

**EZTECT: AUTOMATED ESTRUS DETECTION SYSTEM FOR DAIRY
CATTLE BASED ON FASTER R-CNN WITH SURVEILLANCE AND
NOTIFICATION SYSTEM VIA INTERNET OF THINGS (IOT)**

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College of Engineering

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In Partial Fulfilment of the Course Requirements for the Degree of

Bachelor of Science in Electronics Engineering

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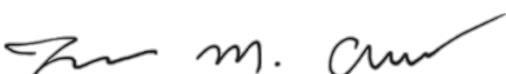
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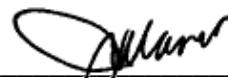
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The Researchers

ABSTRACT

Thorough and precise estrus detection plays a crucial role in the fertility of dairy cows. Direct visual monitoring is the commonly used method of farmers in recognizing estrus signs which not just demands time and effort, but also causes misinterpretations. The primary sign of estrus is the standing heat, where the dairy cows stand to be mounted by other cows, or move slightly forward with the mounting cow(s) for a few seconds. Through the years, various detection methods have already been developed, yet most of these methods involve contact and invasive approaches that affect the estrus behaviors of cows. So, a non-invasive and non-contact estrus detection system using image processing, artificial intelligence, and smart technology is developed to detect standing heat behaviors. The detection system comprises of classification, detection, and notification sub-systems. The two customized neural network models developed through the TensorFlow Object Detection API classify and detect the dairy cows and their estrus behaviors through bounding box region analysis, and the SMS Call notifications through an Android-compatible GSM Module notify the farmers whenever standing heat is detected. The system is integrated with the Internet of Things (IoT) wherein a web application provides access to standing-heat records and other relevant information about the cows and remote monitoring through the Pan-Tilt-Zoom (PTZ) Cameras, and delivers Push Notifications to the farmer's computer or smartphone. The developed smart system detects the cows and their standing heat activities, and notifies the end-users any time.

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Chapter 1

Introduction

1.1 Background of the Study

The estrus cycle of bovine animals is the period from one estrus to the next. Its average period for dairy cattle is 21 days and, in the Philippines, the typical period which the farmers observe is between 18 to 24 days. Estrus usually lasts between 10 to 18 hours, but recent studies have shown that it is now much shorter for modern high yield dairy cows, approximately 8 hours. [1]

A dairy stock requires thorough heat detection, and correct timing of artificial insemination. Most farmers in the Philippines follow the traditional AM-PM Guideline, where in-heat cows detected in the morning are inseminated in the afternoon and estrus cows identified in the afternoon or evening are inseminated the next morning. M. Manafi, however, stated that the optimum time for insemination is between 6 to 17 hours or an average of 11.8 hours after the first sign of estrus. [2] Not detecting estrus is a major factor in low fertility. If in-heat and non-heat cows are not detected in time, producers will suffer economically due to extended calving intervals and additional semen expenses. This means that poor heat detection is costly for the producer and this critical part of reproductive management should be considered. [3]

A variety of methods have already been introduced to detect estrus in livestock, according to literature reviews. One is direct observation, unfortunately, farmers today misinterpret the signs of estrus due to misjudgements caused by visual observation. An increase in behavioral activity is another observable change in cows that are in estrus.

While the behavior of the cow can be monitored by an activity meter on the neck or leg, this kind of method can vary in accordance with the algorithm and the devices used. [3]

In other countries, a company integrates a technology that helps farmers monitor and manage the detection of estrus in cows. The developed technology was a pedometer that tracks the number of cows' steps, examines them on a computer, and identifies whether a cow is in-heat. Another company, on the other hand, integrates a skin attached temperature sensor using an accelerometer and an RFID Chip. Other researchers used direct contact, low power consumption sensor nodes for data collection and communication infrastructure in monitoring cows' physical and physiological conditions which in turn lead to cow's discomfort. For that reason, non-contact type of monitoring systems are developed. Researchers founded a novel imaging processing technology-based estrus detection system for dairy cattle. However, this system is only efficient for daytime use, as it cannot detect standing heat behaviors at night, which subsequently becomes a system disadvantage. [3]

Several companies have been established in the Americas that offer cattle monitoring services which includes estrus detection. An average rate per cow is \$50 and above. In Asia, however, only few are known. And in the Philippines, companies offering these services are non-existent. This shows how underdeveloped the cattle industry in the Philippines is.

According to the Philippine Statistical Authority, the total volume of cattle production for the fourth quarter in 2018 is 0.33 percent lower than the previous year. Cattle inventory, in million heads, is also reduced by 0.73 percent compared to the preceding year. Slaughter rate is constantly high and increasing in contrast to the downward trend in cattle

inventory and birth-rate. [4] A statistic from 2017 shows that in the Asia Pacific region, Philippines is one with the least cattle production. [5]

The statistics shown and estrus detection methods discussed on the earlier statements tell us that Philippines is being left behind by other ASEAN countries in terms of cattle production and technologies involved therein. Companies offering cattle monitoring services are yet to be established in the Philippines and the aforementioned methods have certain limiting factors, so an accurate and cost-effective solution to this problem is still needed. This is where this study comes in – a non-invasive and non-contact estrus detection system that uses image processing, artificial intelligence, and Internet of Things technology which aims to refine the farm's positive detection rate, lessen the non-pregnant period, and thus enhance the economic benefits of pastures.

1.2 Statement of the Problem

Dairy cattle production in the Philippines has been showing signs of depreciation since 2016. Though the country shows the effort by decreasing the importation of live cattle, continual high slaughter rate, low birth-rate, and lack of support won't let the Philippines' cattle industry be a more self-sustaining sector in the foreseeable future. The statistics showed and the methods of detection for estrus on the preceding pages show that in terms of livestock production and the technologies involved, the Philippines has been left behind by other Asian countries. Dairy farmers should use different strategic plans in cattle management, preferably a precise and cost-efficient solution to this problem.

In line with the said problem of the research, there are subsequent problems the researchers have found. One is the need for backyard farms of a cost-effective estrus

detection tool providing accurate results and can be easily used by farmers. Also, dairy farmers need a remotely-accessible system which automatically detects signs of estrus in dairy cows through a non-contact, non-invasive way to efficiently time inseminations. Lastly, a notification system that will alert both the farmers and veterinarian 24/7 of the cow's estrus activity should also be taken into consideration.

1.3. Objectives

1.3.1 General Objectives

The research aims to create an Automated Estrus Detection System for Dairy Cattle based on Faster R-CNN with Surveillance and Notification System via Internet of Things (IoT).

1.3.2 Specific Objectives

1. Construct a cost-effective smart system incorporating with Pan- Tilt-Zoom (PTZ) Cameras, Network Video Recorder (NVR), high performing computer, and microcontrollers such as Arduino Uno and GSM module.
2. Implement image processing techniques and supervised learning for the localization and detection of cows to detect estrus signs through object overlapping.
3. Develop an IoT-based web application capable of data visualization and report generation relevant to the information about the cows, remote camera control for monitoring, and notifications such as Call Alerts and Push Notification to the farmers (end-users).

4. Conduct a study on the accuracy and validity of results gathered through engineering research which shall be evaluated, and validated by professionals, and farmers from the agricultural sectors in the Philippines.

1.4 Significance of the Study

The findings of the study would be beneficial to small and large farms in the cattle industry, given the current lack of commercially available and advanced herd management systems, and inefficient breeding methods. The study would also contribute to ethology, as it focuses on the standing heat signatures of cows by means of an enhanced detection system with real-time visual surveillance.

The system utilizes non-invasive device, which is a camera, to detect the cow's estrus signs and activities in real-time. A notification alert via SMS will be sent to the farmer and veterinarian through Android-compatible GSM module once standing-heat is detected. Moreover, the system is integrated with the Internet of Things (IoT) which gives an access to the standing-heat recordings, and provides remote monitoring and estrus verification through the web application.

With that in mind, detecting estrus at the precise moment will increase cattle reproduction rate, and improves the farmers' visual monitoring capabilities. Also, the use of non-invasive devices decreases the likelihood of cows be irritated and stressed. Hence, work will be more effective and efficient, and dairy production rate will be increased.

1.5 Scope and Limitations

The study will be focusing on developing an automated detection system of estrus for dairy cattle in a barn that utilizes image signal processing techniques to efficiently monitor and report signs of estrus. The use of cameras connected to a computer provides visual information about the cow's estrus cycle. The surveillance system will be integrated with web applications and the Internet of Things (IoT) technology. The proposed method, however, has its limitations: one of which is the usage of the PTZ Network Camera; the second is the location and positioning of the camera under the cowshed; the third is the type of cow to be used for this analysis, which is the Holstein-Friesian x Sahiwal crosses; the fourth is the type of mobile phone to be used, which is a smartphone, and the fifth is the availability of internet access in the remote area.

Since the mounting activity of in-heat cows lasts about three to seven seconds, and the delay of the cameras for one and two seconds, the main concerns will be latency and responsiveness. The system's performance will be influenced by factors such as the angle of view and image noise and the synchronization of interworking devices. The efficiency of the system would also be affected due to internet accessibility, and in-app data transfer rates. The results will be displayed in the web application which provides users with access to real-time monitoring and recording of the date and time of cow estrus.

1.6 Definition of Terms

Cloud storage – is the remote database of the developed web application which stores the image frames and records for data analyses and visualizations.

Ivacy – is a web services security provider which grants remote access and smooth data traffic flow between the farm-installed equipment and the server.

Linode – is a web hosting and cloud provider that registered the web application in the DNS server and granted control to perform the specific features of the app.

Network Video Recorder (NVR) – is an electronic device which stores the playback videos of the cows.

Object Overlapping – is identified event by the detection system, in which the two subjects' (cows) bounding boxes overlap each other.

Surface area – is the solid floor (ground) where the subjects roam, walk, or rest upon in the barn.

System Unit – is an electronic system specifically designed to perform real-time monitoring and data accumulation of the cattle activity.

Chapter 2

Review of Related Literature and Studies

2.1 Conceptual Literature

2.1.1 Dairy Farming and the Cattle Industry

2.1.1.1 Dairy Farming

Dairy cattle, which usually have a bodily trait of mammals, are bigger than normal beef cattle. The benefit of dairy cows is only the maximum possible production of milk. The best dairy cattle are therefore classified as long term, high quality milk-producing, and highly productive bovine animals. When the ambient temperature increases, the cow's body tries to change their physiological and metabolic functions for core temperature regulation. Their high metabolism and reduced water preservation mechanism in the kidney and stomach tract are particularly vulnerable to an increased environmental malaise than that of other ruminants. The environment will naturally affect the dairy cattle physiologically like blood pressure, heart rate, metabolism, breathing rate and the core body temperature. Cattle stamina depends on certain factors in physical changes such as age, weight, gene and species. [6]

For thousands of years, milk farming has been part of farming. Especially milk cows are grown to produce large amounts of milk. Milk cows are typically *Bos taurus* species. A calf must be born every year for the dairy cow to produce 10 months of milk. They are usually inseminated artificially within three months.

Dairy cows can generate very high milk yields only for an average of 3 years after which they are slaughtered and normally use meat for beef. [7]

A cow may live for about two decades, but on average, it will be burnt in commercial systems at the age of six. From 2 to 3 years old, she can give birth. Dairy cows have a social structure and communicate with each other through touch, smell, voice, and body language. It is assumed that 50-70 various cows can be identified. Cows maintained on natural pastures of various vegetation types will differ in feeding behavior and surf the trees from leafy trees on twigs. Cattle are highly motivated to seek food and drink six to ten hours a day. They are also strong enough to rest and lie in a day that enables them to ruminate for long periods of time. [7]

2.1.1.2 Cattle Industry

From 85 to 95% of total livestock productions in backyard systems are increased in the Philippines. Many advantages come from small-scale livestock production. The cattle raise on a farm facilitates the integration of crops, trees and the cycling of soil and nutrients. Non – human crop residues can be converted to foods like milk and meat. Wastes as manure can also be added to the soil, so that high quality crops are fertilized. In general, farmers in backyard systems raise between one and five cattle heads. [8]

According to the Philippine Statistical Authority, an overall livestock production volume of 75.92 thousand tons, live weight, was projected for the fourth

quarter of 2018. It was 0.33 percent below 76.17 thousand tons of live weight in the previous year.

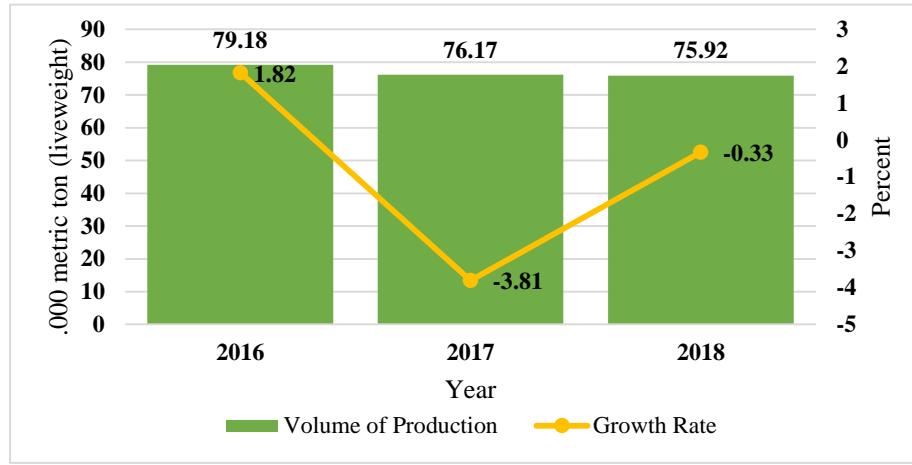


Figure 1: Volume of Cattle Production in the Philippines,
as of December 2018. As illustrated in [4]

In the fourth quarter of 2018, the majority of regions reported production drops. Caraga (28.67 %), East Visayas (8.82 percent) and SOCCSKSARGEN (8.65 %) among the regions recorded a major decline compared to their production levels in 2017.

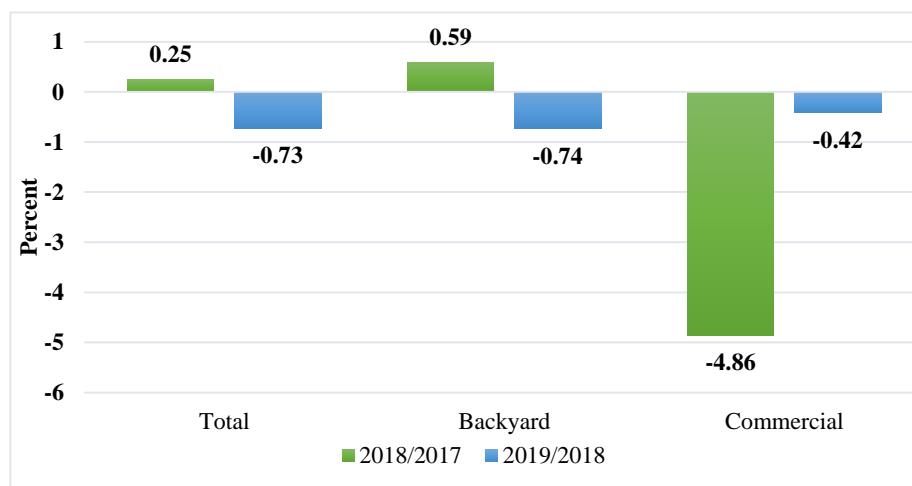


Figure 2: Changes in Cattle Inventory by Farm Type in the Philippines,
as of January 1, 2019. As illustrated in [4]

The total stock of cattle was 2.54 million heads as at 1 January 2019. It was 0.73% less than the inventory of 2.55 million heads in the previous year. Both farm types reported decreases in inventory. Stocks in backyard farms recorded a decrease of 0.74 percent while commercial farms by 0.42 percent. [5]

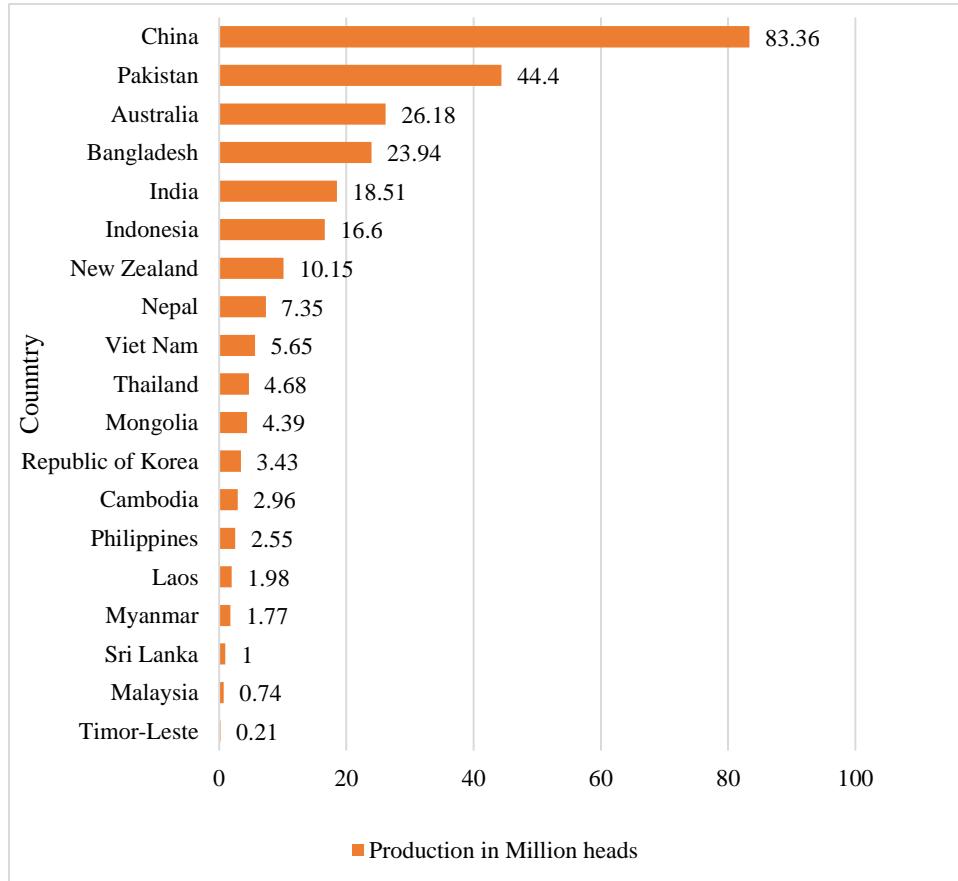


Figure 3: Cattle production in the Asia Pacific region in 2017, by country (in million heads). As illustrated in [5]

Compared to other countries in Asia and the Pacific, the Philippines is one of the least cattle producing countries. As shown from the figure sourced from statista.com, in 2017 the Philippines recorded 2.55 million cattle heads but is still ranked six from the last as compared to the other countries in the statistics.

2.1.2 Estrus Cycle

The estrus cycle is the repeated behavioural changes in most mammalian females induced by reproductive hormones. It starts in females after sexual maturity and is interrupted by anaesthesia or pregnancy. Estrus cycles typically last until death. Bloody discharge are often mistaken as menstruation for some animals. It is ideal for investigating change during the reproductive cycle because of the short cycle time of cows. The cycle controls cow breeding achieves high levels of fertility, schedules production on specific dates, the time of gestation and the development of embryos at certain ages. Proestrus, Estrus, Metestrus and Diestrus are the cycle of Estrus which can be determined according to vaginal smoothing cell types. [9] [10]

At birth, domesticated cows have a complete complementary oocyte (egg) on the surface of their ovaries containing various primordial or primary follicle. No externally perceptible proof of ovarian behaviour appears during the first growth period till the animal reaches the physical dimensions necessary for its successful fertilisation and gestation. The synchronization of the suitable gonadotropin control hormone in the anterior pituitary gland and the local regulation of the ovary currently enables the full ripening and ovulation of the follicle. The subsequent smaller groups of selected follicles then start their final growth and growth to maturity, to start the associated cycles. Domesticated female animals are all but promiscuous, showing only remote and generally short stages of sexual activity (heat or estrus). Secreted in tissues making the walls of growth follicles by specialized endocrine cells, estrogen stimulates physical and comportmental signs of estrus. Thus, under natural conditions, women become sexually driven and open only when ovulation is forthcoming, and conception is

possible. Non-pregnant, healthy dairy cows and mature heifers sexually shows estrus periods regularly thru the year, unless pregnancy or pathology suppresses follicular development and ovulation, thereby suspending the cycle. In both intact, pregnant and even ovariectomized females, estrogen injections can give rise to similar signs, without follicular ripening and ovulation. Unfortunately, the effect that accompanying the treatment of estrogen sometimes goes unnoticed by veterinarians or herds. [11]

2.1.2.1 Proestrus

Pro-estrus is the preliminary stage of ovarian follicles, during which they mature in the anterior pituitary, under the influence of a follicle stimulating hormone. It begins with a bloody flux and a mild vulva swelling. It takes about nine days, but may vary by two or three days. The cow can attract bulls during this phase, but she's not ready to breed and refuses to progress. In general, estrus lasts 18 to 21 days for female mammals. [12]

2.1.2.2 Estrus

It is the period of the sex life of female mammals during in-heat period and once ready for a male mate. During the breeding season of a species, one or more estrus times can occur. Uterine lining thickens in preparation to hold fertilized ovules before ovulation. As the uterine tissue grows to its height, it has the greatest receptivity, the estrus period. Some animals are monestrus, with only one heat during a season of breeding. Other animals are poly-estrus, wherein they are often in-heat during the breeding season if not impregnated. Males may identify an in-heat female through smell, but only at this part of her cycle will she emit

pheromones. During estrus, the female genital area may be swollen and she can show that she is ready to mate through various behavioral signals. [12]

2.1.2.3 Metestrus

This is the luteal phase of the breeding cycle in females of mammals, following ovulation. It is also characterized by the decrease in the secretion of oestrogen, development of corpus luteum, and an increased progesterone. The reproductive tract assumes normal condition if fertilization and implantation do not occur. [12]

2.1.2.4 Diestrus

The rest period between the estral periods of animals. The female rejects the male, the blood levels of estrogen are minimal, and the progesterone levels are high. This provides a physiological state in the uterus that is most conducive to the implantation and growth of the developing fetus. Diestrus is terminated by luteolytic factors such as the endometrium-secreted prostaglandin if pregnancy does not occur. [12]

2.1.3 Breeding

Animal breeding concerns selective breeding which only involves men and women who have met a qualitative breeding criterion. Also, its purpose is to enhance the population in a certain direction genetically. People intent to choose the best animals according to their trait and use them of the next generation of offspring. A shift in population average from a generation to the next is thus caused by selective breeding.

[3]

Different hormone treatments are commonly used in cattle breeding to improve fertility and breeding progress and to reduce the number of days without pregnancy. Superovulation is a hormonal treatment that affects the ovarian function by increasing the number of primordial follicles recruited and the growth of dominant follicles and by changing the number of ovulations and peripheral hormone concentrations. In addition, evidence shows that superovulation not only increases the level of serum *estradiol* but also the behavior of estrus. [3]

2.1.4 Heat Detection, Artificial Insemination, and Timing of Insemination

2.1.4.1 Heat Detection

The most restrictive measure for reaching a high conception rate in dairy herd is the proper heat detection to achieve an appropriate time of insemination. Ineffective heat detection reduces the herd fertility status. Estrus manifestation is caused by Central Nervous System (CNS) effect of estrogen. The best reliable sign of the estrus is the cow standing still to be mounted. By standing heat, ovulation time is well estimated. The perception of animal heat, before a 50-day period of partition has elapsed, will make heat detection more efficient and accurate. Different signs are examined carefully to detect heat. Factors that influence estrus expression should be monitored thoroughly. Heat detection aids are essential instruments in order to efficiently manage reproduction. The following are heat detection techniques: Vaginal pH; Vaginal Smear; Measurement of vaginal conductivity using probe; Fern pattern of cervical mucus discharge; Endometrial biopsy; Cervical mucus glucose content; Uterine tone; Change in parlor behavior; Milk yield fluctuation; Temperature measurement; Heat expectancy charts; Tail

painting; Chin ball device; Use of marker animals and bull parading; Bio-stimulation; Electronic heat mount detector; Heat patch; Pedometer; Video camera and recording using CCTV; Milk progesterone Detection; Infrared spectroscopy and magnetic resonance spectra; and etc. [13]

2.1.4.2 Artificial Insemination

A method of manually placing the semen in the female reproductive tract other than natural mating is called Artificial insemination (AI). To control the spread of disease, AI was developed in animals. It prevents it by separating animals with suspected pathogens to other animals for mating and by avoiding direct contact between animals. Transmission of bacterial diseases can also be prevented using semen extenders containing antibiotics. Artificial Insemination has significant benefits for dairy cattle which are: the increased rate of genetic development and production, the prevention of diseases that can be transmitted when animals are in direct contact, and the possibility of breeding between animals from different locations. Through physiological, behavioural, or physical abnormalities, breeding can occur.; In short, AI is a powerful tool which can be used to conserve rare breeds or endangered animals when linked to other biotechnologies for reproduction such as sperm sexing and sperm cryopreservation. But even so, some males, even without clinical signs of disease, shed virus in semen. Also there are some pathogens in semen extenders that are resistant to antibiotics. [13]

2.1.4.3 Timing of Insemination

For more than 50 years, the timing of AI was investigated relative to the estrus stage. Several studies were conducted during the early development of the AI industry to determine the optimal time of AI. These studies show that from mid estrus up to a few hours following end of the standing behavior, maximum conception rates were achieved, which led to the a.m.-p.m. guideline for management. In this AI Guideline the estrus cows during the AM are to be submitted to AI during the next PM and estrus cows during the PM to AI during the next AM. Two recent extensive field tests by professionals with IA technicians have demonstrated the AI pregnancy rates following the AM-PM Guideline, using once daily AI schedules. The optimum AI time was forecasted by the use of mathematical models based on pedometer readings and 171 cows' rectal palpation. After increased pedometer activity, the risk for pregnancy was higher between 6 and 17 hours, while the calculated optimum AI was 11.8 hours. Researches designed to assess the ideal time for AI have, unfortunately, two technical deficiencies: few cows for valid comparisons statistically and lack of proper estrus knowledge due to low frequency and lack of efficient methods for estrus detection.

[2]

2.1.5 Visual Monitoring

A video imaging technology-based dairy cow estrus detection system was developed, in which video dynamic energy analysis is performed and moving-blocks in the image was discovered. These blocks are processed with a binary image to define cow's length within a rectangular framework. When the cow's specific behaviour is

estrus, the image length of the dairy cow will rise to about two cow lengths, first due to the initial contact of two cows and then shortened due to mounting behaviour, to around 1.5 cow length. The rule of identifying cows under estrus is to detect these change in length. The events according to the rules are stored on the computer and recorded as videos. [14]

2.1.6 Internet of Things

The Internet of Things (IoT) is a key change that practices and redefines business processes across different sectors of the society and industry. The IoT is unique in the form of integration of actuators to regulate their state and sensors to detect physical properties as top-class citizens of the Internet. IoT basically supports smart operations that use software to gain insight into the real world with real world assets and machinery. [15]

IoT solutions require accurate system architecture directives and best practices to ensure systems can be constructed efficiently and that interoperability can be ensured both within and on a definite level of implementation. It applies to a variety of use cases in a variety of industries, companies, consumers and the general public and has a profound impact on the way markets develop. [15]

The IoT technology being implemented in this study uses the full TCP / IP stack and microcontroller features of Arduino, an ATmega328P-based microcontroller, as well as the Wi-Fi module ESP8266, which acts as an MQTT client. The MQTT server is then issued with a command on the ESP8266 module. This makes an integrated IoT

application possible, which receives an estrus detection notification warning that shows the identification number, current and expected date and time of in-heat detection. [15]

2.1.7 GSM/GPRS Module

The GSM is a widely used digital mobile network by mobile users in most countries. It is a system more widely used compared to other technology, TDMA and Multi-Access Code-Division (CDMA). The GSM converts and sends data, then sends in its own time space a channel with two additional user data streams. It works on a 1,800 MHz frequency or 900 megahertz (MHz) band. GSM is a wireless mobile telecommunication that comprises: General Packet Radio Service, High-Speed Circuit-Switched Data, Universal Mobile Telecommunications Service and Enhanced Data GSM Environment. [16]

The GSM network has four different parts: the BSS or base station subsystem, the mobile station or device, the OSS and the NSS or network switching subsystem. The mobile device is connected via its hardware to the network. The SIM card enables the network to identify mobile user information. [16]

The BSS handles mobile traffic with the NSS. BSS involves of two main components: the BSC or Base Control Station and the BTS or Base Transceiver Station. The BTS includes devices that communicate with mobile phones, mainly radio receivers and antennas.

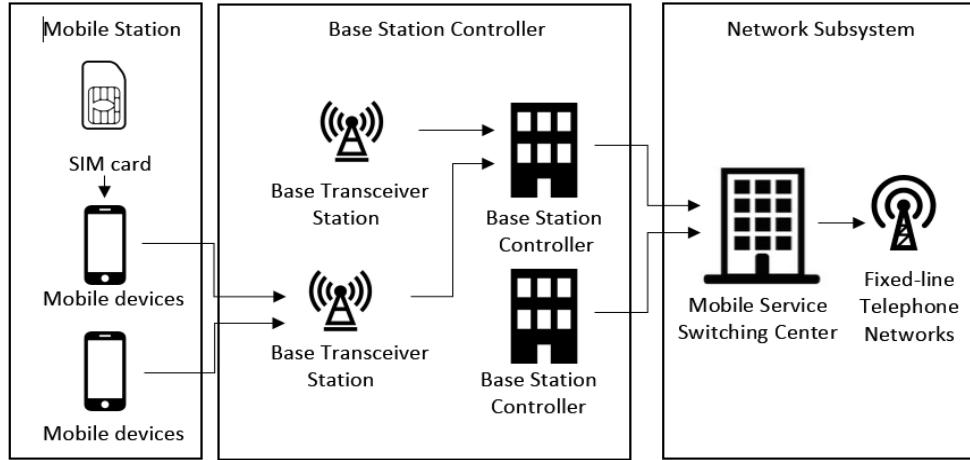


Figure 4: Representation of the Global System Network. As illustrated in [16]

The BSC is the intelligence behind the BTS's on the other hand. It communicates with a group of BTS's and controls them. The NSS is the core network that tracks callers' locations to enable cellular services to be provided and is owned by mobile carriers. The NSS has a wide range of components, including home location register (HLN) and mobile switching centre (MSC). Call routing and short message service (SMS) and SIM card authentication and storage of caller account information are the functions of these components.

Many GSM network operators' agreements with other foreign GSM operators allowing their subscribers to use their phones even if they are traveling to other countries. SIM cards with home network access configurations can be switched to those with metered local access, reducing roaming costs significantly, without any service reductions. [16]

2.2 Related Studies

2.2.1 Image Processing

2.2.1.1 A Motion and Image Analysis Method for Automatic Detection of Estrus and Mating Behavior in Cattle

The projected method in this study was based on cattle's inherent heat behavior. The region of interest was first identified throughout the image where extreme levels of movement arose throughout the said video frames. Then the segmentation of the foreground divides the target from the region of interest into the individual frame. The mounting behaviors have been determined by changing the length of the moving object. If an estrus event is ever reported, the identified event is saved in the computer, which is then confirmed. It is necessary for the farmer to see video frames that is recorder for about 2 minutes a day using the method to verify that the detection results are real estrus events. [17]

2.2.1.2 Faster R-CNN: Towards Real-Time Object Detection with Region Proposal Networks

In this research, the proponents proposed a Region Proposal Network (RPN) that links full-image convolutional features with the detection network, consequently allowing cost-free region proposals. The RPN is a complete convolutional network that concurrently forecasts object bounds and object scores at each point. This network is trained end-to-end to produce high-quality regional proposals that are used by Fast R-CNN for detection. [18]

2.2.1.3 Cow Body Condition Score Estimation with Convolutional Neural Networks

In this research, the proponents investigated cow body condition score estimation through convolutional neural networks and realized the difficulty for a convolutional neural network classifier to directly specify the categories that have very similar features in the dataset. To address this problem, the region that contains discriminative features and inputs the region into a complete classifier is identified. As a result, the proposed method could improve the precision of cow body condition score estimation in comparison with applying a single classifier directly and could achieve 64.55% and 94.5% accuracy within 0.0 and 0.5 units of difference from true values, respectively. Also, a cascaded network specialized to sub-problems would work if a single network's detection performance is insufficient. [19]

2.2.1.4 SSD: Single Shot MultiBox Detector

In this research, the proponents devised a method for detecting objects in images utilizing a single deep neural network. The Single Shot Detector (SSD) discredits the output space of bounding boxes in an array of default boxes over different aspect ratios and scales per feature map location. At the time of prediction, the network produces scores for the inclusion of each object category in each default box and creates modifications to the box to best match the shape of the object. Also, the network incorporates predictions from several feature maps with different resolutions to automatically manage objects of varying sizes. [20]

2.2.1.5 Automatic Control of PTZ Camera Based on Object Detection and Scene Partition

In this study, a method of automatically controlled PTZ camera for the partitioning of image scenes and detection of object are presented. Object located and detected using the method called target detection. This approach is based on Gaussian mixed model (GMM). Applying this to pedestrians resulting to an automatic, simple and feasible method. [21]

2.2.1.6 Inception Single Shot MultiBox Detector for object detection

In this research, the proponents introduced an improved SSD algorithm to enhance its classification accuracy without affecting its speed. In this model called Inception SSD (I-SSD), Inception blocks were adopted to replace the extra layers in SSD. The proposed network can catch more information without increasing complexity. To develop such a method, the batch-normalization (BN) and the residual structure in our I-SSD network architecture were utilized, along with an augmented non-maximum suppression method to overcome its deficiency on the expression ability of the model. [22]

2.2.1.7 A comparison of convolutional object detectors for real-time drone tracking using a PTZ camera

In this research, the proponents examined various convolutional object detectors for real-time drone detection and tracking system using a Pan-Tilt-Zoom (PTZ) camera. In the drone detection and tracking system, an object detector is used to identify whether an image from the PTZ camera contains a drone, and our system

generates PTZ actions to track the detected drone. To detect small-size drones in real-time, an appropriate object detector should be selected. This research analyzes the speed and accuracy of six convolutional object detectors such as SSD mobilenet, SSD Inception, R-FCN, Faster RCNN Resnet, Faster RCNN Inception-Resnet, and YOLOv2. After considering the results from experimentations, YOLOv2 performed best at the detection and tracking of the drones. [23]

2.2.1.8 CNN based region proposals for efficient object detection

In this research, the proponents devised a high-confidence region-based object detection framework that increases the classification performance with lower computational power. The proponents considered a deep network that activates the semantically meaningful regions for object localization to formulate the framework and trained a set of class-specific binary classifiers for object label predictions. These activated regions are used as inputs to a convolutional neural network (CNN) for deep feature extraction. The new region-based detection technique significantly diminishes the computational complexity and enhances object detection's performance. [24]

2.2.1.9 Cow behavior recognition based on image analysis and activities

This research detects salient object from an object contour view and proposes to use the random forest algorithm to measure the patch rarities, at the same time, get its similarities among the patches. A global rarity map was calculated based on the patch's rareness all over the whole image. The salient object's contour approximation was extracted based on its map rarity with the help

of an active contour model. A local saliency map was attained using the patches' similarities inside and outside of the contour. Lastly, a local map was refined using image segmentation. [25]

2.2.1.10 The automatic detection of dairy cow feeding and standing behaviours in free-stall barns by a computer vision-based system

In this research, the proponents modelled an object detection framework similar to the Viola-Jones algorithm using a multi-camera video recording system to capture panoramic top-view images of the cowshed. The framework utilized 656 positives and 384 negatives (image samples) for training, having dimensions of 227 by 102 pixels, and 230 by 100 pixels, respectively. The ability of the system to detect cow behaviors such as feeding and standing activities was shown through high values of its sensitivity of which are approximately 87% and 86%, respectively. In conclusion, the classifier can detect cows and their behaviors in real-time. [26]

2.2.1.11 Deep Residual Learning for Image Recognition

In this research, the proponents reformulated the layers as learning residual functions based on the layer inputs, instead of learning unreferenced functions, and provided comprehensive empirical evidence proving that such residual networks can gain accuracy from considerably increased depth. Based on the results, the proposed method produced good generalization performances on recognition tasks on Pascal VOC and COCO datasets. [27]

2.2.2 Internet of Things

2.2.2.1 Implementation of Smart Infrastructure and Non-Invasive Wearable for Real Time Tracking and Early Identification of Diseases in Cattle Farming using IoT

In this research, the proponents aimed to produce smarter farming of cattle, use non-invasive wearable that is with the help of the Internet of Things, tracks biological and physiological activities of cattle. This device is meant to discover disease before visual signs and detects abnormalities, calvin time insemination, emergency handling, illness, and location tracking. Even the sink node, accountable for smarter and safer infrastructure, is present in the architecture design of the device in the cloud. Readings of the entire sensor are sent to the thinkspeak cloud, this enables the remote access and line graph of each cattle' characteristic of health, daily water, smoke level in farm, and electricity usage possible. [28]

2.2.2.2 Internet of Things (IoT), Mobile Cloud, Cloudlet, Mobile IoT, IoT Cloud, Fog, Mobile Edge, and Edge Emerging Computing Paradigms: Disambiguation and Research

In this research, the proponents clarified various developing computing paradigms connected to the cloud and mobile computing research areas. These consist of mobile clouds, cloudlet computing, fog and edge computing, mobile IoT and IoT cloud computing, participatory and opportunistic sensing, mobile crowdsensing and crowdsourcing, Mobile Cloud and Edge Computing (MCC/MEC), Web of Things (WoT), Wisdom WoT and Semantic (W2T/SWoT/),

Wisdom WoT (W2T). Aside from the previous topics, other related areas were namely, pervasive and ubiquitous computing, Internet of and Underwater and Nano Things (IoUT/IoNT). [29]

2.2.2.3 Taking Arduino to the Internet of Things: The ASIP Programming Model

In this research, the proponents proposed solutions for the issues concerning the limitations of Arduino microcontrollers as it used in IoT. The suggested model is called the ASIP - Arduino Service Interface Programming. It first, provides an abstraction that will ease the capability improvement of the micro-controller. Second and last, this aids network boards that used the following strategies: messaging based on MQTT, bridging devices, discovery services, socket connections, etc. The code implemented on the boards of Arduino, with libraries in Erlang, Python, as well as Java is open-sourced. [30]

2.2.2.4 Taking MQTT and NodeMcu to IOT: Communication in Internet of Things

In this research, the proponents presented several forms of service as a medium in IoT – Internet of Things.. The two forms used are serial USB and MQTT protocol - Message Queuing Telemetry Transport and these acts as a medium for transmission and way to connect to the internet as it deploys to an ESP8266-12 – Wi-Fi module respectively. The concept of publisher-subscriber was used, wherein MQTT is the broker/server that will be in charge of dissipating messages towards specific clients. [31]

2.2.2.5 Smart Disaster Notification System

In this research, the proponents addressed the natural disasters such as flood strike and cyclone through their android application that will provide the finest routes of nearest shelter by voice alarm, voice call, or SMS. The app uses shortest technique based on partition in providing place for the evacuation. Necessary information of upcoming disasters that some websites offer will be easily accessed thru this technology. Therefore, essential instructions are also given as well as alert for possible disaster like wildfire, flood, heavy rain, etc. [32]

2.2.2.6 Dairy Cow Health Monitoring System Based on NB-IoT Communication

In this research, the proponents developed a system that discovers the irrational changes of the cows' physique and gait to determine its estrus status and inform the end-users accordingly through an android application. Consequently, the system diminishes the farm caretakers' pressure and improves the economic status of the farm. With the use of image recognition, the system was able to accurately detect the standing-heat activities of the cows. [33]

2.2.2.7 Building an IoT Framework for Connected Dairy

In this research, the proponents proposed an electronic monitor framework that allows dairy farms to improve its operational efficiency and lessen the economic impact of heat stress on cows through Smart Connected Objects. The connected objects provide predictions and forecasting insights that enhance farm

operational management and provide preparations on any unprecedented weather-related abnormalities. [34]

2.2.2.8 IOT Based Monitoring System in Smart Agriculture

In this research, the proponents utilized Internet of Things technology to monitor the temperature and humidity in agricultural fields through CC200 single chip-embedded camera. The camera captures image frames and sends it through MMS to the end-users via Wi-Fi. [35]

2.2.2.9 Connected Cows: Utilizing Fog and Cloud Analytics toward Data-Driven Decisions for Smart Dairy Farming

In this research, the proponents developed a project that specializes in determining the lameness of cows and potential diseases at an early stage. The project was set up in a farm that consists of 150 cows and showed its detection alerts up to three days before the manual observation of farmers. [36]

2.2.2.10 Cow Behavioral Recognition Using Dynamic Analysis

In this research, the proponents proposed a method that utilizes dynamic analysis for the identification of abnormal cow behaviors. The Image characteristic analysis reads the abnormalities that may affect the production of dairy cattle which consequently improves the accuracy of behavior identification, lessens the pressure of farm caretakers, and raises the farm management efficiency and breeding. [37]

2.2.3 Web Application

2.2.3.1 Context-oriented web application protection model

In this study, another view of vulnerabilities in web application is concern because of the existing different protections contrary to attacks, which have difficulties in the implementation process. This becomes more complicated as many programming languages involved in the development of web application that contribute to a higher possibility of mistakes in programming. Thus, presented model of web applications is unified extensible context-based, which can be applied in implementing a universal protection for web application against attacks. [38]

2.2.3.2 Innovative Mobile Cloud Strategy that Supports Responsive Mobile Web Apps in Education

A unique and effective strategy for mobile cloud, that supports web apps' responsiveness, is introduced in this research. Even components and technical values of this innovative strategy, which fit the four goal of SDG - Sustainable Development Goals are discussed. The developed model provided comprehensive and actionable cloud strategy makes it become a responsive web apps that offers Learning as a Service through a private cloud whenever properly implemented. [39]

2.2.3.3 Intelligent Web Push Architecture with Push Flow Control and Push Continuity

A smart push system with feedback that enables flow control fit for web-supported IoT and mobile devices is presented in this research. The component of the gateway server and client gateway is incorporated into the push architecture. It

is controlled in a way that notifications are delivered whenever the user is obviously about to open it. And to implement this control, features in web push notification are enhanced, which will surely boost the click rate of users. [40]

2.2.3.4 Modern and Responsive Mobile-enabled Web Applications

Innovation of web application that is simple, developed with the latest framework, and has a user friendly libraries and tools is the main goal of this study. This application will only be a single page providing user a mobile-app-like experience which also means, easy conversion into mobile app in the future. The software product produced is beneficial to a company as it offers modified features and faster pace. [41]

2.2.3.5 Computer Vision based drowsiness detection for motorized vehicles with Web Push Notifications

In this research, the proponents proposed a computer vision-based drowsiness gadget for automobiles with web push to inform the driver before the occurrences of possible accidents and prevent driving-related accidents. Eye boundaries defined by 6-coordinates in the live video stream will be detected using the pre-trained model of the driver's face. An alarm will be activated and a web push will be sent with several suggestions of nearby coffee shops to improve the driver's alertness whenever the calculated Ear Aspect Ratio is less than the established threshold. [42]

2.2.3.6 A Low-Effort Analytics Platform for Visualizing Evolving Flask-Based Python Web Services

In this research, the proponents presented a Flask Dashboard library, which aims to address the lack of support on the web developers to gain insight into the developing performance of Flask service. The Flask Dashboard is an ease-of-use library that can be integrated into the pre-existing application that provides several visualization perspectives. [43]

2.2.3.7 Application Research of Embedded Database SQLite

In this research, the proponents manifested how embedded databases, specifically SQLite, meet the demands of data management of a particular system. Upon the analysis of SQLite's characteristics, not only GUI design was obtained but also the function of API and internal structure ARM-Linux platform was attained. This includes the transplant process, application development, and cross-compiling features of the simulation environment. [44]

2.2.3.8 The logistics network system based on the Google Maps API

In this research, the proponents discussed the Google Maps API's features and functions, and a logistics network system in relation to the advancement method of WebGIS. The study proved that through Google Maps API, users can easily embed a map on a logistics web page and if combined with WebGIS can make a visualization application type of logistics network system. [45]

2.2.3.9 GNU/Linux shell access through a web-browser for an embedded Linux e-learning system

In this research, the proponents described a novel way to expand e-learning techniques in the field of embedded Linux education through the use of open-source software technologies and through the use of normal web browsers to facilitate learning. The key element of this system is access to the Linux shell of the embedded device through a web browser. [46]

2.2.3.10 Selecting Visualization Web Services Based on Visualization Characteristics

In this research, the proponents presented a selection of web visualization services under visualization characteristics. To fully provide a review of the algorithm, the proponents considered the architecture of service to learn its visualization domain and the selection of visualization services' novel algorithm about visualization characteristics. [47]

2.2.3.11 Design Patterns and Extensibility of REST API for Networking Applications

In this research, the proponents analyzed issues that can be encountered in hypertext-driven navigations. The scope of the study has three aspects; the first is REST chart, a service description framework, and language that uses to design extensible REST API; second, the importance of the pattern in the REST chart for navigation of large scale API in REST Architecture; third, addressing of the main issue which affects the application using REST API, presenting the user side in

reducing the overhead of hypertext-driven. The effectiveness of the proposed approach is verified in different ways. Based on the result, it shows that on average, the proposed study reduces the major problem using the hypertext REST API by 66% and the flexibility and extensibility of REST API are maintained. [48]

2.2.3.12 A study of the effectiveness of usage examples in REST API documentation

In this study, the proponents discussed the benefits of giving usage examples for documentation by the REST API developers, performed a study to understand the issues encountered by the users during the development of the REST API without using examples, and assessed the users' faced problems in terms of correcting data types, format, headers, and body. As concluded, using the documentation allows the users of REST API to avoid errors and have higher success rate and satisfactory results. [49]

2.2.3.13 Design and implementation of living streaming system based on multi-service nodes collaboration

In this research, the proponents presented the structure and application of live streaming using multi-service nodes, and coordinator nodes to gather its data and conduct distribution of the loads in the system. The proponents utilized Real-Time Messaging Protocol in the collection terminal to act as a protocol in transmitting the videos to nodes and transmit the data to the output nodes in actual time. The clients can watch videos on their smart devices. [50]

2.2.3.14 Web Services for Water Systems: The iWIDGET REST API

In this research, the proponents developed "iWIDGET" which has a major role in terms of smart water meters in making it more efficient in terms of system operations and consumption. The proponents also designed a web application through the Representational State Transfer (REST) in which the user can easily manage the prototype and user interface by using different devices. [51]

2.2.3.15 Archive WEB API: A web service for the experiment data archive of Wendelstein 7-X

In this research, the proponents developed Wendelstein 7-X which has a high standard Control and Data acquisition (CoDaC) system for the study of stellarators. The proponents use the database of this application for the data storage. Not to mention that its API is based on Representational State Transfer (REST) with the use of HTTP as the protocol. The data formats can be read as JSON or PNG, and the API is also possible for importing data to ArchiveDB. [52]

2.2.4 Other Related Literature

2.2.4.1 Securing IoT Devices and Securely Connecting the Dots Using REST API and Middleware

In this research, the proponents presented the part, relation, and the role of REST API in the Internet of Things wherein the technology has recording and counting capabilities. The presentation of the new version of IoT applications has many threats in terms of data privacy and security. That is why securing an IoT application and system is necessary for maintaining secure data through transmission via cloud and networks. The proponents also provided details in REST API to guide the user on how to properly use it for secure transmission and preservation of data in connected devices, applications, and cloud. [53]

2.2.4.2 Expression of Estrus Before Fixed-time AI Affects Conception Rates and Factors that Impact Expression of Estrus and the Repeatability of Expression of Estrus in Sequential Breeding Season

To analyze the effect on subsequent fixed-time of detected standing estrus, several AI protocols were used in this study. This proves that the expression of estrus causes an intense impact on the overall success of pregnancy. Therefore, factors affecting the expression of estrus were also defined, resulting in a conclusion that estrus-cycling status and BCS have the ultimate influence. [54]

2.2.4.3 Design and implementation of living streaming system based on multi-service nodes collaboration

In this research, the proponents presented the structure and application of live streaming using multi-service nodes, and coordinator nodes to gather its data and conduct distribution of the loads in the system. The proponents utilized Real-Time Messaging Protocol in the collection terminal to act as a protocol in transmitting the videos to nodes and transmit the data to the output nodes in actual time. The clients can watch videos on their smart devices. [55]

2.2.4.4 Control of a remotely operated quadrotor aerial vehicle and camera unit using a fly-the-camera perspective

In this research, the proponents presented the remotely controlled video camera on a camera manipulator and vehicle on a mission-centric way of controlling and demonstrated the simulation results with the use of a controller. The quadrotor and the UAV model are combined with a camera created for a single system that can be presented with an actual camera view. The closed-loop controller displays the tracking results through the globally uniformly ultimately bounded (GUUB). [56]

2.2.4.5 A precise high-speed tracking and pointing control system of camera based on FPGA: Closed loop feedback control system to control the remote sensing camera lens moving

In this research, the proponents demonstrated the feasibility of a camera that can be remotely controlled based on FPGA with accurate speed and pointing

control system and can be angularly changed with the set sensor in the camera lens. The system uses a step motor and closed-loop feedback so that the speed must be accurate and stable. [57]

2.2.4.6 A web-based, real-time video surveillance system by leveraging PTZ cameras

In this research, the proponents proposed to leverage pan-tilt-zoom (PTZ) cameras and developed a real-time surveillance system wherein the PTZ cameras can rotate in a horizontal plane by panning and in a vertical plane by tilting and adjust the focal length to control the cameras dynamically for the emergent area. The proponents also implemented the system with a web service to help users easily define the emergent area and preview the video of cameras remotely. [58]

Chapter 3

Methodology

3.1 Theoretical Framework



Figure 5: The Theoretical Framework of the Study

The figure shown above depicts the relevant studies which closely support the proposed research study. According to research, the standing heat or mounting behaviors of cows are considered one of the most prominent estrus signs [13]. In observance of the research findings in [59], a surveillance system can be an effective tool to detect standing

heat activities of cattle. But to efficiently monitor the activities of the cattle, the proposed system will be integrating neural networks as object detectors and bounding box corner predictors such as the Faster R-CNN and Single Shot Detector [18, 20], and will be developing a responsive web application [41] which can deliver push notifications [42], guide the user in decision-making through a Google Map-based Locator [45], and visualize cow-related information through data visualizations and analytics [47]. For remote monitoring and notification features, the smart system will be integrating the Internet of Things technology through the use of multi-directional network PTZ cameras [23, 58] and microcontrollers - Arduino and GSM Module [35]. Understanding the capabilities and principles behind such researches, the researchers compounded each research idea into one and came up with the study entitled - EZTECT: Automated Estrus Detection System for Dairy Cattle based on Faster R-CNN with Surveillance and Notification System via Internet of Things (IoT).

