Smart Pet-caring Detector System

Group #15

University of Victoria

SENG-310-A01

Instructor: Dr. Sowmya Somanath

September 15, 2021

Problem

A smart pet-caring detector system allows people to observe their pet's behaviour at home through an interface on their phones or computers by putting a collar around their pet's neck and control an intelligent robot to provide a series of services for their pets. By analyzing the information collected by the collar and robot, our smart system will notify the users about the state of health of their pets.

Motivation

There are a lot of people who need some help with taking care of their pets properly. As Manoj (2015) claimed that most of us have pets at home, some have the patience to feed them regularly, but some don't. So taking care of them during our busy schedule is one of the main problems in maintaining pets (Manoj, 2015). Also, most pets will be left at home and stay alone for such a long time. According to Nancy (2020), few people today would admit to leaving their dogs home alone for 24 or 48 hours or more, but leaving the dog home for 10 to 12 hours is normal. Letting pets stay in the house for a long time is a common issue (Leanny et al., 2018). Furthermore, the food amount of pets' daily diet is also essential. However, only about 18% of pet owners feed their pets with the recommended amount of food (CVMA, n.d.). Moreover, only half of the pet owners believe their pets have no wellness issues (CVMA, n.d.), but not the other half, which is a worth-severe-considering problem.
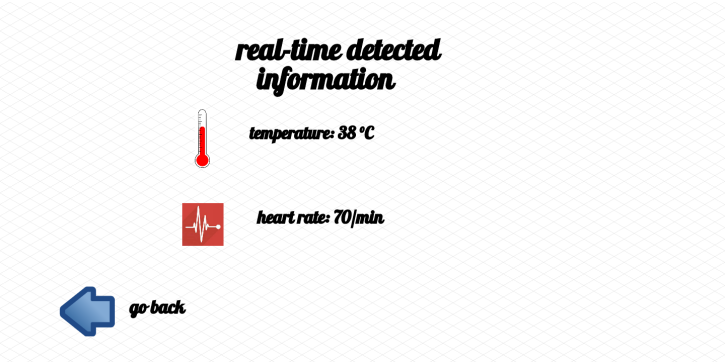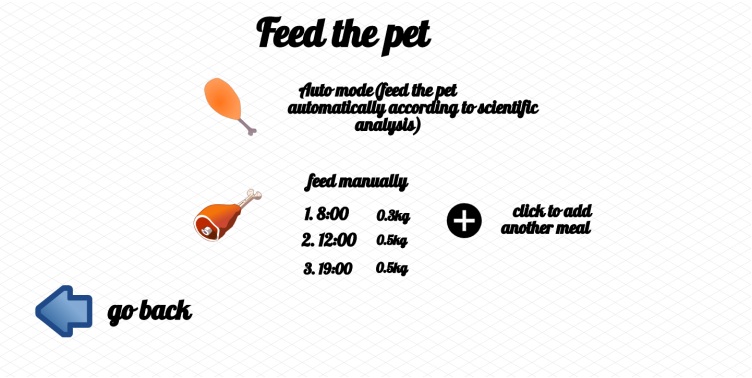
There is an increasing interest from dog handlers and veterinarians in continuously monitoring dogs' vital signs (heart rate, heart rate variability and respiration rate) to identify physiological correlations to stress and excitement outside laboratory environments

(Brugarolas et al., 2014). Physiological information such as body temperature and heart rate is an important signal. However, pets can not have linguistic conversations with humans. Therefore, it is vital for us to collect pets' physical indicators with the help of equipment.
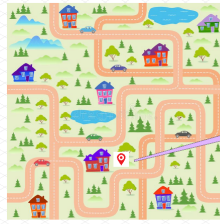
Solution

The motivation listed above can be met. Firstly, many people can not feed their pets regularly because they are busy. But the system we provide allows them to control the robot to feed the pets through an interface on mobile phones. Also, the interface provides scientific advice on how to feed the pets. The collar can measure the pet's heart rate and temperature, then analyze the data and send a medical report to the owners. In addition, we can see the location of the pets in real-time.

Every member of our team has designed a sketch for the interface. In the future, we will evaluate these designs with the potential users and combine the advantages of each design. Finally, we will create a final version of the interface that will be satisfactory to everyone. In the interface we create, the home page includes all the pets you own. By clicking into one pet, you will be directed into a functional zone. The functionalities include: feeding, water supply, health report, pet location and real-time detected information (heart-rate and temperature of the pet).

