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ELDERLY HELPER

INTRODUCTION

The Elderly Helper is a smart device that helps keep senior citizens safe. It lets families watch caregivers in real-time to make sure they're providing good care. This gives peace of mind to families worried about their elderly relatives. Using advanced sensors and online features, the device sends immediate updates and alerts, making it a key tool for protecting seniors.

INSPIRATION

Frequent News Reports

Frequently see reports of **caregivers abusing the elderly** on news or social media.



Feedback from Elderly Relatives

Heard **complaints or concerns** about caregivers from elderly relatives, as well as patterns of **previous abuse**.

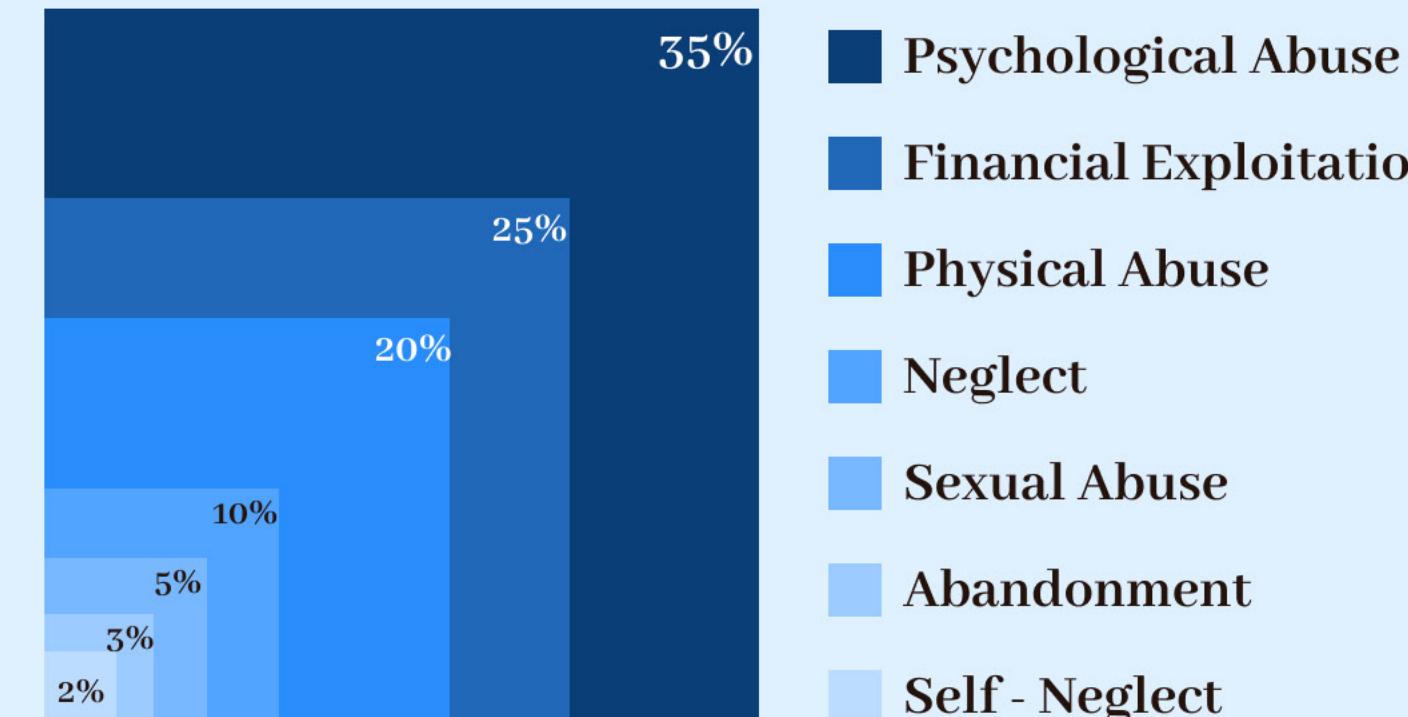
Personal Experience

My family has had unpleasant experiences with caregivers in the past. Although we were not physically harmed, we were continuously neglected by the caregiver.

