ALGODETECTIUM
We're hiring

HealthPass
Surveillance and Protective Measures System

AlgoDetectium

COMPANY

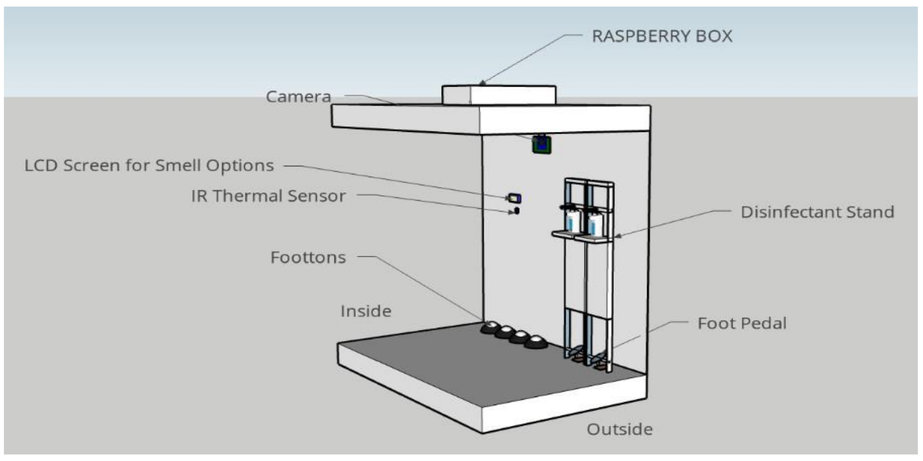
AlgoDetectium was found by five young and ambitious senior year electrical and electronics engineering student on 30th October 2020. The shareholders are Alperen Kalay, Buğra Eryılmaz, Hüseyin Berat Karakaya, Kutay Uğurlu and Özgür Diyar Kozan.

PRODUCT

The company's first product HealthPass is a system that aims to detect the people showing symptoms by applying simple and quick tests to the entrants before they enter the public buildings. The system conducts the following tests:

- Smelling Ability Test
- Body Temperature Test
- Mask Detection Test

In addition to these tests, the system helps authorities maintain social distancing by limiting the number of people inside the building.



TECHNICAL SPECIFICATIONS

The technical requirements and the associated solutions proposed are as follows:

- The body temperature sensing is required to be conducted contactless. The solution is to use an IR Temperature Sensor.
- The smelling ability test is to be conducted with scented disinfectants and by evaluating the user feedback.
- The mask classification task should satisfy at least 75% accuracy requirement. To satisfy this, two neural networks are deployed, one of them being the face detector network(ResNet10) and the other one being mask classification network(MobileNetv2).
- We require all tests to be concluded in 30 seconds.

The corresponding tests are presented in the following section.

DECISION MECHANISM

	Body Temperature<37.5°C	37.5°C <Body Temperature<38°C	38°C <Body Temperature
Improper Mask	**No entrance allowed**	**No entrance allowed**	**No entrance allowed**
Proper Mask & No Loss of Smell	**Entrance allowed**	**Entrance allowed**	**No entrance allowed**
Proper Mask & Loss of Smell	**Entrance allowed**	**No entrance allowed**	**No entrance allowed**

TESTS

Table 1. Confusion Matrix of the Mask Classifier

Ground Truth / Prediction	With Mask	Without Mask or Improper Mask
With Mask	204	26
Without Mask or Improper Mask	24	180

The total accuracy turned out be 0.88.

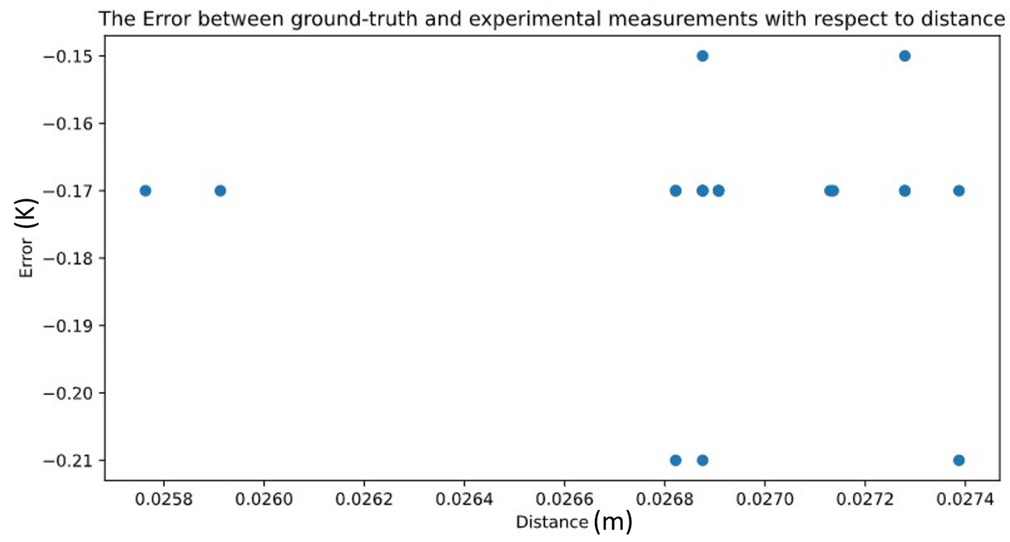


Figure1. The error in temperature measurements

The average time for a user to complete the tests were measured to be around 15 seconds.

EXTRA FEATURES

Database: To increase the scalability of the system, a database is utilized to share the information between multiple HealthPass systems located at multiple entrances. Moreover, it provides an interface for customer to change parameters of the system such as disinfectant options and maximum number of people allowed inside the building.

Smelling Ability Detection Test: We introduce an extra test to detect the smelling ability loss of the entrants.

COST & DELIVERABLES

Table 2. Table of product cost

Raspberry Pi 4B 4GB	$49	Membrane Button	$6.78
Pi Camera Module	$9.5	Magnetic Lock	$5.5
IR Temperature Sensor	$10	Single Channel Relay Board	$0.7
SD Card 32 GB	$5.5	Foottons	$3.45
Ultrasound Distance Sensor	$2	Disinfectant Stands	$30
Nokia LCD Display Screen	$10	**Total**	**$132.45**

We offer to deliver following products in addition to the item given in Table 2:

- HealthPass software
- MongoDB credentials
- 2 years of warranty, maintenance and updates
- User manual