Open Fire

Fire Alarm System

OUR MISSION

Introducing our cutting-edge fire detector project powered by surveillance camera andRobotics!

Our fire detector project combines the power of computer vision and robotics to detect and prevent fires in real-time. By utilizing high-quality cameras and advanced algorithms, our system can analyze video footage and detect any signs of smoke or flames.

Once a fire is detected, our system sends an alert to a central monitoring station through a text message attached with the location of the fire , and triggers the deployment of a firefighting robot.

Equipped with state-of-the-art sensors and tools, our firefighting robot can quickly extinguish fires before they have a chance to spread and cause damage.

Our fire detector project is not only highly effective but also incredibly efficient. By automating the detection and response process, we can help reduce response times and minimize the risk of human error. Our system is also scalable, meaning it can be deployed in a wide range of settings, from small offices to large factories and warehouses.

value Added:

We suggest that our project works by extinguishing with sound (not the usual classic water)

It is important to note that sound wave fire suppression is not a commonly used method and has not been widely tested in real fire situations. Conventional methods of extinguishing fires, such as the use of water, foam, or other extinguishing agents, are considered the safest and most effective methods of extinguishing fires.

The ideal sound frequency for extinguishing a fire depends on the type of fire. In general, class A fires (fires of wood, paper, etc.) can be extinguished with low sound frequencies, generally between 30 and 60 Hertz. Class B fires (fires involving flammable liquids, such as gasoline or oil) require higher sound frequencies, usually between 60 and 120 Hertz. Class C fires (gas fires) can be extinguished with even higher frequencies, usually between 120 and 250 Hertz.

This is to avoid the losses of extinguishing fires with water, for example what happened in the Paris church fire in France.

Detection fire and no fire :

The provided code implements a convolutional neural network (CNN) to perform binary classification of images into two classes: "fire" and "no fire". The dataset used to train and validate the model is stored in two directories: "train" and "valid". The images in these directories are preprocessed and augmented using the ImageDataGenerator class from Keras preprocessing library. The train_generator and validation_generator objects are created using these two directories and used to train and validate the model. The architecture of the CNN consists of several convolutional layers followed by max-pooling layers. The output of these layers is flattened and fed into a fully connected layer with a relu activation function. Dropout layers are added to avoid overfitting, and finally, the output layer is a dense layer with a softmax activation function to perform binary classification. The model is compiled using categorical_crossentropy as the loss function and Adam optimizer with a learning rate of 0.0001. During training, the model is evaluated based on accuracy as the metric. After training, the model's performance is evaluated by plotting the accuracy and loss of the model over the epochs. The training accuracy and validation accuracy are plotted against the epochs, as well as the training loss and validation loss.

In summary, this code implements a CNN model to classify images into two classes: "fire" and "no fire" and evaluates the model's performance using accuracy and loss metrics.EntrerÉcrire à Larbi Larbi

This code is a Python script for detecting fire in a live video stream captured by a camera. It uses a pre-trained convolutional neural network (CNN) model to classify the video frames as either containing fire or not.The script uses several libraries such as OpenCV, NumPy, Pillow, TensorFlow, Keras, Twilio, and Geocoder. Here's a brief explanation of what each library does: cv2 (OpenCV): An open-source computer vision library used for image and video processing tasks. numpy (NumPy): A library for the Python programming language, adding support for large, multi-dimensional arrays and matrices, along with a large collection of high-level mathematical functions to operate on these arrays. PIL (Pillow): A library that adds support for opening, manipulating, and saving many different image file formats. tensorflow (TensorFlow): An open-source machine learning library developed by Google that is used for dataflow and differentiable programming across a range of tasks. keras (Keras): A high-level neural networks API written in Python, which runs on top of TensorFlow, CNTK, or Theano. twilio (Twilio): A cloud communications platform that provides APIs for sending and receiving SMS, voice, and video messages. geocoder (Geocoder): A library for Python that provides a geocoding interface to several popular APIs, including Google Maps, Bing Maps, OpenStreetMap, and more.

The script loads a pre-trained CNN model saved in an H5 file format using TensorFlow's Keras API. It then initializes a video capture using OpenCV and starts capturing frames from the camera. Each frame is then converted to an RGB format, resized to 224x224 (which is the size the model was trained on), converted to an array, and normalized. The model then predicts the probability of the frame containing fire or not. If the model predicts that the frame contains fire, the script sends an SMS message to a specific phone number using the Twilio API.
The message includes the Google Maps URL of the current location, which is determined using the Geocoder library. The script also adds a text label to the video frame indicating whether fire was detected or not, along with the current location.

Finally, the script shows the video stream to the user and waits for the user to press the 'q' key to quit. Once the user quits the script, it releases the video capture and closes all the windows.