3.2 Conceptual Framework

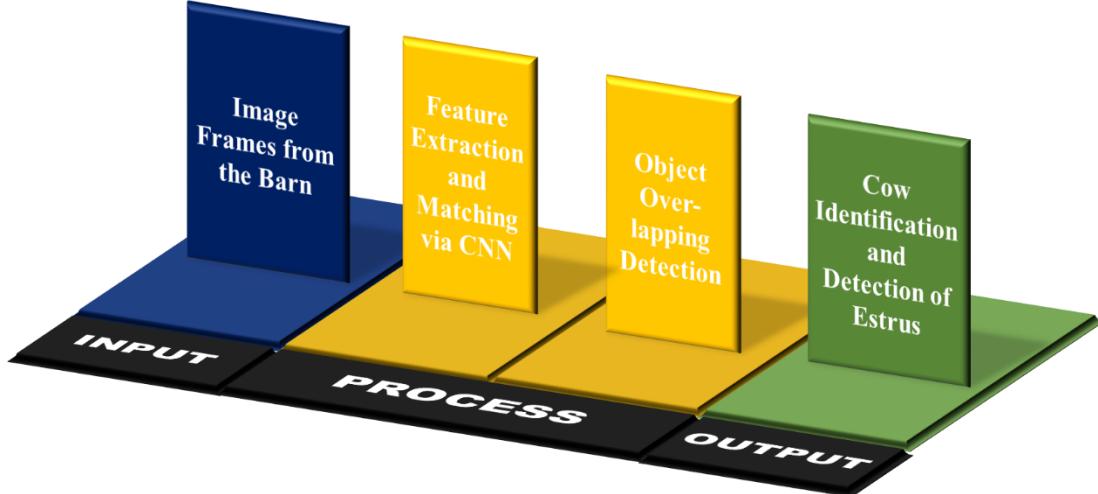


Figure 6: IPO Model for Image Processing

The figure shown above is the Input-Process-Output (IPO) model of the image processing system of the study. The input will be the frames from the live video feed of the barn acquired through the PTZ Cameras. Then, a program will process the acquired image frames to identify whether cows exhibited standing heat. This involves extracting cows' features, matching the said image features using neural networks, and visualizing bounding box predictions of the objects. Once the predicted object satisfies the object overlapping algorithm, the program will declare an estrus event.

3.2.1 Block Diagram

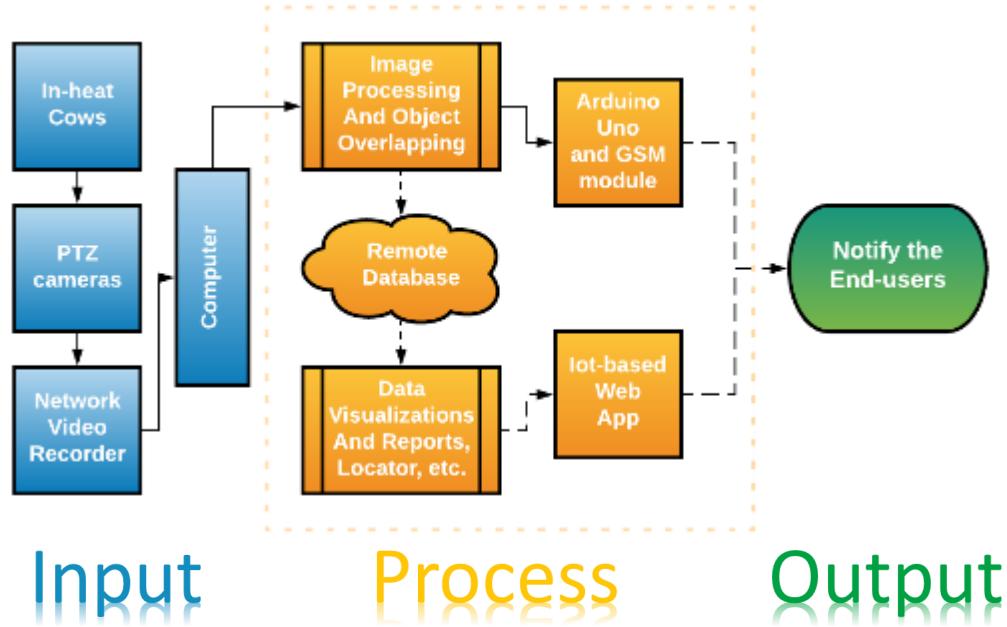


Figure 7: Simplified Block Diagram of the Proposed System

The proposed system starts with the installed PTZ cameras which monitors the cows. The NVR stores the live video feed which the user can access to perform image processing techniques. Also, this program is responsible for detecting estrus events and identifying cows that will exhibit standing heat and mounting behaviors. A database and a cloud storage store all the acquired results locally and wirelessly through the

Internet, respectively. The results contain the date and time of the detected standing heat, estimated next estrus cycle, cow IDs, and other relevant information about the cows in the barn. Simultaneously, the program will inform the end users through the Arduino compatible GSM module by sending a call alert and will send the aforementioned data from the cloud storage to the novel web application. Consequently, the IoT-based web application will provide comprehensive data visualization and will deliver push notifications to the farmers whenever the system detects estrus.

3.2.2 System Architecture

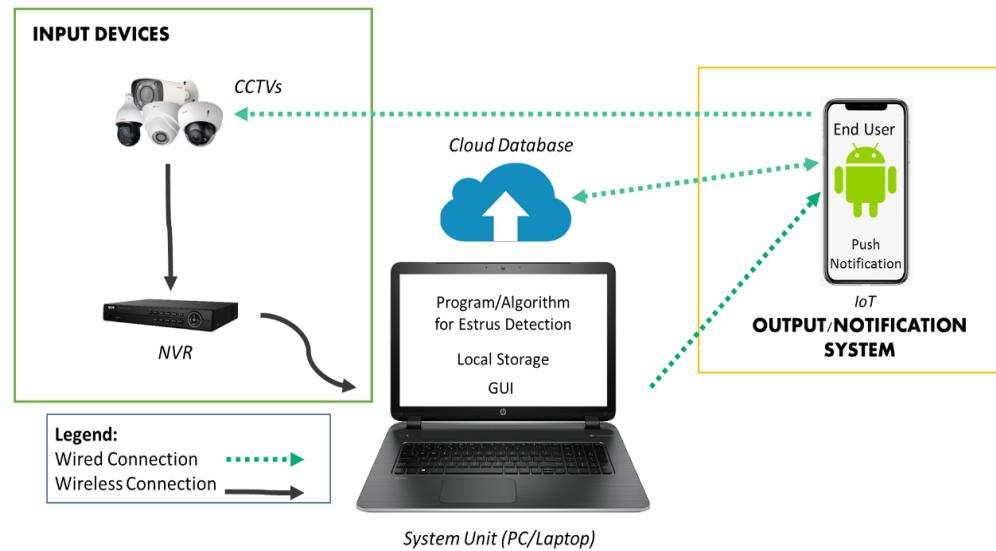


Figure 8: The Over-all System Architecture

The overall system architecture is shown above. It consists of connections between devices from the input to the output. The system consists of three major parts: the input devices, the detection system, and the output system. The PTZ cameras that serve as input devices are connected to the NVR. From this, a wired connection is established between the NVR and the main processing unit. The unit executes the

automatic detection program. Once estrus is detected, all results are stored locally and wirelessly, respectively, by the database and cloud storage. The said data will be sent to the cloud server, which can be accessed through the IoT-based web application.

3.2.3 Network Architecture

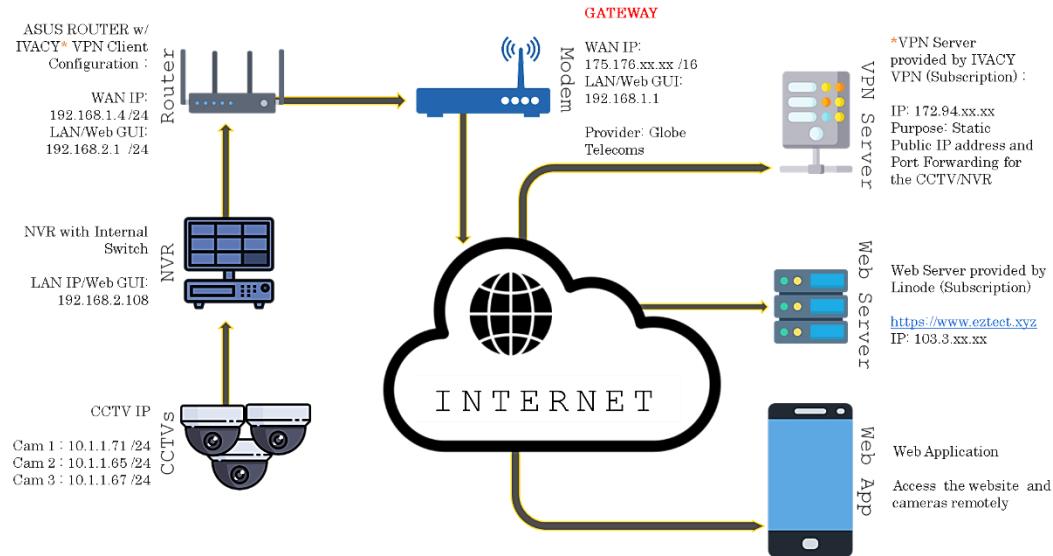


Figure 9: Network Diagram

The figure shown above is the network diagram for the project. A private network is set up on the farm which includes the connectivity between the modem, router, system unit, NVR, and the CCTVs. The 3 CCTVs are connected to the NVR using straight-through UTP cable and IP addresses are statically assigned by the internal switch within the NVR. The NVR is connected directly to the Asus Router together with the System Unit/Laptop. Both their IPs are statically assigned in the router. The router gets internet access from the modem provided by the ISP and is uses a prepaid type connection. The proponents buy prepaid load and register to ISP promos to access the internet, which in this research, the Internet Service Provider (ISP) is

Globe Telecommunications. It is wirelessly connecting to the ISP using Long-Term Evaluation (LTE) and is under CGNAT.

The project uses the Virtual Private Network (VPN). The VPN is a subscription service from Ivacy. The VPN client and its credentials are set up on the Asus router within the private network so that all devices connected to the router, even if they are accessible via Globe Telecom, are connected to the internet through VPN. These allow the private network to have a static public IP address and configurable port forwarding ports that the ISP, Globe Telecom, does not readily provide. This is necessary to gain remote access and allow data traffic from farm-installed equipment such as CCTVs, NVRs, etc. via the VPN provider by opening different ports.

The system unit running the developed detection program sends the output data by using the best routing protocol within the private network to the webserver. This web server is configured in Linode which has its public website IP address registered in a DNS server as www.ezetect.xyz. The users of this project can access the app by going to www.ezetect.xyz using a browser in any device.

3.3 Research Locale

The study was conducted in De Belen Dairy Farm at Hulo street, Barangay Bagong Barrio, San Ildefonso, Bulacan. The barn houses a water buffalo, a bull, and seventeen cows, but the number of cows subjected to surveillance and analysis is seventeen. The researchers used the corresponding measurements in the cameras' monitoring range to fully cover the cowshed and the animals.

3.4 Research Design

3.4.1 Hardware Design

3.4.1.1 Schematic Diagram

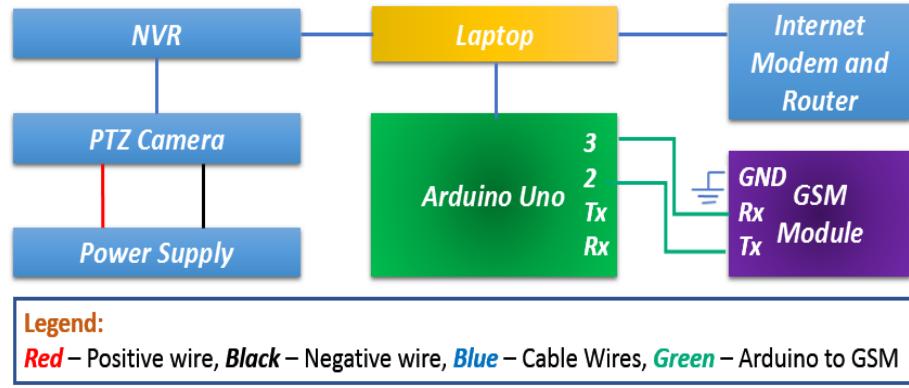


Figure 10: Schematic Diagram of the Proposed System

Figure 10 is a schematic diagram that depicts the interconnectivity of the sensors, microcontrollers, module, and other equipment. The PTZ camera will record the live video feed of the cattle activity through the coaxial cable that is connected from the power supply. The data will be transmitted from the sensors to the NVR via Ethernet cable. Subsequently, the transmitted data will be freely accessed on the database through an IoT-based web application on the system unit which also runs a program for data accumulation and surveillance. Afterward, the data will be sent to the Arduino Uno that is connected to the GSM module. Then, the Arduino microcontroller will directly send a call alert to the end users using the GSM Module, and through the internet, the data results will transmit to the cloud database. Since the overall system requires Internet accessibility, the unit shall be connected to an Internet Modem through Ethernet cables.

3.4.1.2 Calibration of Sensors

3.4.1.2.1 Focal Lens of the CCTV Camera

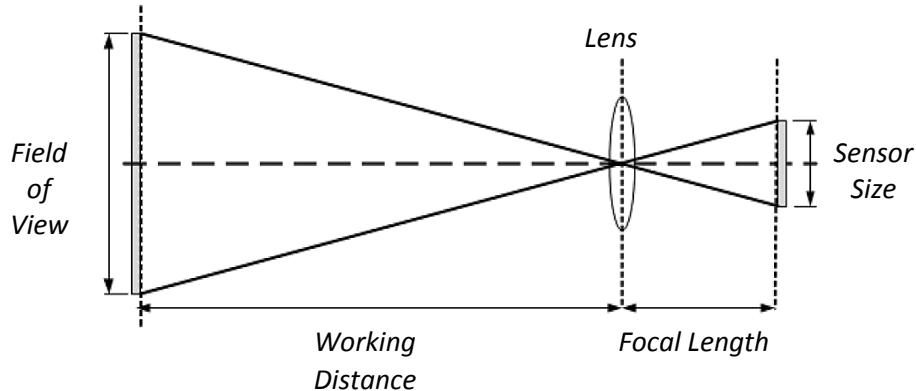


Figure 11: A simplified ray diagram, as illustrated in [60]

As derived from [60], an equation can be used to determine the camera's focal length that is given by:

$$\text{Focal Length} = \frac{\text{sensor size} \times \text{working distance}}{\text{field of view} + \text{sensor size}}$$

Table 1: Standard Sensor Sizes, as illustrated in [60]

Sensor Size	Width (in mm)	Height (in mm)	Diagonal (in mm)
1/4"	3.6	2.7	4.5
1/3"	4.8	3.6	6
1/2"	6.4	4.8	8
1/(1/8)"	7.1	5.4	9
2/3"	8.8	6.6	11
1"	12.8	9.6	16

With the said equation in mind, the standard sensor sizes illustrated in figure 11 should be considered in determining the camera's focal length. Since the camera's CMOS Sensor is $1/3"$, then the sensor sizes are 4.8 and 3.6 millimeters in width and height, respectively. The working distance of the barn is approximately 3.78 meters, and the field(s) of view are approximately 4.87 and 3.97 meters, respectively.

Solving for the focal length through the aforementioned equation:

$$\text{Focal Length (W)} = \frac{(4.8 \times 10^{-3}m) \times (3.78m)}{(4.87m) + (4.8 \times 10^{-3}m)}$$

Hence, **Focal length (W)** $\cong 3.72$ mm

$$\text{Focal Length (L/H)} = \frac{(3.6 \times 10^{-3}m) \times (3.78m)}{(3.97m) + (3.6 \times 10^{-3}m)}$$

Hence, **Focal length (L/H)** $\cong 3.42$ mm

So, the focal lengths 3.72 and 3.42 millimeters in width and length, respectively, meet the standard 2.7mm ~11mm focal length of the camera.

3.4.2 Software Design

3.4.2.1 Algorithm Selection

The proponents initially proposed to utilize Scale-Invariant Feature Transform (SIFT) as the Feature Extractor, HAAR Cascade Classifier as the object detector, and the algorithms namely Random Forest (RF), K-Nearest Neighbor (KNN), and Support Vector Machine (SVM) as the supporting predictive models of the program. The proponents tested the algorithms with actual image frames and video footage from the research locale, however, the results showed unsatisfactory performances in visualizing bounding boxes due to the color indifferences between the cow's back and the surface area of the barn.

The proponents realized that the interoperability of the abovementioned algorithms is not applicable to develop an efficient object detector and an estrus identifier that is fitting for this research. So, the proponents investigated on other probable algorithms which can easily detect objects with their supervision, and identify the overlapping of objects through the coordinates of the predicted bounding boxes. Subsequently, the proponents reviewed and integrated the TensorFlow Object Detection API which demonstrated decent results in object detection through the developed custom neural network models and supervised learning.

3.4.2.2 Custom Object Detectors

The project uses TensorFlow Object Detection API [61] to develop two custom neural network models capable of object detection such as - the Faster R-CNN; and the Single Shot Detector (SSD) model. Initially, the proponents prepared the image dataset which consists of 26,600 and 21,912 image frames for the Faster R-CNN and SSD models, respectively. By using the LabelImg tool, the proponents were able to easily annotate each image frame to provide supervised learning and classification for the program.

After the annotation process, the image datasets are ready for the training and the testing phase. The proponents used 90% of the images for the training while the latter 10% of the images for the testing. After splitting the image dataset, the proponents created two label maps for each model, of which the Faster R-CNN model contains 19 labels such as - “BULL”; “CARACOW”; “COW A”; “COW B”; “COW C”; “COW D”; “COW E”; “COW F”; “COW G”; “COW H”; “COW I”; “COW J”; “COW K”; “COW L”; “COW M”; “COW N”; “COW O”; “COW P”; and “COW Q” while the SSD model contains only the “COW” label. Next, the proponents created TensorFlow records to convert the annotations into TFRecord formats. This process aids the TensorFlow Object Detection API to recognize the labels and annotations made by the proponents.

Afterward, the proponents configured the pre-trained models: Faster R-CNN; and SSD, and the pipeline configuration by setting the number of labels used, the number of image frames to be trained and tested, and the paths of the developed label map and TFRecord files. After setting up the pipeline configuration, the

proponents trained the custom neural network models for approximately 212 hours and 175 hours for the Faster R-CNN and the SSD models, respectively. The proponents monitored the TotalLoss of the models by monitoring the TensorBoard graphs for the Faster R-CNN and the SSD models. Once the optimal range of TotalLoss is observed, the training job can be interrupted. Also, checkpoints that represent the training steps are being saved in the system unit as the training progresses. These checkpoints will be used in visualizing the training performance. The proponents stopped the training of the models when the TotalLoss reached a stable range of values. Once the training is complete, trained frozen inference graphs will be generated to be integrated into the object detection program.

Figure 12 depicts the TotalLoss graph obtained from training the Faster R-CNN model while Table 2 shows the model's training metrics having TotalLoss between approximately 0.04 and 0.14. For this model, the frozen inference graph was generated at the 45616th step of the training process with an approximately 0.04% TotalLoss.

Figure 13 depicts the TotalLoss graph obtained from training the Single Shot Detector (SSD) model while Table 3 shows the model's training metrics having TotalLoss between approximately 1.7 and 2.0. For this model, the frozen inference graph was generated at the 140,171st step of the training process with an approximately 1.41% TotalLoss.

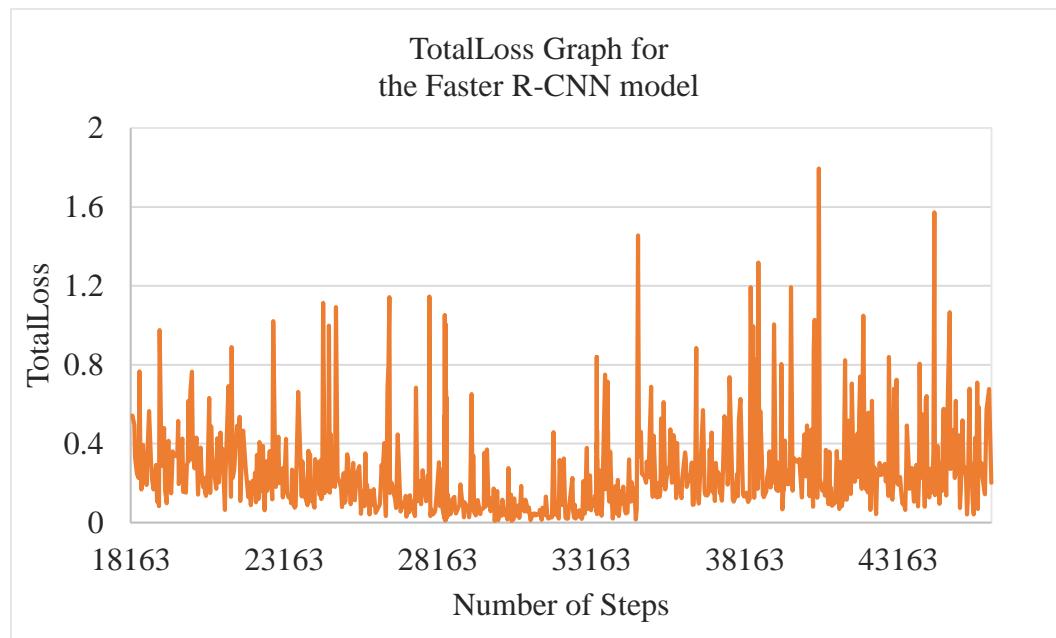


Figure 12: TotalLoss representation for the Faster R-CNN model

Table 2: Training Metrics of the Faster R-CNN Model

Steps	Value
45616	0.040272284
45672	0.431099415
45699	0.083715603
45727	0.708893716
45755	0.06934201
45783	0.584971786
45810	0.254837424
45866	0.302880734
45894	0.229811206
45977	0.143239096

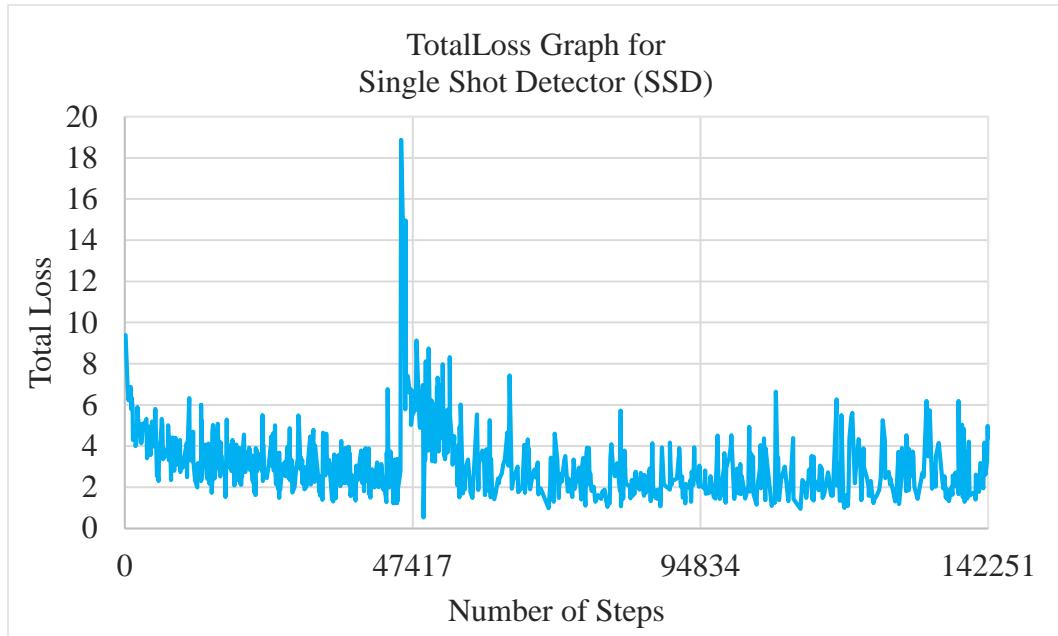


Figure 13: TotalLoss representation for the SSD model

Table 3: Training Metrics of the SSD Model

Steps	Value
140129	1.688523769
140171	1.409463882
140213	2.607795238
140467	1.906678438
140764	1.774537325
140978	3.171329737
141275	3.082624435
141445	1.949746

3.4.2.3 Web Application (“EZTECT App”)

In this research, the proponents developed a web-application through Flask, a Python-driven web development toolkit implemented with RESTful API. Flask is capable of scaling up to complex applications which began as a simple wrapper around Jinja and Werkzeug. It is categorized as a micro-framework possessing a simple but extensible core without lacking in functionality. Numerous extensions provide additional features such as integration, form validation, upload handling, various open authentication technologies, and more. Through Flask, it is easier to take advantage of the framework-agnostic tools built for WSGI of a Python web interface. [62] Because of its flexibility and functionalities, the proponents were able to design the web application to have the following features:

1) *Cattle Performance Report*: This feature helps the user to keep track of automatic estrus detection and insemination instances and to easily assess pregnancy and calving rates through visualizations. (See Figures 14-16.)

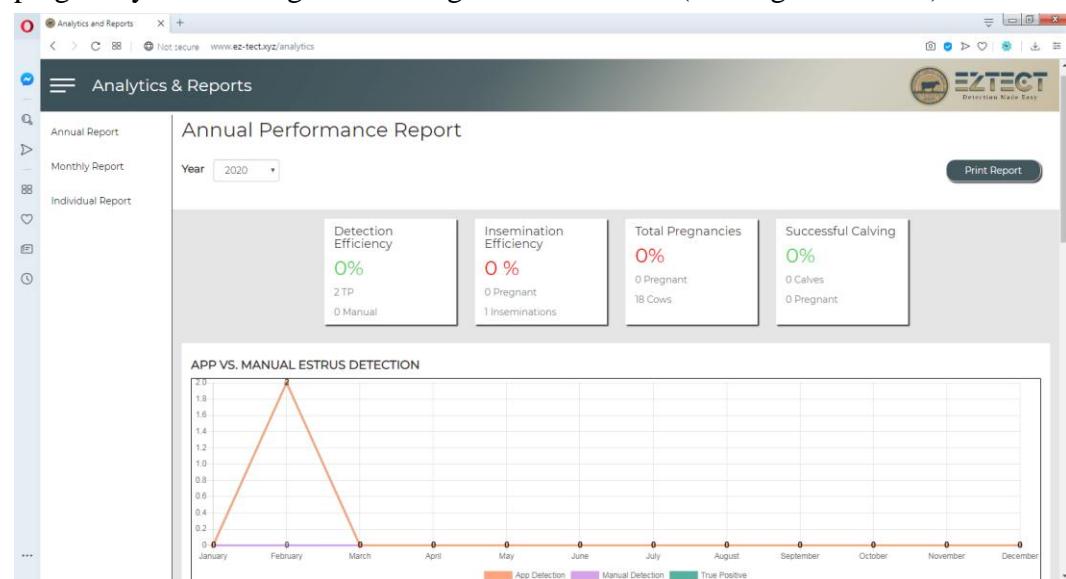


Figure 14: Screenshot of the Annual Performance Report

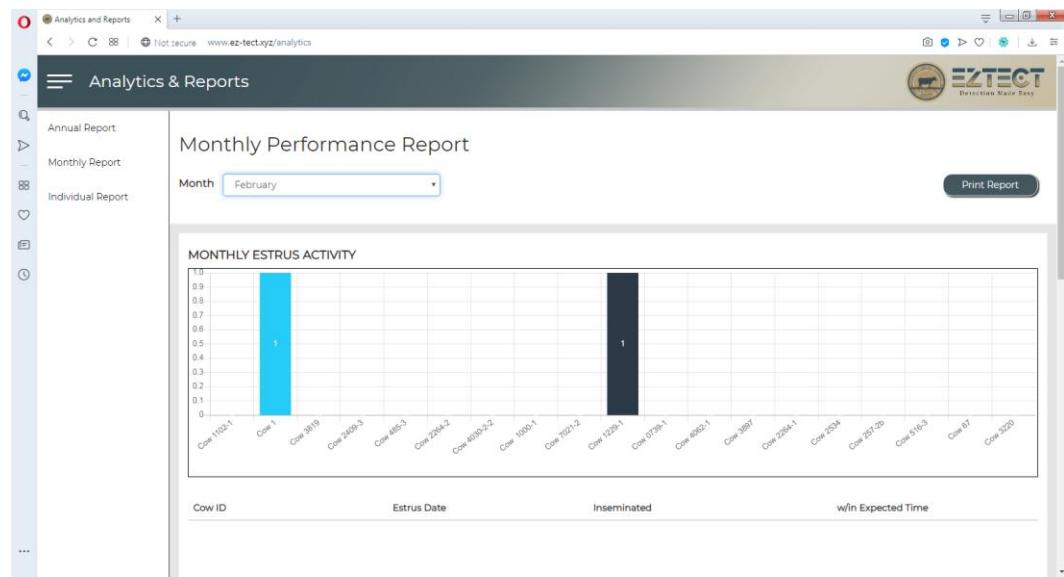


Figure 15: Screenshot of the Monthly Performance Report

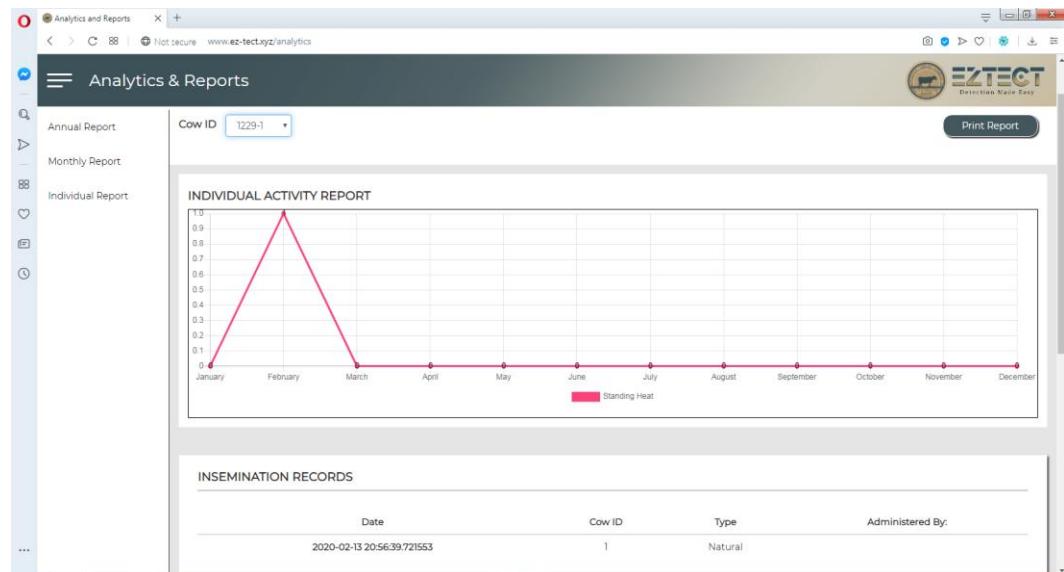


Figure 16: Screenshot of the Individual Cattle Performance Report

2) *Cattle Inventory:* This feature lets the user view his or her livestock and the corresponding IDs, Breed, Gender/Status, and recent estrus record of the cows. (See Figure 17.)

The screenshot shows the 'Cattle Inventory' section of the application. At the top, there is a summary table with four categories: BULL, COW, CALVES, and OTHER. Below this is a detailed list of cattle entries, each with columns for Cow ID, Breed, Gender/Status, Details, and Action.

	BULL	COW	CALVES	OTHER
	1	17	0	1

Cow ID	Breed	Gender/Status	Details	Action
1102-1	Holstein-Sahiwal	Bull/	Details	Remove
1	Local	CaraCow/Milking	Details	Remove
3819	Imported NZ	Cow/Milking	Details	Remove
2409-3	Holstein-Sahiwal	Cow/Milking	Details	Remove
485-3	Holstein-Sahiwal	Cow/Milking	Details	Remove
2264-2	Holstein-Sahiwal	Cow/Milking	Details	Remove
4030-2-2	Holstein-Sahiwal	Cow/Milking	Details	Remove
1000-1	Holstein-Sahiwal	Cow/Milking	Details	Remove
7021-2	Holstein-Sahiwal	Cow/Milking	Details	Remove
1229-1	Holstein-Sahiwal	Cow/Milking	Details	Remove

Figure 17: Screenshot of the Cattle Inventory

3) *Dashboard:* This feature allows the user to see the 8-hour Countdown Timer, the Estrus Logs, and the interactive events, and the prediction of future signs as well. (See Figure 18.)

The screenshot shows the 'Dashboard' section of the application. It includes a sidebar with account management options like 'Hello admin!', 'Add User', and 'Logout'. The main area features sections for 'Recent Estrus Detection', 'Update', and 'Estrus Logs'.

Recent Estrus Detection:

Status	Cow IDs	Time of Detection	End of Estrus (ETC)	Details
Urgent	1 & 1229-1	20:47:47.553322	04:46:17.553322	Detail

Update:

Confirm App Detection	Record Manual Detection	Insemination	Pregnancy	Calving
-----------------------	-------------------------	--------------	-----------	---------

Estrus Logs:

Cow ID	Date	Time of Detection	Confirmed	Inseminated
1	2020-02-13	20:47:47.553322	Yes	Yes
1229-1	2020-02-13	20:47:47.553322	Yes	-

Figure 18: Screenshot of the Dashboard Section

4) *Locator*: This feature informs the user of the estimated travel time between the current location and the farm, ensuring the arrival within the 8-hour effective insemination period through the Google Map API [63]. (See Figure 19.)

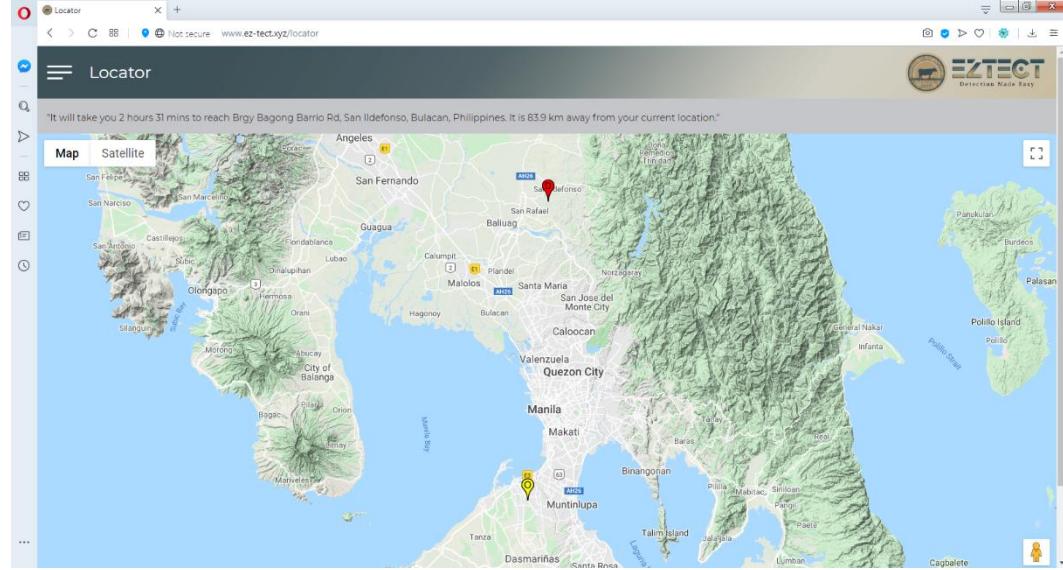


Figure 19: Screenshot of the Locator

5) *Report Generation*: This feature allows the user to download PDF-generated annual, monthly, or individual cattle estrus reports containing all relevant information about the cows; (See Figure 20.)



Figure 20: Screenshot of the Downloadable Report

6) ‘Moonitor’ *Live View*: This feature lets the user access and control the surveillance cameras at ease through the pan, tilt, and zoom capabilities of the cameras to get a better view of the barn; (See Figure 21.)

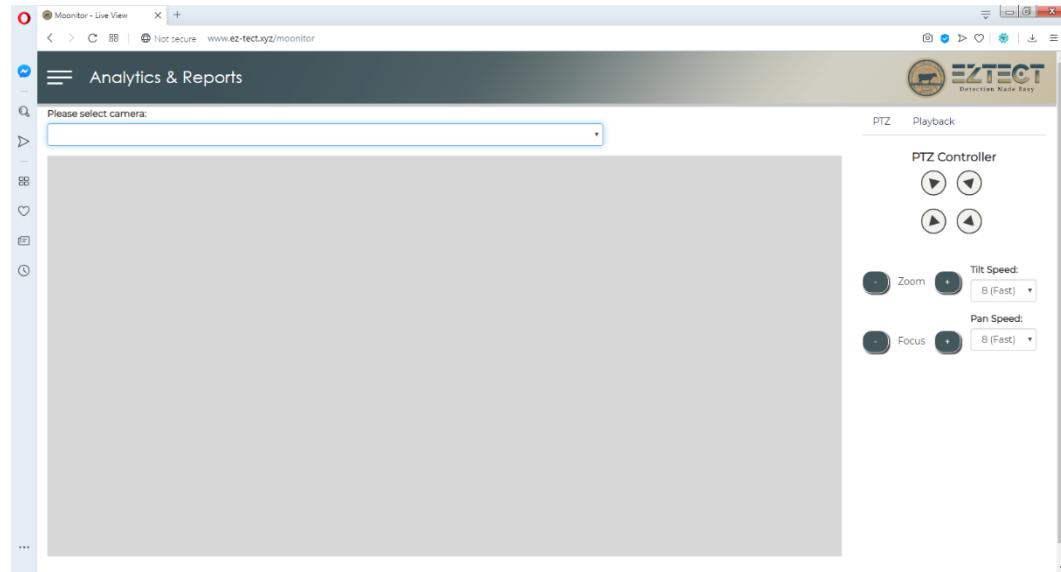


Figure 21: Screenshot of the “Moonitor” Live View

7) *Web Push Notifications*: This feature notifies the user of the detected standing-heat activity through the push notification services provided by the OneSignal platform. [64]

3.4.2.4 Program Flowchart

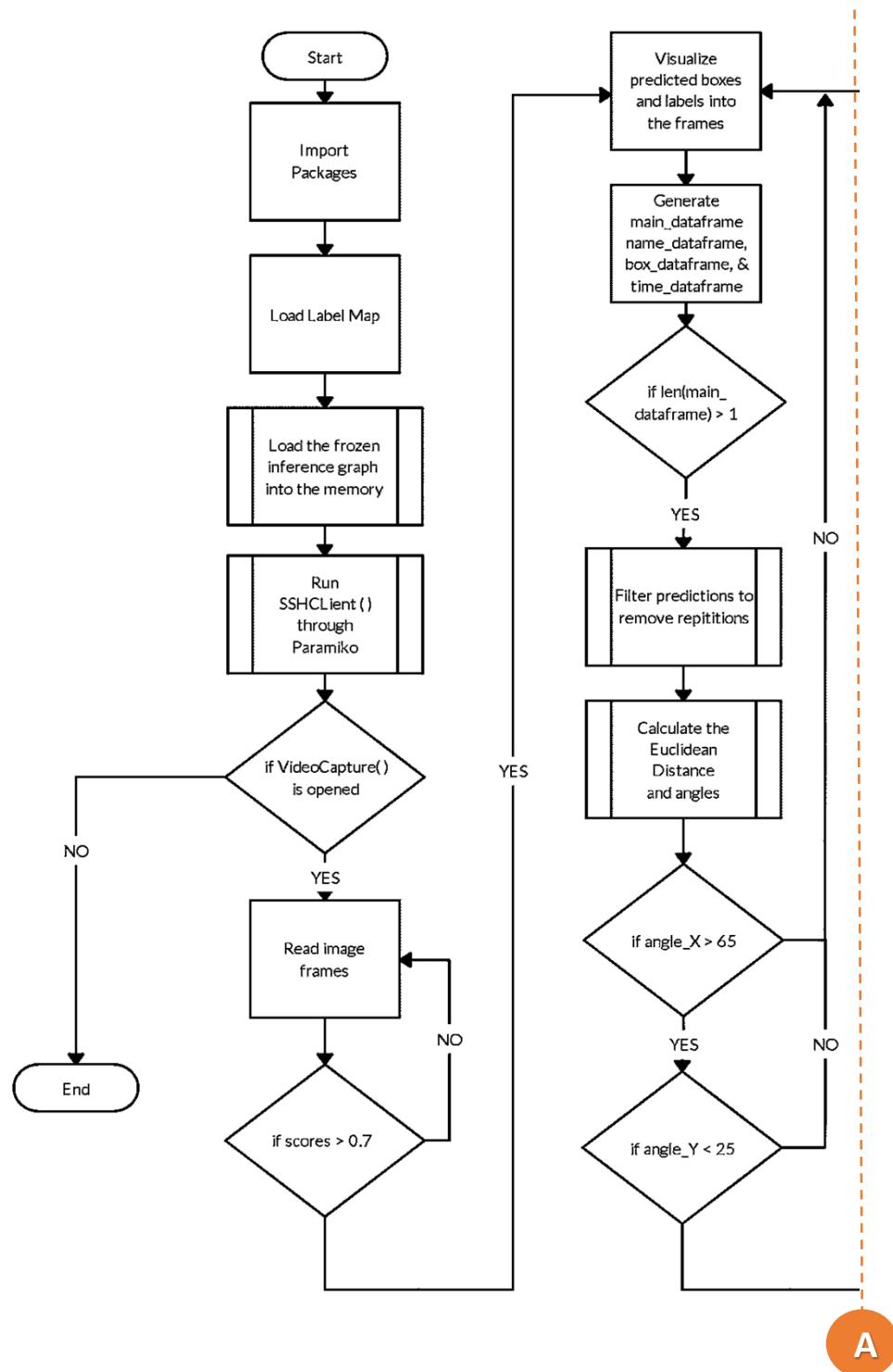


Figure 22: Main Program Flow of the System

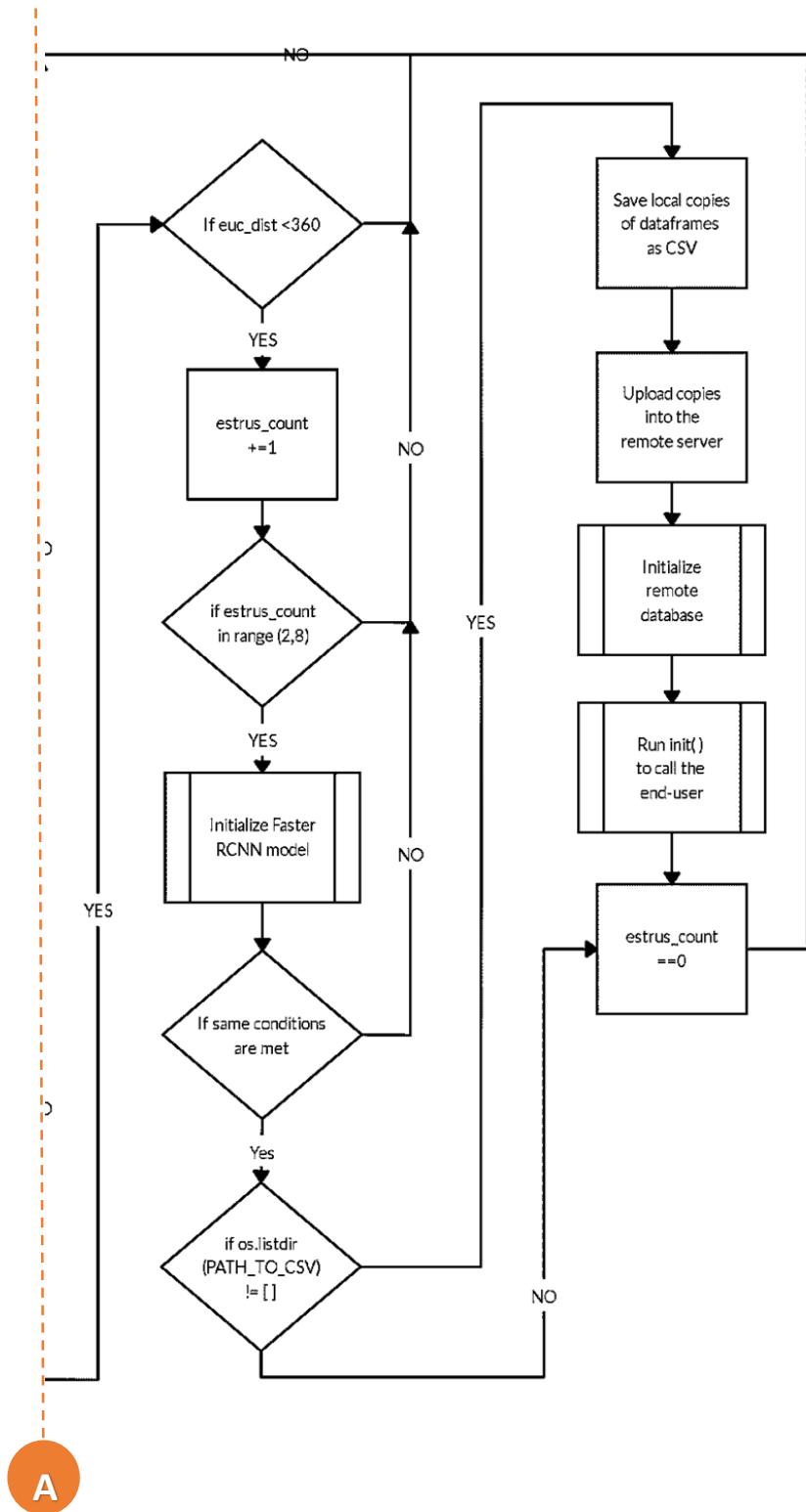


Figure 23: Main Program Flow of the System (cont'd)