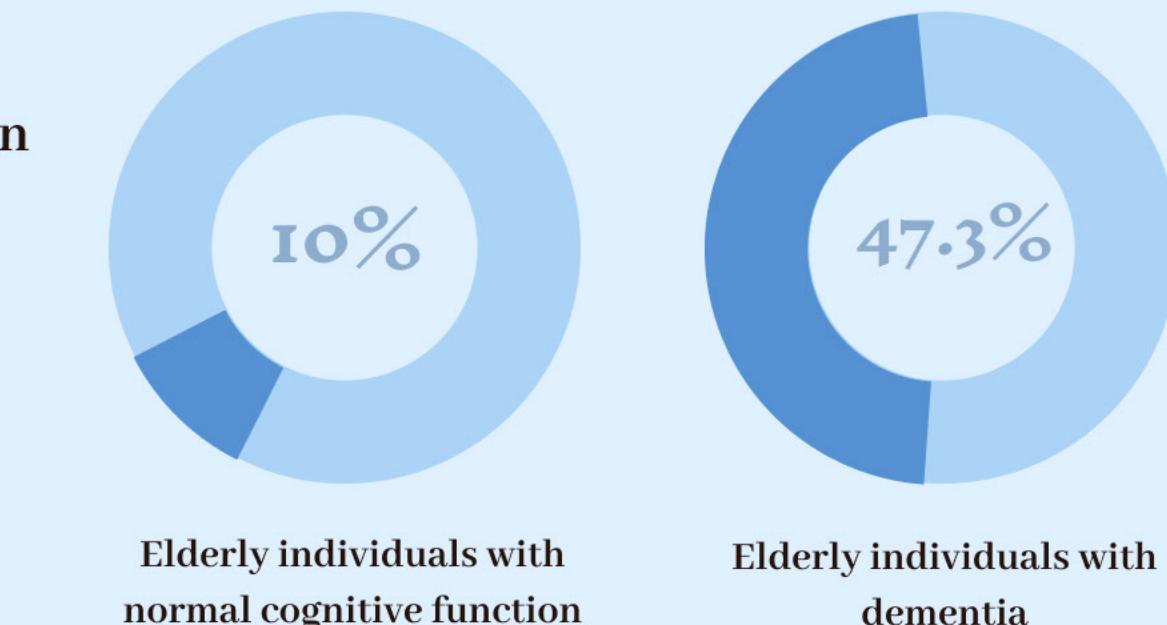
RESEARCH

The abuse of the elderly by caregivers is a global issue, especially in nursing homes and family settings. This troubling problem persists despite the presence of regulations designed to protect vulnerable seniors. The lack of effective enforcement and oversight often allows this abuse to continue unchecked, making it crucial for society to take more proactive measures.

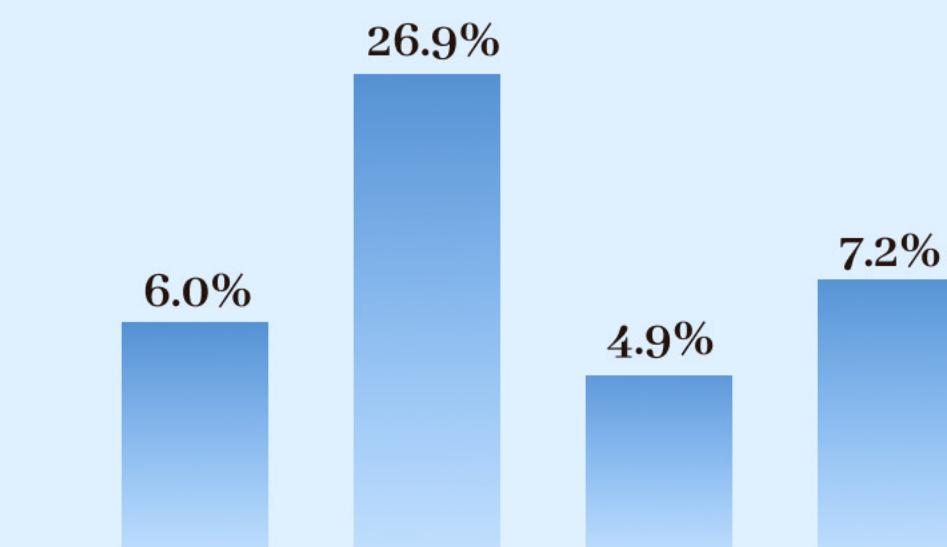
Forms of Abuse



Elderly Abuse in USA



Elderly Abuse in China



In China, physical abuse, emotional abuse, economic abuse, and neglect were **6.0%, 26.9%, 4.9%, and 7.2%**, respectively of rural elderly individuals in Anhui Province.

Consequences from Caregiver Abuse

Physical Consequences

- Bruises, cuts, or other visible injuries
- Chronic pain issues



Psychological Consequences

- Depression and anxiety
- Emotional trauma, such as PTSD



Financial Consequences

- Exploitation, including theft or fraud
- Loss of savings or property



MARKET RESEARCH

Nowadays, with the advancement of technology and the increasing demand for caregivers by the elderly and disabled, more and more smart devices are appearing on the market to monitor the behavior of the elderly or caregivers, thereby ensuring the physical and mental safety of the elderly or disabled.



Silvertree Reach



Mobi Connect Emergency Alert System Bundle



Smart Caregiver Economy Wireless Monitor & Motion Sensor

The #433-EC Monitor is a easy wireless system. It comes with a sensor, monitor, and batteries. You can add five more sensors or buttons. No extra stuff needed.