DETECTION FIRE NO FIRE;

No Fire

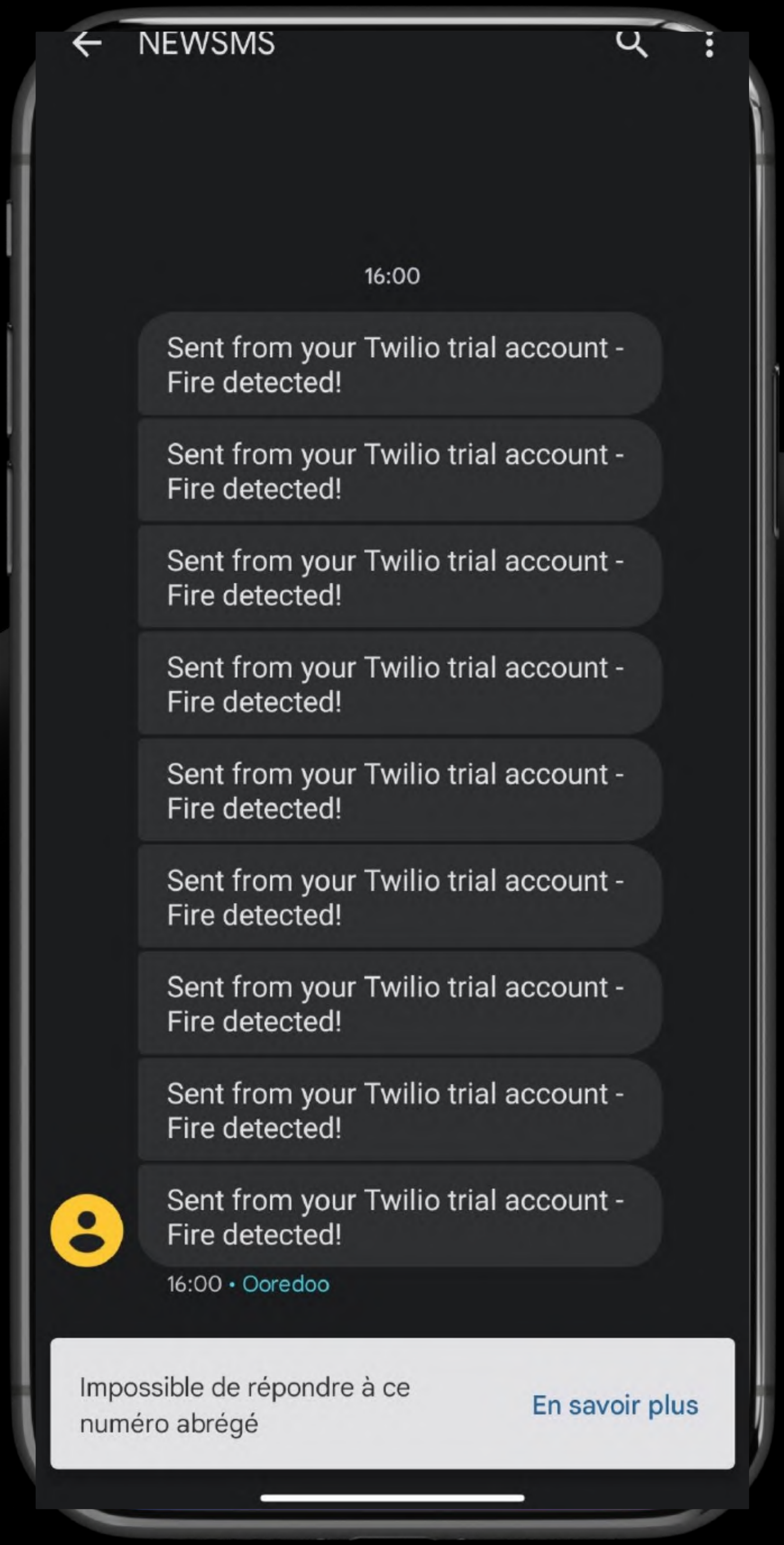
Fire

The firefighter robot:

The robot is equipped with fire sensors, which are used to detect flames or the heat emitted by the fire.
Depending on the location of the fire, the robot moves with the help of two motors and uses its two water pumps to extinguish the flames. Also, to help with monitoring and navigation, a camera can be mounted on the robot.
This camera is programmed using a Raspberry Pi, a mini-computer that controls the operation of the robot. The camera can be used to visualize the environment and detect risk areas or obstacles. In summary, a fire robot with 3 fire sensors, two motors, two water pumps and a programmed camera based on Raspberry Pi is a robot designed to detect, move towards and extinguish fires while providing a live view of the remote situation.