Pet Angel

Tom   + click to add
       another pet

Jack

---

pet information

feed the pet

health report

water supply

real-time
detected information

home

pet location

Feed the pet

Auto mode (feed the pet
automatically according to scientific
analysis)

feed manually

1. 8:00   0.3kg
2. 12:00   0.5kg   + click to add
3. 19:00   0.5kg   another meal

go back

---

real-time detected
information

temperature: 38 ℃

heart rate: 70/min

go back

pet location

your pet
current location

go-back

Health report

temperature: *normal*

heart rate: *normal*

food eaten today: *normal (1.5kg)*

excrement: *normal*

go-back

Pet Information

name: Jack

species: Samoyed dog
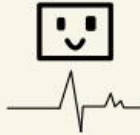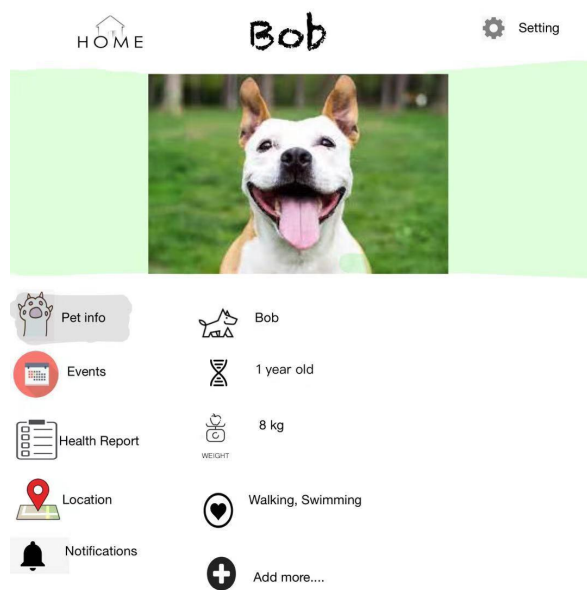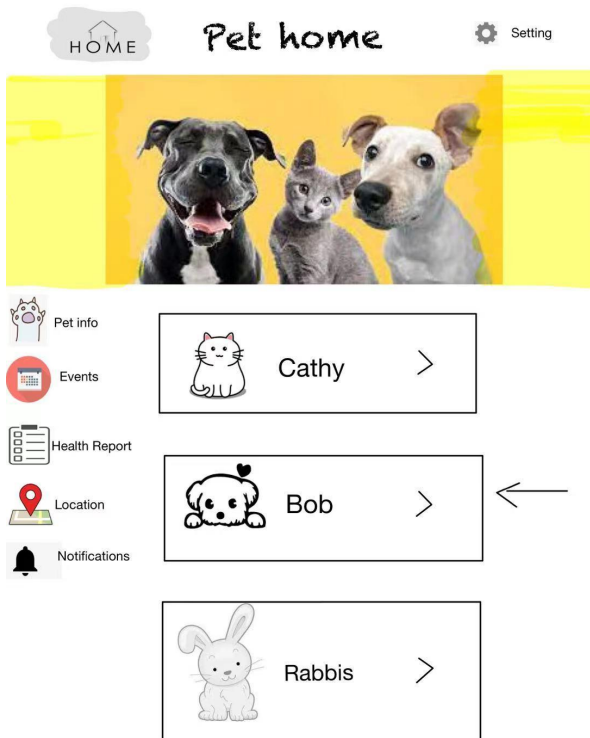
age: 4 years and two months

weight: 20kg

go back

Naco (!)

HEATH

WARNING

NUSING

CARE

Pet home

Setting

Pet info

Events

Health Report

Location

Notifications

| | Cathy | > |

| | Bob | > | ←

| | Rabbis | > |

HOME

Bob

Setting

Pet info
Events
Health Report
Location
Notifications

Bob
1 year old
8 kg WEIGHT
Walking, Swimming
Add more....

← | ⊙ | ↑ | +

♂ PAPI

09/05/2020

Last shower   Heart Rate   TEM Temperature

Fill Food   Fill Water   Toilet Cleaning

▷

Schedule   Gallery   Profile   o o o Setting

No function but a
heart that can keep
clicking

Menu (settings)

Pet health situation

Feed the pet

Pet location

Take picture of the
pets and video re-
cording

Pet community

Pet clean function

COMPANY WEBSITE &
OTHER IMPORTANT INFO

Dark mode

COMPANY WEBSITE &
OTHER IMPORTANT INFO
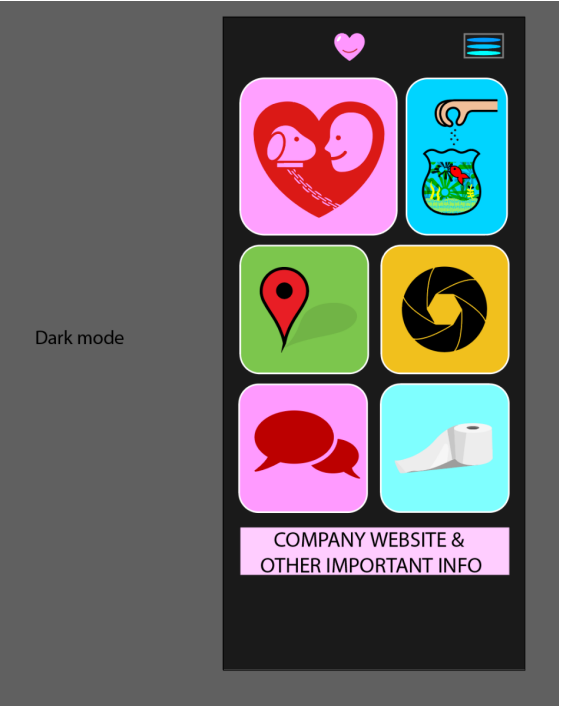
What will show after click the menu