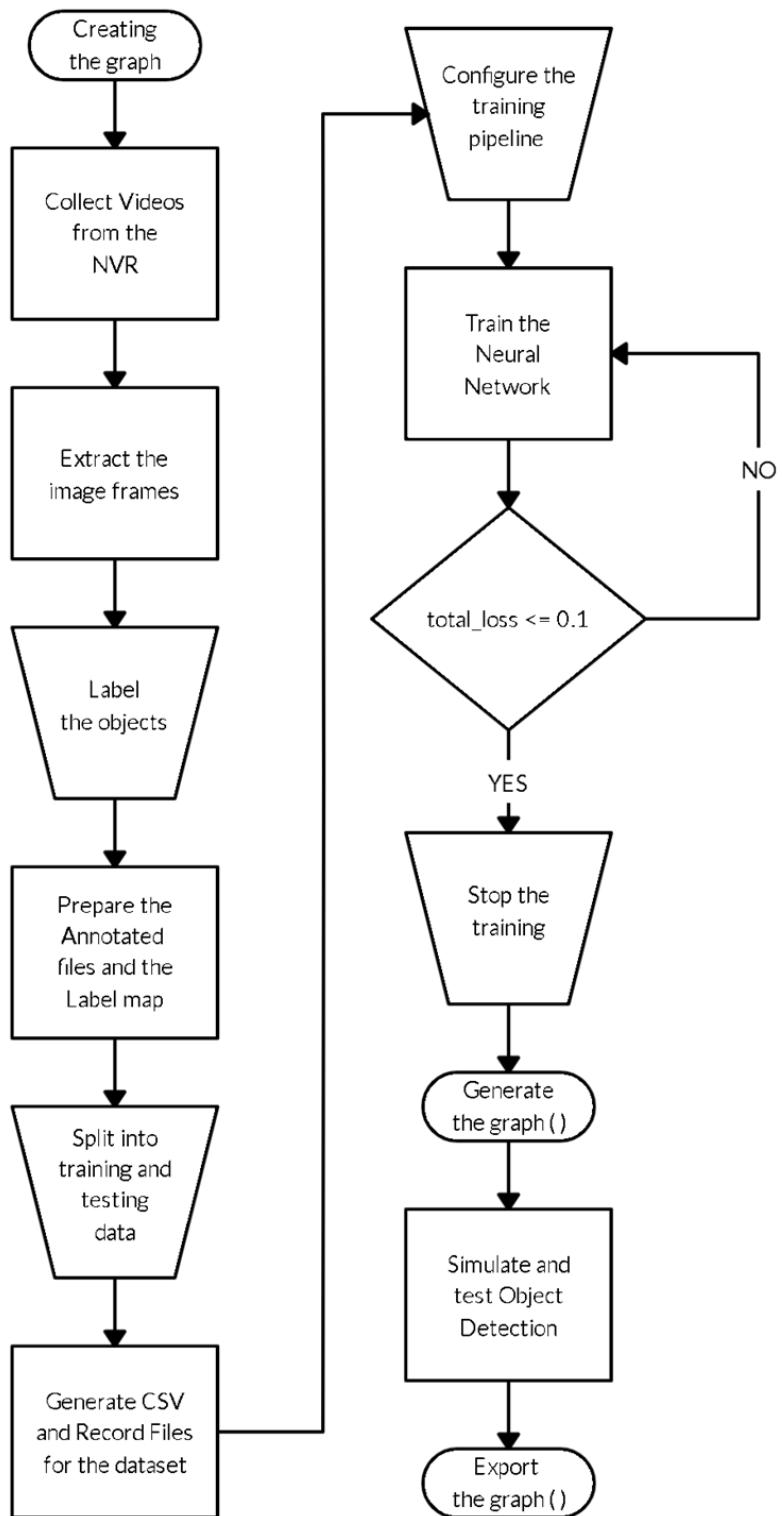


Figure 24: Loading the Frozen Inference Graph (Subroutine)

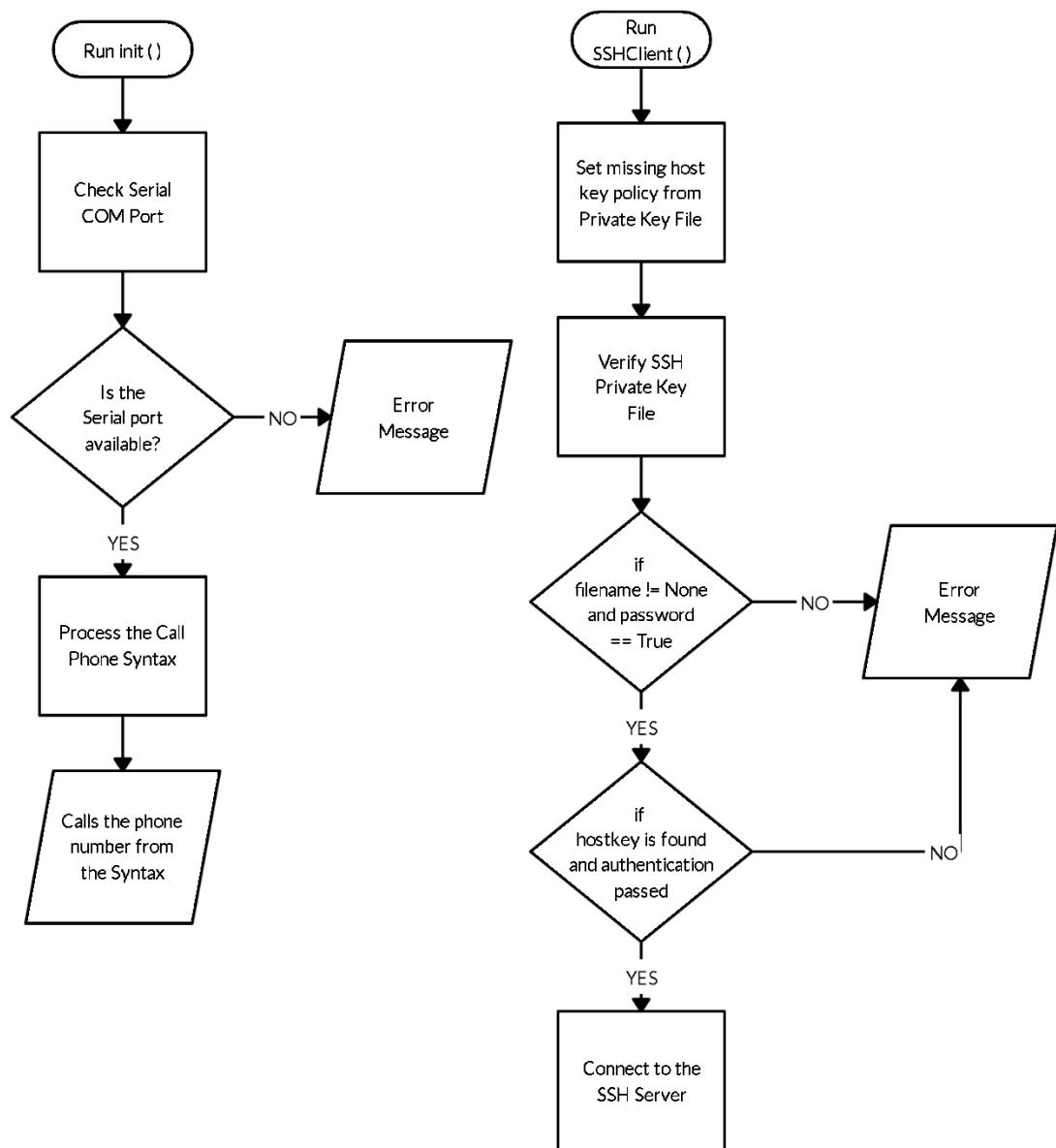


Figure 25: Running init and SSHClient (Subroutines)

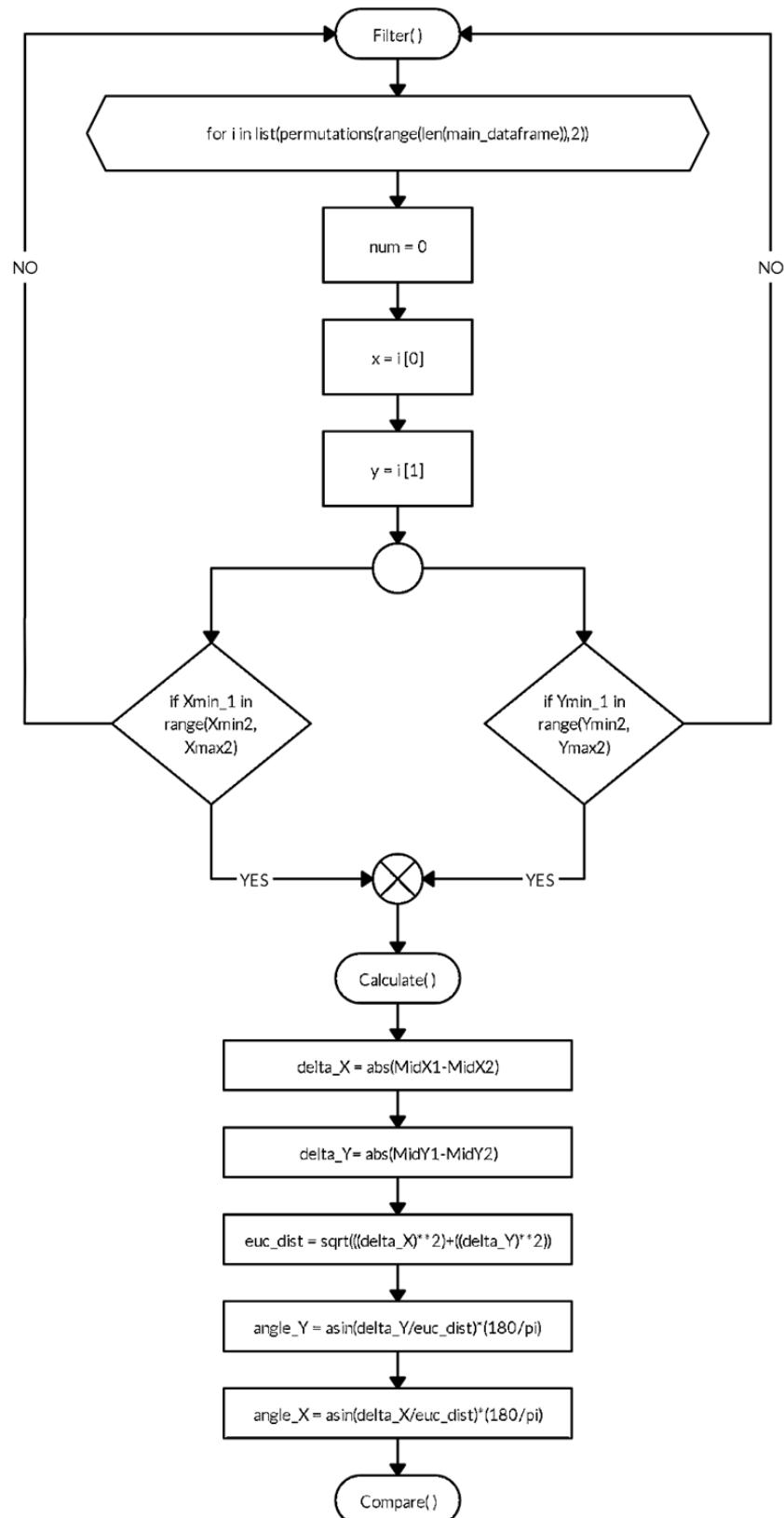


Figure 26: Filter the predictions and Calculate values (Subroutines)

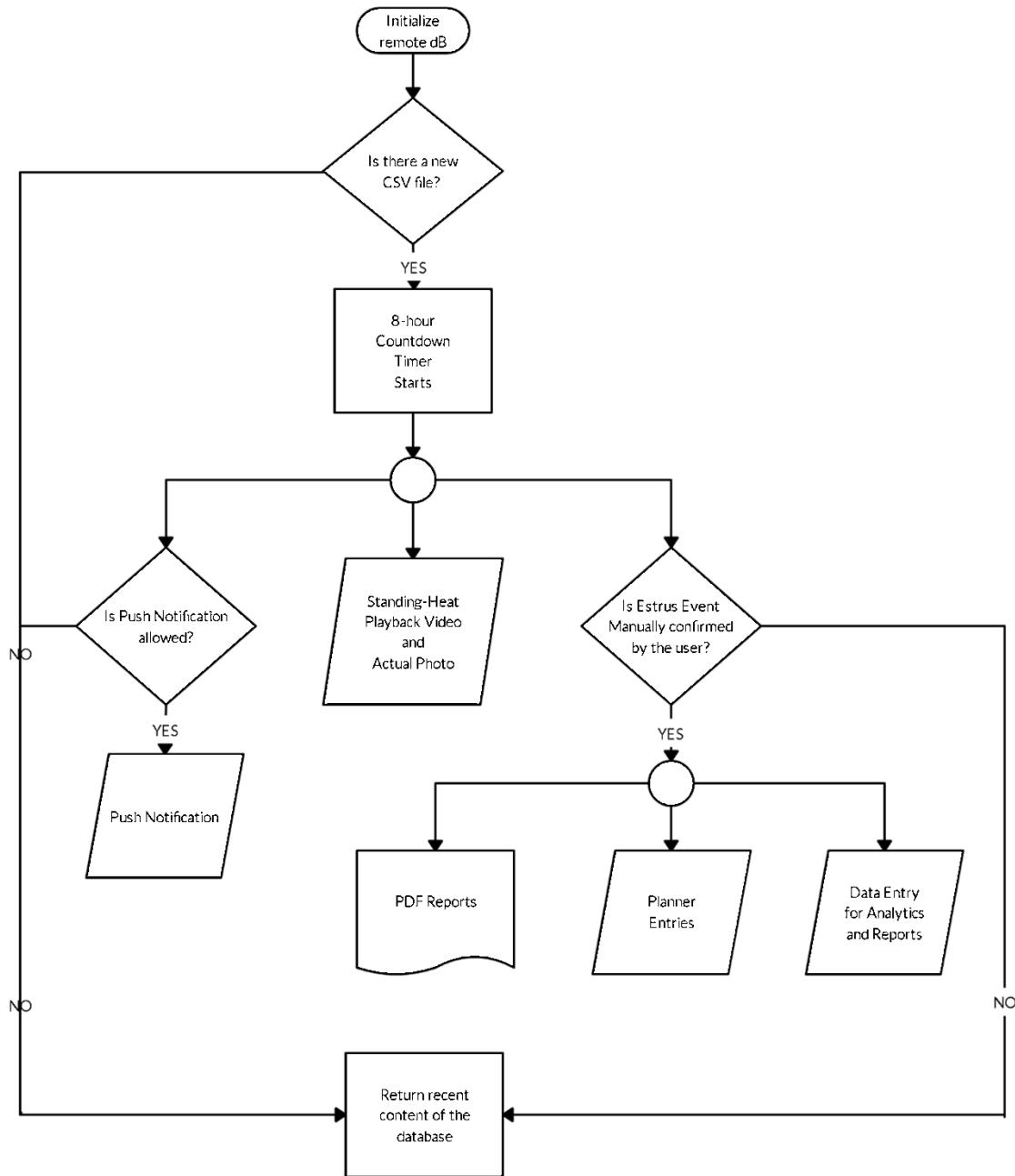


Figure 27: Initialize Remote Database (Subroutine)

The figures shown on the preceding pages are the program flow of the system and its subroutines. In the input section, the program will primarily load the necessary packages, the label map, and the frozen inference graph that is generated and trained. Afterward, the program will run an SSH connection through Paramiko and RSA key authentication. Consequently, the camera will process the image frames through the VideoCapture objects of the program. In the image processing section, the SSD-based neural network will visualize “cow” predictions and identify object overlapping activities through bounding box corner analysis, if the prediction score exceeds seventy percent. The program will also generate various data frames to contain information such as the Cow Name, ID, box coordinates and angles, and date and time of detection, considering there is only one class to be predicted yet. If the dataframes contain more than one detection, the program will filter out the prediction and will calculate the distances between two centroids of object instances and its included angles. After meeting the criteria, the program will iteratively count for the overlapping of objects from 2 to 8 frames/second. If the overlapping occurred during the aforementioned period, then a copy of the frame will be directed to the Faster RCNN model, which will be initialized to perform image classification and object detection. The model will also be generating dataframes to contain the Cow Names, IDs, box coordinates and angles, and date and time of detection of the nineteen classes or cows. If the similar conditions are met in the Faster R-CNN model, an object overlapping or estrus activity will be declared. The program will be locally saving and remotely uploading the comma-separated-value (CSV) files that contain the aforementioned data from the Faster

R-CNN model and will be initializing the remote database to align the data accordingly into the web application routes. The web application will perform data visualization, will forecast the next possible estrus activity, and will activate the 8hr-countdown timer. At the same time, the program will send in a call-alert to the end-user and will deliver push notifications on the app-subscribed network devices. Subsequently, the program will restart its counter and will continue to perform object detection.

3.4.3 Experimental Setup

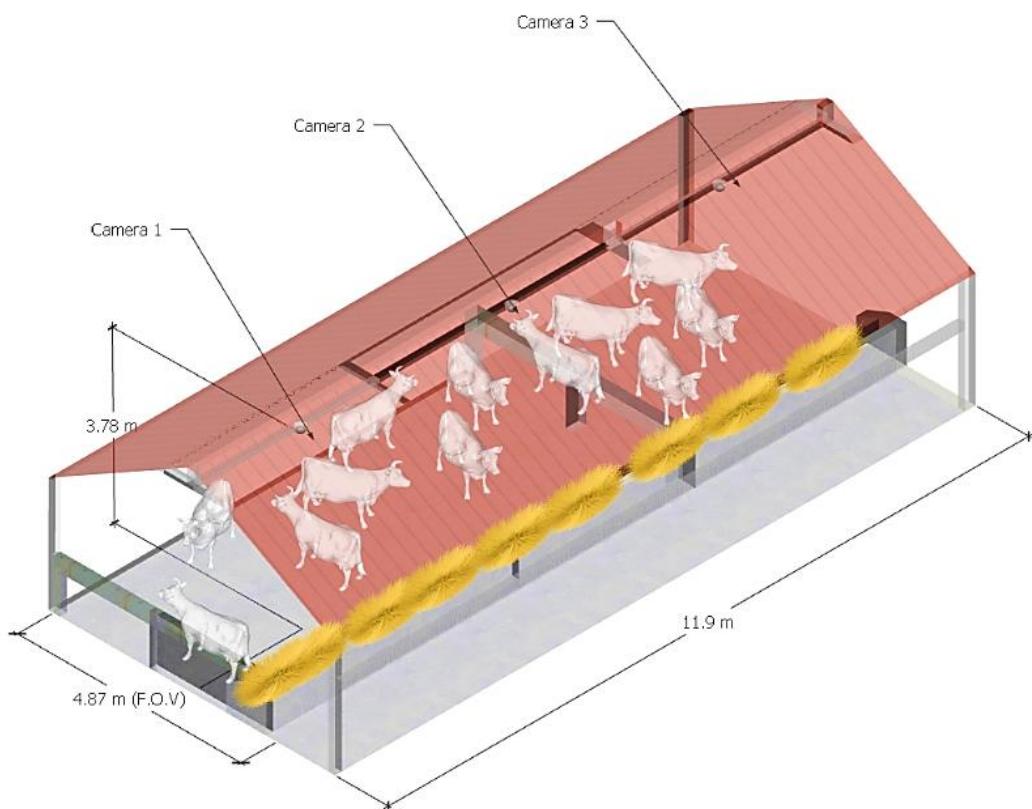


Figure 28: 3-D Representation of the Barn

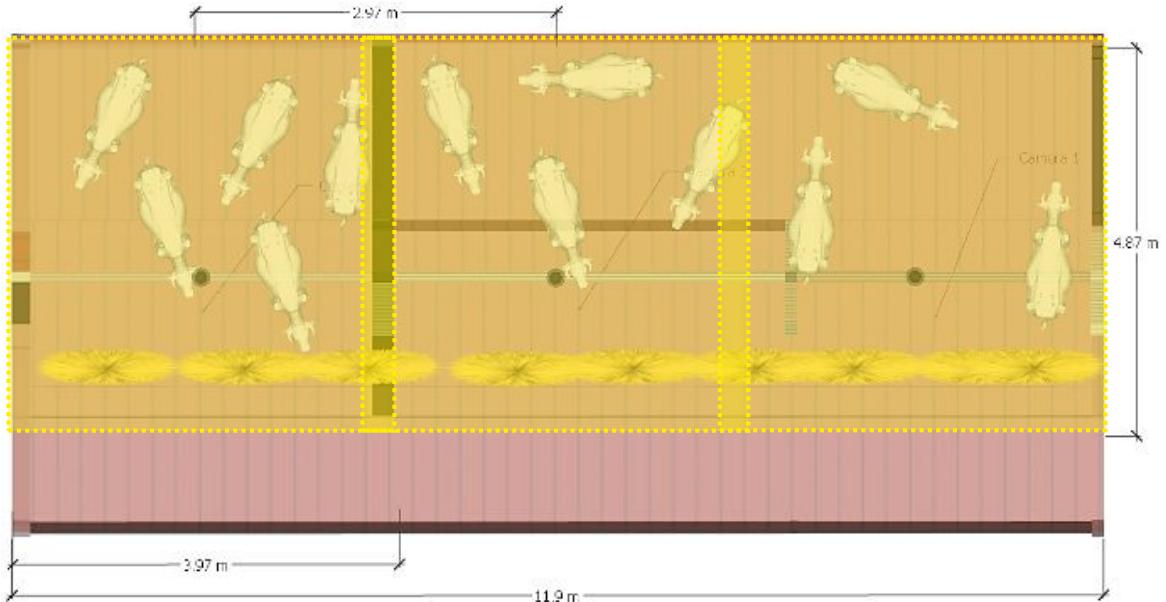


Figure 29: Positioning of the Cameras and Dimension of the Field of View

3.5 Testing Procedure

To test the efficiency and accuracy of the proposed system, the researchers will compare the detection results obtained from the system to the results gathered from the farmers. The researchers will ask the farmers/veterinarian to have a farmer assigned for the conventional way of detection in the farm which is through visual observation of the said farmer. The results will be recorded manually in paper. This farmer also won't have access to the system developed in this research. Another farmer will be assigned to use the researcher's program for detecting estrus. Results will be recorded electronically in the system. The farmer will confirm in the system if an estrus event has actually occurred. The system ran from January 2020 to April 2020, a total of 4 months.

3.6 Statistical Treatment of Data

In this study, the data to be gathered will be subjected to statistical treatment, applying both descriptive and inferential statistics. Descriptive statistics will enable the researchers to interpret the data in a simpler way, will be useful in analyzing the significant difference in image features of estrus cows. In this way, researchers may see patterns emerging from the collections of estrus cows' images. And this is where inferential statistics comes in, observed characteristics will be used to draw conclusions. Measures of central tendency method for descriptive statistics while hypothesis testing method for inferential statistics will be used in the entire research process.

For the output results, the detection from the proposed system will be subjected under descriptive statistics like mean to show the average estrus detection of the conventional and the proposed way. If there are differences in the obtained results from the conventional and the proposed way, an inferential statistics will be used to check if the difference is significant enough to tell that the system is more efficient or less efficient.

3.7 Technical Evaluation

Estrus Detection for Cow Proponent Survey					
Introduction: The students involved prior to this study need to conduct a survey for evaluation of different aspects of the proponent, entitled “ EZTECT: Automated Estrus Detection System for Dairy Cattle based on Faster R-CNN with Surveillance and Notification System via Internet of Things (IoT) ”.					
Instruction: Please rate whether you strongly disagree or strongly agree. Check one response of the following statements. Rate 1 - if Strongly Disagree 2 – disagree 3 - neither agree nor disagree 4 - agree 5 - if Strongly Agree					
Survey statements	Rating				
	1	2	3	4	5
Functionality and Efficiency					
1. The automated estrus detection is easy to learn for monitoring.					
2. The automated estrus detection is more efficient using than the manual or traditional method.					
3. The common sign of estrus detected by the system is more accurate than the other methods.					
4. The prediction of time for artificial insemination is determined by using the system.					
5. The data transferring is on time.					
6. The information appeared on the application and window can't be easy to change.					
Usability and Aesthetics					
7. The whole system including the application is easy to understand and learn.					
8. The whole system requires minimum supervision during the entire operation.					
9. The whole system is easy to operate.					
10. The whole system is pleasing to the eye of the user.					
Mobility and Maintainability					
11. The device does not require special handling during the operation					
12. The instructions on the usage of the system are easy and simple to understand.					
13. Maintenance of the whole system does not require so much effort.					
Safety and Reliability					
14. The device does not have health safety risk or physical risk in entire operation.					
15. The inlets, outlets and connections of wires are properly placed.					
16. The system is precisely less from error.					

Figure 30: Sample of the Technical Evaluation Form

3.8 Work plan (Gantt chart)

Table 4: Project Work Plan

ACTIVITIES	2018		2019												2020								
	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	
Topic Consultation																							
Research on relevant studies																							
Formulation and Submission of Chapter 1 to 3																							
Canvassing and Purchasing of Materials for the system																							
Assessing Research Locales																							
Coding for the Image Processing																							

3.9. Bill of Materials

Table 5: Expenses on the System unit and other devices

Item Description	Quantity	Unit	Unit Cost	Total Cost
4MP 4x PTZ Network Camera	3	pc	Php 13,500.00	Php 40,500.00
Camera Junction Box	3	pc	Php 180.00	Php 540.00
16-CH NVR with PoE	1	pc	Php 3,600.00	Php 3,600.00
2TB Surveillance Hard Drive	1	pc	Php 4,000.00	Php 4,000.00
Laptop (i7, 8GB RAM)	1	pc	Php 12,000.00	Php 12,000.00
Laptop Cooling Pad	1	pc	Php 398.00	Php 398.00
Wi-Fi Router	1	pc	Php 1,150.00	Php 1,150.00
4G LTE Prepaid Router	1	pc	Php 1,595.00	Php 1,595.00
Arduino Uno R3 Module	1	pc	Php 350.00	Php 350.00
GSM Module SIM 800L	1	pc	Php 650.00	Php 650.00
Total	<u>Php 64,783.00</u>			

Table 6: Expenses on Electrical wiring and Network Cabling

Item Description	Quantity	Unit	Unit Cost	Total Cost
CAT5-AMP Cable	100	m	Php 17.00	Php 1,700.00
Flat Cord (No. 16)	50	m	Php 18.00	Php 900.00
3 Gang Outlet	2	pc	Php 135.00	Php 270.00
3 Gang Switch	1	pc	Php 125.00	Php 125.00
Electrical Plug	2	pc	Php 20.00	Php 40.00
Electrical Tape	1	pc	Php 40.00	Php 40.00
Utility Box	1	pc	Php 150.00	Php 150.00
RJ 45 Connector	12	pc	Php 5.00	Php 60.00
BNC Crimping Tools	1	pc	Php 600.00	Php 600.00
Total	<u>Php 3,885.00</u>			

Table 7: Miscellaneous Expenses

Item Description	Quantity	Unit	Unit Cost	Total Cost
Black Cable Tie (8",100pc)	2	pack	Php 229.75	Php 459.50
Acrylic Paint	3	pc	Php 76.00	Php 228.00
Spray Paint	2	pc	Php 100.00	Php 200.00
Paint Brush (No.2)	2	pc	Php 30.00	Php 60.00
Paint Brush (No.1)	1	pc	Php 15.00	Php 15.00
Plywood (3/4)	1	pc	Php 1,375.00	Php 1,375.00
Hinges	2	pc	Php 30.00	Php 60.00
Barrel Bolt (No. 2)	1	pc	Php 45.00	Php 45.00
KD 1/201308	1	pc	Php 64.00	Php 64.00
Stikwel Wood Glue	1	pack	Php 65.00	Php 65.00
Hardener	1	pc	Php 75.00	Php 75.00
Roller Cotton	2	pc	Php 45.00	Php 90.00
Paint Thinner	1	pc	Php 33.00	Php 33.00
Metal Nails (No.2)	1/2	kg	Php 86.00	Php 43.00
Metal Nails (No.1)	1/4	kg	Php 88.00	Php 22.00
Metal Screws	20	pc	Php 1.00	Php 20.00
Exhaust Fan (10")	1	pc	Php 899.00	Php 899.00
Cabinet Door Lock	1	pc	Php 240.00	Php 240.00
LED Bulb (19W)	2	pc	Php 250.00	Php 500.00
Ceiling Receptacle (1/4)	2	pc	Php 27.00	Php 54.00
Ladder (8ft.)	1	pc	Php 2,000.00	Php 2,000.00
Total				<u>Php 6,547.50</u>

Table 8: Expenses on Network and Mobile Services

Item Description	Quantity	Unit	Unit Cost	Total Cost
Domain Subscription	1	year	Php 61.52	Php 61.52
VPN Service Subscription	4	month	Php 657.16	Php 2628.24
Linode Subscription	4	month	Php 380.87	Php 1523.58
Prepaid Load (Internet)	4	month	Php 452.25	Php 1809.00
			Total	Php 6,022.34

Table 9: Overall Expenditure of the Project

Item Description	Cost
System Unit	Php 64,783.00
Electrical Wiring and Network Cabling	Php 3,885.00
Network and Mobile Services	Php 6,022.34
Miscellaneous Expenses	Php 6,547.50
Total	Php 81,237.84

Chapter 4

Results and Discussion

This chapter presents the interpretation of gathered data and analysis of the results based on the tests conducted.

4.1. Project Technical Description

The project entitled EZTECT: Automated Estrus Detection System for Dairy Cattle based on Faster R-CNN with Surveillance and Notification System via the Internet of Things (IoT) is a non-invasive and non-contact estrus detection system that uses image processing, artificial intelligence, and Internet of Things technology to detect standing heat behaviors. The detection system comprises of classification, detection, and notification sub-systems.

Two custom neural network models developed through the TensorFlow Object Detection API classify and detect the dairy cows and their estrus behaviors through bounding box corner analysis. In the pre-training phase, the Faster R-CNN model integrates about 1400 images for each class, but the Single Shot Detector (SSD) model utilizes a total of 21912 cow images. In the pre-processing phase, the Faster R-CNN and SSD models train the images through data augmentation techniques such as autoaugment_image, random_horizontal, random_vertical, random_adjust_brightness, and random_rotate_90. The over-all training for both models took approximately 387 hours.

In the detection stage, the program captures video frames from three strategically-installed PTZ cameras, visualizes bounding box predictions based on models' inference to detect the cows, and declares standing-heat activities based on the overlapping of the

predicted boxes. Whenever the simulation projects the mounting behavior of the cows, the program locally and remotely stores the image of that instance and the record containing vital information of the cows.

The IoT-based Web Application provides access to standing-heat records and other relevant information about the cows, remote monitoring through the Pan-Tilt-Zoom Cameras, and assistance on estimating travel time between the user's current location and the farm. Once the program declares a standing-heat activity, it automatically sends an SMS call to the registered number through an Android-compatible GSM Module and simultaneously notifies the application to deliver push notification alerts to the user's computer or smartphone.

4.2. Project Structural Organizational

4.2.1 Parts of the System

The system consists of Pan-Tilt-Zoom (PTZ) Cameras, a Network Video Recorder (NVR), a laptop, internet modems, and microcontrollers. The 4MP PTZ network cameras capture and read image frames in real-time. Meanwhile, the NVR stores the live video feed of the cameras worth 2TB of capacity up to thirty (30) days.

The laptop is a 3rd generation Intel Core i7-3720QM with 8GB memory that runs at 2.60 GHz. The program runs on this 64-bit Windows 7 unit with a hard drive capacity of 500GB. The network devices mainly responsible for internet connectivity, network linkages, and remote data transfer are the Huawei 4G Router B315 and ASUS RT-N12 Wi-Fi Router. The Huawei 4G router can transfer data at a rate of 150Mbps considering its optimum performance; Meanwhile, the ASUS RT-N12 can connect and link up to four (4) other network devices.

Lastly, the microcontrollers used by the proponents for the SMS Call alerts are the Arduino UNO R3 and SIM800L (GSM module). The Arduino module reads the program to initialize and signal the connected GSM module to send SMS calls to the end-user at an up-link and down-link rate of 85.6kbps. The aforementioned microcontrollers are encapsulated in a black acrylic box. The figures below show the actual setup of the previously mentioned devices in the research locale.



Figure 31: Setup of devices – System Unit, Microcontrollers, Routers, and Recorder



Figure 32: Setup of the Camera

4.2.2 Barn

The targeted cattle barn has a dimension of approximately 4.87 meters in length, 11.9 meters in width, 3.78 meters in height, and 57.95 square meters in surface area. The proponents placed the cameras for approximately 2.98 meters apart atop of cowshed. The figure shown below is the actual cattle barn.



Figure 33: Actual Barn

4.3 Experimental Results, and Data Analysis

Table 10: Legend for Cow ID

COW CODE	COW ID
BULL	1102-1
CARACOW	1
COW A	3819
COW B	2409-3
COW C	485-3
COW D	2264-2
COW E	4030-2-2
COW F	1000-1
COW G	7021-2
COW H	1229-1
COW I	0739-1
COW J	4062-1
COW K	3897
COW L	2264-1
COW M	2534
COW N	257-2b
COW O	516-3
COW P	67
COW Q	3220

The table shown above displays the Cow Codes and Cow IDs of the cattle.

4.3.1 Object Detection Results

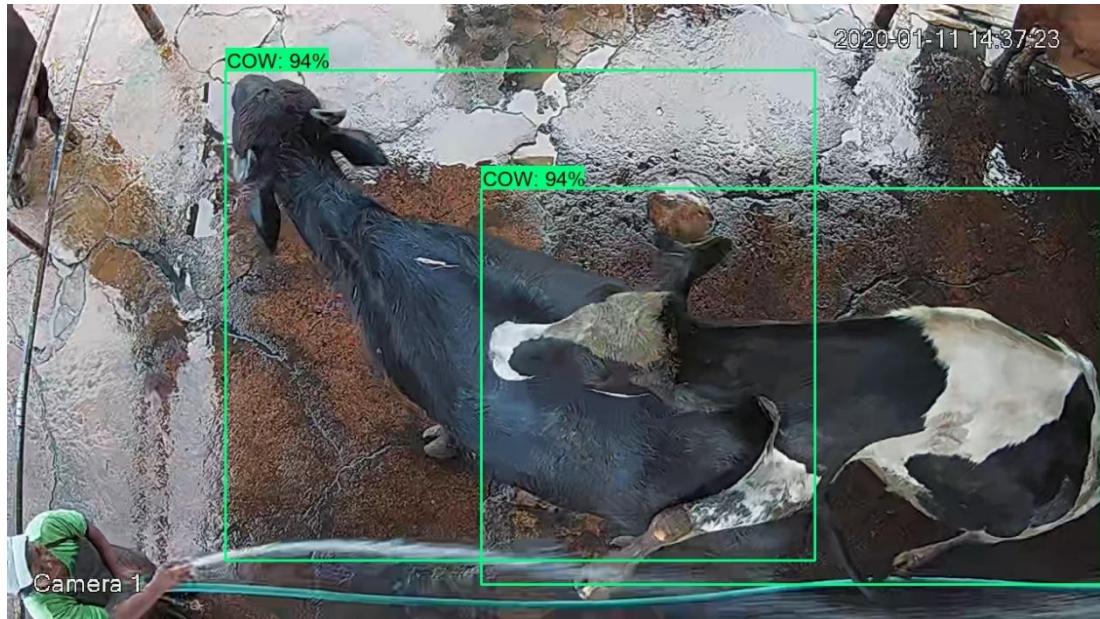


Figure 34: Retrieved image frame of an estrus activity between the cow (“COW”) and the water buffalo (“COW”) through the SSD model

Figure 34 shows the bounding box predictions of the SSD model in the object detection program dated January 11, 2020. It can be observed that the SSD model effectively identified the objects as “COW” with confidence scores of 94%. A copy of this image frame was passed into the Faster R-CNN model to re-implement the visualization of the bounding boxes and to identify the occurring subjects in the frame.

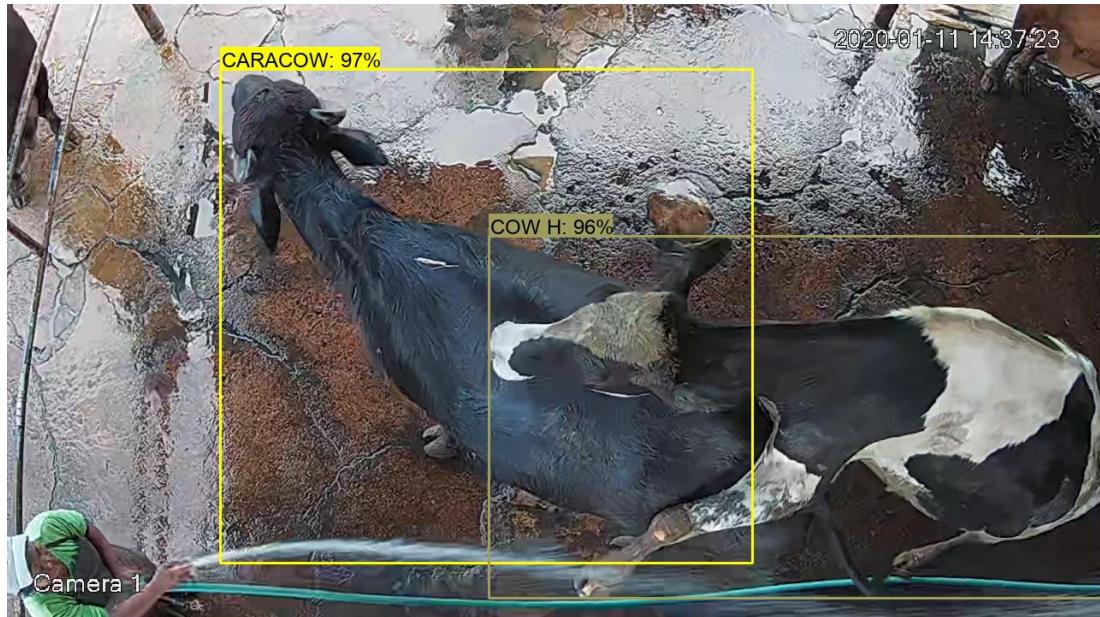


Figure 35: Retrieved image frame of an estrus activity between the cow (“COW H”) and the water buffalo (“CARACOW”) through the Faster R-CNN model

Figure 35 shows the bounding box predictions of the Faster R-CNN model in the object detection program dated January 11, 2020. It can be observed that the Faster R-CNN model successfully identified the cow as “COW H” and the water buffalo as “CARACOW” with confidence scores of 96% and 97%, respectively. This image frame was sent into the remote database of the web application for user verification and assessment.

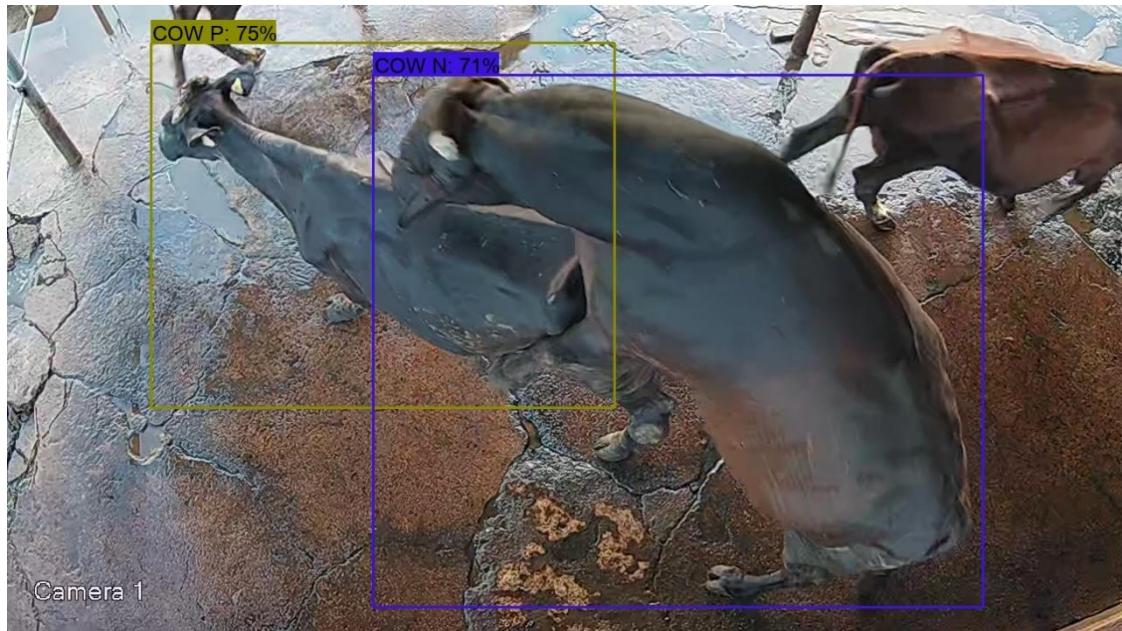


Figure 36: Retrieved image frame of an estrus activity between the cow (“COW P”) and the bull (“COW N”) through the Faster R-CNN model

Figure 36 shows the bounding box predictions of the Faster R-CNN model in the object detection program dated April 2, 2020. It can be observed that the Faster R-CNN model misidentified the cow as “COW P” and the bull as “COW N” with confidence scores of 75% and 71%, respectively. This image frame was sent into the remote database of the web application for user verification and assessment.

4.3.2 Database Results from the Web Application

The screenshot shows a web browser window titled 'Dashboard' with the URL 'eztectxyz/dashboard'. The interface includes a sidebar with 'Hello admin!', 'No Estrus Detected', 'Manage My Account' (Add User, Logout), and a main content area. The main content area has sections for 'Recent Estrus Detection' (table with columns: Status, Cow IDs, Time of Detection, End of Estrus (ETC), Details) and 'Update' (links: Confirm App Detection, Record Manual Detection, Insemination, Pregnancy, Calving). Below these is a section for 'Estrus Logs' (table with columns: Cow ID, Date, Time of Detection, Confirmed, Inseminated) containing four rows of data.

Cow ID	Date	Time of Detection	Confirmed	Inseminated
67	2020-04-02	06:24:13.040000	No	-
257-2b	2020-04-02	06:24:13.040000	No	-
1	2020-01-11	14:37:22.010000	Yes	-
1229-1	2020-01-11	14:37:22.010000	Yes	-

Figure 37: Screenshot of the Dashboard containing the Estrus Logs

Table 11: Tabular Representation of the Database Results for the

Verification of the Actual Project Testing

COW ID	DATE OF DETECTION	TIME OF DETECTION	ESTRUS VALIDITY	INSEMINATED
1	January 11, 2020	2:37:22 PM	TRUE	NO
1229-1	January. 11, 2020	2:37:22 PM	TRUE	YES
257-2b	April 2, 2020	06:24:13 AM	FALSE	NO
67	April 2, 2020	06:24:13 AM	FALSE	NO

Figure 37 and Table 11 represent the validity of the results in monitoring the standing-heat of cattle. Based on the confirmation of the end-user on the web app, the detected event in-between “CARACOW” and “COW H” is “TRUE” while the detected event in-between “COW N” and “COW P” is “FALSE” due to the misidentification of the Faster R-CNN model which led to the 50% detection efficiency.

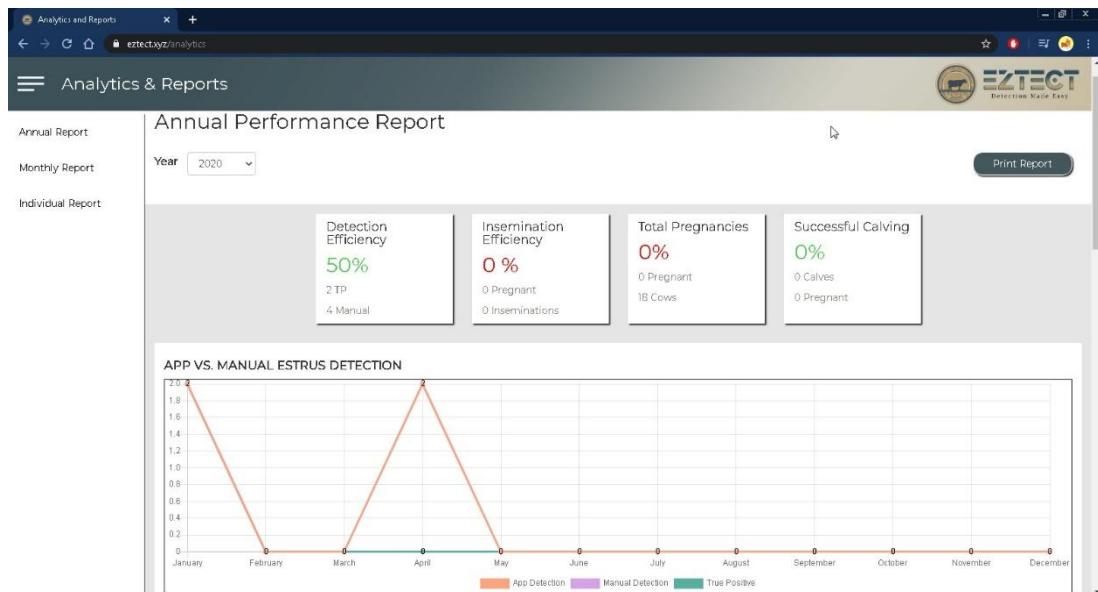


Figure 38: Screenshot of the Annual Performance Report for 2020

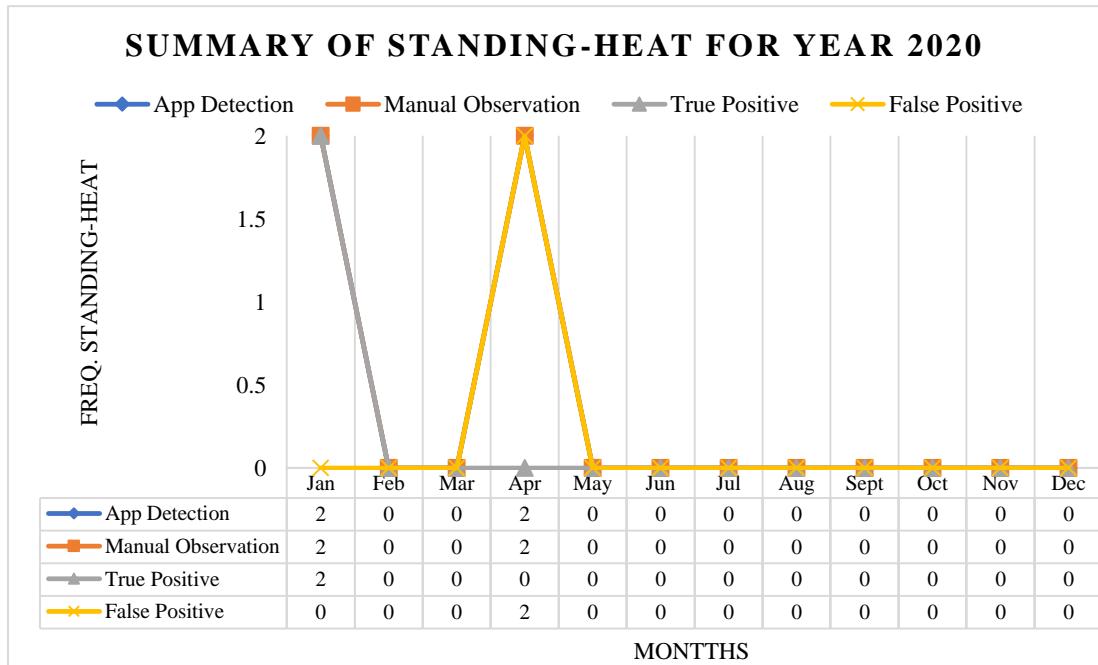


Figure 39: Summarized Graphical Representation of Database Result for the Frequency of Standing-heat from January to December

As shown in Figure 39, there are a total of 4 app-detections of standing-heat, 4 manually detected standing-heat signs, and 2 “True Positive” and “False Positive” detections of the system. As represented in Table 11, the end-user stated “FALSE” due

to the incorrect detection of the system with “COW N” and “COW P” as in-heat cows, which instead should be the “BULL” and “COW Q”. Nevertheless, the system initially and correctly detected 4 standing-heat signs, but with 2 false predictions and identifications leading to 2 “True Positive” and 2 “False Positive” results, attaining a 50% detection efficiency.

