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Adoption of Drone Technology for the Smart Safety Mechanism of Women

Victoria Nozick*

Operations and Information Management Group, Aston Business School, Aston University, Birmingham B4 7ET, United Kingdom; victorianozick@yahoo.com

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Abstract

In any other place in the world, people crave for protection during dark times (Night). Either it is man or women. Everyone is scared of being alone where dark looks like a haunting one to everyone. Where people are going MAD towards women during at that point. So, I am contributing this project to all the women who are hustling hard to get their independence and freedom. These DRONES helps them to keep secure and do all the patrol or Police work during nights.

Keywords: Women safety, Flight controller, Camera, Machine learning, Deep learning.

1 | Introduction

Here may people think how this DRONE is helping to rescue the PEDUSTRIANS. This DRONE is flying Detective Machine with an OS in it. Usually, to fly a Drone or a flight we need a controller into it [1]. The Controller is the brain of the DRONE. Here, we are also using a FLIGHT CONTROLLER which is PixHawk 2.4.8 Controller PX4 32 Bit Autopilot. And these controllers are special because we are adding a feature which is called as external device a camera and the camera data is used to develop the Machine Learning Technology to detect the pedestrians ACTIONS and now is the special feature which is called as Voice Modulation without Voice Using Deep Learning Technology [2]. Where the Bus words like Kill, Help and we train a model where the similar function is also used to detect the spam mails in Gmail [3]. So, the similar algorithm we are using to train the Machine Learning Model. After Detecting the Mischievous Activity in public the cameras captures the images of the incident and send the images to the near police department to RESCUE the pedestrian [4]. Here we need Internet to send the image to the nearest hub. So we use SIM900A GSM module to send the image to the nearest police department [5]. This project is came from the real incidents happened in the society so these article lines makes me force to develop this project.

Corresponding Author: victorianozick@yahoo.com

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1.1 | The Fast R-CNN Algorithm

In the rapidly growing field of deep learning, this is part of a series to understand the publications that are the fundamentals for current day object detection [6]. The original paper "rich feature hierarchies for accurate object detection and semantic segmentation" elaborates one of the first breakthroughs of the use of CNNs in an object detection system called the 'R-CNN' or 'Regions with CNN' that had a much higher object detection performance than other popular methods at the time [7].

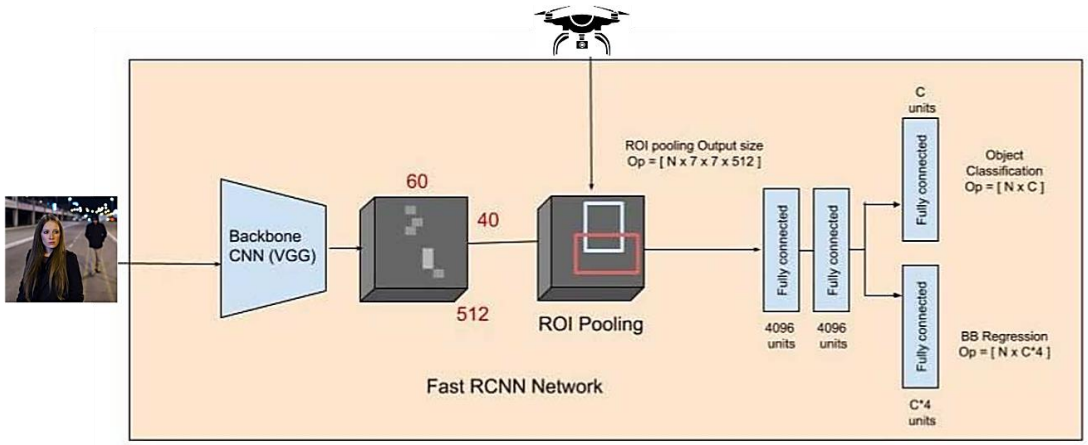

Fig. 1. Fast R-CNN pipeline

The entire image is fed into the backbone CNN and the features from the last convolution layer are obtained [8]. Depending on the backbone CNN used, the output feature maps are much smaller than the original image size [9]. This depends on the stride of the backbone CNN, which is usually 16 in the case of a VGG backbone. Meanwhile, the object proposal windows are obtained from a region proposal algorithm like selective search [10]. As explained in Regions with CNNs, object proposals are rectangular regions on the image that signify the presence of an object [11]. The portion of the backbone feature map that belongs to this window is then fed into the ROI Pooling layer. The ROI pooling layer is a special case of the Spatial Pyramid Pooling (SPP) layer with just one pyramid level [12]. The layer basically divides the features from the selected proposal windows (that come from the region proposal algorithm) into sub-windows of size h/H by w/W and performs a pooling operation in each of these sub-windows [13]. This gives rise to fixed-size output features of size (H x W) irrespective of the input size. H and W are chosen such that the output is compatible with the network's first fully-connected layer [14]. The chosen values of H and W in the Fast R-CNN paper is 7. Like regular pooling, ROI pooling is carried out in every channel individually. The output features from the ROI Pooling layer (N x 7 x 7 x 512 where N is the number of proposals) are then fed into the successive FC layers, and the Softmax and BB-regression branches [15]. The Softmax classification branch produces probability values of each ROI belonging to K categories and one catch-all background category. The BB regression branch output is used to make the bounding boxes from the region proposal algorithm more precise [16].