Caregiver Pager Wireless Call Buttons for Elderly Monitoring SOS Alert System Portable Alarm for Nurse Call Seniors Patients Emergency Home

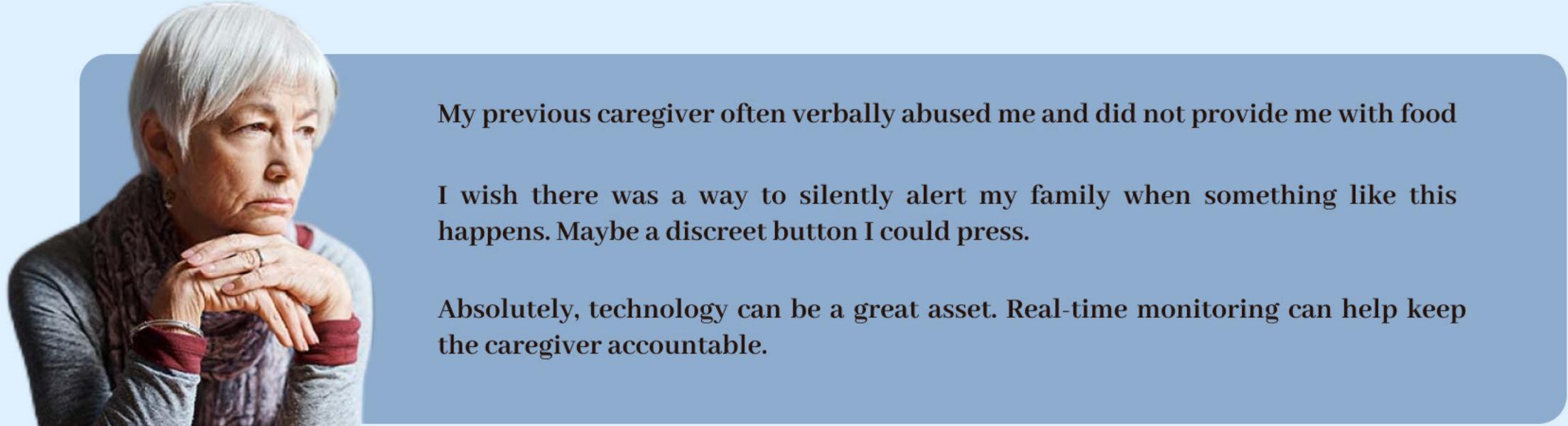


SOS Alert System Portable Alarm

After analyzing the devices available on the market, it was found that almost all devices aimed at protecting the elderly focus on collaborating with caregivers to monitor the condition of the elderly in real-time rather than monitoring whether the caregivers exhibit abnormal behavior.

INTERVIEW

1. Can you describe a specific instance where you felt mistreated or neglected by a caregiver?
2. What signals do you think would have helped you alert someone during those instances of mistreatment?
3. Do you think technology can be helpful in monitoring caregivers and ensuring your safety? If so, how?



PAIN POINT ANALYSIS

For Elderly Individuals



Lack of Oversight

Difficulty in ensuring caregivers are doing their jobs effectively.

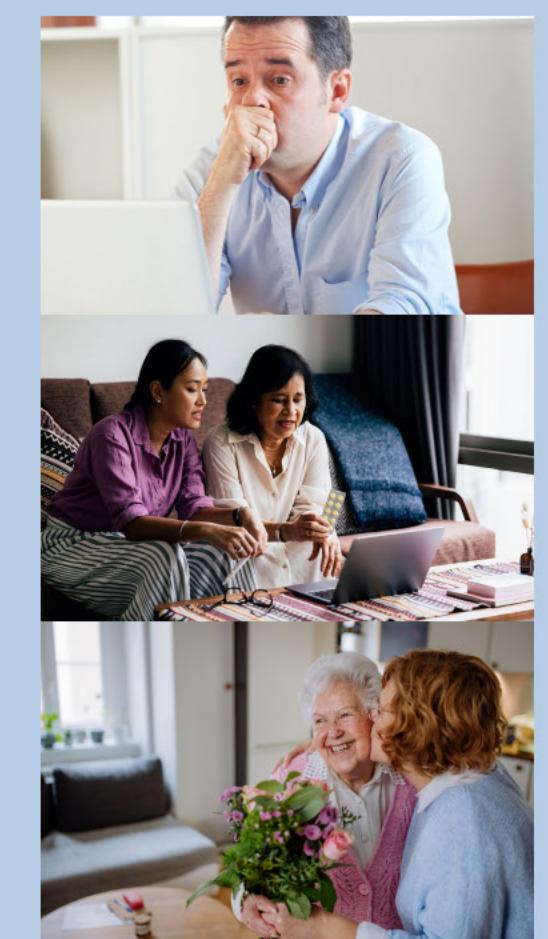
Safety Concerns

Elderly's fear of being mistreated, abused, or neglected.