4.3.3 Notification Alerts

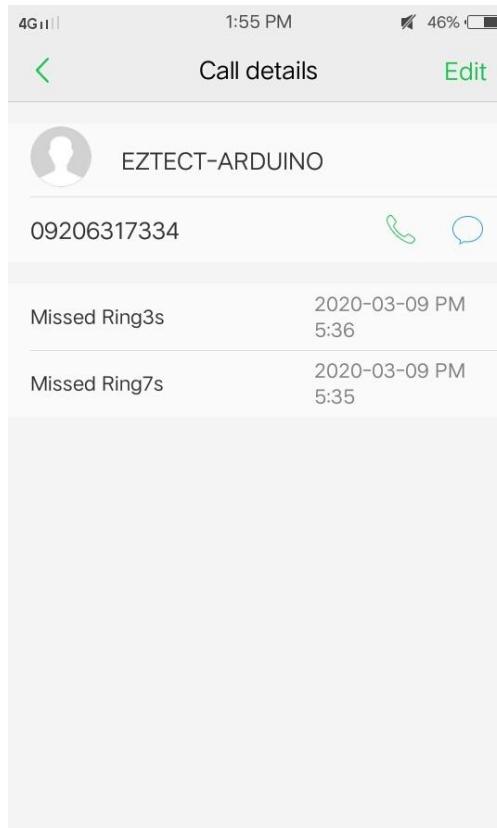


Figure 40: Screenshot of the Call Alerts

Figure 40 illustrates the recorded call alerts obtained from the program through the Arduino and the GSM module during the experimentation and trial phase of the system. The researchers cannot retrieve the call logs from Ms. Catherine Relente due to internet connectivity and other related issues dealt by the COVID-19 pandemic.

4.4 Project Evaluation

Due to the uprising cases brought by the global COVID-19 pandemic, the end-users, namely Mr. Arcadio Francisco De Belen Jr., Ms. Carine Relente, and Dr. Tony were not yet able to evaluate and assess the gathered data and results of the project.

Chapter 5

Summary of Findings, Conclusion, and Recommendation

This chapter presents the summary of findings, the conclusions drawn from the results, and the possible recommendations for the improvements of the study.

5.1 Summary of Findings

The EZTECT project is a non-invasive and non-contact estrus detection system that uses image processing to detect standing heat behaviors. The detection system mainly observed seventeen cows, a carabao, and a bull through cameras installed atop of a cowshed. The proponents performed the proposed algorithm locally in the barn for 4 months, with 10 hours of daylight and artificial light exposure in the barn. But based on the results obtained, the system reported only 2 confirmed estrus events for 19 subjects in the trials. After reviewing the playback videos from the NVR, the proponents found that the cattle caretaker mistakenly added subjects in the area that also affected the validity of the model's performance. Such an incident resulted in false identification of unclassified cows. Also, there are some images stored in the system that do not display actual cattle mounting sessions, but rather images (occlusions) of two or more cows resting or walking in the barn.

Nevertheless, the application of custom neural network models such as - the Faster RCNN; and the Single Shot Detector models made the detection of dairy cattle and object overlapping criteria easier to accomplish than the implementation of Scale-Invariant Feature Transform (SIFT) with HAAR Cascade Classifier, and Random Forest, K-Nearest Neighbor, or Support Vector Machine. The proponents only needed to utilize the TensorFlow Object Detection API to develop the custom object detectors using pre-trained

models which effectively visualized bounding boxes in accordance with the supervised learning designed by the proponents.

5.2 Conclusion

Based on the findings and results of the study, the following are the conclusions drawn out by the proponents:

1. The cost-effective smart system consisted of Pan-tilt-zoom (PTZ) cameras, a Network Video Recorder (NVR), a high-processing laptop, and an Arduino Uno and GSM Module proved to be interoperable and beneficial in - providing local and remote monitoring of the cows in the barn; giving access to high quality recorded video footages for security and validation purposes; managing cattle records, detection results, and other relevant information through the web application; and notifying the proprietors of the De Belen Dairy Farm of any detected estrus activities in the barn.
2. The custom neural network models such as - the Faster R-CNN; and the Single Shot Detector (SSD) models proved to be effective in visualizing bounding boxes for the detection of cows, and identifying its standing-heat behaviors through supervised learning and bounding box corner analysis in comparison with the combination of Scale Invariant Feature Transform (SIFT), HAAR Cascade Classifier, and Random Forest (RF), K-Nearest Neighbor (KNN), or Support Vector Machine (SVM) algorithms.
3. The IoT-based Web Application (“EZTECT App”) proved to be capable of data visualization and report generation of relevant cow information, remote camera control for monitoring, and notification alerts. The App was also able to generate a countdown timer

and a calendar-planner for forecasting and preparations and a locator map for minimizing decisions.

4. The results gathered in the study were initially verified by one of the farm caretakers, wherein the system only performed 50% in detection efficiency. Due to the global COVID-19 pandemic, the dairy farm owner and the veterinarian are not yet able to evaluate the overall performance of the system.

5.3 Recommendation

The project was successfully implemented and done; however, the proponents would like to make the following recommendations to further improve the project:

1. Deploy the project on higher-roofed barns to obtain wider field of view and to lessen the numbers of cameras to be used;
2. Use a high-processing computer for faster training and evaluation, and real-time detection of the subjects;
3. Implement unsupervised learning and/ or predictive models using machine learning algorithms;
4. Use cloud computation and cloud messaging for a more efficient training capacity and transmission of notifications; and
5. Use or find an alternative way of sending data from a remote location to the cloud server.

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APPENDIX A

Source Codes

Image Processing

```
#RecordVidFrameCut.py

def extractFrames(pathIn, pathOut):
    os.makedirs(pathOut)
    cap=cv2.VideoCapture('5A04A3CPAZ05326@ch3
    @main_20200111125959_20200111135959.avi')
    #Change code since the files have a different directory path
    num = 0
    while (cap.isOpened()):
        # Capture frame-by-frame
        ret, frame = cap.read()
        if ret == True:
            num += 1
            print('Saving Frame%d' %num + ' ...')
            cv2.imwrite(os.path.join(pathOut, "Frame{:d}.jpg".format(num)), frame)
        else:
            print('Done!')
            break

    # Releases the capture
    cap.release()
    cv2.destroyAllWindows()

def main():
    #The directory name must be hidden and be automatically labeled
    print('Name your directory: ')
    directory = str(input())
    print('Creating ' + directory + " directory")

    extractFrames('5A04A3CPAZ05326@ch3@main_20200111125959_20200111135959.a
    vi', directory)

if __name__=="__main__":
    main()
```

```

#TF_OBJDETECT_Cam_1(Ch7).py

import os
import math
import sys
import serial
from itertools import permutations, combinations
from datetime import datetime
import paramiko
import cv2
import numpy as np
import pandas as pd
import tensorflow as tf

# This is needed since the notebook is stored in the object_detection folder.
sys.path.append("..")

# Import utilites
from utils import label_map_util
from utils import visualization_utils as vis_util
from TF_OBJDETECT_IMAGE import FASTER_RCNN_CLASSIFIER

# import ClassIDs
# from estrus import cowtp, cowbm

# Grab path to current working directory
CWD_PATH = os.getcwd()

# Path to frozen detection graph .pb file, which contains the model that is used for object
# detection.
# PATH_TO_CKPT =
r'C:\Users\admin\Desktop\Ezetect\Tensorflow\workspace\training_demo\01_19_2020_inf
erence_graph\frozen_inference_graph.pb'
PATH_TO_CKPT =
r'C:\Users\admin\Desktop\Ezetect\Tensorflow\workspace\training_demo\03_13_ssd_inf\fr
ozen_inference_graph.pb'
# PATH_TO_CKPT =
r'C:\Users\admin\Documents\03_04_inference_graph\frozen_inference_graph.pb'

# Path to label map file

```

```

PATH_TO_LABELS =
r'C:\Users\admin\Desktop\Ezetect\Tensorflow\workspace\training_demo\annotations\label
_map.pbtxt'

# Path to Video
PATH_TO_VIDEO =
r'C:\Users\admin\Desktop\Ezetect\ESTRUS_Caracow_x_CowH.avi'

# Path to Event CSVs:
PATH_TO_CSV = 'C:/Users/admin/Desktop/Ezetect/event_csv'

# Path to Event Pics:
PATH_TO_EVENT_PICS = 'C:/Users/admin/Desktop/Ezetect/event_pics'

# Number of classes the object detector can identify
NUM_CLASSES = 1

# Arduino
global board
global estrus

def init__():
    board = serial.Serial('COM4', 9600)
    board.close()
    board.open()

# Load the label map
label_map = label_map_util.load_labelmap(PATH_TO_LABELS)
categories = label_map_util.convert_label_map_to_categories(label_map,
max_num_classes=NUM_CLASSES,
use_display_name=True)
category_index = label_map_util.create_category_index(categories)

# XLA
tf.compat.v1.enable_eager_execution()
tf.config.optimizer.set_jit(True)

# Load the Tensorflow model into memory.
detection_graph = tf.Graph()
with detection_graph.as_default():
    od_graph_def = tf.compat.v1.GraphDef()

```

```

with tf.io.gfile.GFile(PATH_TO_CKPT, 'rb') as fid:
    serialized_graph = fid.read()
    od_graph_def.ParseFromString(serialized_graph)
    tf.import_graph_def(od_graph_def, name="")

sess = tf.compat.v1.Session(graph=detection_graph)

# Define input and output tensors (i.e. data) for the object detection classifier

# Input tensor is the image
image_tensor = detection_graph.get_tensor_by_name('image_tensor:0')

# Output tensors are the detection boxes, scores, and classes
# Each box represents a part of the image where a particular object was detected
detection_boxes = detection_graph.get_tensor_by_name('detection_boxes:0')

# Each score represents level of confidence for each of the objects.
# The score is shown on the result image, together with the class label.
detection_scores = detection_graph.get_tensor_by_name('detection_scores:0')
detection_classes = detection_graph.get_tensor_by_name('detection_classes:0')

# Number of objects detected
num_detections = detection_graph.get_tensor_by_name('num_detections:0')

# Open video file
# video1 = cv2.VideoCapture(PATH_TO_VIDEO)
video1 =
cv2.VideoCapture('rtsp://admin:admin123@192.168.2.108:554/cam/realmonitor?channel
=7&subtype=0') # --- Camera 1
# video2 =
cv2.VideoCapture('rtsp://admin:admin123@192.168.2.108:554/cam/realmonitor?channel
=1&subtype=0') #--- Camera 2
# video3 =
cv2.VideoCapture('rtsp://admin:admin123@192.168.2.108:554/cam/realmonitor?channel
=3&subtype=0') #--- Camera 3
# Counter for detected estrus
estrus_counter = 0

# Initialize SSH Server from Linode:
eztect = paramiko.SSHClient()
eztect.set_missing_host_key_policy(paramiko.AutoAddPolicy())

```

```

eztect_key =
paramiko.RSAKey.from_private_key_file(filename=r'C:\Users\admin\.ssh\Farm.pem',
password='Rising,Sun,00')
eztect.connect(hostname='172.105.124.220', port=22, username='sigiel',
pkey=eztect_key)

while (video1.isOpened()):
    # while True:
        # Acquire frame and expand frame dimensions to have shape: [1, None, None, 3]
        # i.e. a single-column array, where each item in the column has the pixel RGB value
    ret, frame = video1.read()
    if frame is None:
        break
    frame_copy = frame.copy()
    frame_expanded = np.expand_dims(frame, axis=0)

    # Height and Width of the image
    height = frame.shape[0]
    width = frame.shape[1]

    # Perform the actual detection by running the model with the image as input
    (boxes, scores, classes, num) = sess.run([detection_boxes, detection_scores,
detection_classes, num_detections],
                                         feed_dict={image_tensor: frame_expanded})

    # Draw the results of the detection (aka 'visualize the results')
    vis_util.visualize_boxes_and_labels_on_image_array(
        frame,
        np.squeeze(boxes),
        np.squeeze(classes).astype(np.int32),
        np.squeeze(scores),
        category_index,
        use_normalized_coordinates=True,
        line_thickness=3)

    # Dataframes:
    main_DataFrame = pd.DataFrame()
    name_DataFrame = pd.DataFrame()
    box_DataFrame = pd.DataFrame()
    time_DataFrame = pd.DataFrame()

    for index, value in enumerate(classes[0]):
        if scores[0, index] > 0.7:

```

```

ymin = (int(np.squeeze(boxes)[index, 0] * height)) # top
xmin = (int(np.squeeze(boxes)[index, 1] * width)) # left
ymax = (int(np.squeeze(boxes)[index, 2] * height)) # bottom
xmax = (int(np.squeeze(boxes)[index, 3] * width)) # right
mid_x = (boxes[0][index][1] + boxes[0][index][3]) / 2
mid_y = (boxes[0][index][0] + boxes[0][index][2]) / 2

# Create Dataframe containing Cow Name/Classes and Cow IDs
name_DF = pd.DataFrame({'COW NAME':
[category_index.get(value).get('name')], 'ID': [category_index.get(value).get('id')]})
name_dataFrame = name_dataFrame.append(name_DF, ignore_index=True)

# Create Dataframe containing Box Coordinates
box_DF = pd.DataFrame({'Ymin': [ymin], 'Xmin': [xmin], 'Ymax': [ymax],
'Xmax': [xmax], 'MidX': [int(mid_x * width)], 'MidY': [int(mid_y * height)]})
box_dataFrame = box_dataFrame.append(box_DF, ignore_index=True)

# Create Dataframe containing actual datetime
time_DF = pd.DataFrame([datetime.now().strftime("%Y-%m-%d
%H:%M:%S.%f")], columns=['Estrus Time'])
time_dataFrame = time_dataFrame.append(time_DF, ignore_index=True)

if len(name_dataFrame) == len(classes[scores > 0.7]):
    main_DF = pd.concat([name_dataFrame, box_dataFrame, time_dataFrame],
axis=1)
    main_dataFrame = main_dataFrame.append(main_DF, ignore_index=True)
    # print(main_dataFrame)
    if len(main_dataFrame) > 1:
        # Empty list for estrus_counter
        ECL = []
        # Creates condition to avoid repetitive labels in the dataframe
        for i in list(combinations(range(len(main_dataFrame)), 2)):
            num = 0
            x = int(i[0])
            y = int(i[1])
            # Looks through every cow object instance inside the dataframe
            if main_dataFrame.at[x, 'Xmin'] in range(main_dataFrame.at[y,
'Xmin'],main_dataFrame.at[y, 'Xmax']) and main_dataFrame.at[x, 'Ymin'] in
range(main_dataFrame.at[y, 'Ymin'],main_dataFrame.at[y, 'Ymax']):
                delta_X = abs(main_dataFrame.at[y, 'MidX'] - main_dataFrame.at[x,
'MidX'])
                delta_Y = abs(main_dataFrame.at[y, 'MidY'] - main_dataFrame.at[x,
'MidY'])

```

```

# Calculate the euclidean distance between two centroids/ the
'hypotenuse'
euc_dist = math.sqrt(((delta_X) ** 2) + ((delta_Y) ** 2))
# Define angle with resp. to Y axis
angle_Y = (math.asin(delta_Y / euc_dist)) * (180 / math.pi)
# Define angle with resp. to X axis
angle_X = (math.asin(delta_X / euc_dist)) * (180 / math.pi)

# Considering less than 25 and greater than 60 degrees for Y and X
axes, respectively
if angle_Y < 25 and angle_X > 65:
    if euc_dist < 360:
        estrus_counter += 1
        # ECL.append(estrus_counter)
        # Assuming that estrus is valid by 8 frames
        if estrus_counter in range(2,8):
            # Activate Faster RCNN-based Classifier
            FASTER_RCNN_CLASSIFIER(frame_copy)
            if os.listdir(PATH_TO_CSV) != []:
                # Declare paths for SSH and upload photos of estrus events
                os.chdir(PATH_TO_CSV)
                csv_filename = (os.listdir(PATH_TO_CSV))[-1]
                remotepath_event_csv = '/home/sigiel/Ez-
tect/static/event_csv/' + csv_filename
                localpath_event_csv =
'C:/Users/admin/Desktop/Eztect/event_csv/' + csv_filename
                eztect.open_sftp().put(localpath_event_csv,
remotepath_event_csv)

                os.chdir(PATH_TO_EVENT_PICS)
                event_pic_filename =
(os.listdir(PATH_TO_EVENT_PICS))[-1]
                remotepath_event_pics = '/home/sigiel/Ez-
tect/static/event_pics/' + event_pic_filename
                localpath_event_pics =
'C:/Users/admin/Desktop/Eztect/event_pics/' + event_pic_filename
                eztect.open_sftp().put(localpath_event_pics,
remotepath_event_pics)

# Calls the End-user having a delay of approx. 14 sec
# init_()
# Set counter to zero again to recount other possible activities

```

```
os.chdir(r'C:\Users\admin\Desktop\Ezetect\event_pics_backup')
    cv2.imwrite(str(datetime.now().strftime(
        "%B" + "_" + "%d" + "_" + "%y" + "_" + "%H" + '_' +
        "%M" + '_' + "%S" + '_' + "%f")) + '.jpg',
        frame)
    cv2.imwrite(str(datetime.now().strftime(
        "%B" + "_" + "%d" + "_" + "%y" + "_" + "%H" + '_' +
        "%M" + '_' + "%S" + '_' + "%f")) + '.png',
        frame_copy)
    print('Uploaded!')
    estrus_counter = 0
else:
    print('False Detection!')
    estrus_counter = 0

# All the results have been drawn on the frame, so it's time to display it.
# cv2.imshow('Camera 1', cv2.resize(frame, (640, 360)))

# Press <SPACEBAR> to quit
if cv2.waitKey(1) == ord(' '):
    break

# Clean up
video1.release()
cv2.destroyAllWindows()
```

```

#TF_OBJDETECT_Cam_2(Ch1).py

import os
import math
import sys
import serial
from itertools import permutations, combinations
from datetime import datetime
import paramiko
import cv2
import numpy as np
import pandas as pd
import tensorflow as tf

# This is needed since the notebook is stored in the object_detection folder.
sys.path.append("..")

# Import utilites
from utils import label_map_util
from utils import visualization_utils as vis_util
from TF_OBJDETECT_IMAGE import FASTER_RCNN_CLASSIFIER

# import ClassIDs
# from estrus import cowtp, cowbm

# Grab path to current working directory
CWD_PATH = os.getcwd()

# Path to frozen detection graph .pb file, which contains the model that is used for object
# detection.
# PATH_TO_CKPT =
r'C:\Users\admin\Desktop\Ezetect\Tensorflow\workspace\training_demo\01_19_2020_inf
erence_graph\frozen_inference_graph.pb'
PATH_TO_CKPT =
r'C:\Users\admin\Desktop\Ezetect\Tensorflow\workspace\training_demo\03_13_ssd_inf\fro
zen_inference_graph.pb'
# PATH_TO_CKPT =
r'C:\Users\admin\Documents\03_04_inference_graph\frozen_inference_graph.pb'

# Path to label map file
PATH_TO_LABELS =
r'C:\Users\admin\Desktop\Ezetect\Tensorflow\workspace\training_demo\annotations\label
_map.pbtxt'

# Path to Video
PATH_TO_VIDEO = r'C:\Users\admin\Desktop\ESTRUS_Caracow_x_CowH.avi'

```

```

# Path to Event CSVs:
PATH_TO_CSV = 'C:/Users/admin/Desktop/Ezetect/event_csv'

# Path to Event Pics:
PATH_TO_EVENT_PICS = 'C:/Users/admin/Desktop/Ezetect/event_pics'

# Number of classes the object detector can identify
NUM_CLASSES = 1

# Arduino
global board
global estrus

def init_():
    board = serial.Serial('COM4', 9600)
    board.close()
    board.open()

# Load the label map
label_map = label_map_util.load_labelmap(PATH_TO_LABELS)
categories = label_map_util.convert_label_map_to_categories(label_map,
max_num_classes=NUM_CLASSES,
use_display_name=True)
category_index = label_map_util.create_category_index(categories)

# XLA
tf.compat.v1.enable_eager_execution()
tf.config.optimizer.set_jit(True)

# Load the Tensorflow model into memory.
detection_graph = tf.Graph()
with detection_graph.as_default():
    od_graph_def = tf.compat.v1.GraphDef()
    with tf.io.gfile.GFile(PATH_TO_CKPT, 'rb') as fid:
        serialized_graph = fid.read()
        od_graph_def.ParseFromString(serialized_graph)
        tf.import_graph_def(od_graph_def, name="")

    sess = tf.compat.v1.Session(graph=detection_graph)

# Define input and output tensors (i.e. data) for the object detection classifier

# Input tensor is the image
image_tensor = detection_graph.get_tensor_by_name('image_tensor:0')

```

```

# Output tensors are the detection boxes, scores, and classes
# Each box represents a part of the image where a particular object was detected
detection_boxes = detection_graph.get_tensor_by_name('detection_boxes:0')

# Each score represents level of confidence for each of the objects.
# The score is shown on the result image, together with the class label.
detection_scores = detection_graph.get_tensor_by_name('detection_scores:0')
detection_classes = detection_graph.get_tensor_by_name('detection_classes:0')

# Number of objects detected
num_detections = detection_graph.get_tensor_by_name('num_detections:0')

# Open video file
# video = cv2.VideoCapture(PATH_TO_VIDEO)
# video1 =
cv2.VideoCapture('rtsp://admin:admin123@192.168.2.108:554/cam/realmonitor?channel=7&subtype=0') # --- Camera 1
video2 =
cv2.VideoCapture('rtsp://admin:admin123@192.168.2.108:554/cam/realmonitor?channel=1&subtype=0') #--- Camera 2
# video3 =
cv2.VideoCapture('rtsp://admin:admin123@192.168.2.108:554/cam/realmonitor?channel=3&subtype=0') #--- Camera 3
# Counter for detected estrus
estrus_counter = 0

# Initialize SSH Server from Linode:
eztect = paramiko.SSHClient()
eztect.set_missing_host_key_policy(paramiko.AutoAddPolicy())
eztect_key =
paramiko.RSAKey.from_private_key_file(filename=r'C:\Users\admin\.ssh\Farm.pem',
password='RisingSun00')
eztect.connect(hostname='172.105.124.220', port=22, username='sigiel',
pkey=eztect_key)

while (video2.isOpened()):
    # while True:
        # Acquire frame and expand frame dimensions to have shape: [1, None, None, 3]
        # i.e. a single-column array, where each item in the column has the pixel RGB value
    ret, frame = video2.read()
    if frame is None:
        break
    frame_copy = frame.copy()
    frame_expanded = np.expand_dims(frame, axis=0)

    # Height and Width of the image

```

```

height = frame.shape[0]
width = frame.shape[1]

# Perform the actual detection by running the model with the image as input
(boxes, scores, classes, num) = sess.run([detection_boxes, detection_scores,
detection_classes, num_detections],
feed_dict={image_tensor: frame_expanded})

# Draw the results of the detection (aka 'visualize the results')
vis_util.visualize_boxes_and_labels_on_image_array(
    frame,
    np.squeeze(boxes),
    np.squeeze(classes).astype(np.int32),
    np.squeeze(scores),
    category_index,
    use_normalized_coordinates=True,
    line_thickness=3)

# Dataframes:
main_dataFrame = pd.DataFrame()
name_dataFrame = pd.DataFrame()
box_dataFrame = pd.DataFrame()
time_dataFrame = pd.DataFrame()

for index, value in enumerate(classes[0]):
    if scores[0, index] > 0.7:
        ymin = (int(np.squeeze(boxes)[index, 0] * height)) # top
        xmin = (int(np.squeeze(boxes)[index, 1] * width)) # left
        ymax = (int(np.squeeze(boxes)[index, 2] * height)) # bottom
        xmax = (int(np.squeeze(boxes)[index, 3] * width)) # right
        mid_x = (boxes[0][index][1] + boxes[0][index][3]) / 2
        mid_y = (boxes[0][index][0] + boxes[0][index][2]) / 2

        # Create Dataframe containing Cow Name/Classes and Cow IDs
        name_DF = pd.DataFrame({'COW NAME':
[category_index.get(value).get('name')], 'ID': [category_index.get(value).get('id')]})
        name_dataFrame = name_dataFrame.append(name_DF, ignore_index=True)

        # Create Dataframe containing Box Coordinates
        box_DF = pd.DataFrame({'Ymin': [ymin], 'Xmin': [xmin], 'Ymax': [ymax],
'Xmax': [xmax], 'MidX': [int(mid_x * width)], 'MidY': [int(mid_y * height)]})
        box_dataFrame = box_dataFrame.append(box_DF, ignore_index=True)

        # Create Dataframe containing actual datetime
        time_DF = pd.DataFrame([datetime.now().strftime("%Y-%m-%d
%H:%M:%S.%f")], columns=['Estrus Time'])

```

```

time_dataFrame = time_dataFrame.append(time_DF, ignore_index=True)

if len(name_dataFrame) == len(classes[scores > 0.7]):
    main_DF = pd.concat([name_dataFrame, box_dataFrame, time_dataFrame],
axis=1)
    main_dataFrame = main_dataFrame.append(main_DF, ignore_index=True)
    # print(main_dataFrame)
    if len(main_dataFrame) > 1:
        # Creates condition to avoid repetitive labels in the dataframe
        for i in list(combinations(range(len(main_dataFrame)), 2)):
            num = 0
            x = int(i[0])
            y = int(i[1])
            # Looks through every cow object instance inside the dataframe
            if main_dataFrame.at[x, 'Xmin'] in range(main_dataFrame.at[y,
'Xmin'],main_dataFrame.at[y, 'Xmax']) and main_dataFrame.at[x, 'Ymin'] in
range(main_dataFrame.at[y, 'Ymin'],main_dataFrame.at[y, 'Ymax']):
                delta_X = abs(main_dataFrame.at[y, 'MidX'] - main_dataFrame.at[x,
'MidX'])
                delta_Y = abs(main_dataFrame.at[y, 'MidY'] - main_dataFrame.at[x,
'MidY'])
                # Calculate the euclidean distance between two centroids/ the
                'hypotenuse'
                euc_dist = math.sqrt(((delta_X) ** 2) + ((delta_Y) ** 2))
                # Define angle with resp. to Y axis
                angle_Y = (math.asin(delta_Y / euc_dist)) * (180 / math.pi)
                # Define angle with resp. to X axis
                angle_X = (math.asin(delta_X / euc_dist)) * (180 / math.pi)
                # print('Angles: ' + str(angle_Y) + ' and ' + str(angle_X) + ';' + 'Dist: ' +
str(euc_dist))
                # Considering less than 25 and greater than 60 degrees for Y and X
                axes, respectively
                if angle_Y < 25 and angle_X > 65:
                    if euc_dist < 360:
                        estrus_counter += 1
                        # ECL.append(estrus_counter)
                        # Assuming that estrus is valid by 8 frames
                        if estrus_counter in range(2, 8):
                            # Activate Faster RCNN-based Classifier
                            FASTER_RCNN_CLASSIFIER(frame_copy)
                            if os.listdir(PATH_TO_CSV) != []:
                                # Declare paths for SSH and upload photos of estrus events
                                os.chdir(PATH_TO_CSV)
                                csv_filename = (os.listdir(PATH_TO_CSV))[-1]
                                remotepath_event_csv = '/home/sigiel/Ez-
tect/static/event_csv/' + csv_filename

```

```

        localpath_event_csv =
'C:/Users/admin/Desktop/Ezetect/event_csv/' + csv_filename
            ezTECT.open_sftp().put(localpath_event_csv,
remotePath_event_csv)

        os.chdir(PATH_TO_EVENT_PICS)
        event_pic_filename =
(os.listdir(PATH_TO_EVENT_PICS))[-1]
            remotePath_event_pics = '/home/sigiel/Ez-
TECT/static/event_pics/' + event_pic_filename
            localpath_event_pics =
'C:/Users/admin/Desktop/EzTECT/event_pics/' + event_pic_filename
            ezTECT.open_sftp().put(localpath_event_pics,
remotePath_event_pics)

# Calls the End-user having a delay of approx. 14 sec
# init_()
# Set counter to zero again to recount other possible activities

os.chdir(r'C:\Users\admin\Desktop\EzTECT\event_pics_backup')
cv2.imwrite(str(datetime.now().strftime(
    "%B" + " " + "%d" + " " + "%y" + " " + "%H" + ' ' +
    "%M" + ' ' + "%S" + ' ' + "%f")) + '.jpg',
frame)
cv2.imwrite(str(datetime.now().strftime(
    "%B" + " " + "%d" + " " + "%y" + " " + "%H" + ' ' +
    "%M" + ' ' + "%S" + ' ' + "%f")) + '.png',
frame_copy)
print('Uploaded!')
estrus_counter = 0
else:
    print('False Detection!')
    estrus_counter = 0

# All the results have been drawn on the frame, so it's time to display it.
# cv2.imshow('Camera 2', cv2.resize(frame, (640, 360)))

# Press <SPACEBAR> to quit
if cv2.waitKey(1) == ord(' '):
    break

# Clean up
video2.release()
cv2.destroyAllWindows()

```

```

#TF_OBJDETECT_Cam_3(Ch3).py

import os
import math
import sys
import serial
from itertools import permutations, combinations
from datetime import datetime
import paramiko
import cv2
import numpy as np
import pandas as pd
import tensorflow as tf

# This is needed since the notebook is stored in the object_detection folder.
sys.path.append("..")

# Import utilites
from utils import label_map_util
from utils import visualization_utils as vis_util
from TF_OBJDETECT_IMAGE import FASTER_RCNN_CLASSIFIER

# import ClassIDs
# from estrus import cowtp, cowbm

# Grab path to current working directory
CWD_PATH = os.getcwd()

# Path to frozen detection graph .pb file, which contains the model that is used for object
# detection.
# PATH_TO_CKPT =
r'C:\Users\admin\Desktop\Ezetect\Tensorflow\workspace\training_demo\01_19_2020_inf
erence_graph\frozen_inference_graph.pb'
PATH_TO_CKPT =
r'C:\Users\admin\Desktop\Ezetect\Tensorflow\workspace\training_demo\03_13_ssd_inf\f
rozen_inference_graph.pb'
# PATH_TO_CKPT =
r'C:\Users\admin\Documents\03_04_inference_graph\frozen_inference_graph.pb'

# Path to label map file
PATH_TO_LABELS =
r'C:\Users\admin\Desktop\Ezetect\Tensorflow\workspace\training_demo\annotations\label
_map.pbtxt'

# Path to Video
PATH_TO_VIDEO =
r'C:\Users\admin\Desktop\Ezetect\ESTRUS_Caracow_x_CowH.avi'

```

```

# Path to Event CSVs:
PATH_TO_CSV = 'C:/Users/admin/Desktop/Ezetect/event_csv'

# Path to Event Pics:
PATH_TO_EVENT_PICS = 'C:/Users/admin/Desktop/Ezetect/event_pics'

# Number of classes the object detector can identify
NUM_CLASSES = 1

# Arduino
global board
global estrus

def init_():
    board = serial.Serial('COM4', 9600)
    board.close()
    board.open()

# Load the label map
label_map = label_map_util.load_labelmap(PATH_TO_LABELS)
categories = label_map_util.convert_label_map_to_categories(label_map,
max_num_classes=NUM_CLASSES,
use_display_name=True)
category_index = label_map_util.create_category_index(categories)

# XLA
tf.compat.v1.enable_eager_execution()
tf.config.optimizer.set_jit(True)

# Load the Tensorflow model into memory.
detection_graph = tf.Graph()
with detection_graph.as_default():
    od_graph_def = tf.compat.v1.GraphDef()
    with tf.io.gfile.GFile(PATH_TO_CKPT, 'rb') as fid:
        serialized_graph = fid.read()
        od_graph_def.ParseFromString(serialized_graph)
        tf.import_graph_def(od_graph_def, name="")
    sess = tf.compat.v1.Session(graph=detection_graph)

# Define input and output tensors (i.e. data) for the object detection classifier

# Input tensor is the image
image_tensor = detection_graph.get_tensor_by_name('image_tensor:0')

```

```

# Output tensors are the detection boxes, scores, and classes
# Each box represents a part of the image where a particular object was detected
detection_boxes = detection_graph.get_tensor_by_name('detection_boxes:0')

# Each score represents level of confidence for each of the objects.
# The score is shown on the result image, together with the class label.
detection_scores = detection_graph.get_tensor_by_name('detection_scores:0')
detection_classes = detection_graph.get_tensor_by_name('detection_classes:0')

# Number of objects detected
num_detections = detection_graph.get_tensor_by_name('num_detections:0')

# Open video file
# video = cv2.VideoCapture(PATH_TO_VIDEO)
# video1 =
cv2.VideoCapture('rtsp://admin:admin123@192.168.2.108:554/cam/realmonitor?channel=7&subtype=0') # --- Camera 1
# video2 =
cv2.VideoCapture('rtsp://admin:admin123@192.168.2.108:554/cam/realmonitor?channel=1&subtype=0') #--- Camera 2
video3 =
cv2.VideoCapture('rtsp://admin:admin123@192.168.2.108:554/cam/realmonitor?channel=3&subtype=0') #--- Camera 3
# Counter for detected estrus
estrus_counter = 0

# Initialize SSH Server from Linode:
eztect = paramiko.SSHClient()
eztect.set_missing_host_key_policy(paramiko.AutoAddPolicy())
eztect_key =
paramiko.RSAKey.from_private_key_file(filename=r'C:\Users\admin\.ssh\Farm.pem',
password='Rising,Sun,00')
eztect.connect(hostname='172.105.124.220', port=22, username='sigiel',
pkey=eztect_key)

while (video3.isOpened()):
    # while True:
        # Acquire frame and expand frame dimensions to have shape: [1, None, None, 3]
        # i.e. a single-column array, where each item in the column has the pixel RGB value
    ret, frame = video3.read()
    if frame is None:
        break
    frame_copy = frame.copy()
    frame_expanded = np.expand_dims(frame, axis=0)

```

```

# Height and Width of the image
height = frame.shape[0]
width = frame.shape[1]

# Perform the actual detection by running the model with the image as input
(boxes, scores, classes, num) = sess.run([detection_boxes, detection_scores,
detection_classes, num_detections],
feed_dict={image_tensor: frame_expanded})

# Draw the results of the detection (aka 'visualize the results')
vis_util.visualize_boxes_and_labels_on_image_array(
    frame,
    np.squeeze(boxes),
    np.squeeze(classes).astype(np.int32),
    np.squeeze(scores),
    category_index,
    use_normalized_coordinates=True,
    line_thickness=3)

# Dataframes:
main_dataFrame = pd.DataFrame()
name_dataFrame = pd.DataFrame()
box_dataFrame = pd.DataFrame()
time_dataFrame = pd.DataFrame()

for index, value in enumerate(classes[0]):
    if scores[0, index] > 0.7:
        ymin = (int(np.squeeze(boxes)[index, 0] * height)) # top
        xmin = (int(np.squeeze(boxes)[index, 1] * width)) # left
        ymax = (int(np.squeeze(boxes)[index, 2] * height)) # bottom
        xmax = (int(np.squeeze(boxes)[index, 3] * width)) # right
        mid_x = (boxes[0][index][1] + boxes[0][index][3]) / 2
        mid_y = (boxes[0][index][0] + boxes[0][index][2]) / 2

        # Create Dataframe containing Cow Name/Classes and Cow IDs
        name_DF = pd.DataFrame({'COW NAME':
[category_index.get(value).get('name')], 'ID': [category_index.get(value).get('id')]})
        name_dataFrame = name_dataFrame.append(name_DF, ignore_index=True)

        # Create Dataframe containing Box Coordinates
        box_DF = pd.DataFrame({'Ymin': [ymin], 'Xmin': [xmin], 'Ymax': [ymax],
'Xmax': [xmax], 'MidX': [int(mid_x * width)], 'MidY': [int(mid_y * height)]})
        box_dataFrame = box_dataFrame.append(box_DF, ignore_index=True)

    # Create Dataframe containing actual datetime

```

```

time_DF = pd.DataFrame([datetime.now().strftime("%Y-%m-%d
%H:%M:%S.%f")], columns=['Estrus Time'])
time_dataFrame = time_dataFrame.append(time_DF, ignore_index=True)

if len(name_dataFrame) == len(classes[scores > 0.7]):
    main_DF = pd.concat([name_dataFrame, box_dataFrame, time_dataFrame],
axis=1)
    main_dataFrame = main_dataFrame.append(main_DF, ignore_index=True)
    # print(main_dataFrame)
    if len(main_dataFrame) > 1:
        # Creates condition to avoid repetitive labels in the dataframe
        for i in list(combinations(range(len(main_dataFrame)), 2)):
            num = 0
            x = int(i[0])
            y = int(i[1])
            # Looks through every cow object instance inside the dataframe
            if main_dataFrame.at[x, 'Xmin'] in range(main_dataFrame.at[y,
'Xmin'],main_dataFrame.at[y, 'Xmax']) and main_dataFrame.at[x, 'Ymin'] in
range(main_dataFrame.at[y, 'Ymin'],main_dataFrame.at[y, 'Ymax']):
                delta_X = abs(main_dataFrame.at[y, 'MidX'] - main_dataFrame.at[x,
'MidX'])
                delta_Y = abs(main_dataFrame.at[y, 'MidY'] - main_dataFrame.at[x,
'MidY'])
                # Calculate the euclidean distance between two centroids/ the
'hypotenuse'
                euc_dist = math.sqrt(((delta_X) ** 2) + ((delta_Y) ** 2))
                # Define angle with resp. to Y axis
                angle_Y = (math.asin(delta_Y / euc_dist)) * (180 / math.pi)
                # Define angle with resp. to X axis
                angle_X = (math.asin(delta_X / euc_dist)) * (180 / math.pi)
                # print('Angles: ' + str(angle_Y) + ' and ' + str(angle_X) + '; ' + 'Dist: ' +
str(euc_dist))
                # Considering less than 25 and greater than 60 degrees for Y and X
axes, respectively
            if angle_Y < 25 and angle_X > 65:
                if euc_dist < 360:
                    estrus_counter += 1
                    # Assuming that estrus is valid by 8 frames
                    if estrus_counter in range(2,8):
                        # Activate Faster RCNN-based Classifier
                        FASTER_RCNN_CLASSIFIER(frame_copy)
                        if os.listdir(PATH_TO_CSV) != []:
                            # Declare paths for SSH and upload photos of estrus events
                            os.chdir(PATH_TO_CSV)
                            csv_filename = (os.listdir(PATH_TO_CSV))[-1]

```

```

        remotepath_event_csv = '/home/sigiel/Ez-
tect/static/event_csv/' + csv_filename
            localpath_event_csv =
'C:/Users/admin/Desktop/Eztect/event_csv/' + csv_filename
                eztect.open_sftp().put(localpath_event_csv ,
remotepath_event_csv)

        os.chdir(PATH_TO_EVENT_PICS)
        event_pic_filename =
(os.listdir(PATH_TO_EVENT_PICS))[-1]
            remotepath_event_pics = '/home/sigiel/Ez-
tect/static/event_pics/' + event_pic_filename
            localpath_event_pics =
'C:/Users/admin/Desktop/Eztect/event_pics/' + event_pic_filename
                eztect.open_sftp().put(localpath_event_pics ,
remotepath_event_pics)

# Calls the End-user having a delay of approx. 14 sec
# init_()
# Set counter to zero again to recount other possible activities

os.chdir(r'C:\Users\admin\Desktop\Eztect\event_pics_backup')
    cv2.imwrite(str(datetime.now().strftime(
        "%B" + " " + "%d" + " " + "%y" + " " + "%H" + ' ' +
"%M" + ' ' + "%S" + ' ' + "%f")) + '.jpg',
        frame)
    print('Uploaded!')
    estrus_counter = 0
else:
    print('False Detection!')
    estrus_counter = 0

# All the results have been drawn on the frame, so it's time to display it.
# cv2.imshow('Camera 3', cv2.resize(frame, (640, 360)))

# Press <SPACEBAR> to quit
if cv2.waitKey(1) == ord(' '):
    break

# Clean up
video3.release()
cv2.destroyAllWindows()

```

Arduino-GSM

```
#include <SoftwareSerial.h>
SoftwareSerial mySerial(8,7);
void setup() {

    Serial.begin(9600);
    mySerial.begin(9600);
    Serial.println("Initializing... ");
    delay(1000);
    mySerial.println("AT");
    updateSerial();
    mySerial.println("ATD+ +639975137008;");
    updateSerial();
    delay(20000);
    mySerial.println("ATH");
    updateSerial();

}

void loop() {

}

void updateSerial(){
    delay(500);
    while(Serial.available()){
        mySerial.write(Serial.read());
    }
    while(mySerial.available()){
        Serial.write(mySerial.read());
    }
}
```

Web Application

```
from flask import Flask, Response, render_template, redirect, url_for, request, make_response, jsonify, send_from_directory
from flask_wtf import FlaskForm
from flask_wtf.file import FileField, FileAllowed, FileRequired
from werkzeug.utils import secure_filename
from wtforms import StringField, PasswordField, BooleanField, IntegerField, SubmitField, TextField, RadioField
from wtforms.validators import InputRequired, Length, EqualTo, ValidationError
from flask_sqlalchemy import SQLAlchemy
from werkzeug.security import generate_password_hash, check_password_hash
from flask_login import LoginManager, UserMixin, login_user, login_required, logout_user, current_user
from datetime import datetime, timedelta, date
from base64 import b64encode
from sqlalchemy import extract, and_, or_, desc
import operator
import phonenumbers
import calendar
import pandas as pd
import os
import secrets
import datetime
import time
import pdfkit
import csv
import requests
import json
import urllib
from requests.auth import HTTPDigestAuth
```

```
app = Flask(__name__)
app.config['SECRET_KEY'] = 'f8ff9cd3977e55c4b0565c0bf8b98fae'
app.config['SQLALCHEMY_DATABASE_URI'] = 'sqlite:///database.db'
db = SQLAlchemy(app)
login_manager = LoginManager()
login_manager.init_app(app)
login_manager.login_view = 'login'

@login_manager.user_loader
def load_user(user_id):
```

```

return User.query.get(int(user_id))

class User(UserMixin, db.Model):
    id = db.Column(db.Integer, primary_key=True)
    username = db.Column(db.String(15), unique=True, nullable=False)
    password = db.Column(db.String(80), nullable=False)
    fullname = db.Column(db.String(50), unique=True, nullable=False)
    gender = db.Column(db.String(20), nullable=False)
    email = db.Column(db.String(50))
    mobilenumber = db.Column(db.String, unique=True, nullable=False)
    image_file = db.Column(db.String(20), nullable=False, default='user.jpg')
    role_id = db.Column(db.Integer, db.ForeignKey('role.id'), nullable=False)

    def __repr__(self):
        return f"User('{self.username}', '{self.fullname}', '{self.gender}', '{self.email}', '{self.password}', '{self.mobilenumber}', '{self.image_file}', '{self.role_id}')"

class Role(db.Model):
    id = db.Column(db.Integer, primary_key=True)
    level = db.Column(db.Text, nullable=False)
    users = db.relationship('User', backref='access', lazy=True)

    def __repr__(self):
        return f"Role('{self.level}')"

class Action(db.Model):
    id = db.Column(db.Integer, primary_key=True)
    user = db.Column(db.String, nullable=False)
    date = db.Column(db.DateTime, nullable=False)
    action = db.Column(db.String, nullable=False)

    def __repr__(self):
        return f"Action('{self.user}', '{self.date}', '{self.action}')"

class Plans(db.Model):
    id = db.Column(db.Integer, primary_key=True)
    plan = db.Column(db.String)
    start = db.Column(db.String)
    end = db.Column(db.String)

    def __repr__(self):
        return f"Plans('{self.plan}', '{self.start}', '{self.end}')"

```

```

class Cow(db.Model):
    id = db.Column(db.Integer, primary_key=True)
    cownumber = db.Column(db.String, unique=True, nullable=False)
    breed = db.Column(db.Text, nullable=False)
    last_estrus = db.Column(db.DateTime)
    next_estrus = db.Column(db.DateTime)
    date_acquired = db.Column(db.String)
    status = db.Column(db.Text)
    gender = db.Column(db.Text)
    description = db.Column(db.Text)
    photo_file = db.Column(db.String(20), nullable=False, default='cow.jpg')
    logs = db.relationship('Logs', backref='cow')
    manuals = db.relationship('Manual', backref='cow')
    preg = db.relationship('Pregnancy', backref='cow')
    calves = db.relationship('Calving', backref='cow')

    def __repr__(self):
        return f"Cow('{self.cownumber}', '{self.breed}', '{self.last_estrus}', '{self.next_estrus}', '{self.date_acquired}', '{self.status}', '{self.gender}', '{self.description}', '{self.photo_file}')"

class Logs(db.Model):
    id = db.Column(db.Integer, primary_key=True)
    estrus = db.Column(db.DateTime)
    estexp = db.Column(db.DateTime)
    nextes = db.Column(db.DateTime)
    nextesp = db.Column(db.DateTime)
    nextesm = db.Column(db.DateTime)
    condt = db.Column(db.DateTime)
    insdt = db.Column(db.DateTime)
    insday = db.Column(db.DateTime)
    insad = db.Column(db.String)
    ins = db.Column(db.String)
    insty = db.Column(db.String)
    insexp = db.Column(db.String)
    con = db.Column(db.String)
    cattle_id = db.Column(db.Integer, db.ForeignKey('cow.id'))

    def __repr__(self):
        return f"Logs('{self.estrus}', '{self.estexp}', '{self.nextes}', '{self.nextesp}', '{self.nextesm}', '{self.condt}', '{self.insdt}', '{self.insday}', '{self.insad}', '{self.ins}', '{self.insty}', '{self.insexp}', '{self.con}', '{self.cattle_id}')"