The script uses several libraries such as :

- OPENCV
- NUMPY
- PILLOW
- TENSORFLOW
- KERAS
- TWILO
- GEOCODER


NEWSMS
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Sent from your Twilio trial account - Fire detected!
Sent from your Twilio trial account - Fire detected!
Sent from your Twilio trial account - Fire detected!
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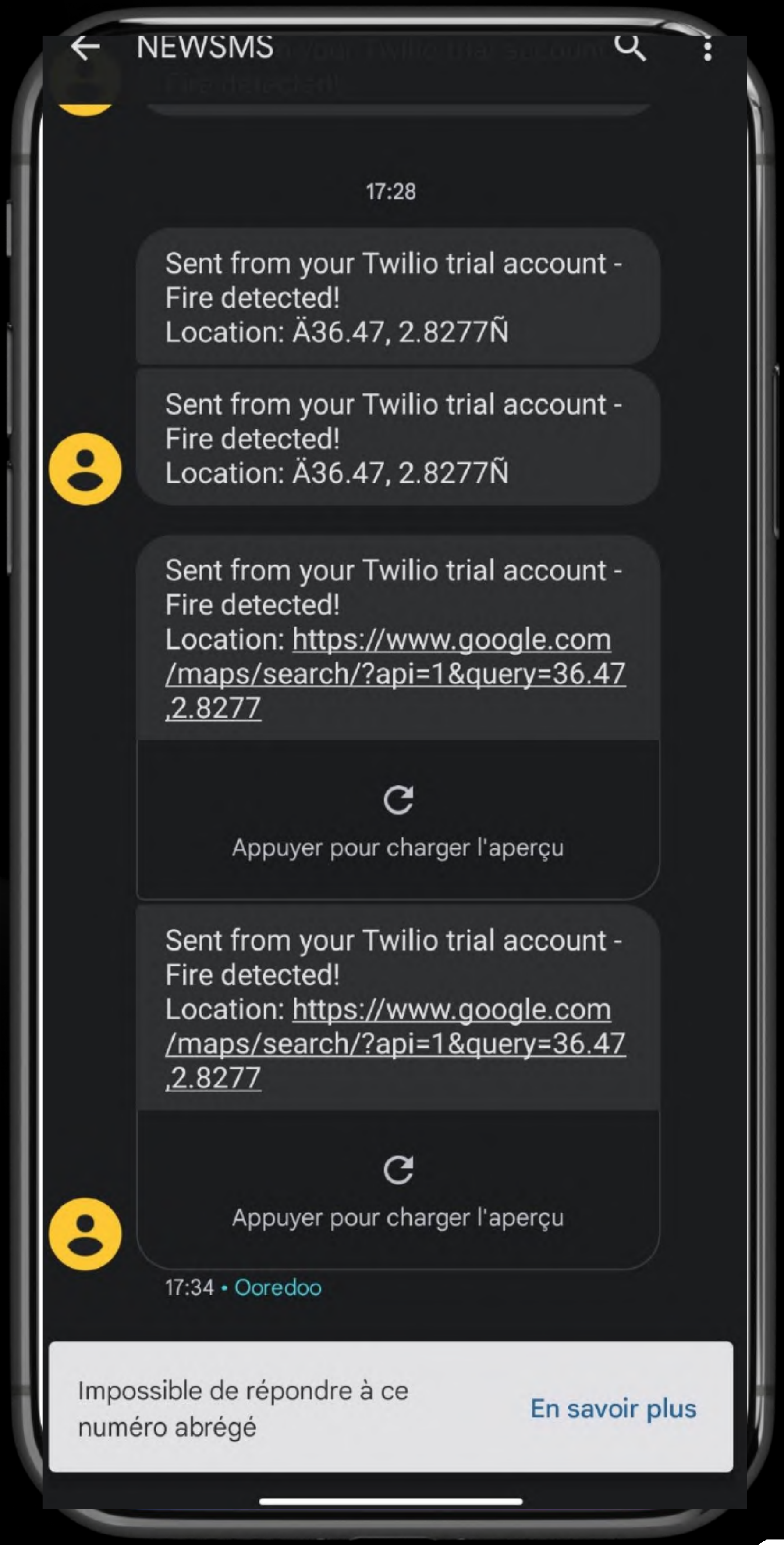
Impossible de répondre à ce numéro abrégé
En savoir plus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17:28
Sent from your Twilio trial account - Fire detected! Location: Ä36.47, 2.8277Ñ
Sent from your Twilio trial account - Fire detected! Location: Ä36.47, 2.8277Ñ
Sent from your Twilio trial account - Fire detected! Location: https://www.google.com/maps/search/?api=1&query=36.47,2.8277
Appuyer pour charger l'aperçu
Sent from your Twilio trial account - Fire detected! Location: https://www.google.com/maps/search/?api=1&query=36.47,2.8277
Appuyer pour charger l'aperçu
17:34 • Ooredoo
Impossible de répondre à ce numéro abrégé
En savoir plus

CONCLUSION:

Finally ,our fire detector project "OPEN FIRE" by Robotics is a game-changer in the field of fire safety.

By combining the power of computer vision and robotics, we can help prevent fires before they occur and minimize the risk of damage and injury.