Health Monitoring

A lack of consistent and effective medication and meal tracking.

For Family Members



Constant Worry

Ongoing concern for the well-being of their elderly relatives.

Lack of Transparency

Difficulty in overseeing caregiver activities and behaviors, especially when remote.

Limited Time

Not having enough time to constantly monitor or visit elderly family members.

PERSONA



NAME ----- Dorothy Williams
AGE ----- 75
GENDER ----- Female

Personal Details

Health Condition
Arthritis & Mild cognitive impairment

Living Situation
Lives with a caregiver

Smart Devices

- Voice-activated controls
- Immediate emergency response features
- Monitoring health and caregiver actions

Personality

Independent	Dependent
Independent	Dependent

Skeptical about new technologies	Trusting
Skeptical about new technologies	Trusting

Fearless	Fearful about caregiver
Fearless	Fearful about caregiver

Acceptance of new technology ★ ★ ★ ★ ★



NAME ----- Michael Williams
AGE ----- 44
GENDER ----- Male

Personal Details

Relationship to Elderly
Son

Occupation
Software Engineer

Time Constraints
Full-time job, busy lifestyle

Smart Devices

- Remote monitoring capabilities
- Easy integration with smartphones
- Detailed reports on caregiver activities
- Alerts for emergencies & potential abuse

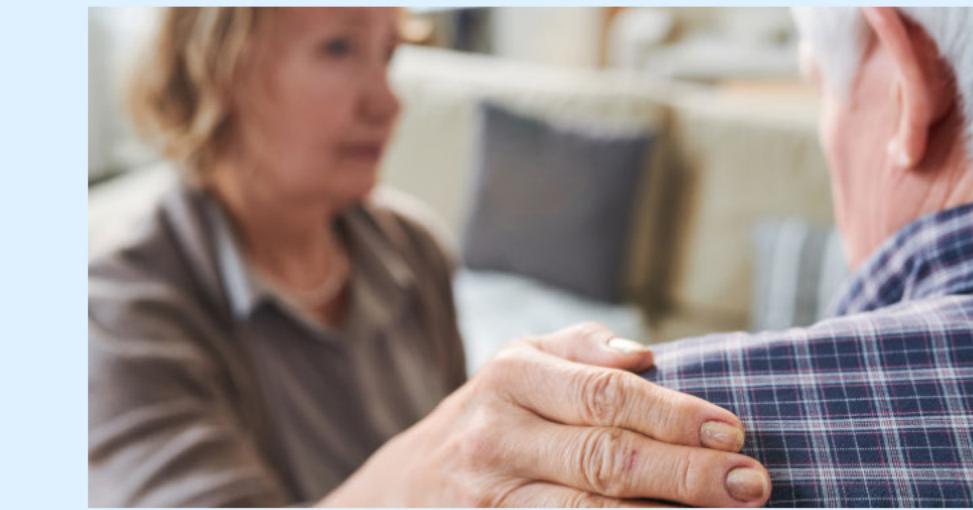
Personality

Unconcerned	Concerned about elderly parent
Unconcerned	Concerned about elderly parent

Acceptance of new technology ★ ★ ★ ★ ★

CONCEPT

AUTOMATIC SOS



 **Voice Recognition**

 **Real-time Monitoring**

When detecting that the caregiver is abusing the elderly, automatically seek help from family members or call the police.