```

```
class Event(db.Model):
    id = db.Column(db.Integer, primary_key=True)
    last_estrus = db.Column(db.DateTime)
    exp_estrus = db.Column(db.DateTime)
    cowt = db.Column(db.String)
    cowb = db.Column(db.String)
    shot_file = db.Column(db.String)

    def __repr__(self):
        return f"Event('{self.last_estrus}', '{self.exp_estrus}', '{self.cowt}', '{self.cowb}', '{self.shot_file}')"
```

```
class Manual(db.Model):
    id = db.Column(db.Integer, primary_key=True)
    estrus = db.Column(db.Date)
    time = db.Column(db.DateTime)
    cattle_id = db.Column(db.Integer, db.ForeignKey('cow.id'))

    def __repr__(self):
        return f"Manual('{self.estrus}', '{self.time}' '{self.cattle_id}')"
```

```
class Pregnancy(db.Model):
    id = db.Column(db.Integer, primary_key=True)
    day = db.Column(db.Date)
    time = db.Column(db.DateTime)
    cattle_id = db.Column(db.Integer, db.ForeignKey('cow.id'))

    def __repr__(self):
        return f"Pregnancy('{self.day}', '{self.time}' '{self.cattle_id}')"
```

```
class Calving(db.Model):
    id = db.Column(db.Integer, primary_key=True)
    calf = db.Column(db.String)
    day = db.Column(db.Date)
    time = db.Column(db.DateTime)
    cattle_id = db.Column(db.Integer, db.ForeignKey('cow.id'))

    def __repr__(self):
        return f"Calving('{self.calf}', '{self.day}', '{self.time}', '{self.cattle_id}')"
```

```
class LoginForm(FlaskForm):
    username = StringField('username', validators=[InputRequired(message='Must enter'))]
```

```

a username.')])]
password = PasswordField('password', validators=[InputRequired(message='Must
enter a password.']])
remember = BooleanField('remember me')
submit = SubmitField('submit')
def validate_username(self, username):
    user = User.query.filter_by(username=username.data).first()
    if user:
        return None
    else:
        raise ValidationError('The username you entered is not valid. Please enter a
valid username.')
def validate_password(self, password):
    user = User.query.filter_by(password=password.data).first()
    if user:
        return None
    else:
        raise ValidationError('The password you entered is not valid. Please enter a
valid password.')
class RegisterForm(FlaskForm):
    fullname = StringField('fullname', validators=[InputRequired(message='Must enter a
fullname.')])
    gender = RadioField('gender', choices = [('Male','Male'),('Female','Female')],  

validators=[InputRequired(message='Must enter a gender.')])
    email = StringField('email')
    mobilenumber = StringField('mobilenumber',
validators=[InputRequired(message='Must enter a phone number.')])
    user = StringField('username', validators=[InputRequired(message='Must enter a
username.')])
    password = PasswordField('password', validators=[InputRequired(message='Must
enter a password.'), EqualTo('confirmpassword'), Length(min=8)])
    confirmpassword = PasswordField('confirmpassword',
validators=[InputRequired(message='Must re-enter password.')])
    role_id = RadioField('role_id', choices = [('1','Admin'),('2','User')],  

validators=[InputRequired(message='Must enter a role.')])
    picture = FileField('Profile Picture', validators=[FileAllowed(['jpg', 'png'])])
    submit = SubmitField('submit')

def validate_username(self, username):
    user = User.query.filter_by(username=username.data).first()
    if user:
        raise ValidationError('That username is taken. Please choose a different one.')

def validate_mobilenumber(self, mobilenumber):

```

```

user = User.query.filter_by(mobilenumber=mobilenumber.data).first()
z = phonenumbers.parse(mobilenumber.data, "PH")
if user:
    raise ValidationError('That mobile number is taken. Please choose a different one.')
if not phonenumbers.is_valid_number(z):
    raise ValidationError('Invalid phone number.')

class EditForm(FlaskForm):
    email = StringField('email')
    mobilenumber = StringField('mobilenumber')
    username = StringField('username')
    password = PasswordField('password')
    picture = FileField('picture', validators=[FileAllowed(['jpg', 'png'])])
    submit = SubmitField('submit')

    def validate_username(self, username):
        if username.data != current_user.username:
            user_2 = User.query.filter_by(username=username.data).first()
            if user_2:
                raise ValidationError('That username is taken. Please choose a different one.')

    def validate_mobilenumber(self, mobilenumber):
        if mobilenumber.data == current_user.mobilenumber:
            user_3 = User.query.filter_by(mobilenumber=mobilenumber.data).first()
            if user_3:
                raise ValidationError('That mobilenumber is taken. Please choose a different one.')

class CowReg(FlaskForm):
    cownumber = StringField('cow_id', validators=[InputRequired(message='Must enter the cow id.')])
    breed = StringField('breed', validators=[InputRequired(message='Must enter the breed.')])
    last_estrus = StringField('last_estrus')
    date_acquired = StringField('date_acquired')
    gender = StringField('status', validators=[InputRequired(message='Must enter the gender.')])
    status = StringField('status', validators=[InputRequired(message='Must enter the status.')])
    description = StringField('description')
    pic = FileField('pic', validators=[FileAllowed(['jpg', 'png'])])
    submit = SubmitField('submit')

```

```

def validate_cownumber(self, cownumber):
    cow = Cow.query.filter_by(cownumber=cownumber.data).first()
    if cow:
        raise ValidationError('That cow number is taken. Please choose a different
one.')

def save_picture(form_picture):
    random_hex = secrets.token_hex(8)
    _, f_ext = os.path.splitext(form_picture.filename)
    picture_fn = random_hex + f_ext
    picture_path = os.path.join(app.root_path, 'static/profile_pics', picture_fn)
    form_picture.save(picture_path)

    return picture_fn

def save_pic(form_pic):
    random_hex = secrets.token_hex(8)
    _, f_ext = os.path.splitext(form_pic.filename)
    pic_fn = random_hex + f_ext
    pic_path = os.path.join(app.root_path, 'static/cow_pics', pic_fn)
    form_pic.save(pic_path)

    return pic_fn

@app.route('/data')
@login_required
def data():
    image_file = url_for('static', filename='profile_pics/' + current_user.image_file)
    return render_template('data.html', image_file=image_file)

@app.route('/result')
@login_required
def result():
    return jsonify({'results': sample(range(1, 10), 5)})

@app.route("/about")
@login_required
def about():
    image_file = url_for('static', filename='profile_pics/' + current_user.image_file)
    return render_template('AboutUs.html', image_file=image_file)

```

```

@app.route('/button')
def button():
    key = 'admin:admin123'
    return jsonify(key=key)

@app.route('/OneSignalSDKWorker.js')
def OneSignalSDKWorker():
    response = make_response(send_from_directory('static',
filename='OneSignalSDKWorker.js'))
    response.headers['Content-Type'] = 'application/javascript'
    return response

@app.route('/OneSignalSDKUpdaterWorker.js')
def OneSignalSDKUpdaterWorker():
    response = make_response(send_from_directory('static',
filename='OneSignalSDKUpdaterWorker.js'))
    response.headers['Content-Type'] = 'application/javascript'
    return response

@app.route('/annual')
@login_required
def annual():
    year = request.args.get('year')
    jan = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 1).count()
    feb = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 2).count()
    mar = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 3).count()
    apr = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 4).count()
    may = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 5).count()
    jun = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 6).count()
    jul = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 7).count()
    aug = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 8).count()
    sep = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 9).count()
    oct = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',

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Logs.estrus) == 10).count()
    nov = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 11).count()
        dec = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 12).count()
            jan1 = Manual.query.filter(extract('year', Manual.estrus) == year, extract('month',
Manual.estrus) == 1).count()
                feb1 = Manual.query.filter(extract('year', Manual.estrus) == year, extract('month',
Manual.estrus) == 2).count()
                    mar1 = Manual.query.filter(extract('year', Manual.estrus) == year, extract('month',
Manual.estrus) == 3).count()
                        apr1 = Manual.query.filter(extract('year', Manual.estrus) == year, extract('month',
Manual.estrus) == 4).count()
                            may1 = Manual.query.filter(extract('year', Manual.estrus) == year, extract('month',
Manual.estrus) == 5).count()
                                jun1 = Manual.query.filter(extract('year', Manual.estrus) == year, extract('month',
Manual.estrus) == 6).count()
                                    jul1 = Manual.query.filter(extract('year', Manual.estrus) == year, extract('month',
Manual.estrus) == 7).count()
                                        aug1 = Manual.query.filter(extract('year', Manual.estrus) == year, extract('month',
Manual.estrus) == 8).count()
                                            sep1 = Manual.query.filter(extract('year', Manual.estrus) == year, extract('month',
Manual.estrus) == 9).count()
                                                oct1 = Manual.query.filter(extract('year', Manual.estrus) == year, extract('month',
Manual.estrus) == 10).count()
                                                    nov1 = Manual.query.filter(extract('year', Manual.estrus) == year, extract('month',
Manual.estrus) == 11).count()
                                                        dec1 = Manual.query.filter(extract('year', Manual.estrus) == year, extract('month',
Manual.estrus) == 12).count()
                                                            jan2 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 1).filter(
                                                                Logs.con == 'Yes').count()
                                                                feb2 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 2).filter(
                                                                Logs.con == 'Yes').count()
                                                                mar2 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 3).filter(
                                                                Logs.con == 'Yes').count()
                                                                apr2 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 4).filter(
                                                                Logs.con == 'Yes').count()
                                                                may2 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 5).filter(
                                                                Logs.con == 'Yes').count()
                                                                jun2 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 6).filter(

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    Logs.con == 'Yes').count()
    jul2 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 7).filter(
        Logs.con == 'Yes').count()
    aug2 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 8).filter(
        Logs.con == 'Yes').count()
    sep2 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 9).filter(
        Logs.con == 'Yes').count()
    oct2 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 10).filter(
        Logs.con == 'Yes').count()
    nov2 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 11).filter(
        Logs.con == 'Yes').count()
    dec2 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 12).filter(
        Logs.con == 'Yes').count()
    return jsonify(year=year, jan=jan, feb=feb, mar=mar, apr=apr, may=may, jun=jun,
jul=jul, aug=aug, sep=sep, oct=oct,
           nov=nov, dec=dec, jan1=jan1, feb1=feb1, mar1=mar1, apr1=apr1,
           may1=may1, jun1=jun1, jul1=jul1,
           aug1=aug1, sep1=sep1, oct1=oct1, nov1=nov1, dec1=dec1, jan2=jan2,
           feb2=feb2, mar2=mar2, apr2=apr2,
           may2=may2, jun2=jun2, jul2=jul2, aug2=aug2, sep2=sep2, oct2=oct2,
           nov2=nov2, dec2=dec2)

```

```

@app.route('/monthly')
@login_required
def monthly():
    month = request.args.get('month')
    year = request.args.get('year')
    janny = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
        Logs.cattle_id == 1).filter(Logs.con == 'Yes').count()
    janny2 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
        Logs.cattle_id == 2).filter(Logs.con == 'Yes').count()
    janny3 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
        Logs.cattle_id == 3).filter(Logs.con == 'Yes').count()
    janny4 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
        Logs.cattle_id == 4).filter(Logs.con == 'Yes').count()

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```

janny5 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
    Logs.cattle_id == 5).filter(Logs.con == 'Yes').count()
janny6 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
    Logs.cattle_id == 6).filter(Logs.con == 'Yes').count()
janny7 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
    Logs.cattle_id == 7).filter(Logs.con == 'Yes').count()
janny8 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
    Logs.cattle_id == 8).filter(Logs.con == 'Yes').count()
janny9 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
    Logs.cattle_id == 9).filter(Logs.con == 'Yes').count()
janny10 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
    Logs.cattle_id == 10).filter(Logs.con == 'Yes').count()
janny11 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
    Logs.cattle_id == 11).filter(Logs.con == 'Yes').count()
janny12 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
    Logs.cattle_id == 12).filter(Logs.con == 'Yes').count()
janny13 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
    Logs.cattle_id == 13).filter(Logs.con == 'Yes').count()
janny14 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
    Logs.cattle_id == 14).filter(Logs.con == 'Yes').count()
janny15 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
    Logs.cattle_id == 15).filter(Logs.con == 'Yes').count()
janny16 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
    Logs.cattle_id == 16).filter(Logs.con == 'Yes').count()
janny17 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
    Logs.cattle_id == 17).filter(Logs.con == 'Yes').count()
janny18 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
    Logs.cattle_id == 18).filter(Logs.con == 'Yes').count()
janny19 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
    Logs.cattle_id == 19).filter(Logs.con == 'Yes').count()
return jsonify(year=year, month=month, janny=janny, janny2=janny2,

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janny3=janny3, janny4=janny4, janny5=janny5,
    janny6=janny6, janny7=janny7, janny8=janny8, janny9=janny9,
janny10=janny10, janny11=janny11,
    janny12=janny12, janny13=janny13, janny14=janny14, janny15=janny15,
janny16=janny16, janny17=janny17,
    janny18=janny18, janny19=janny19)

```

```

@app.route('/indiv')
@login_required
def indiv():
    indiv = request.args.get('indiv')
    year = request.args.get('year')
    ja = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 1).filter(
        Logs.con == 'Yes').filter(Logs.cattle_id == indiv).count()
    fe = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 2).filter(
        Logs.con == 'Yes').filter(Logs.cattle_id == indiv).count()
    m = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 3).filter(
        Logs.con == 'Yes').filter(Logs.cattle_id == indiv).count()
    ap = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 4).filter(
        Logs.con == 'Yes').filter(Logs.cattle_id == indiv).count()
    ma = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 5).filter(
        Logs.con == 'Yes').filter(Logs.cattle_id == indiv).count()
    j = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 6).filter(
        Logs.con == 'Yes').filter(Logs.cattle_id == indiv).count()
    ju = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 7).filter(
        Logs.con == 'Yes').filter(Logs.cattle_id == indiv).count()
    au = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 8).filter(
        Logs.con == 'Yes').filter(Logs.cattle_id == indiv).count()
    se = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 9).filter(
        Logs.con == 'Yes').filter(Logs.cattle_id == indiv).count()
    oc = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 10).filter(
        Logs.con == 'Yes').filter(Logs.cattle_id == indiv).count()
    no = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 11).filter(
        Logs.con == 'Yes').filter(Logs.cattle_id == indiv).count()

```

```

de = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 12).filter(
    Logs.con == 'Yes').filter(Logs.cattle_id == indiv).count()
return jsonify(indiv=indiv, ja=ja, fe=fe, m=m, ap=ap, ma=ma, j=j, ju=ju, au=au,
se=se, oc=oc, no=no, de=de)

@app.route("/analytics", methods=['GET', 'POST'])
@login_required
def analytics():
    image_file = url_for('static', filename='profile_pics/' + current_user.image_file)
    tpos = Logs.query.filter_by(con='Yes').count()
    app = Logs.query.count()
    ins = Logs.query.filter_by(ins='Yes').count()
    man = Manual.query.count()
    preggy = Pregnancy.query.count()
    calving = Calving.query.count()
    c1 = Cow.query.filter_by(gender='CaraCow').count()
    c2 = Cow.query.filter_by(gender='Cow').count()
    c3 = Cow.query.filter_by(gender='Heifer').count()
    total = c1 + c2 + c3
    notpreggy = total - preggy
    if (total != 0):
        preg = '{:.0f}'.format(((preggy / total) * 100))
    if (total == 0):
        preg = 0
    if (preggy != 0):
        cal = '{:.0f}'.format(((calving / preggy) * 100))
    if (preggy == 0):
        cal = 0
    if (man != 0):
        eff = '{:.0f}'.format((tpos / man) * 100)
    if (man == 0):
        eff = 0
    if (ins != 0):
        insp = '{:.0f}'.format(((preggy / ins) * 100))
    if (ins == 0):
        insp = 0
    all_preggy = Pregnancy.query.all()
    all_calv = Calving.query.all()
    all_ins = Logs.query.filter(Logs.insday != None).all()
    all_cow = Cow.query.all()
    all_logs = Logs.query.filter(Logs.con == 'Yes').all()
    Yes = 'Yes'
    year = datetime.datetime.now().year
    month = 1

```

```

ids = 1
monthly = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
    Logs.con == 'Yes').all()
jan = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 1).count()
feb = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 2).count()
mar = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 3).count()
apr = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 4).count()
may = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 5).count()
jun = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 6).count()
jul = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 7).count()
aug = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 8).count()
sep = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 9).count()
oct = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 10).count()
nov = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 11).count()
dec = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 12).count()
jan1 = Manual.query.filter(extract('year', Manual.estrus) == year, extract('month',
Manual.estrus) == 1).count()
feb1 = Manual.query.filter(extract('year', Manual.estrus) == year, extract('month',
Manual.estrus) == 2).count()
mar1 = Manual.query.filter(extract('year', Manual.estrus) == year, extract('month',
Manual.estrus) == 3).count()
apr1 = Manual.query.filter(extract('year', Manual.estrus) == year, extract('month',
Manual.estrus) == 4).count()
may1 = Manual.query.filter(extract('year', Manual.estrus) == year, extract('month',
Manual.estrus) == 5).count()
jun1 = Manual.query.filter(extract('year', Manual.estrus) == year, extract('month',
Manual.estrus) == 6).count()
jul1 = Manual.query.filter(extract('year', Manual.estrus) == year, extract('month',
Manual.estrus) == 7).count()
aug1 = Manual.query.filter(extract('year', Manual.estrus) == year, extract('month',
Manual.estrus) == 8).count()
sep1 = Manual.query.filter(extract('year', Manual.estrus) == year, extract('month',
Manual.estrus) == 9).count()

```

```

oct1 = Manual.query.filter(extract('year', Manual.estrus) == year, extract('month',
Manual.estrus) == 10).count()
nov1 = Manual.query.filter(extract('year', Manual.estrus) == year, extract('month',
Manual.estrus) == 11).count()
dec1 = Manual.query.filter(extract('year', Manual.estrus) == year, extract('month',
Manual.estrus) == 12).count()
jan2 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 1).filter(
    Logs.con == Yes).count()
feb2 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 2).filter(
    Logs.con == Yes).count()
mar2 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 3).filter(
    Logs.con == Yes).count()
apr2 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 4).filter(
    Logs.con == Yes).count()
may2 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 5).filter(
    Logs.con == Yes).count()
jun2 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 6).filter(
    Logs.con == Yes).count()
jul2 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 7).filter(
    Logs.con == Yes).count()
aug2 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 8).filter(
    Logs.con == Yes).count()
sep2 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 9).filter(
    Logs.con == Yes).count()
oct2 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 10).filter(
    Logs.con == Yes).count()
nov2 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 11).filter(
    Logs.con == Yes).count()
dec2 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 12).filter(
    Logs.con == Yes).count()
janny = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
    Logs.cattle_id == 1).filter(Logs.con == 'Yes').count()
janny2 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
    Logs.cattle_id == 1).filter(Logs.con == 'Yes').count()

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```
Logs.estrus) == month).filter()
    Logs.cattle_id == 2).filter(Logs.con == 'Yes').count()
    janny3 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
    Logs.cattle_id == 3).filter(Logs.con == 'Yes').count()
    janny4 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
    Logs.cattle_id == 4).filter(Logs.con == 'Yes').count()
    janny5 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
    Logs.cattle_id == 5).filter(Logs.con == 'Yes').count()
    janny6 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
    Logs.cattle_id == 6).filter(Logs.con == 'Yes').count()
    janny7 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
    Logs.cattle_id == 7).filter(Logs.con == 'Yes').count()
    janny8 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
    Logs.cattle_id == 8).filter(Logs.con == 'Yes').count()
    janny9 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
    Logs.cattle_id == 9).filter(Logs.con == 'Yes').count()
    janny10 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
    Logs.cattle_id == 10).filter(Logs.con == 'Yes').count()
    janny11 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
    Logs.cattle_id == 11).filter(Logs.con == 'Yes').count()
    janny12 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
    Logs.cattle_id == 12).filter(Logs.con == 'Yes').count()
    janny13 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
    Logs.cattle_id == 13).filter(Logs.con == 'Yes').count()
    janny14 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
    Logs.cattle_id == 14).filter(Logs.con == 'Yes').count()
    janny15 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
    Logs.cattle_id == 15).filter(Logs.con == 'Yes').count()
    janny16 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
    Logs.cattle_id == 16).filter(Logs.con == 'Yes').count()
    janny17 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
```

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    Logs.cattle_id == 17).filter(Logs.con == 'Yes').count()
    janny18 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
        Logs.cattle_id == 18).filter(Logs.con == 'Yes').count()
    janny19 = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
        Logs.cattle_id == 19).filter(Logs.con == 'Yes').count()
    ja = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 1).filter(
        Logs.con == 'Yes').filter(Logs.cattle_id == ids).count()
    fe = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 2).filter(
        Logs.con == 'Yes').filter(Logs.cattle_id == ids).count()
    m = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 3).filter(
        Logs.con == 'Yes').filter(Logs.cattle_id == ids).count()
    ap = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 4).filter(
        Logs.con == 'Yes').filter(Logs.cattle_id == ids).count()
    ma = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 5).filter(
        Logs.con == 'Yes').filter(Logs.cattle_id == ids).count()
    j = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month', Logs.estrus)
== 6).filter(
        Logs.con == 'Yes').filter(Logs.cattle_id == ids).count()
    ju = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 7).filter(
        Logs.con == 'Yes').filter(Logs.cattle_id == ids).count()
    au = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 8).filter(
        Logs.con == 'Yes').filter(Logs.cattle_id == ids).count()
    se = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 9).filter(
        Logs.con == 'Yes').filter(Logs.cattle_id == ids).count()
    oc = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 10).filter(
        Logs.con == 'Yes').filter(Logs.cattle_id == ids).count()
    no = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 11).filter(
        Logs.con == 'Yes').filter(Logs.cattle_id == ids).count()
    de = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == 12).filter(
        Logs.con == 'Yes').filter(Logs.cattle_id == ids).count()
    return render_template('Analytics&Reports.html', cal=cal, preg=preg, insp=insp,
eff=eff, total=total, ins=ins,
monthly=monthly, ja=ja, fe=fe, m=m, ap=ap, ma=ma, j=j, ju=ju, au=au,

```

```

se=se, oc=oc, no=no,
        de=de, all_cow=all_cow, janny19=janny19, janny18=janny18,
janny17=janny17, janny16=janny16,
        janny15=janny15, janny14=janny14, janny13=janny13,
janny12=janny12, janny11=janny11,
        janny10=janny10, janny9=janny9, janny8=janny8, janny7=janny7,
janny6=janny6, janny5=janny5,
        janny4=janny4, janny3=janny3, janny2=janny2, janny=janny,
all_logs=all_logs, jan=jan,
        feb=feb, mar=mar, apr=apr, may=may, jun=jun, jul=jul, aug=aug,
sep=sep, oct=oct, nov=nov,
        dec=dec, jan1=jan1, feb1=feb1, mar1=mar1, apr1=apr1, may1=may1,
jun1=jun1, jul1=jul1,
        aug1=aug1, sep1=sep1, oct1=oct1, nov1=nov1, dec1=dec1, jan2=jan2,
feb2=feb2, mar2=mar2,
        apr2=apr2, may2=may2, jun2=jun2, jul2=jul2, aug2=aug2, sep2=sep2,
oct2=oct2, nov2=nov2,
        dec2=dec2, tpos=tpos, app=app, man=man, calving=calving,
all_ins=all_ins, all_calv=all_calv,
        all_preggy=all_preggy, preggy=preggy, notpreggy=notpreggy,
image_file=image_file)

```

```

@app.route("/inquire")
def inquire():
    return render_template('Inquire.html')

```

```

@app.route("/cattle")
@login_required
def cattle():
    image_file = url_for('static', filename='profile_pics/' + current_user.image_file)
    car1 = Cow.query.filter_by(gender='CaraCow').count()
    car2 = Cow.query.filter_by(gender='CaraBull').count()
    heif = Cow.query.filter_by(gender='Heifer').count()
    total_bull = Cow.query.filter_by(gender='Bull').count()
    total_calf = Cow.query.filter_by(gender='Calf').count()
    total_cow = Cow.query.filter_by(gender='Cow').count()
    total_other = car1 + car2 + heif
    all_cow = Cow.query.all()
    return render_template('Cattle Inventory.html', image_file=image_file,
total_bull=total_bull, total_calf=total_calf,
total_cow=total_cow, total_other=total_other, all_cow=all_cow)

```

```

@app.route("/delcow", methods=['GET', 'POST'])

```

```

@login_required
def delcow():
    cow = request.form.get("cow")
    cattle = Cow.query.filter(Cow.id == cow).delete()
    db.session.commit()
    return redirect("/cattle")

@app.route("/contact")
@login_required
def contact():
    image_file = url_for('static', filename='profile_pics/' + current_user.image_file)
    return render_template('AboutUs.html', image_file=image_file)

@app.route("/help")
@login_required
def help():
    image_file = url_for('static', filename='profile_pics/' + current_user.image_file)
    return render_template('Contact Us.html', image_file=image_file)

@app.route("/dashboard")
@login_required
def dashboard():
    image_file = url_for('static', filename='profile_pics/' + current_user.image_file)
    date = datetime.datetime.now()
    seti = pd.to_datetime(date) - pd.DateOffset(hours=8)
    setii = pd.to_datetime(date) - pd.DateOffset(hours=12)
    rec = Event.query.filter(Event.last_estrus <= date).filter(Event.last_estrus >= seti).all()
    rec_eve = Event.query.filter(Event.last_estrus <= date).filter(Event.last_estrus >=
setii).order_by(
        desc('last_estrus')).all()
    all_event = Event.query.order_by(desc('last_estrus')).all()
    all_eve = Logs.query.order_by(desc('estrus')).all()
    eve = Logs.query.count()
    all_preggy = Pregnancy.query.all()
    all_plan = Plans.query.all()
    cow = Cow.query.filter(Cow.cownumber != '1102-1').all()
    all_con = Logs.query.filter(Logs.con == 'Yes').all()
    all_ins = Logs.query.filter(Logs.ins != 'Yes').all()
    return render_template('Dashboard.html', eve=eve, all_con=all_con, all_ins=all_ins,
cow=cow, all_preggy=all_preggy, rec=rec,
all_plan=all_plan, all_eve=all_eve, rec_eve=rec_eve,
all_event=all_event,
image_file=image_file)

```

```

@app.route("/confirm", methods=["POST", "GET"])
@login_required
def confirm():
    estru = request.form.get("estrus")
    estrus = pd.to_datetime(estrus) + pd.DateOffset(days=0)
    exp = pd.to_datetime(estrus) + pd.DateOffset(hours=8)
    exp2 = pd.to_datetime(estrus) + pd.DateOffset(days=21)
    exp_2 = exp2.strftime("%m/%d/%Y")
    con1 = request.form.get("con1")
    con2 = request.form.get("con2")
    id1 = request.form.get("id1")
    id2 = request.form.get("id2")
    cowt = Cow.query.filter_by(cownumber=id1).first()
    cowb = Cow.query.filter_by(cownumber=id2).first()
    time = datetime.datetime.now()
    logs = Logs.query.filter_by(cattle_id=cowt.id).first()
    logss = Logs.query.filter_by(cattle_id=cowb.id).first()
    logs.con = con1
    logs.condt = time
    logss.con = con2
    logss.condt = time
    act = "Confirmed an Estrus Event (" + estru + ")"
    action = Action(user=current_user.username, date=datetime.datetime.now(),
    action=act)
    db.session.add(action)
    db.session.commit()
    if con1 == "Yes":
        new1 = Plans(plan='Cow ' + id1 + ' Last Estrus', start=estrus, end=estrus)
        new_1 = Plans(plan='Cow ' + id1 + ' Next Estrus', start=exp_2, end=exp_2)
        cowt.last_estrus = estrus
        cowt.next_estrus = exp2
        db.session.add(new1)
        db.session.add(new_1)
        db.session.commit()
    if con2 == "Yes":
        new2 = Plans(plan='Cow ' + id2 + ' Last Estrus', start=estrus, end=estrus)
        new_2 = Plans(plan='Cow ' + id2 + ' Next Estrus', start=exp_2, end=exp_2)
        cowb.last_estrus = estrus
        cowb.next_estrus = exp2
        db.session.add(new2)
        db.session.add(new_2)
        db.session.commit()
    return redirect("/dashboard")

```

```

@app.route("/manual", methods=["POST", "GET"])
@login_required
def manual():
    estru = request.form.get("estrus")
    estrus = pd.to_datetime(estrus) + pd.DateOffset(days=0)
    id1 = request.form.get("id1")
    id2 = request.form.get("id2")
    cowt = Cow.query.filter_by(cownumber=id1).first()
    cowb = Cow.query.filter_by(cownumber=id2).first()
    time = datetime.datetime.now()
    new = Manual(estrus=estrus, time=time, cattle_id=cowt.id)
    new1 = Manual(estrus=estrus, time=time, cattle_id=cowb.id)
    act = "Manually Recorded an Estrus Event (" + estru + ")"
    action = Action(user=current_user.username, date=datetime.datetime.now(),
    action=act)
    db.session.add(action)
    db.session.add(new)
    db.session.add(new1)
    db.session.commit()
    return redirect("/dashboard")

```

```

@app.route("/insem", methods=["POST", "GET"])
@login_required
def insem():
    insem = request.form.get("ins")
    ins = pd.to_datetime(insem) + pd.DateOffset(days=0)
    ids = request.form.get("ids")
    ad = request.form.get("ad")
    ty = request.form.get("type")
    time = datetime.datetime.now()
    cow = Cow.query.filter_by(cownumber=ids).first()
    logs = Logs.query.filter_by(cattle_id=cow.id).first()
    logs.insday = ins
    logs.insdt = time
    logs.insad = ad
    logs.ins = "Yes"
    logs.insty = ty
    db.session.commit()
    if (logs.insday <= logs.estexp):
        logs.insexp = "Yes"
    if (logs.insday >= logs.estexp):
        logs.insexp = "No"
    act = "Recorded an Insemination Event of Cow " + ids
    action = Action(user=current_user.username, date=datetime.datetime.now(),

```

```

action=act)
db.session.add(action)
db.session.commit()
return redirect("/dashboard")

@app.route("/pregy", methods=["POST", "GET"])
@login_required
def preggy():
    ids = request.form.get("ids")
    da = request.form.get("day")
    day = pd.to_datetime(da) + pd.DateOffset(days=0)
    cow = Cow.query.filter_by(cownumber=ids).first()
    time = datetime.datetime.now()
    new = Pregnancy(day=day, time=time, cattle_id=cow.id)
    cow.status = 'Pregnant'
    act = "Recorded a Pregnancy Event of Cow " + ids
    action = Action(user=current_user.username, date=datetime.datetime.now(),
    action=act)
    db.session.add(action)
    db.session.add(new)
    db.session.commit()
    return redirect("/dashboard")

@app.route("/calve", methods=["POST", "GET"])
@login_required
def calve():
    calf = request.form.get("calf")
    ids = request.form.get("ids")
    da = request.form.get("day")
    day = pd.to_datetime(da) + pd.DateOffset(days=0)
    cow = Cow.query.filter_by(cownumber=ids).first()
    time = datetime.datetime.now()
    new = Calving(calf=calf, time=time, day=day, cattle_id=cow.id)
    cow.status = 'Milking'
    act = "Recorded a Calving Event of Cow " + ids
    action = Action(user=current_user.username, date=datetime.datetime.now(),
    action=act)
    db.session.add(action)
    db.session.add(new)
    db.session.commit()
    return redirect("/dashboard")

@app.route("/plan", methods=["POST", "GET"])

```

```

@login_required
def plan():
    title = request.args.get('title')
    start = request.args.get('start')
    end = request.args.get('end')
    new = Plans(plan=title, start=start, end=end)
    act = "Made a New Plan - " + title
    action = Action(user=current_user.username, date=datetime.datetime.now(),
    action=act)
    db.session.add(action)
    db.session.add(new)
    db.session.commit()
    return jsonify(title=title, start=start, end=end)

```

```

@app.route("/delplan", methods=['GET', 'POST'])
@login_required
def delplan():
    title = request.args.get('title')
    plan = Plans.query.filter(Plans.plan == title).delete()
    db.session.commit()
    return jsonify(title=title)

```

```

@app.route("/sim")
@login_required
def sim():
    event_pd_dir = '/home/sigiel/Ez-tect/static/event_csv'
    os.chdir(event_pd_dir)
    event_pd_list = os.listdir(os.getcwd())
    last = operator.itemgetter(-1)
    # event_pd_prev = event_pd_list[-1] # Insert Number of event to get .csv file
    event_csv = pd.read_csv(last(event_pd_list))
    cowt = int(event_csv.at[0, 'ID'])
    cowb = int(event_csv.at[1, 'ID'])
    date = event_csv.at[0, 'Estrus Time']
    dt = datetime.datetime.strptime(date, "%Y-%m-%d %H:%M:%S.%f")
    # dt = datetime.datetime.now()
    # cowt = 11
    # cowb = 12
    cow1 = Cow.query.filter_by(id=cowt).first()
    cow2 = Cow.query.filter_by(id=cowb).first()
    estrus = pd.to_datetime(dt) + pd.DateOffset(days=0)
    date = pd.to_datetime(dt) + pd.DateOffset(hours=7, minutes=58, seconds=30)
    nex = pd.to_datetime(estrus) + pd.DateOffset(days=21)
    nexp = pd.to_datetime(nex) + pd.DateOffset(days=3)

```

```

nexm = pd.to_datetime(nex) - pd.DateOffset(days=3)
eve = Event.query.filter(Event.cowt == cow1.cownumber).filter(Event.cowb ==
cow2.cownumber).filter(
    Event.last_estrus == estrus).first()
if eve:
    return redirect(url_for('dashboard'))
else:
    header = {"Content-Type": "application/json; charset=utf-8",
              "Authorization": "Basic MGIyNjk2N2YtMDAyNy00MjQwLTk0ZWMTNmM0MjMxNGJmNDUw"}
    payload = {"app_id": "6197616f-f442-4aba-80a8-1f8a38f22202",
               "included_segments": ["All"],
               "contents": {"en": "Cow " + cow1.cownumber + " and " +
                           cow2.cownumber + " are in-heat"}}
    req = requests.post("https://onesignal.com/api/v1/notifications", headers=header,
data=json.dumps(payload))
    est = Event(last_estrus=estrus, exp_estrus=date, cowt=cow1.cownumber,
cowb=cow2.cownumber)
    est2 = Logs(estrus=estrus, estexp=date, nextes=nex, nextesp=nexp, nextesm=nexm,
con='-', ins='-', insexp='-', cattle_id=cowt)
    est3 = Logs(estrus=estrus, estexp=date, nextes=nex, nextesp=nexp, nextesm=nexm,
con='-', ins='-', insexp='-', cattle_id=cowb)
    db.session.add(est)
    db.session.add(est2)
    db.session.add(est3)
    cow1.last_estrus = estrus
    cow1.next_estrus = nex
    cow1.exp_estrus = date
    cow2.last_estrus = estrus
    cow2.next_estrus = nex
    cow2.exp_estrus = date
    db.session.commit()
    return redirect(url_for('dashboard'))

```

```

@app.route("/estrus", methods=['GET', 'POST'])
@login_required
def estrus():
    image_file = url_for('static', filename='profile_pics/' + current_user.image_file)
    ev = request.form.get("eve")
    eves = Event.query.filter_by(id=ev).first()
    eve = Event.query.filter(Event.id == ev)
    cowt = Cow.query.filter(Cow.cownumber == eves.cowt)
    cowb = Cow.query.filter(Cow.cownumber == eves.cowb)

```

```

return render_template('Estrus Detected.html', eve=eve, cowt=cowt, cowb=cowb,
image_file=image_file)

@app.route("/")
@app.route("/index")
def index():
    return render_template('index.html')

@app.route("/locator")
@login_required
def locator():
    image_file = url_for('static', filename='profile_pics/' + current_user.image_file)
    return render_template('Locator.html', image_file=image_file)

@app.route("/login", methods=['GET', 'POST'])
def login():
    form = LoginForm()
    if form.validate_on_submit():
        user = User.query.filter_by(username=form.username.data).first()
        if user:
            if user.password == form.password.data:
                login_user(user, remember=form.remember.data)
                return redirect(url_for('dashboard'))
    return render_template('login.html', form=form)

@app.route('/logout')
@login_required
def logout():
    logout_user()
    return redirect(url_for('login'))

@app.route("/manage")
@login_required
def manage():
    image_file = url_for('static', filename='profile_pics/' + current_user.image_file)
    form = EditForm()
    all_user = User.query.all()
    all_act = Action.query.order_by(desc('date')).all()
    act = Action.query.count()
    return render_template('ManageAccounts.html', act=act, all_user=all_user,
image_file=image_file, form=form, all_act=all_act)

```

```
@app.route('/edit', methods=['GET', 'POST'])
@login_required
def edit():
    image_file = url_for('static', filename='profile_pics/' + current_user.image_file)
    all_user = User.query.all()
    form = EditForm()
    if form.validate_on_submit():
        if form.picture.data:
            picture_file = save_picture(form.picture.data)
            current_user.image_file = picture_file
        if form.email.data:
            current_user.email = form.email.data
        if form.mobilenumbers.data:
            current_user.mobilenumbers = form.mobilenumbers.data
        if form.username.data:
            current_user.username = form.username.data
        if form.password.data:
            current_user.password = form.password.data
        db.session.commit()
        return redirect(url_for('manage'))
    return render_template('ManageAccounts.html', all_user=all_user,
image_file=image_file, form=form)
```

```
@app.route("/deluser", methods=["POST"])
@login_required
def deluser():
    user = request.form.get("user")
    account = User.query.filter(User.username == user).delete()
    db.session.commit()
    return redirect("/manage")
```

```
@app.route('/moo')
@login_required
def moo():
    username = 'admin'
    password = 'admin123'
    code = request.args.get('code')
    action = request.args.get('action')
    cha = request.args.get('cha')
    arg1 = request.args.get('arg1')
    arg2 = request.args.get('arg2')
    arg3 = request.args.get('arg3')
```

```

url = 'http://172.94.88.47:12380/cgi-bin/ptz.cgi'
values = {'action': action,
          'channel': cha,
          'code': code,
          'arg1': arg1,
          'arg2': arg2,
          'arg3': arg3}
ptzparams = urllib.parse.urlencode(values)
full_url = url + '?' + ptzparams
req = requests.get(full_url, auth=HTTPDigestAuth(username, password))
print(full_url)
print(req.status_code)

return jsonify(code=code, action=action, cha=cha, arg1=arg1, arg2=arg2, arg3=arg3)

```

```

@app.route('/page')
@login_required
def page():
    page = request.args.get('page')
    all_act = Action.query.order_by(desc('date')).paginate(page=page, per_page=2)
    return jsonify(all_act=all_act)

```

```

@app.route("/moonitor")
@login_required
def moonitor():
    image_file = url_for('static', filename='profile_pics/' + current_user.image_file)
    return render_template('Moonitor-LiveView.html', image_file=image_file)

```

```

@app.route('/notif')
@login_required
def notif():
    image_file = url_for('static', filename='profile_pics/' + current_user.image_file)
    return render_template('Locator copy.html', image_file=image_file)

```

```

@app.route("/cow", methods=['GET', 'POST'])
@login_required
def cow():
    image_file = url_for('static', filename='profile_pics/' + current_user.image_file)
    form = CowReg()
    if form.validate_on_submit():
        new_cow = Cow(cownumber=form.cownumber.data, breed=form.breed.data,
                      date_acquired=form.date_acquired.data,

```

```

    status=form.status.data, description=form.description.data)
db.session.add(new_cow)
db.session.commit()
if form.last_estrus.data:
    est = pd.to_datetime(form.last_estrus.data) + pd.DateOffset(days=0)
    cow = Cow.query.filter_by(id=new_cow.id).first()
    cow.last_estrus = est
    db.session.commit()
if form.pic.data:
    pic_file = save_pic(form.pic.data)
    cow = Cow.query.filter_by(id=new_cow.id).first()
    cow.photo_file = pic_file
    db.session.commit()
return redirect(url_for('cattle'))
return render_template('Cattle Registration.html', form=form,
image_file=image_file)

```

```

@app.route("/add", methods=['GET', 'POST'])
@login_required
def add():
    image_file = url_for('static', filename='profile_pics/' + current_user.image_file)
    form = RegisterForm()
    if form.validate_on_submit():
        new_user = User(fullname=form.fullname.data, gender=form.gender.data,
email=form.email.data, mobilenumber=form.mobilenumbers.data,
username=form.user.data, password=form.password.data, role_id=form.role_id.data)
        db.session.add(new_user)
        db.session.commit()
        if form.picture.data:
            picture_file = save_picture(form.picture.data)
            user = User.query.filter_by(id=new_user.id).first()
            user.image_file = picture_file
            db.session.commit()
        return redirect(url_for('manage'))
    return render_template('UserRegistration.html', form=form, image_file=image_file)

```

```

@app.route("/cal")
@login_required
def cal():
    return render_template('cal.html')

```

```

@app.route('/pdf', methods=["POST", "GET"])
@login_required

```

```

def pdf():
    year = request.form.get('pdf')
    all_logs = Logs.query.filter(extract('year', Logs.estrus) == year).filter(Logs.con ==
'Yes').limit(22).all()
    rendered = render_template('annualpdf.html', all_logs=all_logs, year=year)
    pdf = pdfkit.from_string(rendered, False)
    response = make_response(pdf)
    response.headers['Content-Type'] = 'application/pdf'
    response.headers['Content-Disposition'] = 'inline;filename=annual_report.pdf'

    return response

@app.route('/monthlypdf', methods=["POST", "GET"])
@login_required
def monthlypdf():
    year = request.form.get("yearlypdf")
    month = request.form.get("monthlypdf")
    mont = int(month)
    mo = calendar.month_name[mont]
    all_logs = Logs.query.filter(extract('year', Logs.estrus) == year, extract('month',
Logs.estrus) == month).filter(
        Logs.con == 'Yes').limit(22).all()
    rendered = render_template('monthlypdf.html', all_logs=all_logs, year=year,
mo=mo)
    pdf = pdfkit.from_string(rendered, False)
    response = make_response(pdf)
    response.headers['Content-Type'] = 'application/pdf'
    response.headers['Content-Disposition'] = 'inline;filename=monthly_report.pdf'

    return response

@app.route('/indivpdf', methods=["POST", "GET"])
@login_required
def indivpdf():
    co = request.form.get("indivpdf")
    cow = Cow.query.filter(Cow.id == co).first()
    all_cal = Calving.query.filter(Calving.cattle_id == co).count()
    all_logs = Logs.query.filter(Logs.cattle_id == co).filter(Logs.con ==
'Yes').limit(29).all()
    rendered = render_template('indivpdf.html', cow=cow, all_cal=all_cal,
all_logs=all_logs)
    pdf = pdfkit.from_string(rendered, False)

```

```

response = make_response(pdf)
response.headers['Content-Type'] = 'application/pdf'
response.headers['Content-Disposition'] = 'inline;filename=individual_report.pdf'

return response

if __name__ == '__main__':
    app.run(debug=True)

```

Web Application (cont'd)

```

from main import db, Cow, Event, Logs
from datetime import datetime, timedelta, date
from estrus import cowtp, cowbm
import pandas as pd
import datetime
import time
import sys

cowt = cowtp
cowb = cowbm
cow1 = Cow.query.filter_by(id=cowt).first()
cow2 = Cow.query.filter_by(id=cowb).first()
estrus = pd.to_datetime(datetime.datetime.now()) + pd.DateOffset(days=0)
date = pd.to_datetime(datetime.datetime.now()) + pd.DateOffset(hours=8)
nex = pd.to_datetime(estrus) + pd.DateOffset(days=21)
nexp = pd.to_datetime(nex) + pd.DateOffset(days=3)
nexm = pd.to_datetime(nex) - pd.DateOffset(days=3)
est = Event(last_estrus=estrus, exp_estrus=date, cowt=cow1.cownumber,
cowb=cow2.cownumber)
est2 = Logs(estrus=estrus, estexp=date, nextes=nex, nextesp=nexp, nextesm=nexm,
con='-', ins='-', insexp='-', cattle_id=cowt)
est3 = Logs(estrus=estrus, estexp=date, nextes=nex, nextesp=nexp, nextesm=nexm,
con='-', ins='-', insexp='-', cattle_id=cowb)
db.session.add(est)
db.session.add(est2)
db.session.add(est3)
cow1.last_estrus = estrus
cow1.next_estrus = nex
cow1.exp_estrus = date
cow2.last_estrus = estrus
cow2.next_estrus = nex
cow2.exp_estrus = date
db.session.commit()

```

Web Application: Template

```
#AboutUs.html

<!DOCTYPE html>

<html lang="en">
  <head>
    <meta charset="utf-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1">
    <meta name="description" content="">
    <meta name="author" content="">
    <title>About Us</title>
    <link href="../static/bootstrap/css/bootstrap.css" rel="stylesheet">
    <link rel="shortcut icon" href="{{ url_for('static', filename='img/EZTECT_Logo.png') }}>
    <link href="../static/css/style.css" rel="stylesheet">
  </head>

  <body class="d-flex flex-column justify-content-start">

    <nav style="height: 100vh; background-color: #1e1e1e; z-index: 100; position: fixed; overflow: hidden; transition: 0.5s; width: 0;" class="overlay" id="overlay" data-pg-collapsed>
      <div style="width: 100vw; display: flex; flex-direction: column; align-items: center; transition: 0.5s;" id="mainOverlayContainer">

        <div style="height: 10vh; display: flex; flex-direction: row; align-items: center; justify-content: flex-start; padding: 1em; width: 100%; background-size: cover;" class="close&farm">
          
```

```
<span style="color: #ffffff; margin-left: 1em; font-weight: lighter; font-style: normal; font-variant: normal; white-space: normal; font-size: 25px;" alt="Farm Name" class="text-capitalize font-weight-bolder">Ezetect Farm </span>

</div><div class="row d-sm-flex flex-sm-column justify-content-sm-start align-items-sm-start" style="width: 100%; display: flex; height: 100vh;">

    <div class="col-sm-1 col-lg-8 col-md-8" style="height: 90vh; display: flex; align-items: flex-start; justify-content: space-around;">

        <div class="row lg-menu-items">

            <div class="col-md-6">
                <a style="text-decoration: none" href="/dashboard"><h3 class="link-hover link" style="cursor: pointer;">Dashboard</h3></a>
                <p class="hide-at-small">View Detected Cows on Estrus;<br>See Upcoming Estrus Events on Calendar</p>
            </div>

            <div class="col-md-6">
                <a style="text-decoration: none" href="/cattle"><h3 class="link-hover link" style="cursor: pointer;">Cattle Inventory</h3></a>
                <p class="hide-at-small">View Individual Cattle Information;<br>Register New Cows entering the barn<br/></p>
            </div>
        </div>

        <div class="col-md-6">
            <a style="text-decoration: none" href="/analytics"><h3 class="link-hover link" style="cursor: pointer;">Analytics & Reports</h3></a>
            <p class="hide-at-small">View and Print Yearly, Monthly, or Individual Cattle Reports</p>
        </div>

        <div class="col-md-6">
            <a style="text-decoration: none" href="/locator"><h3 class="link-hover link" style="cursor: pointer;">Locator</h3></a>
        </div>
    </div>
</div>
```

<p class="hide-at-small">Estimated Time of Arrival on Farm for Estrus Confirmation & Cow Insemination</p>

</div>

<div class="col-md-6">

<h3 class="link-hover">LiveView - Moonitor</h3>

<p class="hide-at-small">View Live Feed on Barn and Control the PTZ Cameras</p>

</div>

</div>

<div class="row lg-menu-items" style="flex-direction: row; align-items: flex-start; width: 100%;>

<div class="col-md-6">

<h3 class="link-hover">About Us</h3>

</div>

<div class="col-md-6">

<h3 class="link-hover">Help & Support</h3>

</div>

</div>

</div>

<div class="col-md-4 menu-userinfobtns col-sm-1" style="display: flex; flex-direction: column; justify-content: flex-start; align-items: center; margin: 1en; height: 90vh;">

<div style="width: 100%; flex-direction: column; align-items: center; justify-content: center; display: flex; height: 40vh;" class="menu-usrinfo">

Admin

{ % else %

User

{ % endif %

</div>

<div style="display: flex; flex-direction: column; align-items: center; width: 100%; justify-content: space-around; margin-top: 2em; height: 50vh;" class="menu-btns">

 <button onclick="window.location.href = '/manage';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Manage My Account</button>{ % if current_user.role_id == 1 % } <button onclick="window.location.href = '/add';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Add Users</button>{ % endif % }<button onclick="window.location.href = '/logout';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Logout</button>

</div>

</div>

</div>

</div>

</nav>

<header style="height: 10vh; background-color: #1e1e1e; width: 100%; display: inline-flex;" id="headermain" data-pg-collapsed>

 <div style="width: 100vw; display: flex; flex-direction: column; align-items: center; height: 10vh;" id="mainHeaderContainer">

 <div style="height: 10vh; display: flex; flex-direction: row; align-items: center; justify-content: flex-start; padding: 1em; width: 100%; background-image:

