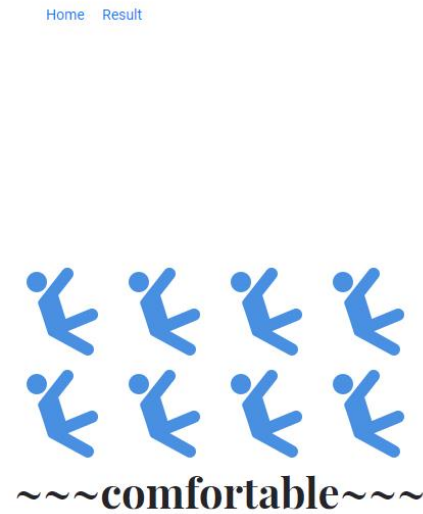
The project is carried out with the aim of developing a response system that can detect and report in the event of a fall accident.

[GO TO SHOW RESULT](#)



● *WEB PAGE* – Result / Comfortable

TIMI-RUM



Level 0 – Nothing Happened

The state that falling is not detected yet

● *WEB PAGE* – Result / Accident Occur

TIMI-RUM

[Home](#) [Result](#)



!!! accident occur !!!

Level 1 – Falling Detected

Falling is detected both web cam screen and sound occurrence at the same time

System ask whether help is needed

● *WEB PAGE* - Result / Emergency



Level 2 – Help is needed

If the person say yes, then in web page, design is changed to red, and alarm is played

THANK YOU!