EASY OPERATING SYSTEM & HIDDEN

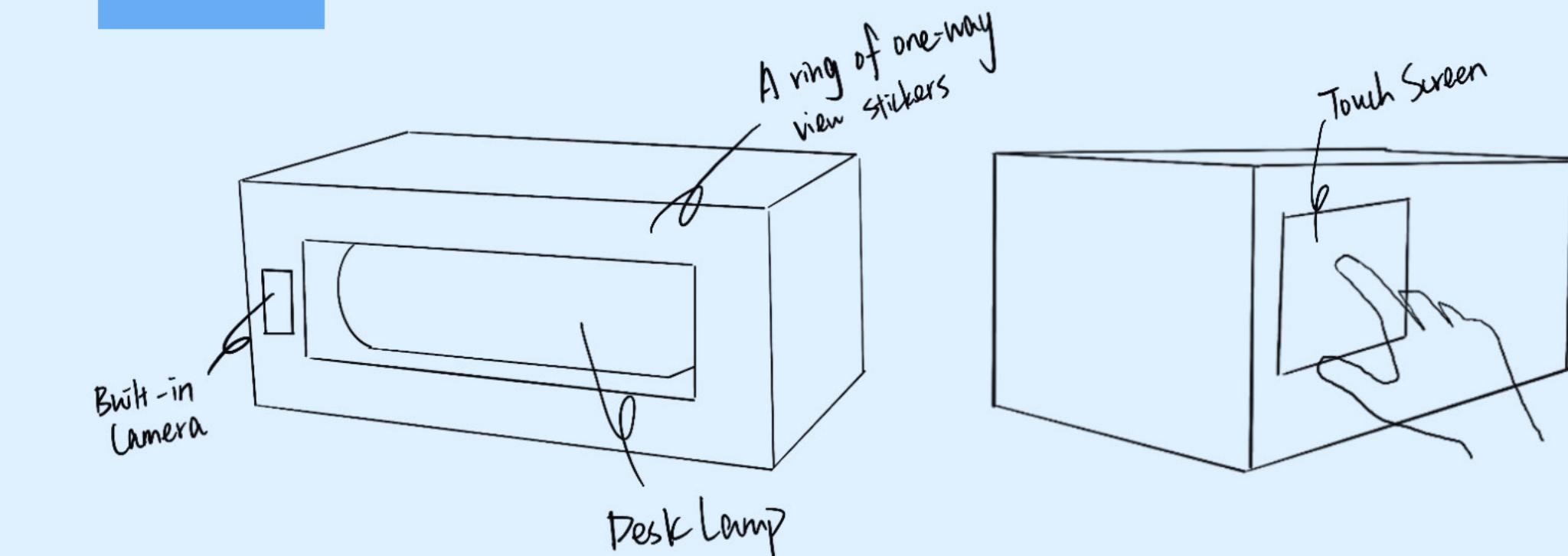


 **Simple User Interface**

 **Touch Screen**

A small touch screen with a Raspberry Pi makes it easier for elderly people to use and can be hidden in a lamp so caregivers won't see it

SKETCH



TECHNICAL PROCESS

Train speech recognition models using Baidu Cloud to improve recognition accuracy.



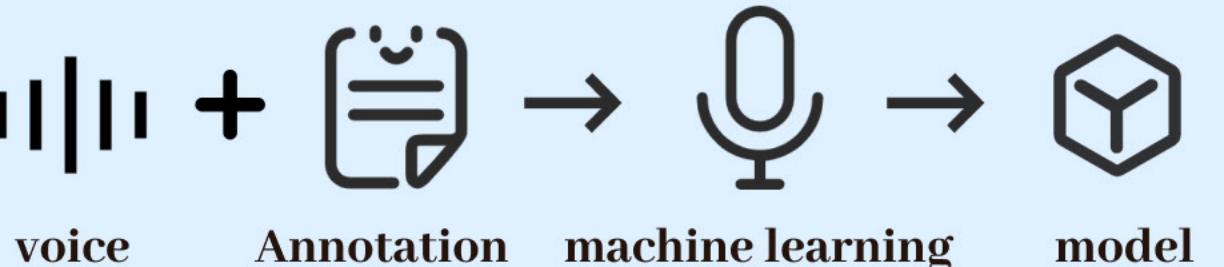
Read the text document and compare it with the content of the voice input.

```
def Compare(input_str):
    with open('1.txt', 'r', encoding='utf-8') as file:
        content = file.read()
        result = content.split("\n")
    for word in result:
        similarity_score = Similarity(word, input_str)
        if similarity_score >= 0.8:
            return True
```

Function for submit email

```
def submit_email():
    global receiver_email
    receiver_email = email_entry.get()
    print(f"Receiver email set to {receiver_email}")
    root.destroy()

    while True:
        say = speech.input()
        speech.say("you said: " + say)
        if Compare(say):
            try:
                SendEmail(receiver_email)
                print("Email sent successfully")
            except smtplib.SMTPException:
                print("Error: Unable to send email")
```



If the similarity is higher than 80%, then the recognition is successful

```
def Similarity(text_str, input_str):
    seq_matcher = SequenceMatcher(None, text_str, input_str)
    sim = seq_matcher.ratio()
    return sim
```

