National Design Project 2023

Home Security for People with Dementia

Project made by Team J:
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The Problem

People with dementia tend to forget where they are or live if they go out for extended periods of time. This is dangerous as they might be outside but have no idea how to get home without help or even get into an accident.

Design Brief

To help caregivers watch over their loved ones who has dementia so that they could not leave their home on their own without the acknowledgement from the caregivers.

Research

A member of the team interviewed his own great-grandmother who has dementia and her caregiver.

Also, with reference to TV programmes that discussed the challenges that caregivers of dementia patients faced, we learnt that one of the problem faced by caregivers is when the person with dementia managed to go outside their residence, they might have problem remembering where his/her home is.

They might not even have clarity of mind to communicate coherently when seeking help. This could endanger the dementia patient as they roamed about places, not knowing where, who, why or how about themselves or the place they are at.

Proposed Solution

We have made a device that can be attached to the front door of a subject's house. This device can detect a person's face to determine if they can open the door.

Using facial recognition, if it detected a registered elderly with dementia trying to open the door and gain access to the outside, it will ensure the door remain locked and send a request to open the door to the caregiver through a mobile application. Upon receiving the request, the caregiver can choose to remotely unlock the door.

The purpose is not to imprison the dementia patient, but to keep the caregiver in the know and have certain form of control.

Our prototype failsafes

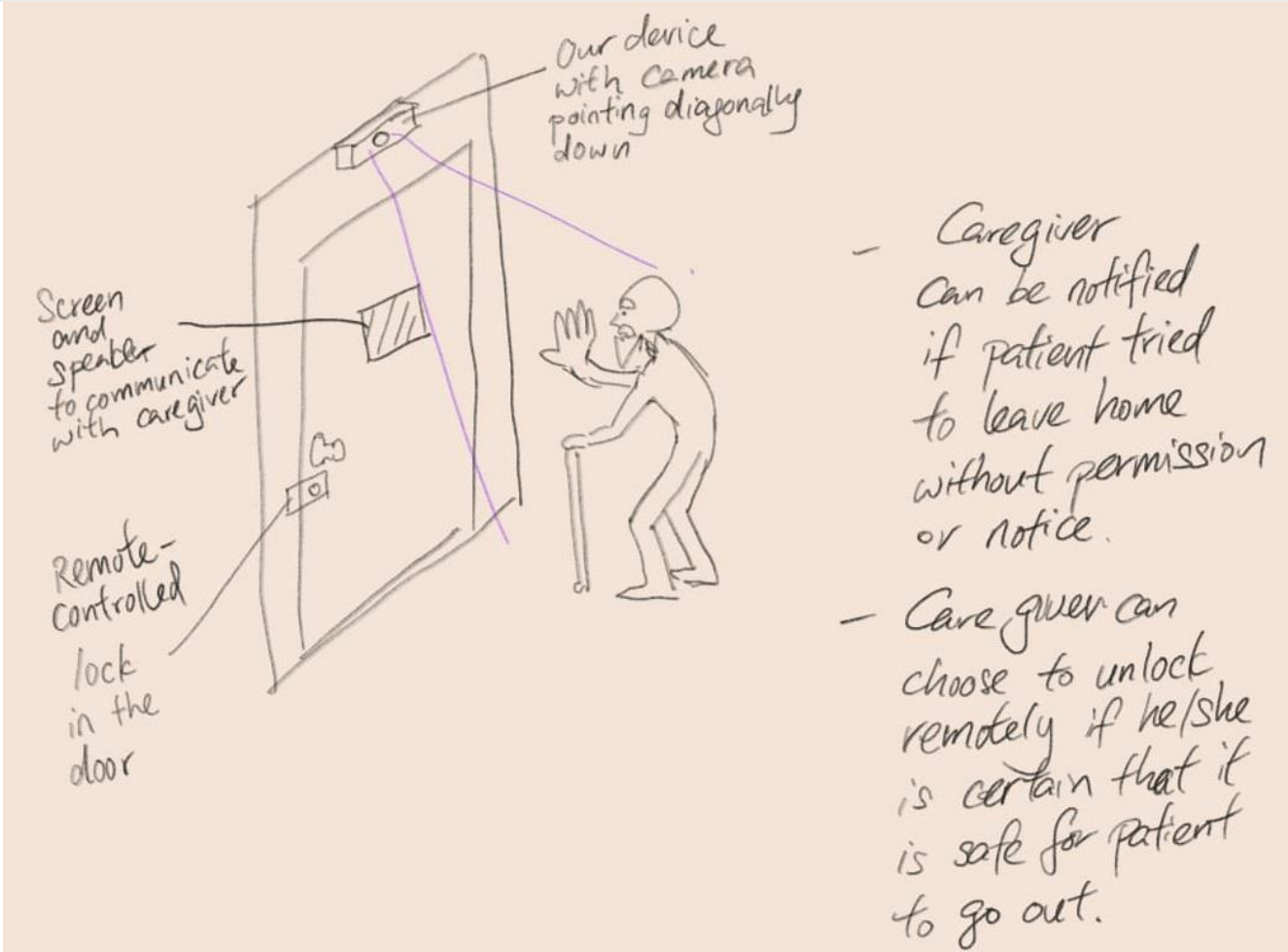
Our project has many failsafes to ensure the safety of the elderly (which are not included in our prototype due to budget constraints).