2 | Literature Review

A literature review or narrative review is a type of review article. A literature reviews is a scholarly paper, which includes the current knowledge including substantive findings, as well as theoretical and methodological contributions to a particular topic [17]. Early work on the Tech to the rescue: Women increasingly use apps and gadgets to keep them safe Chennai: Safety remains a concern for women despite laws having been strengthened in the wake of the brutal Nirbhaya gang rape and murder on a moving bus in the national capital seven years ago [18]. Now, women are increasingly seeking technology-based solutions to make their commute safer. Apps and wearable gadgets, most of which allow tracking by family members, make women feel less vulnerable when they have to commute in non-peak hours or walk through deserted streets [19]. Although one gives up individual privacy in using such apps and wearables, they are popular as the benefits outweigh such concerns. Besides, there are several apps that women can

download and use, if their phones do not come with such default settings [20]. Himmat, a safety app launched by Delhi Police allows a registered user to send an SOS alert, which is received by the Delhi Police Control Room and passed on to the nearest police station to send immediate help to the location of the sender [21]. Hyderabad Police's similar app is called Hawkeye. If the mobile or SOS Device used by the person is lost or battery low. That situation is helpless. To avoid these types of situations drones are helpful for everyone to deploy.

3 | Proposed Work

3.1 | Algorithm Used

Automatic Face-To-Face Translation". Their technique, called LipGAN allows us the lip-movements of a person to convert it into a matched words. The framework used for this task is a typical Generative Adversarial Network (GAN) architecture, so it contains a generator module and a discriminator module [22].

3.2 | PixHawk Controller 2.4.8

Pixhawk 4® is an advanced autopilot designed and made in collaboration with Holybro® and the PX4 team. It is optimized to run PX4 v1.7 and later, and is suitable for academic and commercial developers. Difference between Pixhawk 2.4.8 & 2.4.6:

Table 1. Parameters.

Parameter	Pixhawk 2.4.6	Pixhawk 2.4.8
Barometer sensor	MEAS MS5611	MEAS MS5607
Compass Module (Magnetometer)	3CLDW 303H	X4HBA 303H
RAM	256 kb	128 Kb.
Connectors	Gold Plated	Tin-Plated

3.3 | Voltage Ratings

Pixhawk 4 can be triple-redundant on the power supply if three power sources are supplied. The three power rails are: POWER1, POWER2 and USB. The output power rails FMU PWM OUT and I/O PWM OUT (0V to 36V) do not power the flight controller board (and are not powered by it). You must supply power to one of POWER1, POWER2 or USB or the board will be unpowered [23].

3.4 | Normal Operation Maximum Ratings

Under these conditions all power sources will be used in this order to power the system:

I. POWER1 and POWER2 inputs (4.9V to 5.5V).
II. USB input (4.75V to 5.25V).

3.5 | Absolute Maximum Ratings

Under these conditions the system will not draw any power (will not be operational), but will remain intact.

I. POWER1 and POWER2 inputs (operational range 4.1V to 5.7V, 0V to 10V undamaged).
II. USB input (operational range 4.1V to 5.7V, 0V to 6V undamaged).
III. Servo input: VDD_SERVO pin of FMU PWM OUT and I/O PWM OUT (0V to 42V undamaged).

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3.6 | Mission Planner

It is a software where we deploy and evaluate the drone gyroscope, Magnetic Attraction, these instructions will show you how to download the latest firmware onto the autopilot hardware that already has ArduPilot firmware installed. This process will use the Mission Planner ground control station. See Loading Firmware onto boards without existing ArduPilot firmware.

3.7 | SIMA 900 GSM Module

SIM900A GSM Module is the smallest and cheapest module for GPRS/GSM communication. It is common with Arduino and microcontroller in most of embedded application. The module offers GPRS/GSM technology for communication with the uses of a mobile sim. It uses a 900 and 1800MHz frequency band and allows users to receive/send mobile calls and SMS. The keypad and display interface allows the developers to make the customize application with it. Furthermore, it also has modes, command mode and data mode. In every country the GPRS/GSM and different protocols/frequencies to operate. Command mode helps the developers to change the default setting according to their requirements. Where we use this module for sending the images of the threating person via sim. And to access this module we need to use Arduino for getting the inputs. Where the mischievous activity detected in the camera the PixHawk Controller Send the signals to Arduino and this Arduino will send the information to the SIM Module to send the images to the nearest hub location and we will connect the External GPS to the DRONE. The drone coordinates will be sent by the SIM module through internet to the nearest hub or police station for rescue the PEDUSTRAIN.

4 | Conclusion

Analysing various approaches, it is deduced that it is much more practical and reliable to use deep learning rather than traditional machine learning strategies for target recognition. Implementation of machine learning involves a lot of mathematical equations which are boring to a computer program. Implementing profound coevolutionary neural networks cuts computations by a significant amount. Successfully the generated system recognizes the threating person the send the coordinates and images to the nearest police department.

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