```

```

url('../static/img/header_bg.png'); background-size: cover; background-color: #f8f9ff;" class="navbar-header" id="header">

 About Us<div class="logo-ezTECT" id="logo-ezTECT">

 </div>

</div>

</div>

</header><div class="mainContent" id="mainContent" style="background-color: #ffffff; height: inherit;">

 <div class="row AboutProject" id="AboutProject" data-pg-collapsed>

 <div class="col-md-6">

 <h3 style="color: #736c6c; font-weight: 800;">About the Project : EZTECT</h3>

 <p style="font-size: 14px;">Precise estrus detection and timed artificial insemination play crucial roles in the reproductive performances of cow. Standing heat is the most obvious sign that a cow is in estrus or in heat. In the Philippines where small scale farms number the most, manual observation is the run-of-the-mill approach for recognizing this sign of estrus which demands time and attention.</p><p style="font-size: 14px;">EzTECT is a project developed by the students of the Technological University of the Philippines – Manila, which aims to solve one of the common problems in Dairy Agriculture, that is – Precise Estrus Detection of Cattle.</p>

 </div>

 <div class="col-md-6" style="display: flex; flex-direction: row; align-items: center; justify-content: center;">

 </div>

```

```
</div><div class="row meetTheTeam" id="meetTheTeam" style="height: 100%; width: 100vw;">

 <section class="content-block team-1 team-1-2">
 <div class="container" style="display: flex; flex-direction: column; width: 100%;">
 <div class="underlined-title" data-pg-collapsed>
 <h1>Say hello to the team</h1>
 <hr style="border: 2px solid #368b9c; width: 20vw;">
 </div>
 <div class="row" style="flex-direction: row; align-items: center; justify-content: center; display: flex; flex-wrap: wrap;">
 <div class="col-sm-6 team-member-wrap col-md-3" data-pg-collapsed>
 <div class="team-member">

 <div class="team-details">
 <h4 class="member-name" style="text-align: center;">Engr. Nilo M. Arago</h4>
 <p class="position" style="text-align: center;">Founder, Project Lead, and Adviser</p>
 <p style="text-align: center;">Master of Engineering Major in Electronics Engineering
Bachelor of Science in Electronics and Communications Engineering</p>
 </div>
 </div>
 </div>
 <div class="col-md-3 col-sm-6 team-member-wrap" data-pg-collapsed>
 <div class="team-member">
```

```


<div class="team-details">
 <h4 class="member-name" style="text-align: center;">Rodney
 Rafael Robles, ECT</h4>
 <p class="position" style="text-align: center;">Project Manager
 and
Machine Learning Developer</p>
 <p style="text-align: center;">Bachelor of Science in
 Electronics Engineering (Undergraduate)
Electronics Technician
(October 2018-
 Present)</p>
</div>

</div>

</div>

<div class="col-md-3 col-sm-6 team-member-wrap" data-pg-collapsed>
 <div class="team-member">

 <div class="team-details">
 <h4 class="member-name" style="text-align: center;">Chris
 Alvarez, ECT</h4>
 <p class="position" style="text-align: center;">Arduino
 Programmer and
Web Developer</p>
 <p style="text-align: center;">Bachelor of Science in
 Electronics Engineering (Undergraduate)
Electronics Technician
(October 2018-
 Present)</p>
 </div>
 </div>
</div>

<div class="col-md-3 col-sm-6 team-member-wrap">
 <div class="team-member">

```

```
<div class="team-details">
 <h4 class="member-name" style="text-align: center;">Charl
 Legista, ECT</h4>
 <p class="position" style="text-align: center;">Network
 Programmer and
Web Designer</p>
 <p style="text-align: center;">Bachelor of Science in
 Electronics Engineering (Undergraduate)
Electronics Technician
(October 2018-
 Present)</p>
</div>
</div>
</div>
<div class="col-md-3 col-sm-6 team-member-wrap">
 <div class="team-member">

 <div class="team-details">
 <h4 class="member-name" style="text-align: center;">Angie
 Mabale, ECT</h4>
 <p class="position" style="text-align: center;">Web
 Developer</p>
 <p style="text-align: center;">Bachelor of Science in
 Electronics Engineering (Undergraduate)
Electronics Technician
(October 2018-
 Present)</p>
 </div>
 </div>
 </div>
 <div class="col-md-3 col-sm-6 team-member-wrap">
 <div class="team-member">

 <div class="team-details">
```

```
<h4 class="member-name" style="text-align: center;">Nicole
Reipo, ECT</h4>

<p class="position" style="text-align: center;">Database
Developer and
Web Developer</p>

<p style="text-align: center;">Bachelor of Science in
Electronics Engineering (Undergraduate)
Electronics Technician
(October 2018-
Present).</p>

</div>

</div>

</div>

</div>

</div>

</div>

</div></div></div>
```

```
<script src="../static/assets/js/jquery.min.js"></script><script
src="../static/bootstrap/js/bootstrap.min.js"></script>

<script>

 var overlay = document.getElementById('overlay');

 document.getElementById('open-menu').addEventListener('click',
function(){

 overlay.style.width="100%");

 document.getElementById('cancel-menu').addEventListener('click',
function(){

 overlay.style.width="0%");

</script>

<script src="../static/assets/js/ie10-viewport-bug-workaround.js"></script>

<script type="text/javascript" src="../static/assets/js/popper.js"></script></body>
</html>
```

```

#Analytics&Reports.html
<!DOCTYPE html>
<html lang="en">
 <head>
 <meta charset="utf-8">
 <meta http-equiv="X-UA-Compatible" content="IE=edge">
 <meta name="viewport" content="width=device-width, initial-scale=1">
 <meta name="description" content="">
 <meta name="author" content="">
 <title>Analytics and Reports</title>
 <link href="../static/bootstrap/css/bootstrap.css" rel="stylesheet">
 <link rel="shortcut icon" href="{{ url_for('static', filename='img/EZTECT_Logo.png') }}">
 <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/fullcalendar/3.10.0/fullcalendar.css">
 <script src="https://ajax.googleapis.com/ajax/libs/jquery/3.4.0/jquery.min.js"></script>

 <script
 src="https://cdnjs.cloudflare.com/ajax/libs/Chart.js/2.8.0/Chart.min.js"></script>
 <script src="//cdnjs.cloudflare.com/ajax/libs/moment.js/2.8.2/moment.min.js"></script>
 <script src="https://cdn.jsdelivr.net/npm/chartjs-plugin-datalabels"></script>
 <link href="../static/css/style.css" rel="stylesheet">

 </head>
 <body class="d-flex flex-column justify-content-start">

```

```

<nav style="height: 100vh; background-color: #1e1e1e; z-index: 100; position: fixed; overflow: hidden; transition: 0.5s; width: 0;" class="overlay" id="overlay" data-pg-collapsed>

 <div style="width: 100vw; display: flex; flex-direction: column; align-items: center; transition: 0.5s;" id="mainOverlayContainer">

 <div style="height: 10vh; display: flex; flex-direction: row; align-items: center; justify-content: flex-start; padding: 1em; width: 100%; background-size: cover;" class="close&farm">

 Eztec Farm

 </div><div class="row d-sm-flex flex-sm-column justify-content-sm-start align-items-sm-start" style="width: 100%; display: flex; height: 100vh;">

 <div class="col-sm-1 col-lg-8 col-md-8" style="height: 90vh; display: flex; align-items: flex-start; justify-content: space-around;">

 <div class="lg-menu-items">

 <div class="col-md-6">
 <h3 class="link-hover" style="cursor: pointer;">Dashboard</h3>
 <p class="hide-at-small">View Detected Cows on Estrus; See Upcoming Estrus Events on Calendar</p>
 </div>
 <div class="col-md-6">
 <h3 class="link-hover" style="cursor: pointer;">Cattle Inventory</h3>
 <p class="hide-at-small">View Individual Cattle Information, Register New Cows entering the barn
</p>
 </div>
 </div>
 </div>
 </div>
 </div>
</nav>

```

```
<div class="col-md-6">
 <h3
class="link:hover link" style="cursor: pointer;">Analytics & Reports</h3>
 <p class="hide-at-small">View and Print Yearly, Monthly, or per Cow
ID Analytical Reports</p>
</div>

<div class="col-md-6">
 <h3 class="link:hover
link" style="cursor: pointer;">Locator</h3>
 <p class="hide-at-small">ETA on Farm for Estrus Confirmation &
Cow Insemination</p>
</div>

<div class="col-md-6">
 <h3
class="link:hover link" style="cursor: pointer;">LiveView - Moonitor</h3>
 <p class="hide-at-small">View Live Feed on Barn, abd Control PTZ
Camera</p>
</div>
</div>

<div class="row lg-menu-items" style="flex-direction: row; align-items:
flex-start; width: 100%;>
 <div class="col-md-6">
 <h3 class="link:hover
link" style="cursor: pointer;">Contact Us</h3>
 </div>
 <div class="col-md-6">
 <h3 class="link:hover
link" style="cursor: pointer;">Help & Support</h3>
 </div>
</div>
```

```

 </div>

 <div class="col-md-4 menu-userinfobtns col-sm-1" style="display: flex; flex-direction: column; justify-content: flex-start; align-items: center; margin: 1en; height: 90vh;">

 <div style="width: 100%; flex-direction: column; align-items: center; justify-content: center; display: flex; height: 40vh;" class="menu-usrinfo">

 {{current_user.username}}

 {% if current_user.role_id == 1 %}

 Admin

 {% else %}

 User

 {% endif %}

 </div>

 <div style="display: flex; flex-direction: column; align-items: center; width: 100%; justify-content: space-around; margin-top: 2em; height: 50vh;" class="menu-btns">

 <button onclick="window.location.href = '/manage';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Manage My Account</button>{% if current_user.role_id == 1 %} <button

 onclick="window.location.href = '/add';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Add Users</button>{% endif %}<button

 onclick="window.location.href = '/logout';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Logout</button>

 </div>

 </div>

```

```
</div>
</div>
</nav>
<header style="height: 10vh; background-color: #1e1e1e; width: 100%; display: inline-flex;" id="headermain" data-pg-collapsed>
 <div style="width: 100vw; display: flex; flex-direction: column; align-items: center; height: 10vh;" id="mainHeaderContainer">

 <div style="height: 10vh; display: flex; flex-direction: row; align-items: center; justify-content: flex-start; padding: 1em; width: 100%; background-image: url('../static/img/header_bg.png'); background-size: cover; background-color: #f8f9ff;" class="navbar-header" id="header">
 Analytics & Reports<div class="logo-eztect" id="logo-eztect">

 </div>
 </div>
 </div>
 </div>
</header>
<div class="mainContentAnR" id="mainContent">

 <div class="sidebar" style="box-shadow: inset -1px 0px 0;*>
 Annual Report
 Monthly Report
 Individual Report
```

```

</div>

<div class="content tab-content" style="width: inherit;"><div class="tab-pane fade in active" style="max-width: auto;" data-pg-collapsed id="annualReport" data-toggle="tab">

 <div class="mainAnRHeader" data-pg-collapsed>
 <h2 style="text-align: left;">Annual Performance Report</h2>
 <div class="analyticsHeader" style="width: 100%; flex-direction: row; display: flex; flex-wrap: wrap; align-items: center;">
 <div class="form-group" style="flex-direction: row; display: flex; align-items: center; margin-top: 1em; margin-bottom: 1em; width: 50%; flex-wrap: wrap;">
 <label for="formInput2" style="font-size: 16px;">Year</label>
 <select id="year" name="year" class="form-control" style="margin-left: 1em; width: 100px;" data-pg-collapsed>
 <option value="2020">2020</option>
 <option value="2019">2019</option>
 </select>
 </div><script>
 document.addEventListener('DOMContentLoaded', function(event) {
 document.getElementById('monthlypdf').value = '1';
 document.getElementById('yearlypdf').value = '2020';
 document.getElementById('pdf').value = '2020';
 document.getElementById('indivpdf').value = '1';
 });
 </script>

 <form method="post" id="goo" action="/pdf" target="_blank">
 <input name="pdf" id="pdf" type="text" hidden >
 </form>
 </div>
</div>

```

```

<button onclick="goofunction()" type="submit" class="btn btn-light"
style="margin: 1em; padding-left: 2em; padding-right: 2em; width: auto;">Print
Report</button>

<script>
function goofunction() {
 document.getElementById("goo").submit();
}
</script>

</div>
</div>

<div class="mainAnRContent" style="width: 100%;">
 <div id="summarySectn" style="width: inherit;" data-pg-collapsed>
 <div style="width: 100%; display: flex;">
 <div class="row summary-at-llarge" style="display: flex; width:
100%; flex-wrap: wrap; align-items: center; justify-content: center;"><div style="margin:
1em; background-color: #ffffff; box-shadow: 2px 2px 2px #292424; width: 200px;
height: 160px;" class="col-md-3"><p>
 <h4>Detection Efficiency</h4>
 <div>
 <h2 style="color: #49d449; margin-top: 0;">{ {eff} } %
 </h2>
 </div><p id="t">{ {tpos} } TP </p><p id="m">{ {man} } Manual</p>
 </div>
 <div style="margin: 1em; background-color: #ffffff; box-shadow:
2px 2px 2px #292424; width: 200px; height: 160px;" class="col-md-3" data-pg-
collapsed=""><h4>Insemination Efficiency</h4><h2 style="color: Red; margin-top:
0;">{ {insp} } %
 </h2><p>{ {preggy} } Pregnant </p><p>{ {ins} } Inseminations</p></div>
 </div>
 </div>
</div>

```

```

<div style="margin: 1em; background-color: #ffffff; box-shadow: 2px 2px 2px #292424; width: 200px; height: 160px;" class="col-md-3" data-pg-collapsed="">

 <h4>Total Pregnancies</h4><h2 style="color: Red; margin-top: 0;">{ {preg} }%<p id="percentage"></p></h2><p>{ {preggy} } Pregnant </p><p>{ {total} } Cows</p>

 </div>

 <div style="margin: 1em; background-color: #ffffff; box-shadow: 2px 2px 2px #292424; width: 200px; height: 160px;" class="col-md-3" data-pg-collapsed="">

 <h4>Successful Calving</h4><h2 style="color: #49d449; margin-top: 0;">{ {cal} }%</h2><p>{ {calving} } Calves</p><p>{ {preggy} } Pregnant</p>

 </div></div>

 </div>

 </div>

 <div id="mainGraphSectn" style="padding: 1em; border-color: #000000; data-pg-collapsed">

 <div style="background-color: #ffffff; padding: 1em; width: 100%; data-pg-collapsed">

 <h4 style="font-weight: 700; text-transform: uppercase;">App vs. Manual Estrus Detection</h4><div class="pg-empty-placeholder" style="height: 40vh; background-color: #ffffff; border: 1px solid #000000;"><canvas id="myChart1" style="width: 100%; height: 100%;"></canvas></div>

 </div>

 <div class="pg-empty-placeholder" style="height: 40vh; background-color: #ffffff; padding: 1em; overflow: auto; data-pg-collapsed"><table class="table" style="background-color: #ffffff;">

 <thead>

 <tr>

 <th>Month</th>
 <th style="text-align: center;">App Detection</th>
 <th style="text-align: center;">Manual Detection</th>


```

True Positive	
January	
jan	{ {jan} }
jan1	{ {jan1} }
jan2	{ {jan2} }
February	
feb	{ {feb} }
feb1	{ {feb1} }
feb2	{ {feb2} }
March	
mar	{ {mar} }
mar1	{ {mar1} }
mar2	{ {mar2} }
April	
apr	{ {apr} }
apr1	{ {apr1} }
apr2	{ {apr2} }

```
</tr>

<tr>
 <th scope="row">May</th>
 <td id="may">{ {may} }</td>
 <td id="may1">{ {may1} }</td id="may">
 <td id="may2">{ {may2} }</td>
</tr>

<tr>
 <th scope="row">June</th>
 <td id="jun">{ {jun} }</td>
 <td id="jun1">{ {jun1} }</td id="jun">
 <td id="jun2">{ {jun2} }</td id="jun">
</tr>

<tr>
 <th scope="row">July</th>
 <td id="jul">{ {jul} }</td>
 <td id="jul1">{ {jul1} }</td id="jul">
 <td id="jul2">{ {jul2} }</td id="jul">
</tr>

<tr>
 <th scope="row">August</th>
 <td id="aug">{ {aug} }</td>
 <td id="aug1">{ {aug1} }</td id="aug">
 <td id="aug2">{ {aug2} }</td id="aug">
</tr>

<tr>
 <th scope="row">September</th>
 <td id="sep">{ {sep} }</td>
```

```

<td id="sep1">{ {sep1} }</td id="sep">
<td id="sep2">{ {sep2} }</td id="sep">
</tr>

<tr>
 <th scope="row">October</th>
 <td id="oct">{ {oct} }</td>
 <td id="oct1">{ {oct1} }</td>
 <td id="oct2">{ {oct2} }</td id="oct">
</tr>

<tr>
 <th scope="row">November</th>
 <td id="nov">{ {nov} }</td>
 <td id="nov1">{ {nov1} }</td id="nov">
 <td id="nov2">{ {nov2} }</td id="nov">
</tr>

<tr>
 <th scope="row">December</th>
 <td id="dec">{ {dec} }</td>
 <td id="dec1">{ {dec1} }</td id="dec">
 <td id="dec2">{ {dec2} }</td id="dec">
</tr>

</tbody>
</table></div>
</div>

<div id="subGraphSectn" style="padding: 1em; width: 100%;"><div
style="width: 100%; "> <div class="row flex-col-992d"
style="display: flex; width: 100%; ">

 <div class="col-md-6" style="background-color: #ffffff; box-
shadow: 2px 2px 3px; margin-left: .5em; margin-top: .5em; margin-bottom: .5em;" data-
pg-collapsed="">

```

```

<div style="padding: 1em; width: 100%;" data-pg-
collapsed="">
 <h4 style="font-weight: 700; text-transform:
uppercase;">Pregnancy</h4>
 <p>Percentage out from the total number of female cow in
inventory</p>
 <div class="pg-empty-placeholder" style="height:
40vh;background-color: #ffffff; border: 1px solid #000000;">
 <canvas id="myChart2" style="width: 100%; height:
100%;"></canvas>
 </div>
</div>
<div class="pg-empty-placeholder" style="height: 40vh;
padding: 1em; overflow: auto;" data-pg-collapsed="">
 <table class="table">
 <thead>
 <tr>
 <th style="text-align: left;">Cow ID</th>
 <th style="text-align: left;">Confirmed Date</th>
 </tr>
 </thead>
 <tbody>
 { %for cow in all_preggy % }
 <tr>
 <th scope="row" style="text-align:
left;">{ {cow.cow.cownumber} }</th>
 <td style="text-align: left;">{ {cow.day} }</td>
 </tr>
 { % endfor % }
 </tbody>
 </table>

```

```

 </div>
 </div>
 <div class="col-md-6" style="background-color: #ffffff; box-
shadow: 2px 2px 3px; margin-left: .5em; margin-top: .5em; margin-bottom: .5em;" data-
pg-collapsed="">
 <div style="background-color: #ffffff; padding: 1em; width:
100%;" data-pg-collapsed="">
 <h4 style="font-weight: 700; text-transform:
uppercase;">Calving</h4>
 <p>Percentage of successful births out from the total number
of pregnant cows</p>
 <div class="pg-empty-placeholder" style="height: 40vh;
background-color: #ffffff; border: 1px solid #000000;">
 <canvas id="myChart3" style="width: 100%; height:
100%;"></canvas>
 </div>
 </div>
 <div class="pg-empty-placeholder" style="height: 40vh;
background-color: #ffffff; padding: 1em; overflow: auto;" data-pg-collapsed="">
 <table class="table" style="background-color: #ffffff;">
 <thead>
 <tr>
 <th style="text-align: left;">Calving Date</th>
 <th style="text-align: left;">Calf ID</th>
 <th style="text-align: left;">Cow ID</th>
 <th></th>
 </tr>
 </thead>
 <tbody>
 { %for cow in all_calv % }
 <tr>

```

```

<th scope="row" style="text-align:
left;">{ {cow.day} }</th>
<td style="text-align: left;">{ {cow.calf} }</td>
<td style="text-align:
left;">{ {cow.cow.cownumber} }</td>
</tr>
{ % endfor %
</tbody>
</table>
</div>
</div>
</div></div><div><div data-pg-collapsed style="background-color:
#ffffff; box-shadow: 2px 2px 3px; margin-top: 1em; margin-bottom: 1em; flex-direction:
column;" class="col-md-12"><div style="background-color: #ffffff; padding: 1em;
width: 100%;" data-pg-collapsed>
<h4 style="font-weight: 700; text-transform:
uppercase;">Insemination records</h4>
<hr style="margin-top:
0; margin-bottom: 0;">
</div><div class="pg-empty-placeholder" style="height: 40vh;
background-color: #ffffff; padding: 1em; overflow: auto; width: 100%; margin-bottom:
1em;" data-pg-collapsed><table class="table" style="background-color: #ffffff;">
<thead>
<tr>
<th style="text-align: center;">Date</th>
<th style="text-align: center;">Cow ID</th>
<th style="text-align: center;">Type</th>
<th style="text-align: center;">Administered By:</th>
</tr>
</thead>
<tbody>

```

```

{ %for cow in all_ins % }

<tr>

 <th scope="row" style="text-align:
center;">{ {cow.insdt} }</th>

 <td style="text-align:
center;">{ {cow.cow.cownumber} }</td>

 <td style="text-align: center;">{ {cow.insty} }</td>

 <td style="text-align: center;">{ {cow.insad} }</td>

</tr>

{ % endfor % }

</tbody>

</table></div> </div></div></div>

</div>

</div><div class="tab-pane fade" style="max-width: auto;" id="monthlyReport" data-pg-collapsed>

<div class="mainAnRHeader">

 <h2 style="text-align: left;">Monthly Performance Report</h2>

 <div class="analyticsHeader" style="width: 100%; flex-direction: row;
display: flex; flex-wrap: wrap; align-items: center;">

 <div class="form-group" style="flex-direction: row; display: flex;
align-items: center; margin-top: 1em; margin-bottom: 1em; width: 50%; flex-wrap:
wrap;">

 <label for="selMonth" style="font-size: 16px;">Month</label>

 <select id="month" name="month" class="form-control"
style="margin-left: 1em; width: inherit;">

 <option value="1">January</option>
 <option value="2">February</option>
 <option value="3">March</option>
 <option value="4">April</option>
 <option value="5">May</option>
 <option value="6">June</option>

```

```
<option value="7">July</option>
<option value="8">August</option>
<option value="9">September</option>
<option value="10">October</option>
<option value="11">November</option>
<option value="12">December</option>
</select>
</div>
<div>

<form method="post" action="/monthlypdf" target="_blank">
<input name="monthlypdf" id="monthlypdf" type="text" hidden >
<input name="yearlypdf" id="yearlypdf" type="text" hidden >
<button type="submit" class="btn btn-light" style="margin: 1em; padding-left: 2em; padding-right: 2em; width: auto;">Print Report</button>
</form>
</div></div>
</div>
<div class="mainAnRContent" style="width: 100%;" data-pg-collapsed>
<div id="summarySectn" style="width: inherit;">
<div style="width: 100%; display: flex;">

</div>
</div>
<div id="mainGraphSectn" style="padding: 1em; border-color: #000000;" data-pg-collapsed>
<div style="background-color: #ffffff; padding: 1em; width: 100%;">
<h4 style="font-weight: 700; text-transform: uppercase;">Monthly estrus activity</h4><div class="pg-empty-placeholder" style="height: 40vh; background-color: #ffffff; border: 1px solid #000000;">
```

```

<canvas id ="myChart4" height="70vh;"></canvas>

</div>
</div>

<div class="pg-empty-placeholder" style="height: 40vh; background-color: #ffffff; padding: 1em; overflow: auto;"><table class="table" style="background-color: #ffffff;">

<thead>
<tr>
<th>Cow ID</th>
<th style="text-align: center;">Estrus Date</th>
<th style="text-align: center;">Inseminated</th>
<th style="text-align: center;">w/in Expected Time</th>
</tr>
</thead>

<tbody>
{ % for cow in monthly % }

<tr>
<th scope="row">{ {cow.cow.cownumber} }</th>
<td>{ {cow.estrus.date()} }</td>
<td>{ {cow.ins} }</td>
<td>{ {cow.insexp} }</td>
</tr>
{ % endfor % }

</tbody>
</table></div>
</div>

```

```

<div id="subGraphSectn" style="padding: 1em; width: 100%;"><div
style="width: 100%;"> </div><div><div style="background-color: #ffffff; box-
shadow: 2px 2px 3px; margin-bottom: 1em; flex-direction: column;" class="col-md-12"
data-pg-collapsed><div style="background-color: #ffffff; padding: 1em; width: 100%;">
 <h4 style="font-weight: 700; text-transform: uppercase;">expected
 Estrus</h4> <hr style="margin-top: 0; margin-bottom: 0;">
 </div><div class="pg-empty-placeholder" style="height: 40vh;
background-color: #ffffff; padding: 1em; overflow: auto; width: 100%; margin-bottom:
1em;"><table class="table" style="background-color: #ffffff;"><thead>
 <tr>
 <th style="text-align: center;">Cow ID</th>
 <th style="text-align: center;">Date (21 Days)</th>
 <th style="text-align: center;">Early (-3Days)</th>
 <th style="text-align: center;">Late (+3Days)</th>
 </tr>
</thead>

<tbody>
 { % for cow in all_logs % }

 <tr>
 <th scope="row" style="text-align:
center;">{ { cow.cow.cownumber } }</th>
 <td style="text-align: center;">{ { cow.nextes.date() } }</td>
 <td style="text-align: center;">{ { cow.nextesm.date() } }</td>
 <td style="text-align: center;">{ { cow.nextesp.date() } }</td>
 </tr>
 { % endfor % }

</tbody></table></div> </div><div
style="background-color: #ffffff; box-shadow: 2px 2px 3px; margin-top: 1em; margin-
bottom: 1em; flex-direction: column;" class="col-md-12" data-pg-collapsed><div
style="background-color: #ffffff; padding: 1em; width: 100%;">

```

```

<h4 style="font-weight: 700; text-transform: uppercase;">>Insemination records</h4> <hr style="margin-top: 0; margin-bottom: 0;">

</div><div class="pg-empty-placeholder" style="height: 40vh; background-color: #ffffff; padding: 1em; overflow: auto; width: 100%; margin-bottom: 1em;"><table class="table" style="background-color: #ffffff;">

<thead>
 <tr>
 <th style="text-align: center;">Date</th>
 <th style="text-align: center;">Cow ID</th>
 <th style="text-align: center;">Type</th>
 <th style="text-align: center;">Administered By:</th>
 </tr>
</thead>

<tbody>
 { %for cow in all_ins %}
 <tr>
 <th scope="row" style="text-align: center;">{ {cow.insdt} }</th>
 <td style="text-align: center;">{ {cow.cow.cownumber} }</td>
 <td style="text-align: center;">{ {cow.insty} }</td>
 <td style="text-align: center;">{ {cow.insad} }</td>
 </tr>
 { % endfor %}
</tbody>
</table></div> </div></div></div>

</div><div class="tab-pane fade" style="max-width: auto;" id="indReport">

```

```
<div class="mainAnRHeader">
 <h2 style="text-align: left;">Individual Cattle Report</h2>
 <div class="analyticsHeader" style="width: 100%; flex-direction: row; display: flex; flex-wrap: wrap; align-items: center;">
 <div class="form-group" style="flex-direction: row; display: flex; align-items: center; margin-top: 1em; margin-bottom: 1em; width: 50%; flex-wrap: wrap;">
 <label for="formInput2" style="font-size: 16px;">Cow ID</label>
 <select name="indiv" id="indiv" class="form-control" style="margin-left: 1em; width: 100px;">
 <option value="1">1102-1</option>
 <option value="2">1</option>
 <option value="3">3819</option>
 <option value="4">2409-3</option>
 <option value="5">485-3</option>
 <option value="6">2264-2</option>
 <option value="7">4030-2-2</option>
 <option value="8"> 1000-1</option>
 <option value="9">7021-2</option>
 <option value="10">1229-1</option>
 <option value="11">0739-1</option>
 <option value="12">4062-1</option>
 <option value="13">3897</option>
 <option value="14">2264-1</option>
 <option value="15">2534</option>
 <option value="16">257-2b</option>
 <option value="17">516-3</option>
 <option value="18">67</option>
 <option value="19">3220</option>
 </select>
 </div>
 </div>
</div>
```

```

</div><div>

 <form method="post" action="/indivpdf" target="_blank">

 <input name="indivpdf" id="indivpdf" type="text" hidden >

 <button type="submit" class="btn btn-light" style="margin: 1em; padding-left: 2em; padding-right: 2em; width: auto;">Print Report</button>

 </form>

</div></div>

</div>

<div class="mainAnRContent" style="width: 100%;">

 <div id="summarySectn" style="width: inherit;">

 <div style="width: 100%; display: flex;">

 <div class="row summary-at-llarge" style="display: none; width: 100%; flex-wrap: wrap; align-items: center; justify-content: center;"><div style="margin: 1em; background-color: #ffffff; box-shadow: 2px 2px 2px #292424; width: 200px; height: 160px;" class="col-md-3">

 <h4>Detection Efficiency</h4>

 <div>

 <h2 style="color: #49d449; margin-top: 0;">

 200%

 </h2>

 </div>

 <div><p>{ {tpos} } TP </p><p>{ {man} } Manual</p>

 </div>

 <div style="margin: 1em; background-color: #ffffff; box-shadow: 2px 2px 2px #292424; width: 200px; height: 160px;" class="col-md-3"><h4>Insemination Efficiency</h4><h2 style="color: Red; margin-top: 0;">

 50%</h2><p>{ {preggy} } Pregnant </p><p>{ {ins} } Inseminations</p></div>

 <div style="margin: 1em; background-color: #ffffff; box-shadow: 2px 2px 2px #292424; width: 200px; height: 160px;" class="col-md-3">

```

```

<h4>Total Pregnancies</h4><h2 style="color: Red; margin-top: 0;">22.2%</h2><p>{ {preggy} } Pregnant </p><p>{ {total} } Cows</p>
</div>

<div style="margin: 1em; background-color: #ffffff; box-shadow: 2px 2px 2px #292424; width: 200px; height: 160px;" class="col-md-3">
 <h4>Successful Calving</h4><h2 style="color: #49d449; margin-top: 0;">100%</h2><p>{ {calving} } Calves</p><p>{ {preggy} } Pregnant</p>
 </div></div>

</div>

<div id="mainGraphSectn" style="padding: 1em; border-color: #000000;">
 <div style="background-color: #ffffff; padding: 1em; width: 100%;">
 <h4 style="font-weight: 700; text-transform: uppercase;">Individual activity report</h4><div class="pg-empty-placeholder" style="height: 40vh; background-color: #ffffff; border: 1px solid #000000;">
 <canvas id = "myChart6" height= "70vh"></canvas>
 </div>
 </div>

 </div>

 <div id="subGraphSectn" style="padding: 1em; width: 100%;"><div data-pg-collapsed><div style="background-color: #ffffff; box-shadow: 2px 2px 3px; margin-top: 1em; margin-bottom: 1em; flex-direction: column;" class="col-md-12" data-pg-collapsed><div style="background-color: #ffffff; padding: 1em; width: 100%;">
 <h4 style="font-weight: 700; text-transform: uppercase;">Insemination records</h4> <hr style="margin-top: 0; margin-bottom: 0;"/>
 </div><div class="pg-empty-placeholder" style="height: 40vh; background-color: #ffffff; padding: 1em; overflow: auto; width: 100%; margin-bottom: 1em;"><table class="table" style="background-color: #ffffff;">
 <thead>
 <tr>

```

```

 <th style="text-align: center;">Date</th>
 <th style="text-align: center;">Cow ID</th>
 <th style="text-align: center;">Type</th>
 <th style="text-align: center;">Administered By:</th>
 </tr>
</thead>

<tbody>
 { %for cow in all_ins % }

 <tr>
 <th scope="row" style="text-align: center;">{ {cow.insdt} }</th>
 <td style="text-align: center;">{ {cow.cow.cownumber} }</td>
 <td style="text-align: center;">{ {cow.insty} }</td>
 <td style="text-align: center;">{ {cow.insad} }</td>
 </tr>

 { % endfor % }

</tbody>
</table></div> </div></div><div style="width: 100%;" data-pg-collapsed> <div class="row flex-col-992d" style="display: flex; width: 100%;">
 <div class="col-md-6" style="background-color: #ffffff; box-shadow: 2px 2px 3px; margin-left: .5em; margin-top: .5em; margin-bottom: .5em;">
 <div style="padding: 1em; width: 100%;">
 <h4 style="font-weight: 700; text-transform: uppercase;">Pregnancy Records</h4>
 </div>
 <div class="pg-empty-placeholder" style="height: 40vh; padding: 1em; overflow: auto;">

```

```

<table class="table">
 <thead>
 <tr>
 <th style="text-align: left;">Cow ID</th>
 <th style="text-align: left;">Confirmed Date</th>
 </tr>
 </thead>
 <tbody>
 { %for cow in all_preggy % }
 <tr>
 <th scope="row" style="text-align: left;">{ {cow.cow.cownumber} }</th>
 <td style="text-align: left;">{ {cow.day} }</td>
 </tr>
 { % endfor % }
 </tbody>
</table>
</div>
</div>

<div class="col-md-6" style="background-color: #ffffff; box-shadow: 2px 2px 3px; margin-left: .5em; margin-top: .5em; margin-bottom: .5em;">
 <div style="background-color: #ffffff; padding: 1em; width: 100%;">
 <h4 style="font-weight: 700; text-transform: uppercase;">Calving records</h4>
 </div>
 <div class="pg-empty-placeholder" style="height: 40vh; background-color: #ffffff; padding: 1em; overflow: auto;">
 <table class="table" style="background-color: #ffffff;">
 <thead>
 <tr>

```

```

<th style="text-align: left;">Calving Date</th>
<th style="text-align: left;">Calf ID</th>
<th style="text-align: left;">Cow ID</th>
<th></th>
</tr>
</thead>
<tbody>
{ %for cow in all_calv % }

<tr>
<th scope="row" style="text-align: left;">{ {cow.day} }</th>
<td style="text-align: left;">{ {cow.calf} }</td>
<td style="text-align: left;">{ {cow.cow.cownumber} }</td>
</tr>
{ % endfor %

</tbody>
</table>
</div>
</div>
</div></div></div>
</div>
</div>

<div id="janny" hidden>{ {janny} }</div><div hidden
id="janny2">{ {janny2} }</div><div hidden id="janny3">{ {janny3} }</div><div hidden
id="janny4">{ {janny4} }</div><div hidden id="janny5">{ {janny5} }</div><div hidden
id="janny6">{ {janny6} }</div><div hidden id="janny7">{ {janny7} }</div><div hidden
id="janny8">{ {janny8} }</div>

<div id="janny9" hidden>{ {janny9} }</div><div hidden
id="janny10">{ {janny10} }</div><div hidden id="janny11">{ {janny11} }</div><div
hidden id="janny12">{ {janny12} }</div><div hidden
id="janny13">{ {janny13} }</div><div hidden id="janny14">{ {janny14} }</div><div
hidden id="janny15">{ {janny15} }</div><div hidden id="janny16">{ {janny16} }</div>

```

```

<div id="janny17" hidden>{ {janny17} }</div><div hidden
id="janny18">{ {janny18} }</div hidden><div id="janny19">{ {jann19y} }</div>
<div id="ja" hidden>{ {ja} }</div><div hidden id="fe">{ {fe} }</div><div
hidden id="m">{ {m} }</div><div hidden id="ap">{ {ap} }</div><div hidden
id="ma">{ {ma} }</div><div hidden id="j">{ {j} }</div><div hidden
id="ju">{ {ju} }</div><div hidden id="au">{ {au} }</div>
<div id="se" hidden>{ {se} }</div><div hidden id="oc">{ {oc} }</div><div
hidden id="no">{ {no} }</div><div hidden id="de">{ {de} }</div>
<input id="pointspossible" value="{ {man} }" hidden><input id="pointsgiven"
value="{ {tpos} }" hidden>

</div>
</div>
<script>

$(function annual() {
 $('#year').bind('change', function annual() {
 $.getJSON('/annual', {
 year: $('select[name="year"]').val(),
 },
 function(datas) {
 $("#jan").text(datas.jan);
 $("#feb").text(datas.feb);
 $("#mar").text(datas.mar);
 $("#apr").text(datas.apr);
 $("#may").text(datas.may);
 $("#jun").text(datas.jun);
 $("#jul").text(datas.jul);
 $("#aug").text(datas.aug);
 }
 });
});

```

```
 $("#" + sep).text(datas.sep);
 $("#" + oct).text(datas.oct);
 $("#" + nov).text(datas.nov);
 $("#" + dec).text(datas.dec);
 $("#" + jan1).text(datas.jan1);
 $("#" + feb1).text(datas.feb1);
 $("#" + mar1).text(datas.mar1);
 $("#" + apr1).text(datas.apr1);
 $("#" + may1).text(datas.may1);
 $("#" + jun1).text(datas.jun1);
 $("#" + jul1).text(datas.jul1);
 $("#" + aug1).text(datas.aug1);
 $("#" + sep1).text(datas.sep1);
 $("#" + oct1).text(datas.oct1);
 $("#" + nov1).text(datas.nov1);
 $("#" + dec1).text(datas.dec1);
 $("#" + jan2).text(datas.jan2);
 $("#" + feb2).text(datas.feb2);
 $("#" + mar2).text(datas.mar2);
 $("#" + apr2).text(datas.apr2);
 $("#" + may2).text(datas.may2);
 $("#" + jun2).text(datas.jun2);
 $("#" + jul2).text(datas.jul2);
 $("#" + aug2).text(datas.aug2);
 $("#" + sep2).text(datas.sep2);
 $("#" + oct2).text(datas.oct2);
 $("#" + nov2).text(datas.nov2);
 $("#" + dec2).text(datas.dec2);
```

```

 $("#" + pdf).val(datas.year);

 annualchart.data.datasets[0].data =
[$("#jan").text(),$("#feb").text(),$("#mar").text(),$("#apr").text(),$("#may").text(),$("#ju
n").text(),$("#jul").text(),$("#aug").text(),$("#sep").text(),$("#oct").text(),$("#nov").text()
,$("#dec").text()];

 annualchart.data.datasets[1].data =
[$("#jan1").text(),$("#feb1").text(),$("#mar1").text(),$("#apr1").text(),$("#may1").text(),
$("#jun1").text(),$("#jul1").text(),$("#aug1").text(),$("#sep1").text(),$("#oct1").text(),$("#"
#nov1").text(),$("#dec1").text()];

 annualchart.data.datasets[2].data =
[$("#jan2").text(),$("#feb2").text(),$("#mar2").text(),$("#apr2").text(),$("#may2").text(),
$("#jun2").text(),$("#jul2").text(),$("#aug2").text(),$("#sep2").text(),$("#oct2").text(),$("#"
#nov2").text(),$("#dec2").text()];

 annualchart.update();

 });

 return false;

});

});

</script>

```

```

<script>

$(function monthly() {

 $('#month').bind('change', function monthly() {

 $.getJSON('/monthly', {

```

```

month: $('select[name="month"]').val(),
year: $('select[name="year"]').val(),
},

function (data) {
 $('#janny').text(data.janny);
 $('#janny2').text(data.janny2);
 $('#janny3').text(data.janny3);
 $('#janny4').text(data.janny4);
 $('#janny5').text(data.janny5);
 $('#janny6').text(data.janny6);
 $('#janny7').text(data.janny7);
 $('#janny8').text(data.janny8);
 $('#janny9').text(data.janny9);
 $('#janny10').text(data.janny10);
 $('#janny11').text(data.janny11);
 $('#janny12').text(data.janny12);
 $('#janny13').text(data.janny13);
 $('#janny14').text(data.janny14);
 $('#janny15').text(data.janny15);
 $('#janny16').text(data.janny16);
 $('#janny17').text(data.janny17);
 $('#janny18').text(data.janny18);
 $('#janny19').text(data.janny19);
 $('#monthlypdf').val(data.month);
 $('#yearlypdf').val(data.year);

 monthlychart.data.datasets[0].data =
[$('#janny').text(),$('#janny2').text(),$('#janny3').text(),$('#janny4').text(),$('#janny5').text(),$('#janny6').text(),$('#janny7').text(),$('#janny8').text(),$('#janny9').text(),$(

```

```

 "#janny10").text(),$("#janny11").text(),$("#janny12").text(),$("#janny13").text(),$("#jan
ny14").text(),$("#janny15").text(),$("#janny16").text(),$("#janny17").text(),$("#janny18"
).text(),$("#janny19").text()]);
 monthlychart.update()
});

return false;

});

});

};

</script>

```

<script>

```

$(function indiv() {
 $('#indiv').bind('change', function indiv() {
 $.getJSON('/indiv', {
 indiv: $('select[name="indiv"]').val(),
 year: $('select[name="year"]').val(),
 },

```

```

 function (data) {
 $("#ja").text(data.ja);
 $("#fe").text(data.fe);
 $("#m").text(data.m);
 $("#ap").text(data.ap);
 $("#ma").text(data.ma);
 $("#j").text(data.j);
 $("#ju").text(data.ju);

```

```

 $("#" + au).text(data.au);
 $("#" + se).text(data.se);
 $("#" + oc).text(data.oc);
 $("#" + no).text(data.no);
 $("#" + de).text(data.de);
 $("#" + indivpdf).val(data.indiv);

 indivchart.data.datasets[0].data =
 [$("#ja").text(),$("#fe").text(),$("#m").text(),$("#ap").text(),$("#ma").text(),$("#j").text(),
 $("#ju").text(),$("#au").text(),$("#se").text(),$("#oc").text(),$("#no").text(),$("#de").text()
]);

 indivchart.update()

 });

 return false;
}

});

});

});

</script>
```

```

<script>

var ctx = document.getElementById('myChart1').getContext('2d');

var annualchart = new Chart(ctx, {
 type: 'line',
 data: {
 labels: ['January', 'February', 'March', 'April', 'May', 'June',
 'July','August','September','October','November','December'],
 datasets: [{
 label: 'App Detection',

```

```
 backgroundColor: '#FEA47F',
 borderColor: '#FEA47F',
 data:[{ {jan} },{{feb}},{{mar}},{ {apr} },{{may}},{ {jun} },{{jul}},{ {aug} },{{sep}},{ {oct} },{{nov}},{ {dec} }],
 lineTension: 0,
 fill: false,
},{
 label:'Manual Detection',
 backgroundColor:'#D6A2E8',
 borderColor:'#D6A2E8',
 data:[{ {jan1} },{{feb1}},{{mar1}},{ {apr1} },{{may1}},{ {jun1} },{{jul1}},{ {aug1} },{ {sep1} },{{oct1}},{ {nov1} },{ {dec1} }],
 lineTension: 0,
 fill: false,
},{
 label: 'True Positive',
 backgroundColor:'#58B19F',
 borderColor:'#58B19F',
 data:[{ {jan2} },{{feb2}},{{mar2}},{ {apr2} },{{may2}},{ {jun2} },{{jul2}},{ {aug2} },{ {sep2} },{{oct2}},{ {nov2} },{ {dec2} }],
 lineTension: 0,
 fill:false,
}]
},
options: {
 responsive:true,
```

```
legend:{
 position: 'bottom',
},
plugins:{
 datalabels:{
 color:'#000',
 },
},
});

</script>
<script>
var ctx = document.getElementById('myChart2').getContext('2d');
var chart = new Chart(ctx,{
 type:'pie',
 data:{
 labels:['Pregnant', 'Not Pregnant'],
 datasets: [{
 backgroundColor:['#6D214F', '#B33771'
],
 borderColor:['#fff'],
 data:[{ {preggy} }, { {notpreggy} }],
 }],
 },
 options:{
```

```
 labels:{
 },
 responsive:true,
 legend:{
 position:'bottom',
 },
 plugins:{
 datalabels:{
 formatter: (value,ctx)=> {
 let sum=0;
 let dataArr = ctx.chart.data.datasets[0].data;
 dataArr.map(data =>{
 sum += data;
 });
 let percentage = (value*100/sum).toFixed(2)+"%";
 return percentage;
 },
 color: '#FFF',
 anchor: 'end',
 align:'start',
 borderWidth: 1,
 font:{
 style:"bold",
```

```
 },
 },
 },
 },
 });

</script>
<script>

var ctx = document.getElementById('myChart3').getContext('2d');

var chart = new Chart(ctx,{
 type:'doughnut',
 data:{
 labels: ['Calves','Pregnant Cows'],
 datasets: [{backgroundColor:['#3B3B98', '#1B9CFC'],
 },
],
 borderColor:['#fff'],
 data:[{calving},{preggy}],},
 }],
 },
 options:{responsive:true,
 legend:{position:'bottom'},
 },
 plugins:{
```

```
 dataLabels: {

 color: '#FFF',
 anchor: 'end',
 align: 'start',

 borderWidth: 1,
 font: {
 size: 15,
 },
 },
 },
});

</script>
<script>
var ctx = document.getElementById('myChart4').getContext('2d');

var monthlychart = new Chart(ctx, {
 type: 'bar',
 data: {
 label: 'Standing Heat',
 datasets: [{
 data: [{ janny: 1, janny2: 2, janny3: 3, janny4: 4, janny5: 5, janny6: 6, janny7: 7 }]
 }]
 }
};
```