These include a smoke/gas detector and a motion sensor. In the unlikely event of a gas leak or fire, a message will be sent to the caregiver informing them to unlock the door.

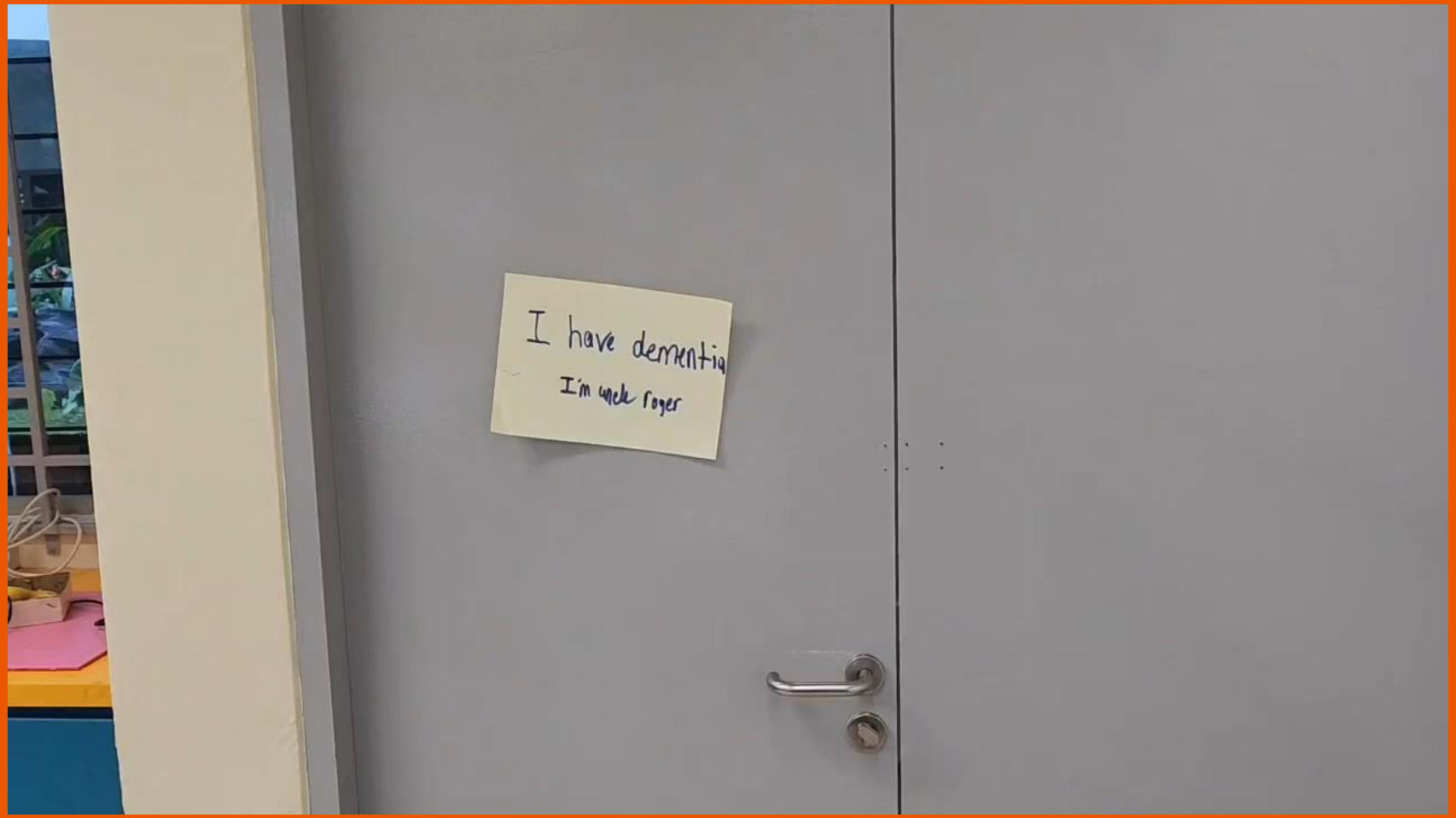
If the motion sensor does not detect movement for a set period of time, the sensor will send a warning informing the caregiver about the situation.

*Note that the picture is not our prototype

Prototype Sketch



Demonstration



Future improvements

We will like to inform you that this is a prototype and there are some things we would like to improve/add but we cannot because of certain constraints. These will be listed in the following:

- Due to limitations of materials available for our prototype, the switch was not being able to be placed at the door as intended. A wireless switch akin to the door bell switch can be used.
- Instead of a switch to activate the camera, we could design the camera to do an image capture only when a deliberate hand sign such as an outstretched palm top activate the camera.
- Due to limitations of materials available for our prototype, we were not able to include a speaker and screen for the elderly to communicate with the caretaker as intended.
- Ideally, the product should also include a smoke detector and a motion detector to survey other possible risks at home.

THANK YOU :)