Function for sending email

```
def SendEmail(receiver_email):
    if receiver_email is None:
        print("Receiver email is not set")
        return
    mail_host = "smtp.163.com"
    mail_user = "anthonyli213@163.com"
    mail_pass = "HKMAGOXGEUQEYPKE"

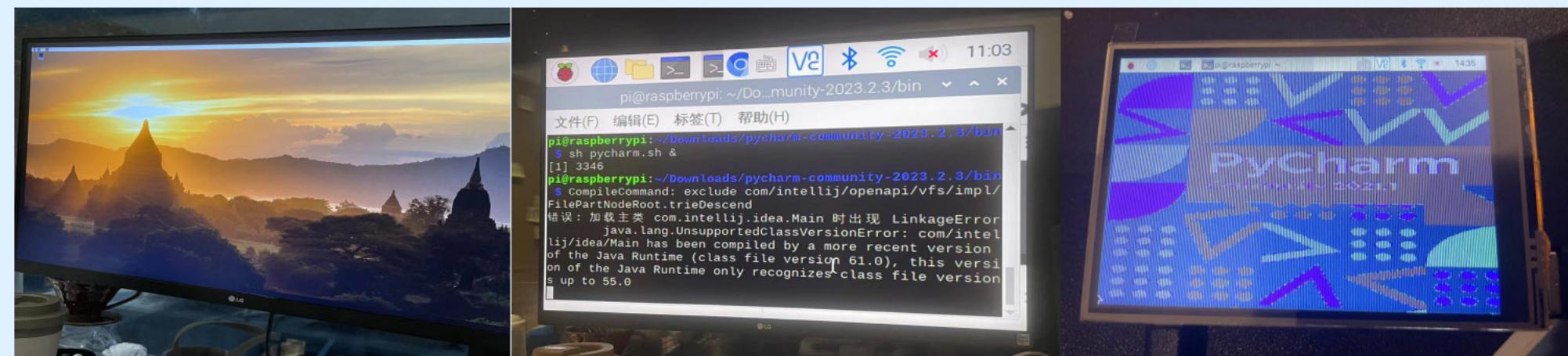
    sender = 'anthonyli213@163.com'
    receivers = receiver_email
    message = MIMEText
    ('An emergency situation has occurred', 'plain', 'utf-8')
    message['From'] = Header("Emergency", 'utf-8')
    message['To'] = Header("Emergency", 'utf-8')

    subject = 'Emergency'
    message['Subject'] = Header(subject, 'utf-8')
    smtpObj = smtplib.SMTP()
    smtpObj.connect(mail_host, 25)
    smtpObj.login(mail_user, mail_pass)
    smtpObj.sendmail(sender, receivers, message.as_string())
```

MAKING PROCESS

Run the Raspberry Pi and install Pycharm

First configure the Raspberry Pi on the display screen, then switch to a 3.5-inch small screen for use.

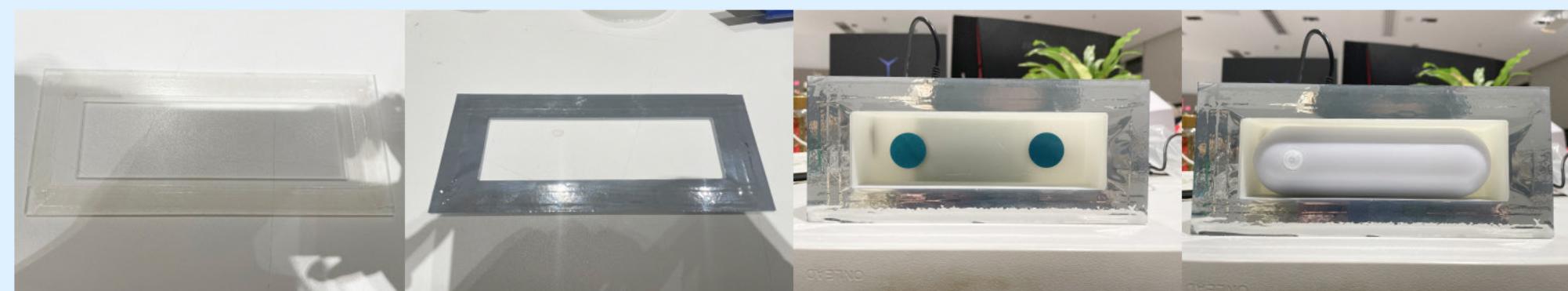


Making of the Desktop Lamp

Use 3D printing technology to print out the lamp box model, and install the lamp on top.



Stick one-way view stickers on the transparent acrylic board to ensure that the internal camera can monitor the outside, but the caregiver cannot see inside.