,{{janny8}},{{janny9}},{{janny10}},{{janny11}},{{janny12}},{{janny13}},{{janny14}},{{janny15}},{{janny16}},{{janny17}},{{janny18}},{{janny19}}],

    backgroundColor:[

        '#FEA47F',

        '#25CCF7',

        '#EAB543',

        '#55E6C1',

        '#CAD3C8',

        '#F97F51',

        '#1B9CFC',

        '#F8EFBA',

        '#58B19F',

        '#2C3A47',

        '#B33771',

        '#3B3B98',

        '#FD7272',

        '#9AECDB',

        '#D6A2E8',

        '#6D214F',

        '#182C61',

        '#FC427B',

        '#BDC581',

    ],

    borderColor:[

        '#FEA47F',

        '#25CCF7',

        '#EAB543',

        '#55E6C1',

        '#CAD3C8',

```
'#F97F51',
'#1B9CFC',
'#F8EFBA',
'#58B19F',
'#2C3A47',
'#B33771',
'#3B3B98',
'#FD7272',
'#9AECDB',
'#D6A2E8',
'#6D214F',
'#182C61',
'#FC427B',
'#BDC581'],
},
],
labels: ['Cow 1102-1','Cow 1','Cow 3819','Cow 2409-3','Cow 485-3','Cow 2264-2','Cow 4030-2-2','Cow 1000-1','Cow 7021-2','Cow 1229-1','Cow 0739-1','Cow 4062-1','Cow 3897','Cow 2264-1','Cow 2534','Cow 257-2b','Cow 516-3','Cow 67', 'Cow 3220'],
},
options: {
responsive: true,
legend:{
position:'hide',
},
plugins:{
datalabels:{
color: '#fff',
},
},
```

```
 },

 }
});
</script>
<script>
var ctx = document.getElementById('myChart6').getContext('2d');
var indivchart = new Chart(ctx, {
 type: 'line',
 data: {
 labels: ['January', 'February', 'March', 'April', 'May', 'June',
 'July','August','September','October','November','December'],
 datasets: [{
 label: 'Standing Heat',
 backgroundColor: '#FC427B',
 borderColor: '#FC427B',
 data:
 [{{ja}},{{fe}},{{m}},{{ap}},{{ma}},{{j}},{{ju}},{{au}},{{se}},{{oc}},{{no}},{{de}}
],
 lineTension: 0,
 fill: false,

 }]
 },
 options: {
 responsive:true,
 legend:{
 position: 'bottom',
 },
 },
```

```
plugins:{
 datalabels:{
 color:'#000',

 },
},
},
});
</script>
<script>
$(function(){

 $('#pointspossible').on('input', function() {
 calculate();
 });
 $('#pointsgiven').on('input', function() {
 calculate();
 });
 function calculate(){
 var pPos = parseInt($('#pointspossible').val());
 var pEarned = parseInt($('#pointsgiven').val());
 var perc="";
 if(isNaN(pPos) || isNaN(pEarned)){
 perc=" ";
 }else{
 perc = ((pEarned/pPos) * 100).toFixed(3);
 }
 }
});
```

```
$('#eff').val(perc);

}

});

</script>

<script src="../static/bootstrap/js/bootstrap.min.js"></script>

<script>

var overlay = document.getElementById('overlay');

document.getElementById('open-menu').addEventListener('click',
function(){

 overlay.style.width="100%");

 document.getElementById('cancel-menu').addEventListener('click',
function(){

 overlay.style.width="0%");

</script>

<script src="https://cdn.jsdelivr.net/npm/chart.js@2.8.0"></script>
<script src="../static/assets/js/ie10-viewport-bug-workaround.js"></script>
<script type="text/javascript" src="../static/assets/js/popper.js"></script>
<script
src="https://cdnjs.cloudflare.com/ajax/libs/Chart.js/2.6.0/Chart.min.js"></script>
<script src="https://cdnjs.cloudflare.com/ajax/libs/jspdf/1.3.5/jspdf.min.js"></script>
<script
src="https://cdnjs.cloudflare.com/ajax/libs/html2canvas/0.4.1/html2canvas.min.js"><script>
pt>

</body>
</html>
```

```

#annualpdf.html

<!DOCTYPE html>

<html xmlns="http://www.w3.org/1999/xhtml" lang="" xml:lang="">
<head>
<title>Annual Report</title>

<meta http-equiv="Content-Type" content="text/html; charset=UTF-8"/>

<style type="text/css">
<!--

 p {margin: 0; padding: 0;} .ft10{font-size:14px;font-family:Times;color:#000000;}
 .ft11{ font-size:35px;font-family:Times;color:#000000;}
 .ft12{font-size:26px;font-family:Times;color:#3a3838;}
 .ft13{font-size:11px;font-family:Times;color:#3a3838;}
 .ft14{font-size:12px;font-family:Times;color:#000000;}
 .ft15{font-size:14px;line-height:20px;font-family:Times;color:#000000; }

-->
</style>
</head>
<body bgcolor="white" vlink="blue" link="blue">

 <div id="page1-div" style="position:relative;width:918px;height:1296px;">

 <p style="position:absolute;top:57px;left:108px;white-space:nowrap"
class="ft15">
 </p>
 <p style="position:absolute;top:1225px;left:143px;white-space:nowrap"
class="ft10"> </p>

```

{ {year} } Annual&#160;Performance&#160;Report&#160;};</p>

De Belen&#160;Dairy&#160;Farm&#160;};</p>

EZTECT&#160;|&#160;TUP&#160;};</p>

All&#160;Rights Reserved&#160;};</p>

&#160;};</p>

|                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                           |                                                                                                                                             |  |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|--|--|
|                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                           |                                                                                                                                             |  |  |
| <p style="margin: 0;">&lt;TD WIDTH=81 HEIGHT=12 STYLE="border: 1px solid #bfbfbf; padding: 0in 0.08in"&gt;</p> <p style="margin: 0;">&lt;P LANG="en-PH" ALIGN=CENTER&gt;&lt;FONT FACE="Arial, serif"&gt;&lt;FONT SIZE=3&gt;&lt;B&gt;Cow</p> <p style="margin: 0;">ID&lt;/B&gt;&lt;/FONT&gt;&lt;/FONT&gt;&lt;/P&gt;</p> | <p style="margin: 0;">&lt;/TD&gt;</p> <p style="margin: 0;">&lt;TD WIDTH=100 STYLE="border: 1px solid #bfbfbf; padding: 0in 0.08in"&gt;</p> <p style="margin: 0;">&lt;P LANG="en-PH" ALIGN=CENTER&gt;&lt;FONT FACE="Arial, serif"&gt;&lt;FONT SIZE=3&gt;&lt;B&gt;Status&lt;/B&gt;&lt;/FONT&gt;&lt;/FONT&gt;&lt;/P&gt;</p> | <p style="margin: 0;">&lt;/TD&gt;</p> <p style="margin: 0;">&lt;TD WIDTH=136 STYLE="border: 1px solid #bfbfbf; padding: 0in 0.08in"&gt;</p> |  |  |

|                                                                                                                                                                                                                                                                                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>&lt;P LANG="en-PH" ALIGN=CENTER&gt;&lt;FONT FACE="Arial, serif"&gt;&lt;FONT SIZE=3&gt;&lt;B&gt;Date<br/>of Detection&lt;/B&gt;&lt;/FONT&gt;&lt;/FONT&gt;&lt;/P&gt;</p>                                                                                                         |
| <p>&lt;P LANG="en-PH" ALIGN=CENTER&gt;&lt;FONT FACE="Arial, serif"&gt;&lt;FONT SIZE=3&gt;&lt;B&gt;Insemination<br/>Date&lt;/B&gt;&lt;/FONT&gt;&lt;/FONT&gt;&lt;/P&gt;</p>                                                                                                         |
| <p>&lt;P LANG="en-PH" ALIGN=CENTER&gt;&lt;FONT FACE="Arial, serif"&gt;&lt;FONT SIZE=3&gt;&lt;B&gt;Other<br/>Information&lt;/B&gt;&lt;/FONT&gt;&lt;/FONT&gt;&lt;/P&gt;</p>                                                                                                         |
| <p>&lt;% for cow in all_logs %&gt;</p>                                                                                                                                                                                                                                            |
| <p>&lt;TR VALIGN=TOP&gt;</p> <p>&lt;TD WIDTH=81 HEIGHT=13 STYLE="border: 1px solid #bfbfbf; padding: 0in 0.08in"&gt;</p> <p>&lt;P LANG="en-PH" ALIGN=CENTER&gt;&lt;FONT FACE="Arial, serif"&gt;&lt;FONT SIZE=3&gt;{ {cow.cow.cownumber} }&lt;/FONT&gt;&lt;/FONT&gt;&lt;/P&gt;</p> |
| <p>&lt;/TD&gt;</p> <p>&lt;TD WIDTH=100 STYLE="border: 1px solid #bfbfbf; padding: 0in 0.08in"&gt;</p> <p>&lt;P LANG="en-PH" ALIGN=CENTER&gt;&lt;FONT FACE="Arial, serif"&gt;&lt;FONT SIZE=3&gt;{ {cow.cow.status} }&lt;/FONT&gt;&lt;/FONT&gt;&lt;/P&gt;</p>                       |
| <p>&lt;/TD&gt;</p> <p>&lt;TD WIDTH=136 STYLE="border: 1px solid #bfbfbf; padding: 0in 0.08in"&gt;</p>                                                                                                                                                                             |

```

<P LANG="en-PH" ALIGN=CENTER><FONT FACE="Arial,
serif">{ {cow.estrus.date()} }</P>

</TD>

<TD WIDTH=196 STYLE="border: 1px solid #bfbfbf; padding: 0in
0.08in">

<P LANG="en-PH" ALIGN=CENTER><FONT FACE="Arial,
serif">{ {cow.insday} }</P>

</TD>

<TD WIDTH=227 STYLE="border: 1px solid #bfbfbf; padding: 0in
0.08in">

<P LANG="en-PH" STYLE="margin-bottom: 0in"> Date
Acquired: <FONT FACE="Arial,
serif">{ {cow.cow.date_acquired} }</P>
<P LANG="en-PH"> Breed:
{ {cow.cow.breed} }</P>
</TD>
</TR>
{ % endfor % }

</TABLE>
</body>
</html>

```

```
#calendar.html
<!DOCTYPE html>
<html lang="en">
 <head>
 <meta charset="utf-8">
 <meta http-equiv="X-UA-Compatible" content="IE=edge">
 <meta name="viewport" content="width=device-width, initial-scale=1">
 <meta name="description" content="">
 <meta name="author" content="">
 <title>Dashboard</title>
 <link href="../static/bootstrap/css/bootstrap.css" rel="stylesheet">
 <link rel="shortcut icon" href="{{ url_for('static', filename='img/EZTECT_Logo.png') }}">
 <link rel="stylesheet"
 href="https://cdnjs.cloudflare.com/ajax/libs/fullcalendar/3.10.0/fullcalendar.css">
 <script src="https://ajax.googleapis.com/ajax/libs/jquery/3.4.0/jquery.min.js"></script>

 <script
 src="https://cdnjs.cloudflare.com/ajax/libs/moment.js/2.8.2/moment.min.js"></script>
 <script
 src="https://cdnjs.cloudflare.com/ajax/libs/fullcalendar/2.1.1/fullcalendar.min.js"></script>
 <link href="../static/css/style.css" rel="stylesheet">
 <link href="https://fullcalendar.io/js/fullcalendar-2.1.1/fullcalendar.css"
 rel="stylesheet" />
 <link
 href="https://cdnjs.cloudflare.com/ajax/libs/fullcalendar/3.0.1/fullcalendar.min.css"
 rel="stylesheet" />
 <script
 src="https://ajax.googleapis.com/ajax/libs/jquery/1.11.1/jquery.min.js"></script>
 <script
 src="https://cdnjs.cloudflare.com/ajax/libs/fullcalendar/3.0.1/fullcalendar.js"></script>
```

```
<script
src="https://cdnjs.cloudflare.com/ajax/libs/moment.js/2.15.1/moment.min.js"></script>

<script type="text/javascript" src="../static/js/fullcalendar.js"></script>

<script type="text/javascript" src="../static/js/fullcalendar.min.js"></script>

<style>

.fc-state-default {

background-color: #f5f5f5;

background-image: -moz-linear-gradient(top, #ffffff, #e6e6e6);

background-image: -webkit-gradient(linear, 0 0, 0 100%, from(#ffffff), to(#e6e6e6));

background-image: -webkit-linear-gradient(top, #ffffff, #e6e6e6);

background-image: -o-linear-gradient(top, #ffffff, #e6e6e6);

background-image: linear-gradient(to bottom, #ffffff, #e6e6e6);

background-repeat: repeat-x;

border-color: #e6e6e6 #e6e6e6 #bfbfbf;

border-color: rgba(0, 0, 0, 0.1) rgba(0, 0, 0, 0.1) rgba(0, 0, 0, 0.25);

color: #333;

text-shadow: 0 1px 1px rgba(255, 255, 255, 0.75);

box-shadow: inset 0 1px 0 rgba(255, 255, 255, 0.2), 0 1px 2px rgba(0, 0, 0, 0.05); }

.fc-state-hover,
.fc-state-down,
.fc-state-active,
.fc-state-disabled {

color: white; /* active-textcolor */

background-color: #e6e6e6; }

.fc-state-hover {

color: #00BFFF; /* hover-textcolor */

text-decoration: none;
```

```
background-position: 0 -15px;
-webkit-transition: background-position 0.1s linear;
-moz-transition: background-position 0.1s linear;
-o-transition: background-position 0.1s linear;
transition: background-position 0.1s linear; }
```

```
.fc-state-down,
.fc-state-active {
background-color: #00BFFF; /* active-bgcolor */
background-image: none;
box-shadow: inset 0 2px 4px rgba(0, 0, 0, 0.15), 0 1px 2px rgba(0, 0, 0, 0.05); }
```

```
.fc-event {
position: relative;
/* for resize handle and other inner positioning */
display: block;
/* make the <a> tag block */
font-size: .85em;
line-height: 1.3;
border-radius: 3px;
border: 1px solid #00BFFF; /* txtcolor */
/* default BORDER color */ }
```

```
.fc-event,
.fc-event-dot {
background-color: #00BFFF; /* bgcolor */
/* default BACKGROUND color */ }
```

```
.fc-event,
.fc-event:hover {
 color: black; /* txtcolor */
 /* default TEXT color */
 text-decoration: none;
 /* if <a> has an href */ }
```

```
.fc-unthemed td.fc-today {
 background: #F0F8FF; /* today */ }
```

```
/* icons in buttons */
```

```
.fc button .fc-icon {
 /* non-theme */
 color: white;
 position: relative;
 top: -0.05em;
 /* seems to be a good adjustment across browsers */
 margin: 0 .2em;
 vertical-align: middle; }
</style>
<script>
```

```
$(document).ready(function () {
 $.getJSON('/sim', {
 trial: $('#select[name="trial"]').val(),
 },
```

```
function(datas) {
 $("#trial").text(datas.trial);

});
return false;
});

</script>

<script src="https://cdn.onesignal.com/sdks/OneSignalSDK.js" async=""></script>
<link href="../static/css/simplePagination.css" type="text/css" rel="stylesheet">
<style>
 .light-theme .current {
 background: #00BFFF;
 color: #FFF;
 border-color: #00BFFF;
 box-shadow: 0 1px 0 rgba(255,255,255,1), 0 2px rgba(0, 0, 0, 0.3) inset;
 cursor: default;
 }
</style>
<script>
 var OneSignal = window.OneSignal || [];
 OneSignal.push(function() {
 OneSignal.init({
 appId: "6197616f-f442-4aba-80a8-1f8a38f22202",
 });
 });
</script>
```

```

 });
}

</script>

<link rel="stylesheet" href="https://fonts.googleapis.com/css?family=Roboto"><link
rel="stylesheet"
href="https://fonts.googleapis.com/css?family=Roboto+Condensed"><link
rel="stylesheet" href="https://fonts.googleapis.com/css?family=Roboto+Slab"><link
rel="stylesheet" href="https://fonts.googleapis.com/css?family=Open+Sans"><link
rel="stylesheet"
href="https://fonts.googleapis.com/css?family=Open+Sans+Condensed"><link
rel="stylesheet" href="https://fonts.googleapis.com/css?family=Montserrat"><link
rel="stylesheet" href="https://fonts.googleapis.com/css?family=Playfair+Display"><link
rel="stylesheet"
href="https://fonts.googleapis.com/css?family=Playfair+Display+SC"></head>

<body class="d-flex flex-column justify-content-start">
<input id="trial" value="sana" hidden>

<nav style="height: 100vh; background-color: #1e1e1e; z-index: 100; position: fixed;
overflow: hidden; transition: 0.5s; width: 0;" class="overlay" id="overlay" data-pg-
collapsed>

<div style="width: 100vw; display: flex; flex-direction: column; align-items: center;
transition: 0.5s;" id="mainOverlayContainer">

 <div style="height: 10vh; display: flex; flex-direction: row; align-items: center;
justify-content: flex-start; padding: 1em; width: 100%; background-size: cover;
class="close&farm">

 <span style="color: #ffffff; margin-left: 1em; font-weight: lighter; font-style:
normal; font-variant: normal; white-space: normal; font-size: 25px;" alt="Farm Name"
class="text-capitalize font-weight-bolder">EzTECT Farm

 </div><div class="row d-sm-flex flex-sm-column justify-content-sm-start align-
items-sm-start" style="width: 100%; display: flex; height: 100vh;">

 <div class="col-sm-1 col-lg-8 col-md-8" style="height: 90vh; display: flex;
align-items: flex-start; justify-content: space-around;">

```

```
<div class="row lg-menu-items">
 <div class="col-md-6">
 <h3 class="link: hover link" style="cursor: pointer;">Dashboard</h3>
 <p class="hide-at-small">View Detected Cows on Estrus;
See Upcoming Estrus Events on Calendar</p>
 </div>
 <div class="col-md-6">
 <h3 class="link: hover link" style="cursor: pointer;">Cattle Inventory</h3>
 <p class="hide-at-small">View Individual Cattle Information;
Register New Cows entering the barn
</p>
 </div>
 <div class="col-md-6">
 <h3 class="link: hover link" style="cursor: pointer;">Analytics & Reports</h3>
 <p class="hide-at-small">View and Print Yearly, Monthly, or Individual Cattle Reports</p>
 </div>
 <div class="col-md-6">
 <h3 class="link: hover link" style="cursor: pointer;">Locator</h3>
 <p class="hide-at-small">Estimated Time of Arrival on Farm for Estrus Confirmation & Cow Insemination</p>
 </div>
 <div class="col-md-6">
 <h3 class="link: hover link" style="cursor: pointer;">LiveView - Moonitor</h3>
 <p class="hide-at-small">View Live Feed on Barn and Control the PTZ Cameras</p>
 </div>
</div>
```

```

 </div>

 </div>

 <div class="row lg-menu-items" style="flex-direction: row; align-items: flex-start; width: 100%;">

 <div class="col-md-6">

 <h3 class="link:hover link" style="cursor: pointer;">About Us</h3>

 </div>

 <div class="col-md-6">

 <h3 class="link:hover link" style="cursor: pointer;">Help & Support</h3>

 </div>

 </div>

 </div>

 <div class="col-md-4 menu-userinfobtns col-sm-1" style="display: flex; flex-direction: column; justify-content: flex-start; align-items: center; margin: 1en; height: 90vh;">

 <div style="width: 100%; flex-direction: column; align-items: center; justify-content: center; display: flex; height: 40vh;" class="menu-usrinfo">

 {{current_user.username}}

 {% if current_user.role_id == 1 %}

 Admin

 {% else %}

 User

 {% endif %}

 </div>

```

```

<div style="display: flex; flex-direction: column; align-items: center; width: 100%; justify-content: space-around; margin-top: 2em; height: 50vh;" class="menu-btns">

 <button onclick="window.location.href = '/manage';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Manage My Account</button>{ % if current_user.role_id == 1 % } <button onclick="window.location.href = '/add';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Add Users</button>{ % endif % }<button onclick="window.location.href = '/logout';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Logout</button>

</div>

</div>

</div>

</div>

</nav>

<header style="height: 10vh; background-color: #1e1e1e; width: 100%; display: inline-flex;" id="headermain" data-pg-collapsed>

 <div style="width: 100vw; display: flex; flex-direction: column; align-items: center; height: 10vh;" id="mainHeaderContainer">

 <div style="height: 10vh; display: flex; flex-direction: row; align-items: center; justify-content: flex-start; padding: 1em; width: 100vw; background-image: url('../static/img/header_bg.png'); background-size: cover; background-color: #f8f9ff;" class="navbar-header" id="header">

 Dashboard<div class="logo-ezTECT" id="logo-ezTECT">


```

```


</div>

</div>
</div>

</header><div class="mainContent maincontent-fxd" id="mainContent">
<div class="row infoNoticeSec" id="infoNoticeSec" style="height: 100%; width:
100%;" data-pg-collapsed>
<div id="HelloUser" class="col-md-3 HelloUser sidebar-sm" data-pg-
collapsed>
<input name="title" type="text" id="title" hidden>
<input name="start" type="text" id="start" hidden>
<input name="end" type="text" id="end" hidden>

<div class="usertimer" data-pg-collapsed>
<h2 style="text-align: center; font-size: 20px;">Hello
{{current_user.username}} !</h2>
<hr/>
{ % for cow in rec %}
<div class="timer" id="timer_yes">
<h3 style="color: #e42727; text-align: center;">Cow {{cow.cowt}} &
Cow {{cow.cowb}} End of Estrus</h3>
<h3 class="countdowntimer" id="dem{{cow.last_estrus}}"></h3>
</div>
{ % else %
<div class="timer" id="timer_none">
<h3 style="color: #e42727; text-align: center;">No Estrus
Detected</h3>
</div>

```

```

{ % endfor % }

</div><hr class="hide-at-med"/><h4 class="hide-at-small" style="width: 100%; text-align: center; padding: 1em 1em 2em;" data-pg-collapsed>

Manage My Account

{ % if current_user.role_id == 1 % }

Add User

{ % endif % }

Logout

</h4></div><div class="col-md-9 width-sm" data-pg-collapsed style="min-height: 90vh; max-height: 100%;"><div class="dashboard-sections" id="recentestrusdetection">

<h2>Recent Estrus Detection</h2>

<hr>

<div class="pg-empty-placeholder" style="overflow: auto;">

<table class="table" data-pg-collapsed style="max-width: 100%; min-width: 100%;">

<thead>

<tr data-pg-collapsed="">

<th>Status</th>

<th>Cow IDs</th>

<th>Time of Detection</th>

<th>End of Estrus (ETC)</th>

<th>Details</th>

</tr>

</thead>

<tbody>

{ % for eve in rec_eve % }

<form action="/estrus" method="POST">

<tr data-pg-collapsed="">

<input type="hidden" value="{{eve.id}}" name="eve">

```

```

<th scope="row" id="demo{{eve.id}}">Expired</th>
<td>{{eve.cowt}} & {{eve.cowb}}</td>
<td>{{eve.last_estrus.time()}}</td>
<td>{{eve.exp_estrus.time()}}</td>
<td><input style="color:#1e1e1e; border:none; background:none" type="submit" value="Detail"></td>
</tr>
</form>
{ % endfor %

</tbody>
</table>
</div>

</div><div class="dashboard-sections" id="loghistory" data-pg-collapsed><h2 data-pg-collapsed="">Update</h2><hr>
<div style="width: 100%; display: flex; flex-direction: column; justify-content: flex-start; align-items: flex-start; overflow: auto;">
<ul class="nav nav-justified nav-tabs nav-tabs-justified" role="tablist" data-pg-collapsed>
<li class="nav-item">
Confirm App Detection

<li class="nav-item">
Record Manual Detection

<li class="nav-item">
Insemination

```

```


<li class="nav-item">
 Pregnancy

<li class="nav-item">
 Calving

<div class="tab-content" style="width: 100%;">
 <div id="confAppDetection" class="tab-pane fade in" style="width: 100%;">
 <form action="/confirm" method="post" ><div class="form-row flex-sm-column" style="display: flex; flex-wrap: wrap;" data-pg-collapsed>
 <div class="form-group" data-pg-collapsed style="padding: .5em; width: inherit;">
 <label class="control-label" for="formInput3">Estrus Date</label>
 <select name="estrus" type="datetime-local" class="form-control" id="formInput3" placeholder="Placeholder text">{ % for eve in all_event % }
 <option style="color:black">{ {eve.last_estrus} }</option>{ % endfor % }</select>
 </div>
 <div class="form-group" data-pg-collapsed style="padding: .5em; width: inherit;">
 <label class="control-label" for="formInput3">Cow ID (Top)</label>
 <select name="id1" type="text" class="form-control" id="formInput3" placeholder="Pumatong">{ % for eve in all_event %
 % }<option>{ {eve.cowt} }</option>{ % endfor % }</select>
 </div>
 <div class="form-group" style="padding: .5em; width: inherit;" data-pg-collapsed>

```

```

 <label class="control-label" for="estrusTop">Estrus</label>
 <select name="con1" class="form-control" id="estrusTop">
 <option value="Yes">Yes</option>
 <option value="No">No</option>
 </select>
 </div>
 <div class="form-group" data-pg-collapsed style="padding: .5em; width: inherit;">
 <label class="control-label" for="formInput3">Cow ID (Bottom)</label>
 <select name="id2" type="text" class="form-control" id="formInput3" placeholder="Pinatungan">{ % for eve in all_event % }<option>{ {eve.cowb} }</option>{ % endfor % }</select>
 </div>
 <div class="form-group" style="padding: .5em; width: inherit;" data-pg-collapsed>
 <label class="control-label" for="estrusBot">Estrus</label>
 <select name="con2" class="form-control" id="estrusBot">
 <option value="Yes">Yes</option>
 <option value="No">No</option>
 </select>
 </div>
 </div><button type="submit" class="btn btn-light" style="width: auto; padding-left: 2em; padding-right: 2em; box-shadow: 2px 2px 2px #131212; margin-top: 1em;">Submit</button>
</div></form>
<div class="tab-pane fade ptz-playbk" id="recManualDetection" data-pg-collapsed>
 <form action="/manual" method="post"><div class="form-row flex-sm-column" style="display: flex;">
 <div class="form-group" data-pg-collapsed style="padding: .5em;">
 <label class="control-label" for="formInput3">Estrus Date</label><input name="estrus"

```

```

type="date" class="form-control" id="formInput3" placeholder="Placeholder
text">></div><div class="form-group" data-pg-collapsed style="padding: .5em;">>
 <label class="control-label" for="formInput3">Cow ID (Top)</label>
 <select name="id1" type="text" class="form-control" id="formInput3"
placeholder="Pumatong"><option></option>{ % for cow in cow
% }<option>{ {cow.cownumber} }</option>{ % endfor % }</select>
</div><div class="form-group" data-pg-collapsed style="padding: .5em;">> <label
class="control-label" for="formInput3">Cow ID (Bottom)</label><select name="id2"
type="text" class="form-control" id="formInput3"
placeholder="Pinatungan"><option></option>{ % for cow in cow
% }<option>{ {cow.cownumber} }</option>{ % endfor % }</select></div></div><button
type="submit" class="btn btn-light" style="width: auto; padding-left: 2em; padding-right:
2em; box-shadow: 2px 2px 2px #131212; margin-top: 1em;">>Submit</button>
</div></form>
<div class="tab-pane fade ptz-playbk" id="insemination">
 <form action="/insem" method="post"><div class="form-row flex-sm-column"
style="display: flex;" data-pg-collapsed><div class="form-group" data-pg-collapsed
style="padding: .5em;">> <label class="control-label"
for="formInput3">Insemination Date</label><input name="ins" type="datetime-local"
class="form-control" id="formInput3" placeholder="Placeholder text"></div><div
class="form-group" data-pg-collapsed style="padding: .5em;">> <label class="control-
label" for="formInput3">Insemination Type</label><select name="type" type="text"
class="form-control" id="formInput3" placeholder="Enter
Name"><option>Natural</option><option>Artificial</option><option>Artificial &
Natural</option></select></div><div class="form-group" data-pg-collapsed
style="padding: .5em;">>
 <label class="control-label" for="formInput3">Cow ID </label>
 <select name="ids" type="text" class="form-control" id="formInput3"
placeholder="Inseminated Cow">{ % for eve in all_ins
% }<option>{ {eve.cow.cownumber} }</option>{ % endfor % }</select>
</div><div class="form-group" data-pg-collapsed style="padding: .5em;">> <label
class="control-label" for="formInput3">Administered By:</label><input name="ad"
type="text" class="form-control" id="formInput3" placeholder="Enter Name"></div>
</div> <button type="submit" class="btn btn-light" style="width:
auto; padding-left: 2em; padding-right: 2em; box-shadow: 2px 2px 2px #131212; margin-
top: 1em;">>Submit</button>
</div></form>

```

```

<div class="tab-pane fade ptz-playbk" id="pregnancy">

 <form action="/pregy" method="post"><div class="form-row flex-sm-column"
style="display: flex;" data-pg-collapsed><div class="form-group" data-pg-collapsed
style="padding: .5em;"> <label class="control-label" for="formInput3">Pregnancy
Date</label><input name="day" type="date" class="form-control" id="formInput3"
placeholder="Placeholder text"></div><div class="form-group" data-pg-collapsed
style="padding: .5em;">

 <label class="control-label" for="formInput3">Cow ID </label>

 <select name="ids" type="text" class="form-control" id="formInput3"
placeholder="Pregnant Cow ID"><option></option>{ % for cow in cow
% }<option>{ {cow.cownumber} }</option>{ % endfor % }</select>

 </div></div> <button type="submit" class="btn btn-light"
style="width: auto; padding-left: 2em; padding-right: 2em; box-shadow: 2px 2px 2px
#131212; margin-top: 1em;">Submit</button>

</div></form>

<div class="tab-pane fade ptz-playbk" id="calving">

 <form action="/calve" method="post"><div class="form-row flex-sm-column"
style="display: flex;" data-pg-collapsed><div class="form-group" data-pg-collapsed
style="padding: .5em;"> <label class="control-label" for="formInput3">Calving
Date</label><input name="day" type="date" class="form-control" id="formInput3"
placeholder="Placeholder text"></div><div class="form-group" data-pg-collapsed
style="padding: .5em;">

 <label class="control-label" for="formInput3">Calf ID</label>

 <input name="calf" type="text" class="form-control" id="formInput3"
placeholder="Calf Cow ID">

 </div><div class="form-group" data-pg-collapsed style="padding: .5em;"> <label
class="control-label" for="formInput3">Mother Cow ID</label><select name="ids"
type="text" class="form-control" id="formInput3" placeholder="Mother Cow
ID"><option></option>{ % for cow in all_preggy
% }<option>{ {cow.cow.cownumber} }</option>{ % endfor % }</select></div></div>
<button type="type" class="btn btn-light" style="width: auto; padding-left: 2em;
padding-right: 2em; box-shadow: 2px 2px 2px #131212; margin-top:
1em;">Submit</button>

</div></form>

</div>

```

```

</div></div><div class="dashboard-sections" id="loghistory" data-pg-collapsed><h2 data-pg-collapsed="">Estrus Logs</h2><hr><div class="pg-empty-placeholder" style="overflow: auto;">

 <table class="table" data-pg-collapsed="" style="min-width: 100%; max-width: 100%;" id="content">

 <thead>

 <tr>

 <th>Cow ID</th>

 <th>Date</th>

 <th>Time of Detection</th>

 <th>Confirmed</th>

 <th>Inseminated</th>

 </tr>

 </thead>

 <tbody>

 { % for cow in all_eve % }

 <tr>

 <th scope="row">{ {cow.cow.cownumber} }</th>

 <td>{ {cow.estrus.date()} }</td>

 <td>{ {cow.estrus.time()} }</td>

 <td>{ {cow.con} }</td>

 <td>{ {cow.ins} }</td>

 </tr>

 { % endfor % }

 </tbody>

 </table>

```

```
link">3<a href="#page-2" class="page-link
next">Next</div>

</div></div><div class="dashboard-sections"
id="calendaryow"><h2>Upcoming on Calendar</h2><hr><div class="container"
style="height: 40vh; width: 100%;">

<div id="calendar"></div>

</div></div></div></div>

</div></div>

<script src="../static/js/jquery.simplePagination.js"></script>

<script>
 var x = {eve};

 if (x < 5){
 document.getElementById("pagination").hidden=true;
 document.getElementById("pag").hidden=true;
 }
 else{
 jQuery(function($){
 var items = $("#content tbody tr");

 var numItems = items.length;
 var perPage = 4;

 // Only show the first 2 (or first `per_page`) items initially.
 items.slice(perPage).hide();

 // Now setup the pagination using the `#pagination` div.
 });
 }
}</script>
```

```

$("#pagination").pagination({
 items: numItems,
 itemsOnPage: perPage,
 cssStyle: "compact-theme",

 // This is the actual page changing functionality.
 onPageClick: function(pageNumber) {
 // We need to show and hide `tr`'s appropriately.
 var showFrom = perPage * (pageNumber - 1);
 var showTo = showFrom + perPage;

 // We'll first hide everything...
 items.hide()
 // ... and then only show the appropriate rows.
 .slice(showFrom, showTo).show();
 }
});

});}

});}

</script>
<script src="../static/bootstrap/js/bootstrap.min.js"></script>

<script>
var overlay = document.getElementById('overlay');

document.getElementById('open-menu').addEventListener('click',
function(){
 overlay.style.width="100%");

 document.getElementById('cancel-menu').addEventListener('click',
function(){

```

```

 overlay.style.width="0% "});

</script>

<script src="../static/assets/js/ie10-viewport-bug-workaround.js"></script>
<script type="text/javascript" src="../static/assets/js/popper.js"></script>

{ % for cow in rec % }

<script>

 var countDownDate{ {cow.id} } = new Date("{ {cow.exp_estrus} }").getTime();

 var x = setInterval(function() {

 var now = new Date().getTime();

 var distance = countDownDate{ {cow.id} } - now;

 var hours = Math.floor((distance % (1000 * 60 * 60 * 24)) / (1000 * 60 * 60));

 var minutes = Math.floor((distance % (1000 * 60 * 60)) / (1000 * 60));

 var seconds = Math.floor((distance % (1000 * 60)) / 1000);

 document.getElementById("dem{ {cow.last_estrus} }").innerHTML = hours + "h "
 + minutes + "m " + seconds + "s ";

 document.getElementById("demo{ {cow.id} }").innerHTML = "Urgent";

 if (distance < 0) {

 clearInterval(x);

 }
 }, 1000);

</script>

{ % endfor % }

<script>

$(document).ready(function() {

 $('#calendar').fullCalendar({
 header: {

```

```
 left: 'prev,next today',
 center: 'title',
 right: 'month,agendaWeek,agendaDay',
 },
}

selectable: true,
selectHelper: true,
select: function(start, end) {
 var title = prompt('Event Title:');
 var eventData;
 if (title) {
 eventData = {
 title: title,
 start: start,
 end: end
 };
 $('#calendar').fullCalendar('renderEvent',
eventData, true); // stick? = true
 }
 $('#calendar').fullCalendar('unselect');
},
editable: true,
eventLimit: true,
eventRender: function(event, element){
 element.popover({
 content: event.description,
 trigger: 'hover',
 placement: 'top',
 container: 'body'
```

```
});

element.append("X");
 element.find(".closeon").click(function() {
 $('#calendar').fullCalendar('removeEvents',event._id);
 });
},
events: [
{
 title: 'All Day Event',
 start: '2014-10-01'
},
{
 title: 'Long Event',
 start: '2014-10-07',
 end: '2019-10-10'
},
{
 id: 999,
 title: 'Repeating Event',
 start: '2019-12-09T16:00:00'
},
{
 id: 999,
 title: 'Repeating Event',
 start: '2019-10-16T16:00:00'
},
{
 title: 'Conference',
```

```
 start: '2019-11-11',
 end: '2019-10-13'
 },
 {
 title: 'Meeting',
 start: '2019-11-12T10:30:00',
 end: '2019-11-12T12:30:00'
 },
 {
 title: 'Lunch',
 start: '2019-11-12T12:00:00'
 },
 {
 title: "Cow's Meeting",
 start: '2019-11-12T14:30:00'
 },
 {
 title: 'Cow Happy Hour',
 start: '2019-09-12T17:30:00'
 },
 {
 title: 'Dinner',
 start: '2019-11-12T20:00:00'
 },
 {
 title: 'Birthday of Cow A',
 start: '2019-11-13T07:00:00'
 },
}
```

```
{
 title: 'Estrus',
 url: 'http://google.com/',
 start: '2019-11-15'
}
],
});
</script>

</body>
</html>
```

```
#Cattle Inventory.html
<!DOCTYPE html>
<html lang="en" class="">
 <head>
 <meta charset="utf-8">
 <meta http-equiv="X-UA-Compatible" content="IE=edge">
 <meta name="viewport" content="width=device-width, initial-scale=1">
 <meta name="description" content="">
 <meta name="author" content="">
 <title>Cattle Inventory</title>
 <link href="../static/bootstrap/css/bootstrap.css" rel="stylesheet">
 <link rel="shortcut icon" href="{{ url_for('static', filename='img/EZTECT_Logo.png') }}">
 <link href="../static/css/style.css" rel="stylesheet">
 </head>

 <body class="d-flex flex-column justify-content-start">

 <nav style="height: 100vh; background-color: #1e1e1e; z-index: 100; position: fixed; overflow: hidden; transition: 0.5s; width: 0;" class="overlay" id="overlay" data-pg-collapsed>
 <div style="width: 100vw; display: flex; flex-direction: column; align-items: center; transition: 0.5s;" id="mainOverlayContainer">
 <div style="height: 10vh; display: flex; flex-direction: row; align-items: center; justify-content: flex-start; padding: 1em; width: 100%; background-size: cover;" class="close&farm">

```

```
Ezetect Farm

</div><div class="row d-sm-flex flex-sm-column justify-content-sm-start align-items-sm-start" style="width: 100%; display: flex; height: 100vh;">

 <div class="col-sm-1 col-lg-8 col-md-8" style="height: 90vh; display: flex; align-items: flex-start; justify-content: space-around;">

 <div class="row lg-menu-items">
 <div class="col-md-6">
 <h3 class="link-hover link" style="cursor: pointer;">Dashboard</h3>
 <p class="hide-at-small">View Detected Cows on Estrus;
See Upcoming Estrus Events on Calendar</p>
 </div>
 <div class="col-md-6">
 <h3 class="link-hover link" style="cursor: pointer;">Cattle Inventory</h3>
 <p class="hide-at-small">View Individual Cattle Information;
Register New Cows entering the barn
</p>
 </div>
 <div class="col-md-6">
 <h3 class="link-hover link" style="cursor: pointer;">Analytics & Reports</h3>
 <p class="hide-at-small">View and Print Yearly, Monthly, or Individual Cattle Reports</p>
 </div>
 <div class="col-md-6">
 <h3 class="link-hover link" style="cursor: pointer;">Locator</h3>
 </div>
 </div>
 </div>
</div>
```

<p class="hide-at-small">Estimated Time of Arrival on Farm for Estrus Confirmation & Cow Insemination</p>

</div>

<div class="col-md-6">

<a href="/moonitor"><h3 class="link-hover">LiveView - Moonitor</h3></a>

<p class="hide-at-small">View Live Feed on Barn and Control the PTZ Cameras</p>

</div>

</div>

<div class="row lg-menu-items" style="flex-direction: row; align-items: flex-start; width: 100%;>

<div class="col-md-6">

<a href="/contact"><h3 class="link-hover">About Us</h3></a>

</div>

<div class="col-md-6">

<a href="/help"><h3 class="link-hover">Help & Support</h3></a>

</div>

</div>

</div>

<div class="col-md-4 menu-userinfobtns col-sm-1" style="display: flex; flex-direction: column; justify-content: flex-start; align-items: center; margin: 1en; height: 90vh;">

<div style="width: 100%; flex-direction: column; align-items: center; justify-content: center; display: flex; height: 40vh;" class="menu-usrinfo">

Admin</span>

{ % else %

<span style="font-size: 25px; color: #f7f7f7;">User</span>

{ % endif %

</div>

<div style="display: flex; flex-direction: column; align-items: center; width: 100%; justify-content: space-around; margin-top: 2em; height: 50vh;" class="menu-btns">

    <button onclick="window.location.href = '/manage';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Manage My Account</button>{ % if current_user.role_id == 1 % } <button onclick="window.location.href = '/add';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Add Users</button>{ % endif % }<button onclick="window.location.href = '/logout';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Logout</button></a>

</div>

</div>

</div>

</div>

</nav>

<header style="height: 10vh; background-color: #1e1e1e; width: 100%; display: inline-flex;" id="headermain">

    <div style="width: 100vw; display: flex; flex-direction: column; align-items: center; height: 10vh;" id="mainHeaderContainer">

        <div style="height: 10vh; display: flex; flex-direction: row; align-items: center; justify-content: flex-start; padding: 1em; width: 100vw; background-image:

```

```
url('../static/img/header_bg.png'); background-size: cover; background-color: #f8f9ff;" class="navbar-header" id="header">

    <span style="color: #ffffff; margin-left: 1em; font-weight: lighter; font-style: normal; font-variant: normal; white-space: normal; font-size: 25px;" alt="Farm Name" class="text-capitalize font-weight-bolder">Cattle Inventory</span><div class="logo-ezrect" id="logo-ezrect">

    </div>

</div>

</div>

</header>

{ % for cow in all_cow % }

    <div style="background-color: #d5c2a4; z-index: 50; overflow: hidden; transition: .5s ease; position: fixed; width: 100%; height: 0;" id="overlayCowInfo{{cow.id}} class="margin-3em"><div class="pg-empty-placeholder" style="width: 100vw; height: 100%; padding: 3em; transition: .4s ease;">

        <div style="width: 100%; height: 10vh; display: flex; flex-direction: row; align-items: center;" id="cowinfoheader">

            <h2 style="color: #3c5158; margin-top: 0; margin-bottom: 0; font-size: 25px;">Cow Information</h2>

            <button type="button" aria-hidden="true" class="close" style="margin-left: auto; line-height: 25px;" id="closeCowInfo{{cow.id}}>X</button>

        </div>

        <h3 style="color: #5c5c5c; font-size: 20px;">Cow {{cow.cownumber}}</h3>

        <hr>

        <div class="pg-empty-placeholder" style="width: 100%; height: 60vh; overflow: auto;">
```

```

<div class="row cowinfosection" style="display: flex; align-items: flex-start; width: 100%;">

    <div class="col-md-6" style="width: 100%; flex-direction: row; flex-wrap: wrap; align-items: flex-start; justify-content: flex-start; display: flex; height: 100%;">

        <div class="row" style="flex-direction: row; align-items: center; justify-content: flex-start; flex-wrap: wrap; display: flex;">

            <div style="padding: 10px;" class="col-md-6 img-size-sm">
                
            </div>
        </div>

        <div class="row" style="flex-direction: row; align-items: center; justify-content: flex-start; flex-wrap: wrap; display: flex;">

            <div style="padding: 10px;" class="col-md-6 img-size-sm">
                
            </div>
        </div>

        <div class="col-md-5" style="font-size: 15px;">
            <div class="row" style="flex-direction: row; display: flex;">
                <div style="flex-direction: row; display: flex; width: 50%; align-items: flex-start; justify-content: space-between;" class="col-md-4">
                    <p style="font-size: 15px; color: #605b57;">Gender/Status</p>
                    <p style="font-size: 20px; color: #605b57;">:</p>
                </div>
                <div class="col-md-4" style="font-size: 15px; color: #605b57; text-align: left;">
                    <p style="font-size: 15px; color: #605b57;">{{cow.gender}}/{{cow.status}}</p>
                </div>
            </div>
        </div>
    </div>
</div>

```

```
</div>

<div class="row" style="flex-direction: row; display: flex;">

    <div class="col-md-4" style="flex-direction: row; display: flex; width: 50%; align-items: flex-start; justify-content: space-between;">

        <p style="font-size: 15px; color: #605b57;">Breed</p>
        <p style="font-size: 20px; color: #605b57;">:</p>
    </div>

    <div class="col-md-4" style="font-size: 15px; color: #605b57; text-align: left;">

        <p style="font-size: 15px; color: #605b57;">{ { cow.breed } }</p>
    </div>

</div>

<div class="row" style="flex-direction: row; display: flex;">

    <div class="col-md-4" style="flex-direction: row; display: flex; width: 50%; align-items: flex-start; justify-content: space-between;">

        <p style="font-size: 15px; color: #605b57;">Date Acquired</p>
        <p style="font-size: 20px; color: #605b57;">:</p>
    </div>

    <div class="col-md-4" style="font-size: 15px; color: #605b57; text-align: left;">

        <p style="font-size: 15px; color: #605b57;">{ { cow.date_acquired } }</p>
    </div>

</div>

<div class="row" style="flex-direction: row; display: flex;">

    <div class="col-md-4" style="flex-direction: row; display: flex; width: 50%; align-items: flex-start; justify-content: space-between;">

        <p style="font-size: 15px; color: #605b57;">Last Estrus</p>
        <p style="font-size: 20px; color: #605b57;">:</p>
    </div>
```

```
<div class="col-md-4" style="font-size: 15px; color: #605b57; text-align: left;">
    <p style="font-size: 15px; color: #605b57;">{{cow.last_estrus}}</p>
</div>
</div>
<div class="row" style="flex-direction: row; display: flex;">
    <div class="col-md-4" style="flex-direction: row; display: flex; width: 50%; align-items: flex-start; justify-content: space-between;">
        <p style="font-size: 15px; color: #605b57;">Estimated Next Estrus</p>
        <p style="font-size: 20px; color: #605b57;">:</p>
    </div>
    <div class="col-md-4" style="font-size: 15px; color: #605b57; text-align: left;">
        <p style="font-size: 15px; color: #605b57;">{{cow.next_estrus}}</p>
    </div>
    </div>
    <div class="row" style="flex-direction: row; display: flex;">
        <div class="col-md-4" style="flex-direction: row; display: flex; width: 50%; align-items: flex-start; justify-content: space-between;">
            <p style="font-size: 15px; color: #605b57;">Physical Characteristic / Descriptor</p>
            <p style="font-size: 20px; color: #605b57;">:</p>
        </div>
        <div class="col-md-4" style="flex-direction: row; display: flex; width: 50%; align-items: center; justify-content: space-around;">
            <p style="font-size: 15px; color: #605b57; text-align: left;">{{cow.description}}</p>
        </div>
    </div>
```

```
</div>
</div>
</div>
</div></div>
{ % endfor %

<div class="mainContent formtypemid" id="mainContent" style="border-left-
color: #abafa8;">

<div class="row cowInventory" id="cowInventory" style="display: flex; flex-
direction: column; align-items: flex-start; justify-content: flex-start;"><div class="row
flex-hr-sm-nw" style="display: flex; flex-direction: row; align-items: flex-start; align-
content: flex-start; justify-content: space-around; max-width: 100%; min-width: 100%;">

<div style="flex-direction: column; box-shadow: 0px 4px 2px #dab469;
max-width: 22%; min-width: 22%;" class="col-md-3 col-2">

    <h2 style="text-transform: uppercase; color: #120e0e; text-align: center;
cursor: pointer;" class="fntsizeadjust-sm">Bull</h2>

    <p style="text-align: center;" class="fntsizeadjust-
sm">{ {total_bull} }</p>

</div><div style="flex-direction: column; box-shadow: 0px 4px 2px
#dab469; max-width: 22%; min-width: 22%;" class="col-md-3 col-3">

    <h2 style="text-transform: uppercase; color: #120e0e; text-align: center;
cursor: pointer;" class="fntsizeadjust-sm">Cow</h2>

    <p style="text-align: center;" class="fntsizeadjust-
sm">{ {total_cow} }</p>

</div><div style="flex-direction: column; box-shadow: 0px 4px 2px
#dab469; max-width: 22%; min-width: 22%;" class="col-md-3 col-3">

    <h2 style="text-transform: uppercase; color: #120e0e; text-align: center;
cursor: pointer;" class="fntsizeadjust-sm">Calves</h2>

    <p style="text-align: center;" class="fntsizeadjust-sm">{ {total_calf} }</p>

</div><div style="flex-direction: column; box-shadow: 0px 4px 2px
#dab469; max-width: 22%; min-width: 22%;" class="col-md-3 col-3">

    <h2 style="text-transform: uppercase; color: #120e0e; text-align: center;
cursor: pointer;" class="fntsizeadjust-sm">other</h2>
```

```

<p style="text-align: center;" class="fntsizeadjust-sm">{{total_other}}</p>

</div>
</div>

<div style="overflow: auto; max-width: 100%; min-width: 100%;">

    <table class="table margin-lg" style="vertical-align: middle; overflow-x: auto; border-collapse: collapse; border-spacing: 0;">

        <thead>

            <tr>

                <th style="text-align: center;">Cow ID</th>
                <th style="text-align: center;">Breed</th>
                <th style="text-align: center;">Gender/Status</th>
                <th style="text-align: center;">Details</th>
                { % if current_user.role_id == 1 % }

                <th style="text-align: center;">Action</th>{ % endif % }

            </tr>
        </thead>

        <tbody>

            { % for cow in all_cow % }

                <form action="/delcow" method="POST">

                    <tr>

                        <input type="hidden" value="{{cow.id}}" name="cow">
                        <th scope="row">{{cow.cownumber}}</th>
                        <td>{{cow.breed}}</td>
                        <td>{{cow.gender}}/{{cow.status}}</td>
                        <td>

                            <a style="font-size: 15px;" class="cowdetails" id="cowdetails{{cow.id}}">Details</a>

                        </td>
                    </tr>
                </form>
            { % endfor % }

        </tbody>
    </table>
</div>

```

```

<td>
    <button type="submit" style="background-color: none; border:
none; background: none;" onclick="return confirm('Are you sure you want to delete Cow
{cow.cownumber} ')>{% if current_user.role_id == 1 %} <a style="font-size:
15px;">Remove</a>{ % endif %}</button>
</td>
</tr>
</form>
{ % endfor %}
</tbody>
</table>
</div></div>