PET PROFILES

PERSONAL PROFILE

SETTINGS

PRIVACY AGREEMENT

SHARE WITH FRIENDS

RATE THIS APP

COMPANY WEBSITE & OTHER IMPORTANT INFO

Dark Mode

PET PROFILES

PERSONAL PROFILE

SETTINGS

PRIVACY AGREEMENT

SHARE WITH FRIENDS

RATE THIS APP

COMPANY WEBSITE & OTHER IMPORTANT INFO

Pet info page

PET NAME

AGE

BIRTHDAY

FAVOURITE
FOOD

PET PHOTO

EMOTION NOW

SHOWER TIME

INJECTION TIME

SLEEPING
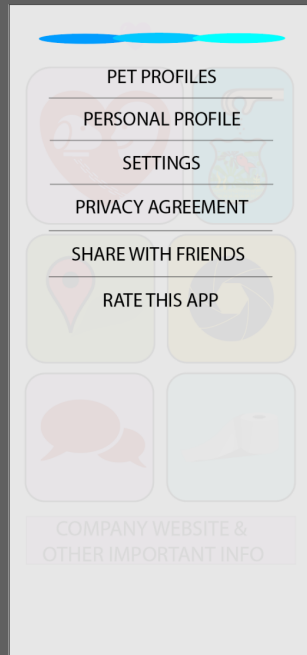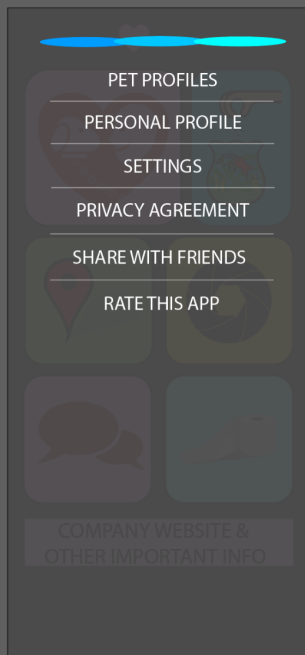
MORE ⌄

Pet info page in dark
mode

PET NAME

AGE

BIRTHDAY

FAVOURITE
FOOD

PET PHOTO

EMOTION NOW

SHOWER TIME

INJECTION TIME

SLEEPING

MORE ⌄
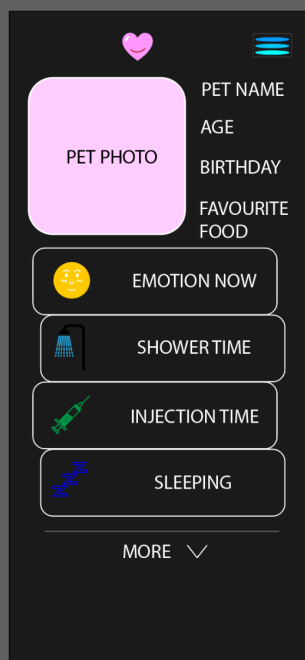
Reference

Brugarolas, R., Dieffenderfer, J., Walker, K., Wagner, A., Sherman, B., Roberts, D., & Bozkurt, A. (2014). Wearable wireless biophotonic and biopotential sensors for canine health monitoring. Paper presented at the 2203-2206. https://doi.org/10.1109/ICSENS.2014.6985477

Canadian Veterinary Medical Association (CVMA). *A snapshot of Canada's pet health and wellness from the Canadian Veterinary Medical Association (CVMA,) in partnership with Hill's Science Diet.* Canadian Veterinary Medical Association. Retrieved from https://www.canadianveterinarians.net/documents/canada-s-pet-wellness-report2011.

Leanny, R., Cayao, C., Shores, D., Jamora, K., Clarke, J. R., & Downs, A. (2018, December 26). *8 Dangers of Leaving Your Dog Home Alone for Long.* Top Dog Tips. Retrieved from https://topdogtips.com/dangers-leaving-dog-home-alone/

Manoj, M. (2015). Automatic Pet Feeder. *International Journal of Advances in Science Engineering and Technology, ISSN*, 2321-9009. https://ijisrt.com/assets/upload/submitted_files/1575569700.pdf

Tucker, N. (2020, January 10). *How long is too long to leave a Dog home alone?* Whole Dog Journal. Retrieved from https://www.whole-dog-journal.com/care/how-long-is-too-long-to-leave-a-dog-alone/.