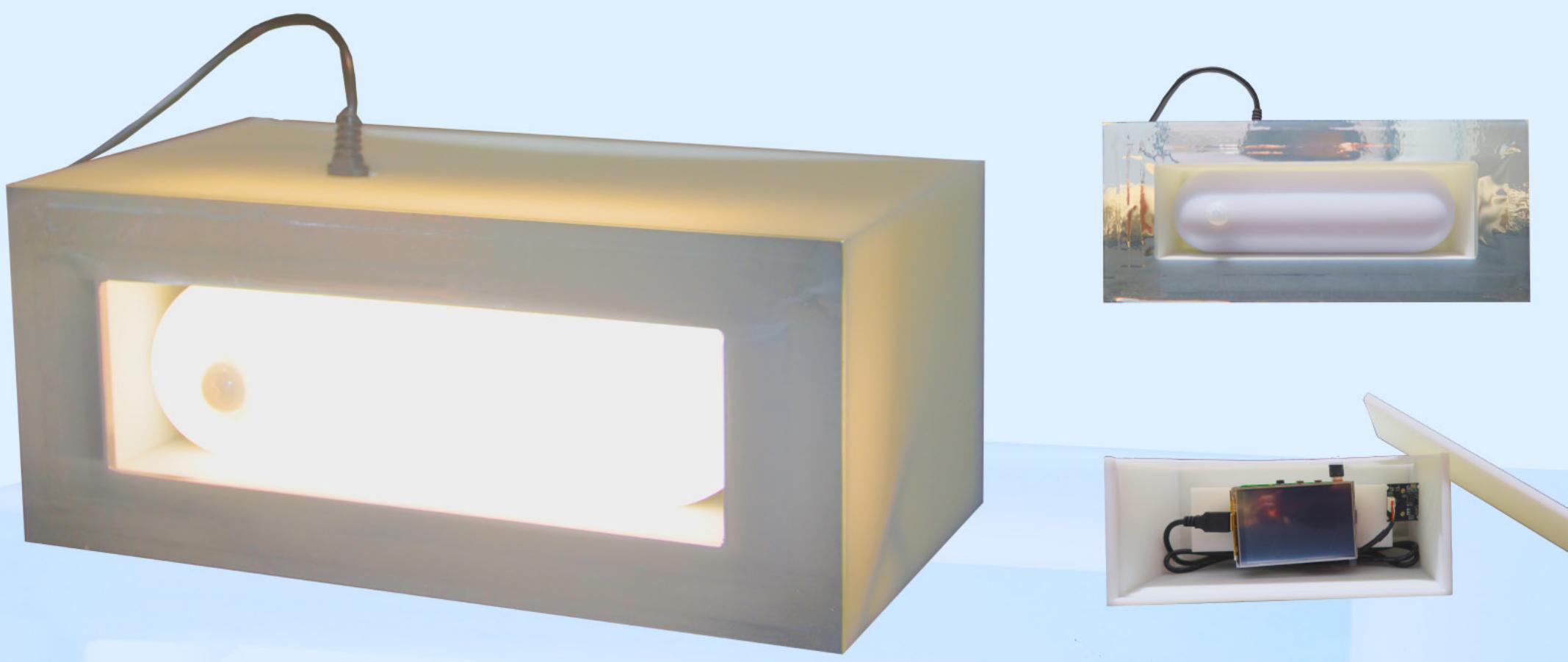
Put the Raspberry Pi inside and install the camera in a transparent location.



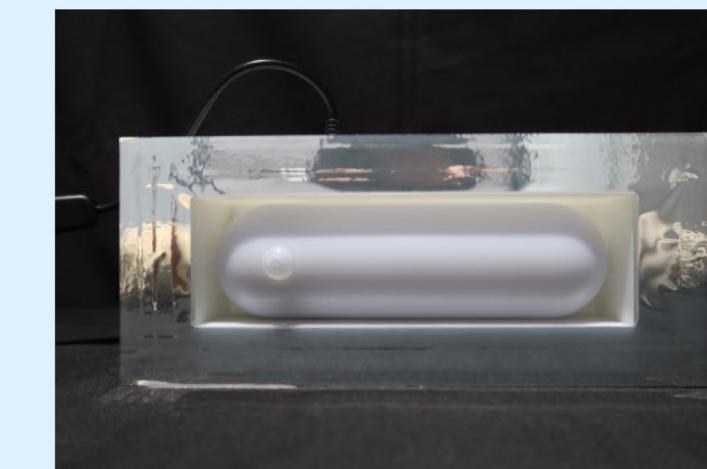
FINAL OUTCOME



The Elderly Helper is a device that keeps old people safe. Families can watch caregivers live to make sure they're doing a good job. This makes families worry less. The device also sends quick alerts, helping to protect seniors.



HOW TO USE



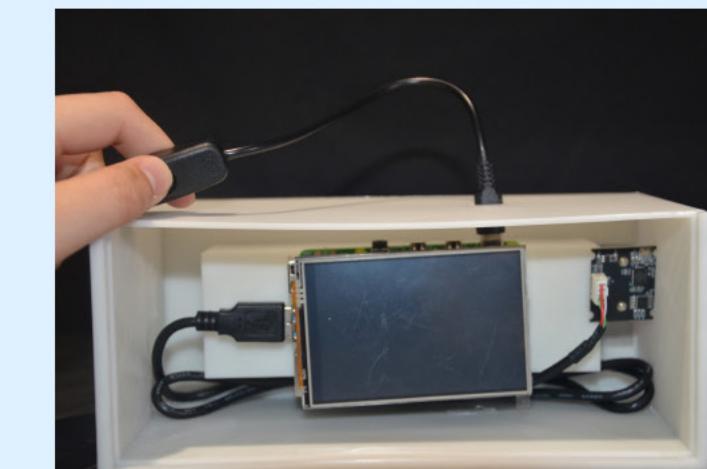
Step 1

Plug in the desk lamp's power supply (which is actually the Raspberry Pi's power supply).



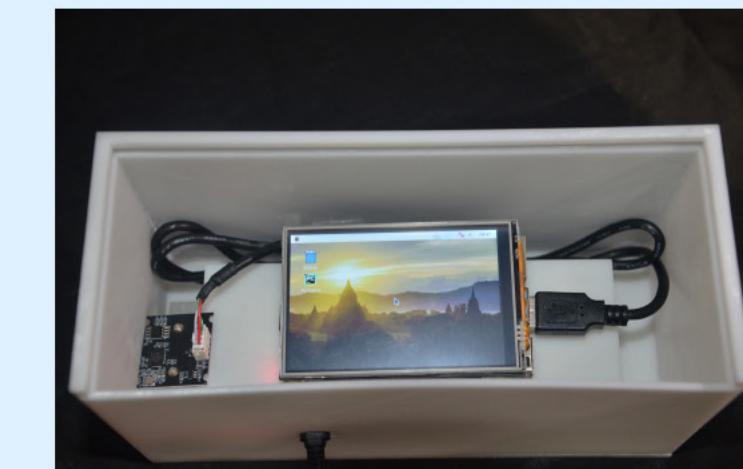
Step 2

Open the back cover of the desk lamp.



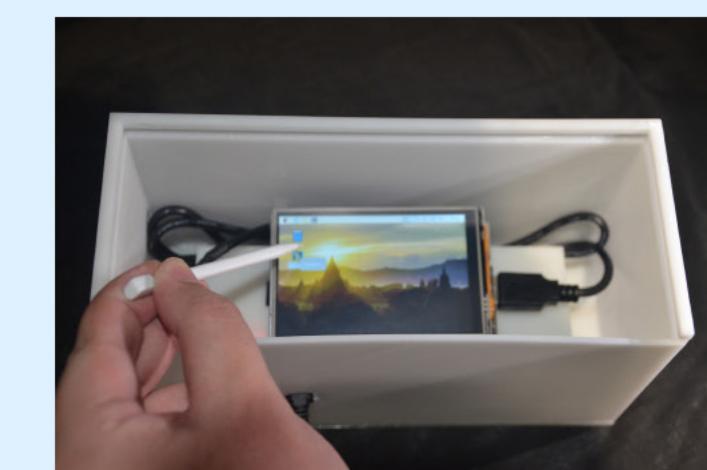
Step 3

Press the power button to run the Raspberry Pi.



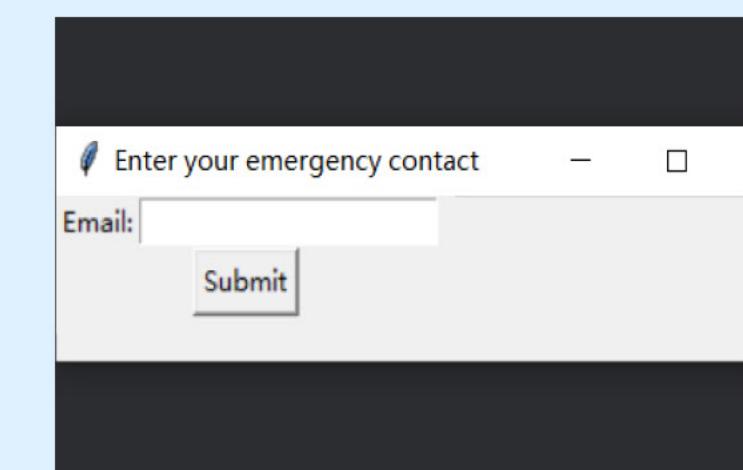
Step 4

Enter the Raspberry Pi's interface.



Step 5

Run the program to monitor the caregiver and automatically call for help.



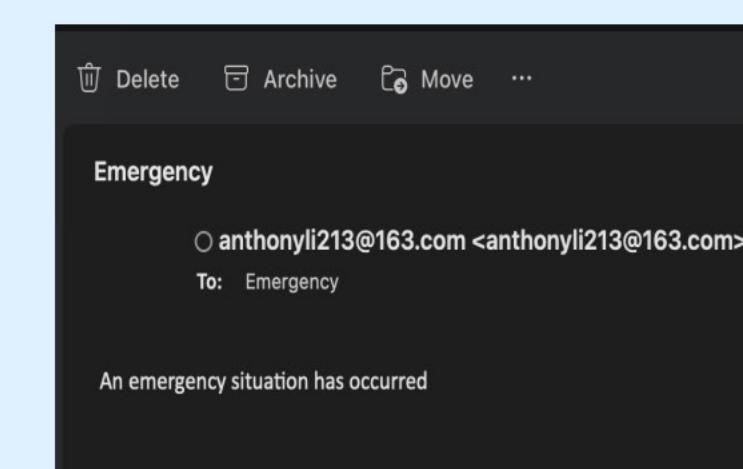
Step 6

Enter the emergency contact's email.



Step 7

Turn on the desk lamp, and monitor the caregiver in real-time for any abnormal behavior.



Step 8

If the caregiver is abusive, the system automatically emails an emergency contact.