<button type="button" class="btn btn-light" onclick="window.location.href = '/cow';"
style="font-size: 20px; z-index: 1; position: fixed; height: 8vh; border-radius: 3em;
bottom: 5vh; right: 10vw; width: 8vh; color: #ac8338; box-shadow: 1px 1px
2px;">+</button></div>

<script src="../static/assets/js/jquery.min.js"></script><script
src="../static/bootstrap/js/bootstrap.min.js"></script>
<script>
    var overlay = document.getElementById('overlay');
    document.getElementById('open-menu').addEventListener('click',
function(){
    overlay.style.width="100%");
    document.getElementById('cancel-menu').addEventListener('click',
function(){
    overlay.style.width="0%";
}
</script>
{ % for cow in all_cow % }
<script>
```

```
    var overlayCowInfo{ {cow.id} } =  
document.getElementById('overlayCowInfo{ {cow.id} }');  
  
    document.getElementById('cowdetails{ {cow.id} }').addEventListener('click',  
function(){  
    overlayCowInfo{ {cow.id} }.style.height="90vh");  
  
    document.getElementById('closeCowInfo{ {cow.id} }').addEventListener('click',  
function(){  
    overlayCowInfo{ {cow.id} }.style.height="0%");  
  
    </script>  
{ % endfor % }  
<script src="../static/assets/js/ie10-viewport-bug-workaround.js"></script>  
<script type="text/javascript" src="../static/assets/js/popper.js"></script></body>  
</html>
```

```
#Cattle Registration.html
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="utf-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1">
    <meta name="description" content="">
    <meta name="author" content="">
    <title>Cattle Registration</title>
    <link href="../static/bootstrap/css/bootstrap.css" rel="stylesheet">
    <link rel="shortcut icon" href="{{ url_for('static', filename='img/EZTECT_Logo.png') }}">
    <link href="../static/css/style.css" rel="stylesheet">
  </head>

  <body class="d-flex flex-column justify-content-start">

    <nav style="height: 100vh; background-color: #1e1e1e; z-index: 100; position: fixed; overflow: hidden; transition: 0.5s; width: 0;" class="overlay" id="overlay" data-pg-collapsed>
      <div style="width: 100vw; display: flex; flex-direction: column; align-items: center; transition: 0.5s;" id="mainOverlayContainer">
        <div style="height: 10vh; display: flex; flex-direction: row; align-items: center; justify-content: flex-start; padding: 1em; width: 100%; background-size: cover;" class="close&farm">
          
        </div>
      </div>
    </nav>
  </body>

```

```
<span style="color: #ffffff; margin-left: 1em; font-weight: lighter; font-style: normal; font-variant: normal; white-space: normal; font-size: 25px;" alt="Farm Name" class="text-capitalize font-weight-bolder">Ezetect Farm </span>

</div><div class="row d-sm-flex flex-sm-column justify-content-sm-start align-items-sm-start" style="width: 100%; display: flex; height: 100vh;">

    <div class="col-sm-1 col-lg-8 col-md-8" style="height: 90vh; display: flex; align-items: flex-start; justify-content: space-around;">

        <div class="row lg-menu-items">

            <div class="col-md-6">
                <a style="text-decoration: none" href="/dashboard"><h3 class="link-hover link" style="cursor: pointer;">Dashboard</h3></a>
                <p class="hide-at-small">View Detected Cows on Estrus;<br>See Upcoming Estrus Events on Calendar</p>
            </div>

            <div class="col-md-6">
                <a style="text-decoration: none" href="/cattle"><h3 class="link-hover link" style="cursor: pointer;">Cattle Inventory</h3></a>
                <p class="hide-at-small">View Individual Cattle Information;<br>Register New Cows entering the barn<br/></p>
            </div>
        </div>

        <div class="col-md-6">
            <a style="text-decoration: none" href="/analytics"><h3 class="link-hover link" style="cursor: pointer;">Analytics & Reports</h3></a>
            <p class="hide-at-small">View and Print Yearly, Monthly, or Individual Cattle Reports</p>
        </div>

        <div class="col-md-6">
            <a style="text-decoration: none" href="/locator"><h3 class="link-hover link" style="cursor: pointer;">Locator</h3></a>
        </div>
    </div>
</div>
```

<p class="hide-at-small">Estimated Time of Arrival on Farm for Estrus Confirmation & Cow Insemination</p>

</div>

<div class="col-md-6">

<p class="hide-at-small">View Live Feed on Barn and Control the PTZ Cameras</p>

</div>

</div>

<div class="row lg-menu-items" style="flex-direction: row; align-items: flex-start; width: 100%;>

<div class="col-md-6">

</div>

<div class="col-md-6">

</div>

</div>

</div>

<div class="col-md-4 menu-userinfobtns col-sm-1" style="display: flex; flex-direction: column; justify-content: flex-start; align-items: center; margin: 1en; height: 90vh;">

<div style="width: 100%; flex-direction: column; align-items: center; justify-content: center; display: flex; height: 40vh;" class="menu-usrinfo">

{{current_user.username}}

```

{ % if current_user.role_id == 1 % }

<span style="font-size: 25px; color: #f7f7f7;">Admin</span>

{ % else %

<span style="font-size: 25px; color: #f7f7f7;">User</span>

{ % endif %

</div>

<div style="display: flex; flex-direction: column; align-items: center; width: 100%; justify-content: space-around; margin-top: 2em; height: 50vh;" class="menu-btns">

    <button onclick="window.location.href = '/manage';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Manage My Account</button>{ % if current_user.role_id == 1 % } <button onclick="window.location.href = '/add';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Add Users</button>{ % endif % }<button onclick="window.location.href = '/logout';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Logout</button></a>

</div>

</div>

</div>

</div>

</nav>

<header style="height: 10vh; background-color: #1e1e1e; width: 100%; display: inline-flex;" id="headermain">

    <div style="width: 100vw; display: flex; flex-direction: column; align-items: center; height: 10vh;" id="mainHeaderContainer">

        <div style="height: 10vh; display: flex; flex-direction: row; align-items: center; justify-content: flex-start; padding: 1em; width: 100%; background-image:

```

```

url('../static/img/header_bg.png'); background-size: cover; background-color: #f8f9ff;" class="navbar-header" id="header">

    <span style="color: #ffffff; margin-left: 1em; font-weight: lighter; font-style: normal; font-variant: normal; white-space: normal; font-size: 25px;" alt="Farm Name" class="text-capitalize font-weight-bolder">Cattle Registration</span><div class="logo-ezrect" id="logo-ezrect">

    </div>

</div>
</div>
</header>

<form role="form" method="POST" action="/cow" enctype="multipart/form-data">
    {{ form.hidden_tag() }}

    <div id="mainContentCowReg" style="background-color: #ffffff; box-shadow: 5px 4px 3px #352c2c;" class="mainContentCowReg"><div class="row CowRegForm" id="CowRegForm" style="height: 100%; width: 100%;">

        <div class="col-md-6" style="min-height: 30vh; max-height: 100%; flex-direction: column; align-items: flex-start; justify-content: flex-start;">

            <div class="form-group" style="display: flex; flex-direction: column; align-items: flex-start; justify-content: flex-start; width: 100%;">

                <label for="regCowPic"><h4>Upload Cow Picture</h4></label>

                <input name="pic" accept="image/*" type="file" class="form-control-file" id="regCowPic" onchange="readURL(this); style="margin: 2em; align-self: center; width: 90%;">

```

```

{ % if form.pic.errors % }

    { % for error in form.pic.errors % }

        <span class="text-danger" style="color:red"> {{ error }}</span>

    { % endfor % }

    { % endif % }

</div></div>

<div class="col-md-6"><h4>Cow Information</h4>

<div style="padding-left: 2em;">

<div class="form-group" data-pg-collapsed style="width: 100%;">

    <label for="regCowId">Cow ID</label>

    { % if form.cownumber.errors % }

        { { form.cownumber(class="form-control form-control-lg is-invalid") } }

    <div class="invalid-feedback">

        { % for error in form.cownumber.errors % }

            <span style="color:red"> {{ error }}</span>

        { % endfor % }

    </div>

    { % else % }

        <input name="cownumber" type="text" class="form-control" id="regCowId">

    { % endif % }

</div>

<div class="form-group" data-pg-collapsed style="width: 100%;">

    <label for="regBreed">Breed</label>

    { % if form.breed.errors % }

        { { form.breed(class="form-control form-control-lg is-invalid") } }

    <div class="invalid-feedback">

        { % for error in form.breed.errors % }

            <span style="color:red"> {{ error }}</span>

        { % endfor % }

    </div>

```

```
{% endfor %}

</div>

{% else %}

<input name="breed" type="text" class="form-control" id="regBreed">

{% endif %}

</div>

<div class="form-group" data-pg-collapsed style="width: 100%;">

    <label for="regStatus">Gender</label>

    {% if form.gender.errors %}

        {{ form.gender(class="form-control form-control-lg is-invalid") }}

    <div class="invalid-feedback">

        {% for error in form.gender.errors %}

            <span style="color:red">{{ error }}</span>

        {% endfor %}

    </div>

    {% else %}

        <select name="gender" id="regStatus" class="form-control">

            <option></option>

            <option>Bull</option>

            <option>Calf</option><hr/>

            <option>Heifer</option>

            <option>Cow</option>

            <option>CaraCow</option>

            <option>CaraBull</option>

        </select>

    {% endif %}

</div>

<div class="form-group" data-pg-collapsed style="width: 100%;">
```

```

<label for="regStatus">Status</label>
{%
  if form.status.errors %
  {
    form.status(class="form-control form-control-lg is-invalid")
  }
<div class="invalid-feedback">
  {% for error in form.status.errors %}
    <span style="color:red"> {{ error }} </span>
  {% endfor %}
</div>
{% else %}
<select name="status" id="regStatus" class="form-control">
  <option></option>
  <option>Dry</option>
  <option>Milkling</option>
  <option>Pregnant</option>
</select>
{% endif %}
</div>
<div class="form-group" data-pg-collapsed style="width: 100%;">
<label for="formInput8">Date Acquired</label>
{%
  if form.date_acquired.errors %
  {
    form.date_acquired(class="form-control form-control-lg is-invalid")
  }
<div class="invalid-feedback">
  {% for error in form.date_acquired.errors %}
    <span style="color:red"> {{ error }} </span>
  {% endfor %}
</div>
{% else %}
<input name="date_acquired" type="date" class="form-control" id="formInput8">

```

```

{ % endif % }

</div>

<div class="form-group" data-pg-collapsed style="width: 100%;">
    <label for="formInput8">Last Estrus Information</label>
    { % if form.last_estrus.errors % }

        { { form.last_estrus(class="form-control form-control-lg is-invalid") } }

        <div class="invalid-feedback">
            { % for error in form.last_estrus.errors % }

                <span style="color:red"> { { error } } </span>

            { % endfor % }

        </div>

    { % else % }

        <input name="last_estrus" type="datetime-local" class="form-control"
id="formInput8">

    { % endif % }

</div>

<div class="form-group" data-pg-collapsed style="width: 100%;">
    <label for="formInput8">Physical Characteristic / Descriptor</label>
    { % if form.description.errors % }

        { { form.description(class="form-control form-control-lg is-invalid") } }

        <div class="invalid-feedback">
            { % for error in form.description.errors % }

                <span style="color:red"> { { error } } </span>

            { % endfor % }

        </div>

    { % else % }

        <textarea name="description" class="form-control" rows="3"></textarea>

    { % endif % }

</div>

```

```
</div>

<div class="row" id="regButton" style="height: 100%; width: 100%; display: flex; align-items: center; justify-content: center;">
    <button type="submit" class="btn btn-light btn-lg" style="box-shadow: 4px 3px 4px #494545;">Register</button></div></div>

</form>

<script>
function readURL(input) {
    if (input.files && input.files[0]) {
        var reader = new FileReader();

        reader.onload = function (e) {
            $('#img')
                .attr('src', e.target.result)
        };

        reader.readAsDataURL(input.files[0]);
    }
}

</script>

<script src="../static/assets/js/jquery.min.js"></script><script src="../static/bootstrap/js/bootstrap.min.js"></script>

<script>
var overlay = document.getElementById('overlay');

document.getElementById('open-menu').addEventListener('click',
function(){
    overlay.style.width="100%");

    document.getElementById('cancel-menu').addEventListener('click',
function(){
```

```
        overlay.style.width="0% "});  
    </script>  
    <script class="jsbin"  
src="http://ajax.googleapis.com/ajax/libs/jquery/1/jquery.min.js"></script>  
    <script class="jsbin" src="http://ajax.googleapis.com/ajax/libs/jqueryui/1.8.0/jquery-  
ui.min.js"></script>  
    <!-- IE10 viewport hack for Surface/desktop Windows 8 bug -->  
    <script src="../static/assets/js/ie10-viewport-bug-workaround.js"></script>  
    <script type="text/javascript" src="../static/assets/js/popper.js"></script></body>  
</html>
```

```
#Contact Us.html
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="utf-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1">
    <meta name="description" content="">
    <meta name="author" content="">
    <title>Contact Us</title>
    <link href="../static/bootstrap/css/bootstrap.css" rel="stylesheet">
    <link rel="shortcut icon" href="{{ url_for('static', filename='img/EZTECT_Logo.png') }}">
    <link href="../static/css/style.css" rel="stylesheet">
  </head>

  <body class="d-flex flex-column justify-content-start">

    <nav style="height: 100vh; background-color: #1e1e1e; z-index: 100; position: fixed; overflow: hidden; transition: 0.5s; width: 0;" class="overlay" id="overlay" data-pg-collapsed>
      <div style="width: 100vw; display: flex; flex-direction: column; align-items: center; transition: 0.5s;" id="mainOverlayContainer">
        <div style="height: 10vh; display: flex; flex-direction: row; align-items: center; justify-content: flex-start; padding: 1em; width: 100%; background-size: cover;" class="close&farm">
          
        </div>
      </div>
    </nav>
  </body>

```

```
<span style="color: #ffffff; margin-left: 1em; font-weight: lighter; font-style: normal; font-variant: normal; white-space: normal; font-size: 25px;" alt="Farm Name" class="text-capitalize font-weight-bolder">Ezetect Farm </span>

</div><div class="row d-sm-flex flex-sm-column justify-content-sm-start align-items-sm-start" style="width: 100%; display: flex; height: 100vh;">

    <div class="col-sm-1 col-lg-8 col-md-8" style="height: 90vh; display: flex; align-items: flex-start; justify-content: space-around;">

        <div class="row lg-menu-items">
            <div class="col-md-6">
                <a style="text-decoration: none" href="/dashboard"><h3 class="link-hover link" style="cursor: pointer;">Dashboard</h3></a>
                <p class="hide-at-small">View Detected Cows on Estrus;<br>See Upcoming Estrus Events on Calendar</p>
            </div>
            <div class="col-md-6">
                <a style="text-decoration: none" href="/cattle"><h3 class="link-hover link" style="cursor: pointer;">Cattle Inventory</h3></a>
                <p class="hide-at-small">View Individual Cattle Information;<br>Register New Cows entering the barn<br/></p>
            </div>
            <div class="col-md-6">
                <a style="text-decoration: none" href="/analytics"><h3 class="link-hover link" style="cursor: pointer;">Analytics & Reports</h3></a>
                <p class="hide-at-small">View and Print Yearly, Monthly, or Individual Cattle Reports</p>
            </div>
            <div class="col-md-6">
                <a style="text-decoration: none" href="/locator"><h3 class="link-hover link" style="cursor: pointer;">Locator</h3></a>
            </div>
        </div>
    </div>
</div>
```

```
<p class="hide-at-small">Estimated Time of Arrival on Farm for Estrus  
Confirmation && Cow Insemination</p>  
</div>  
  
<div class="col-md-6">  
    <a style="text-decoration: none" href="/moonitor"><h3  
    class="link:hover link" style="cursor: pointer;">LiveView - Moonitor</h3></a>  
  
    <p class="hide-at-small">View Live Feed on Barn and Control the PTZ  
    Cameras</p>  
  
</div>  
</div>  
  
<div class="row lg-menu-items" style="flex-direction: row; align-items:  
flex-start; width: 100%;">  
    <div class="col-md-6">  
        <a style="text-decoration: none" href="/contact"><h3 class="link:hover  
        link" style="cursor: pointer;">About Us</h3></a>  
    </div>  
    <div class="col-md-6">  
        <a style="text-decoration: none" href="/help"><h3 class="link:hover  
        link" style="cursor: pointer;">Help & Support</h3></a>  
    </div>  
    </div>  
    <div class="col-md-4 menu-userinfobtns col-sm-1" style="display: flex; flex-  
    direction: column; justify-content: flex-start; align-items: center; margin: 1en; height:  
    90vh;">  
  
        <div style="width: 100%; flex-direction: column; align-items: center;  
        justify-content: center; display: flex; height: 40vh;" class="menu-usrinfo">  
              
            <span style="font-size: 25px; color: #f7f7f7; margin-top:  
            1em;">{{current_user.username}}</span>  
        </div>  
    </div>
```

```

{ % if current_user.role_id == 1 % }

<span style="font-size: 25px; color: #f7f7f7;">Admin</span>

{ % else %

<span style="font-size: 25px; color: #f7f7f7;">User</span>

{ % endif %

</div>

<div style="display: flex; flex-direction: column; align-items: center; width: 100%; justify-content: space-around; margin-top: 2em; height: 50vh;" class="menu-btns">

    <button onclick="window.location.href = '/manage';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Manage My Account</button>{ % if current_user.role_id == 1 % } <button onclick="window.location.href = '/add';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Add Users</button>{ % endif % }<button onclick="window.location.href = '/logout';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Logout</button></a>

</div>

</div>

</div>

</div>

</nav>

<header style="height: 10vh; background-color: #1e1e1e; width: 100%; display: inline-flex;" id="headermain" data-pg-collapsed>

    <div style="width: 100vw; display: flex; flex-direction: column; align-items: center; height: 10vh;" id="mainHeaderContainer">

        <div style="height: 10vh; display: flex; flex-direction: row; align-items: center; justify-content: flex-start; padding: 1em; width: 100%; background-image:

```

```
url('../static/img/header_bg.png'); background-size: cover; background-color: #f8f9ff;" class="navbar-header" id="header">

    <span style="color: #ffffff; margin-left: 1em; font-weight: lighter; font-style: normal; font-variant: normal; white-space: normal; font-size: 25px; font-family: Century Gothic;" alt="Farm Name" class="text-capitalize font-weight-bolder">Contact Us</span><div class="logo-eztext" id="logo-eztext">

    </div>
</div>
</div>

</header><div class="mainContentContactUs" id="mainContent" style="background-color: #ffffff; width: 100%;">

    <section class="content-block contact-1" data-pg-collapsed>

        <div class="container text-center">

            <div class="col-sm-10 col-sm-offset-1">

                <div class="underlined-title">

                    <h1 style="line-height: 5vh;">Get in Touch</h1>
                    <hr style="width: 40vw;">

                    <h2 spellcheck="true" data-medium-editor-element="true" role="textbox" aria-multiline="true" data-medium-editor-editor-index="1" medium-editor-index="8b8e0b27-77f6-f005-0aca-deb9c2ab3417" data-placeholder="Type your text" data-medium-focused="true" style="font-size: 20px; margin-top: 2em; margin-bottom: 2em;">PLEASE READ THE INSTRUCTIONS BELOW</h2>

                </div>
                <p style="margin-top: 1.5em; margin-bottom: 1.5em; text-align: center;">For any issues with your account, please contact your system administrator/farm owner first. In case the issues are still not solved, contact the developers thru:</p>
                <div class="contact-info" style="display: flex; flex-direction: column; align-items: center; justify-content: center;">
```

```
<div class="row" style="flex-direction: column; align-items: flex-start; align-content: center; width: 80%; margin-top: 1em; margin-bottom: 1em; justify-content: space-around;">

    <span>THE EZTECT GROUP</span>

    <span>      |      </span>

    <span>TUP Manila - Ayala Blvd., Ermita, Manila,  
Philippines</span>

    <p data-pg-collapsed style="text-align: center;"><a href="https://www.google.com/gmail/" target="_blank" style="font-size: 15px;">estrusdetection@gmail.com</a></p>

</div>

</div>

</div>

</div>

</div>

</section></div>

<script src="../static/assets/js/jquery.min.js"></script><script src="../static/bootstrap/js/bootstrap.min.js"></script>

<script>

    var overlay = document.getElementById('overlay');

    document.getElementById('open-menu').addEventListener('click',
function(){

    overlay.style.width="100%");

    document.getElementById('cancel-menu').addEventListener('click',
function(){

    overlay.style.width="0%");

</script>

<script src="../static/assets/js/ie10-viewport-bug-workaround.js"></script>
<script type="text/javascript" src="../static/assets/js/popper.js"></script></body>
</html>
```

```
#Dashboard.html
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="utf-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1">
    <meta name="description" content="">
    <meta name="author" content="">
    <title>Dashboard</title>
    <link href="../static/bootstrap/css/bootstrap.css" rel="stylesheet">
    <link rel="shortcut icon" href="{{ url_for('static', filename='img/EZTECT_Logo.png') }}">
    <link rel="stylesheet"
      href="https://cdnjs.cloudflare.com/ajax/libs/fullcalendar/3.10.0/fullcalendar.css">
    <script src="https://ajax.googleapis.com/ajax/libs/jquery/3.4.0/jquery.min.js"></script>

    <script
      src="https://cdnjs.cloudflare.com/ajax/libs/moment.js/2.8.2/moment.min.js"></script>
    <script
      src="https://cdnjs.cloudflare.com/ajax/libs/fullcalendar/2.1.1/fullcalendar.min.js"></script>
    <link href="../static/css/style.css" rel="stylesheet">
    <link href="https://fullcalendar.io/js/fullcalendar-2.1.1/fullcalendar.css"
      rel="stylesheet" />
    <link
      href="https://cdnjs.cloudflare.com/ajax/libs/fullcalendar/3.0.1/fullcalendar.min.css"
      rel="stylesheet" />
    <script
      src="https://ajax.googleapis.com/ajax/libs/jquery/1.11.1/jquery.min.js"></script>
    <script
      src="https://cdnjs.cloudflare.com/ajax/libs/fullcalendar/3.0.1/fullcalendar.js"></script>
```

```
<script  
src="https://cdnjs.cloudflare.com/ajax/libs/moment.js/2.15.1/moment.min.js"></script>  
  
<script type="text/javascript" src="../static/js/fullcalendar.js"></script>  
  
<script type="text/javascript" src="../static/js/fullcalendar.min.js"></script>  
  
<style>  
  
.fc-state-default {  
  
background-color: #f5f5f5;  
  
background-image: -moz-linear-gradient(top, #ffffff, #e6e6e6);  
  
background-image: -webkit-gradient(linear, 0 0, 0 100%, from(#ffffff), to(#e6e6e6));  
  
background-image: -webkit-linear-gradient(top, #ffffff, #e6e6e6);  
  
background-image: -o-linear-gradient(top, #ffffff, #e6e6e6);  
  
background-image: linear-gradient(to bottom, #ffffff, #e6e6e6);  
  
background-repeat: repeat-x;  
  
border-color: #e6e6e6 #e6e6e6 #bfbfbf;  
  
border-color: rgba(0, 0, 0, 0.1) rgba(0, 0, 0, 0.1) rgba(0, 0, 0, 0.25);  
  
color: #333;  
  
text-shadow: 0 1px 1px rgba(255, 255, 255, 0.75);  
  
box-shadow: inset 0 1px 0 rgba(255, 255, 255, 0.2), 0 1px 2px rgba(0, 0, 0, 0.05); }  
  
.fc-state-hover,  
.fc-state-down,  
.fc-state-active,  
.fc-state-disabled {  
  
color: white; /* active-textcolor */  
  
background-color: #e6e6e6; }  
  
.fc-state-hover {  
  
color: #00BFFF; /* hover-textcolor */  
  
text-decoration: none;
```

```
background-position: 0 -15px;  
-webkit-transition: background-position 0.1s linear;  
-moz-transition: background-position 0.1s linear;  
-o-transition: background-position 0.1s linear;  
transition: background-position 0.1s linear; }
```

```
.fc-state-down,  
.fc-state-active {  
background-color: #00BFFF; /* active-bgcolor */  
background-image: none;  
box-shadow: inset 0 2px 4px rgba(0, 0, 0, 0.15), 0 1px 2px rgba(0, 0, 0, 0.05); }
```

```
.fc-event {  
position: relative;  
/* for resize handle and other inner positioning */  
display: block;  
/* make the <a> tag block */  
font-size: .85em;  
line-height: 1.3;  
border-radius: 3px;  
border: 1px solid #00BFFF; /* txtcolor */  
/* default BORDER color */ }
```

```
.fc-event,  
.fc-event-dot {  
background-color: #00BFFF; /* bgcolor */  
/* default BACKGROUND color */ }
```

```
.fc-event,  
.fc-event:hover {  
    color: black; /* txtcolor */  
    /* default TEXT color */  
    text-decoration: none;  
    /* if <a> has an href */ }
```

```
.fc-unthemed td.fc-today {  
    background: #F0F8FF; /* today */ }
```

```
/* icons in buttons */
```

```
.fc button .fc-icon {  
    /* non-theme */  
    color: white;  
    position: relative;  
    top: -0.05em;  
    /* seems to be a good adjustment across browsers */  
    margin: 0 .2em;  
    vertical-align: middle; }  
</style>  
<script>
```

```
$(document).ready(function () {  
    $.getJSON('/sim', {  
        trial: $('#select[name="trial"]').val(),  
    },
```

```
function(datas) {  
    $("#trial").text(datas.trial);  
  
});  
return false;  
});  
  
</script>  
  
<script src="https://cdn.onesignal.com/sdks/OneSignalSDK.js" async=""></script>  
<link href="../static/css/simplePagination.css" type="text/css" rel="stylesheet">  
<style>  
    .light-theme .current {  
        background: #00BFFF;  
        color: #FFF;  
        border-color: #00BFFF;  
        box-shadow: 0 1px 0 rgba(255,255,255,1), 0 2px rgba(0, 0, 0, 0.3) inset;  
        cursor: default;  
    }  
</style>  
<script>  
    var OneSignal = window.OneSignal || [];  
    OneSignal.push(function() {  
        OneSignal.init({  
            appId: "6197616f-f442-4aba-80a8-1f8a38f22202",  
        });  
    });  
</script>
```

```

    });
}

</script>

<link rel="stylesheet" href="https://fonts.googleapis.com/css?family=Roboto"><link
rel="stylesheet"
href="https://fonts.googleapis.com/css?family=Roboto+Condensed"><link
rel="stylesheet" href="https://fonts.googleapis.com/css?family=Roboto+Slab"><link
rel="stylesheet" href="https://fonts.googleapis.com/css?family=Open+Sans"><link
rel="stylesheet"
href="https://fonts.googleapis.com/css?family=Open+Sans+Condensed"><link
rel="stylesheet" href="https://fonts.googleapis.com/css?family=Montserrat"><link
rel="stylesheet" href="https://fonts.googleapis.com/css?family=Playfair+Display"><link
rel="stylesheet"
href="https://fonts.googleapis.com/css?family=Playfair+Display+SC"></head>

<body class="d-flex flex-column justify-content-start">
<input id="trial" value="sana" hidden>

<nav style="height: 100vh; background-color: #1e1e1e; z-index: 100; position: fixed;
overflow: hidden; transition: 0.5s; width: 0;" class="overlay" id="overlay" data-pg-
collapsed>

<div style="width: 100vw; display: flex; flex-direction: column; align-items: center;
transition: 0.5s;" id="mainOverlayContainer">

    <div style="height: 10vh; display: flex; flex-direction: row; align-items: center;
justify-content: flex-start; padding: 1em; width: 100%; background-size: cover;
class="close&farm">

        <span style="color: #ffffff; margin-left: 1em; font-weight: lighter; font-style:
normal; font-variant: normal; white-space: normal; font-size: 25px;" alt="Farm Name"
class="text-capitalize font-weight-bolder">EzTECT Farm </span>

    </div><div class="row d-sm-flex flex-sm-column justify-content-sm-start align-
items-sm-start" style="width: 100%; display: flex; height: 100vh;">

        <div class="col-sm-1 col-lg-8 col-md-8" style="height: 90vh; display: flex;
align-items: flex-start; justify-content: space-around;">

```

```
<div class="row lg-menu-items">
    <div class="col-md-6">
        <a style="text-decoration: none" href="/dashboard"><h3 class="link: hover link" style="cursor: pointer;">Dashboard</h3></a>
        <p class="hide-at-small">View Detected Cows on Estrus;<br>See Upcoming Estrus Events on Calendar</p>
    </div>
    <div class="col-md-6">
        <a style="text-decoration: none" href="/cattle"><h3 class="link: hover link" style="cursor: pointer;">Cattle Inventory</h3></a>
        <p class="hide-at-small">View Individual Cattle Information;<br>Register New Cows entering the barn<br/></p>
    </div>
    <div class="col-md-6">
        <a style="text-decoration: none" href="/analytics"><h3 class="link: hover link" style="cursor: pointer;">Analytics & Reports</h3></a>
        <p class="hide-at-small">View and Print Yearly, Monthly, or Individual Cattle Reports</p>
    </div>
    <div class="col-md-6">
        <a style="text-decoration: none" href="/locator"><h3 class="link: hover link" style="cursor: pointer;">Locator</h3></a>
        <p class="hide-at-small">Estimated Time of Arrival on Farm for Estrus Confirmation & Cow Insemination</p>
    </div>
    <div class="col-md-6">
        <a style="text-decoration: none" href="/moonitor"><h3 class="link: hover link" style="cursor: pointer;">LiveView - Moonitor</h3></a>
        <p class="hide-at-small">View Live Feed on Barn and Control the PTZ Cameras</p>
    </div>
</div>
```

```

        </div>

        </div>

        <div class="row lg-menu-items" style="flex-direction: row; align-items: flex-start; width: 100%;">

            <div class="col-md-6">

                <a style="text-decoration: none" href="/contact"><h3 class="link:hover link" style="cursor: pointer;">About Us</h3></a>

            </div>

            <div class="col-md-6">

                <a style="text-decoration: none" href="/help"><h3 class="link:hover link" style="cursor: pointer;">Help & Support</h3></a>

            </div>

        </div>

        </div>

        <div class="col-md-4 menu-userinfobtns col-sm-1" style="display: flex; flex-direction: column; justify-content: flex-start; align-items: center; margin: 1en; height: 90vh;">

            <div style="width: 100%; flex-direction: column; align-items: center; justify-content: center; display: flex; height: 40vh;" class="menu-usrinfo">

                <span style="font-size: 25px; color: #f7f7f7; margin-top: 1em;">{{current_user.username}}</span>

                {% if current_user.role_id == 1 %}

                    <span style="font-size: 25px; color: #f7f7f7;">Admin</span>

                {% else %}

                    <span style="font-size: 25px; color: #f7f7f7;">User</span>

                {% endif %}

            </div>

```

```

<div style="display: flex; flex-direction: column; align-items: center; width: 100%; justify-content: space-around; margin-top: 2em; height: 50vh;" class="menu-btns">

    <button onclick="window.location.href = '/manage';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Manage My Account</button>{ % if current_user.role_id == 1 % } <button onclick="window.location.href = '/add';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Add Users</button>{ % endif % }<button onclick="window.location.href = '/logout';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Logout</button></a>

    </div>

</div>

</div>

</div>

</nav>

<header style="height: 10vh; background-color: #1e1e1e; width: 100%; display: inline-flex;" id="headermain" data-pg-collapsed>

    <div style="width: 100vw; display: flex; flex-direction: column; align-items: center; height: 10vh;" id="mainHeaderContainer">

        <div style="height: 10vh; display: flex; flex-direction: row; align-items: center; justify-content: flex-start; padding: 1em; width: 100vw; background-image: url('../static/img/header_bg.png'); background-size: cover; background-color: #f8f9ff;" class="navbar-header" id="header">

            <span style="color: #ffffff; margin-left: 1em; font-weight: lighter; font-style: normal; font-variant: normal; white-space: normal; font-size: 25px;" alt="Farm Name" class="text-capitalize font-weight-bolder">Dashboard</span><div class="logo-ezTECT" id="logo-ezTECT">

```

```


</div>

</div>
</div>

</header><div class="mainContent maincontent-fxd" id="mainContent">
<div class="row infoNoticeSec" id="infoNoticeSec" style="height: 100%; width:
100%;" data-pg-collapsed>
<div id="HelloUser" class="col-md-3 HelloUser sidebar-sm" data-pg-
collapsed>
<input name="title" type="text" id="title" hidden>
<input name="start" type="text" id="start" hidden>
<input name="end" type="text" id="end" hidden>

<div class="usertimer" data-pg-collapsed>
<h2 style="text-align: center; font-size: 20px;">Hello
{{current_user.username}} !</h2>
<hr/>
{ % for cow in rec %}
<div class="timer" id="timer_yes">
<h3 style="color: #e42727; text-align: center;">Cow {{cow.cowt}} &
Cow {{cow.cowb}} End of Estrus</h3>
<h3 class="countdowntimer" id="dem{{cow.last_estrus}}"></h3>
</div>
{ % else %
<div class="timer" id="timer_none">
<h3 style="color: #e42727; text-align: center;">No Estrus
Detected</h3>
</div>

```

```

{ % endfor % }

</div><hr class="hide-at-med"/><h4 class="hide-at-small" style="width: 100%; text-align: center; padding: 1em 1em 2em;" data-pg-collapsed>

<a style="cursor: pointer;" href="/manage">Manage My Account</a><br/><br/>

{ % if current_user.role_id == 1 % }

<a style="cursor: pointer;" href="/add">Add User</a><br/><br/>

{ % endif % }

<a style="cursor: pointer;" href="/logout">Logout</a><br/>

</h4></div><div class="col-md-9 width-sm" data-pg-collapsed style="min-height: 90vh; max-height: 100%;"><div class="dashboard-sections" id="recentestrusdetection">

<h2>Recent Estrus Detection</h2>

<hr>

<div class="pg-empty-placeholder" style="overflow: auto;">

<table class="table" data-pg-collapsed style="max-width: 100%; min-width: 100%;">

<thead>

<tr data-pg-collapsed="">

<th>Status</th>

<th>Cow IDs</th>

<th>Time of Detection</th>

<th>End of Estrus (ETC)</th>

<th>Details</th>

</tr>

</thead>

<tbody>

{ % for eve in rec_eve % }

<form action="/estrus" method="POST">

<tr data-pg-collapsed="">

<input type="hidden" value="{{eve.id}}" name="eve">

```

```

<th scope="row" id="demo{{eve.id}}">Expired</th>
<td>{{eve.cowt}} & {{eve.cowb}}</td>
<td>{{eve.last_estrus.time()}}</td>
<td>{{eve.exp_estrus.time()}}</td>
<td><input style="color:#1e1e1e; border:none; background:none" type="submit" value="Detail"></td>
</tr>
</form>
{ % endfor %

</tbody>
</table>
</div>

</div><div class="dashboard-sections" id="loghistory" data-pg-collapsed><h2 data-pg-collapsed="">Update</h2><hr>
<div style="width: 100%; display: flex; flex-direction: column; justify-content: flex-start; align-items: flex-start; overflow: auto;">
<ul class="nav nav-justified nav-tabs nav-tabs-justified" role="tablist" data-pg-collapsed>
<li class="nav-item">
<a class="nav-link active" href="#confAppDetection" data-toggle="tab" role="tab" aria-controls="" aria-expanded="true" style="color: #21293a;">Confirm App Detection</a>
</li>
<li class="nav-item">
<a class="nav-link" href="#recManualDetection" data-toggle="tab" role="tab" aria-controls="" aria-expanded="true" style="color: #21293a;">Record Manual Detection</a>
</li>
<li class="nav-item">
<a class="nav-link" href="#insemination" data-toggle="tab" role="tab" aria-controls="" aria-expanded="true" style="color: #21293a;">Insemination</a>

```

```

</li>
<li class="nav-item">
    <a class="nav-link" href="#pregnancy" data-toggle="tab" role="tab" aria-controls="" aria-expanded="true" style="color: #21293a;">Pregnancy</a>
</li>
<li class="nav-item">
    <a class="nav-link" href="#calving" data-toggle="tab" role="tab" aria-controls="" aria-expanded="true" style="color: #21293a;">Calving</a>
</li>
</ul>
<div class="tab-content" style="width: 100%;">
    <div id="confAppDetection" class="tab-pane fade in" style="width: 100%;">
        <form action="/confirm" method="post" ><div class="form-row flex-sm-column" style="display: flex; flex-wrap: wrap;" data-pg-collapsed>
            <div class="form-group" data-pg-collapsed style="padding: .5em; width: inherit;">
                <label class="control-label" for="formInput3">Estrus Date</label>
                <select name="estrus" type="datetime-local" class="form-control" id="formInput3" placeholder="Placeholder text">{ % for eve in all_event % }
<option style="color:black">{ {eve.last_estrus} }</option>{ % endfor % }</select>
            </div>
            <div class="form-group" data-pg-collapsed style="padding: .5em; width: inherit;">
                <label class="control-label" for="formInput3">Cow ID (Top)</label>
                <select name="id1" type="text" class="form-control" id="formInput3" placeholder="Pumatong">{ % for eve in all_event %
 }<option>{ {eve.cowt} }</option>{ % endfor % }</select>
            </div>
            <div class="form-group" style="padding: .5em; width: inherit;" data-pg-collapsed>

```

```

        <label class="control-label" for="estrusTop">Estrus</label>
        <select name="con1" class="form-control" id="estrusTop">
            <option value="Yes">Yes</option>
            <option value="No">No</option>
        </select>
    </div>
    <div class="form-group" data-pg-collapsed style="padding: .5em; width: inherit;">
        <label class="control-label" for="formInput3">Cow ID (Bottom)</label>
        <select name="id2" type="text" class="form-control" id="formInput3" placeholder="Pinatungan">{ % for eve in all_event % }<option>{ {eve.cowb} }</option>{ % endfor % }</select>
    </div>
    <div class="form-group" style="padding: .5em; width: inherit;" data-pg-collapsed>
        <label class="control-label" for="estrusBot">Estrus</label>
        <select name="con2" class="form-control" id="estrusBot">
            <option value="Yes">Yes</option>
            <option value="No">No</option>
        </select>
    </div>
    </div><button type="submit" class="btn btn-light" style="width: auto; padding-left: 2em; padding-right: 2em; box-shadow: 2px 2px 2px #131212; margin-top: 1em;">Submit</button>
</div></form>
<div class="tab-pane fade ptz-playbk" id="recManualDetection" data-pg-collapsed>
    <form action="/manual" method="post"><div class="form-row flex-sm-column" style="display: flex;">
        <div class="form-group" data-pg-collapsed style="padding: .5em;">
            <label class="control-label" for="formInput3">Estrus Date</label><input name="estrus"

```

```

type="date" class="form-control" id="formInput3" placeholder="Placeholder
text">></div><div class="form-group" data-pg-collapsed style="padding: .5em;">>
    <label class="control-label" for="formInput3">Cow ID (Top)</label>
    <select name="id1" type="text" class="form-control" id="formInput3"
placeholder="Pumatong"><option></option>{ % for cow in cow
% }<option>{ {cow.cownumber} }</option>{ % endfor % }</select>
</div><div class="form-group" data-pg-collapsed style="padding: .5em;">>      <label
class="control-label" for="formInput3">Cow ID (Bottom)</label><select name="id2"
type="text" class="form-control" id="formInput3"
placeholder="Pinatungan"><option></option>{ % for cow in cow
% }<option>{ {cow.cownumber} }</option>{ % endfor % }</select></div></div><button
type="submit" class="btn btn-light" style="width: auto; padding-left: 2em; padding-right:
2em; box-shadow: 2px 2px 2px #131212; margin-top: 1em;">>Submit</button>
</div></form>
<div class="tab-pane fade ptz-playbk" id="insemination">
    <form action="/insem" method="post"><div class="form-row flex-sm-column"
style="display: flex;" data-pg-collapsed><div class="form-group" data-pg-collapsed
style="padding: .5em;">>      <label class="control-label"
for="formInput3">Insemination Date</label><input name="ins" type="datetime-local"
class="form-control" id="formInput3" placeholder="Placeholder text"></div><div
class="form-group" data-pg-collapsed style="padding: .5em;">>      <label class="control-
label" for="formInput3">Insemination Type</label><select name="type" type="text"
class="form-control" id="formInput3" placeholder="Enter
Name"><option>Natural</option><option>Artificial</option><option>Artificial &
Natural</option></select></div><div class="form-group" data-pg-collapsed
style="padding: .5em;">>
        <label class="control-label" for="formInput3">Cow ID </label>
        <select name="ids" type="text" class="form-control" id="formInput3"
placeholder="Inseminated Cow">{ % for eve in all_ins
% }<option>{ {eve.cow.cownumber} }</option>{ % endfor % }</select>
</div><div class="form-group" data-pg-collapsed style="padding: .5em;">>      <label
class="control-label" for="formInput3">Administered By:</label><input name="ad"
type="text" class="form-control" id="formInput3" placeholder="Enter Name"></div>
</div>          <button type="submit" class="btn btn-light" style="width:
auto; padding-left: 2em; padding-right: 2em; box-shadow: 2px 2px 2px #131212; margin-
top: 1em;">>Submit</button>
</div></form>

```

```

<div class="tab-pane fade ptz-playbk" id="pregnancy">

    <form action="/pregy" method="post"><div class="form-row flex-sm-column"
style="display: flex;" data-pg-collapsed><div class="form-group" data-pg-collapsed
style="padding: .5em;">      <label class="control-label" for="formInput3">Pregnancy
Date</label><input name="day" type="date" class="form-control" id="formInput3"
placeholder="Placeholder text"></div><div class="form-group" data-pg-collapsed
style="padding: .5em;">

        <label class="control-label" for="formInput3">Cow ID&nbsp;</label>

        <select name="ids" type="text" class="form-control" id="formInput3"
placeholder="Pregnant Cow ID"><option></option>{ % for cow in cow
% }<option>{ {cow.cownumber} }</option>{ % endfor % }</select>

    </div></div>          <button type="submit" class="btn btn-light"
style="width: auto; padding-left: 2em; padding-right: 2em; box-shadow: 2px 2px 2px
#131212; margin-top: 1em;">Submit</button>

</div></form>

<div class="tab-pane fade ptz-playbk" id="calving">

    <form action="/calve" method="post"><div class="form-row flex-sm-column"
style="display: flex;" data-pg-collapsed><div class="form-group" data-pg-collapsed
style="padding: .5em;">      <label class="control-label" for="formInput3">Calving
Date</label><input name="day" type="date" class="form-control" id="formInput3"
placeholder="Placeholder text"></div><div class="form-group" data-pg-collapsed
style="padding: .5em;">

        <label class="control-label" for="formInput3">Calf ID</label>

        <input name="calf" type="text" class="form-control" id="formInput3"
placeholder="Calf Cow ID">

    </div><div class="form-group" data-pg-collapsed style="padding: .5em;">      <label
class="control-label" for="formInput3">Mother Cow ID</label><select name="ids"
type="text" class="form-control" id="formInput3" placeholder="Mother Cow
ID"><option></option>{ % for cow in all_preggy
% }<option>{ {cow.cow.cownumber} }</option>{ % endfor % }</select></div></div>
<button type="type" class="btn btn-light" style="width: auto; padding-left: 2em;
padding-right: 2em; box-shadow: 2px 2px 2px #131212; margin-top:
1em;">Submit</button>

</div></form>

</div>

```

```

</div></div><div class="dashboard-sections" id="loghistory" data-pg-collapsed><h2 data-pg-collapsed="">Estrus Logs</h2><hr><div class="pg-empty-placeholder" style="overflow: auto;">

    <table class="table" data-pg-collapsed="" style="min-width: 100%; max-width: 100%;" id="content">

        <thead>

            <tr>

                <th>Cow ID</th>

                <th>Date</th>

                <th>Time of Detection</th>

                <th>Confirmed</th>

                <th>Inseminated</th>

            </tr>

        </thead>

        <tbody>

            { % for cow in all_eve % }

            <tr>

                <th scope="row">{ {cow.cow.cownumber} }</th>

                <td>{ {cow.estrus.date()} }</td>

                <td>{ {cow.estrus.time()} }</td>

                <td>{ {cow.con} }</td>

                <td>{ {cow.ins} }</td>

            </tr>

            { % endfor % }

        </tbody>

    </table>

```

```
link">3</a></li><li><a href="#page-2" class="page-link
next">Next</a></li></ul></div>

</div></div><div class="dashboard-sections"
id="calendaryow"><h2>Upcoming on Calendar</h2><hr><div class="container"
style="height: 40vh; width: 100%;">

<div id="calendar"></div>

</div></div></div></div>

</div></div>

<script src="../static/js/jquery.simplePagination.js"></script>

<script>
    var x = {eve};

    if (x < 5){
        document.getElementById("pagination").hidden=true;
        document.getElementById("pag").hidden=true;
    }
    else{
        jQuery(function($){
            var items = $("#content tbody tr");

            var numItems = items.length;
            var perPage = 4;

            // Only show the first 2 (or first `per_page`) items initially.
            items.slice(perPage).hide();

            // Now setup the pagination using the `#pagination` div.
        });
    }
}</script>
```

```

$( "#pagination" ).pagination({
    items: numItems,
    itemsOnPage: perPage,
    cssStyle: "compact-theme",

    // This is the actual page changing functionality.
    onPageClick: function(pageNumber) {
        // We need to show and hide `tr`'s appropriately.
        var showFrom = perPage * (pageNumber - 1);
        var showTo = showFrom + perPage;

        // We'll first hide everything...
        items.hide()
            // ... and then only show the appropriate rows.
            .slice(showFrom, showTo).show();
    }
});

});}

});}

</script>
<script src="../static/bootstrap/js/bootstrap.min.js"></script>

<script>
    var overlay = document.getElementById('overlay');

    document.getElementById('open-menu').addEventListener('click',
function(){
    overlay.style.width="100%");

    document.getElementById('cancel-menu').addEventListener('click',
function(){

```

```

        overlay.style.width="0% "});

</script>

<script src="../static/assets/js/ie10-viewport-bug-workaround.js"></script>
<script type="text/javascript" src="../static/assets/js/popper.js"></script>

{ % for cow in rec % }

<script>

    var countDownDate{ {cow.id} } = new Date("{ {cow.exp_estrus} }").getTime();

    var x = setInterval(function() {

        var now = new Date().getTime();

        var distance = countDownDate{ {cow.id} } - now;

        var hours = Math.floor((distance % (1000 * 60 * 60 * 24)) / (1000 * 60 * 60));

        var minutes = Math.floor((distance % (1000 * 60 * 60)) / (1000 * 60));

        var seconds = Math.floor((distance % (1000 * 60)) / 1000);

        document.getElementById("dem{ {cow.last_estrus} }").innerHTML = hours + "h "
        + minutes + "m " + seconds + "s ";

        document.getElementById("demo{ {cow.id} }").innerHTML = "Urgent";

        if (distance < 0) {

            clearInterval(x);

        }

    }, 1000);

</script>

{ % endfor % }

<script>

$('#calendar').fullCalendar({


    header: {

        left: 'title',

        right: 'prev,next',
```

```
},  
  
selectable: true,  
selectHelper: true,  
select: function(start, end) {  
    var title = prompt('Event Title:');  
    var eventData;  
    if (title) {  
        eventData = {  
            title: title,  
            start: start,  
            end: end  
        });  
        document.getElementById("title").value = title;  
        document.getElementById("start").value = start;  
        document.getElementById("end").value = end;  
        $('#calendar').fullCalendar('renderEvent', eventData, true);  
        $.getJSON('/plan', {  
            title: $('input[name="title"]').val(),  
            start: $('input[name="start"]').val(),  
            end: $('input[name="end"]').val()  
        },  
        function(datas) {  
            $("#title").val(datas.title);  
            $("#start").val(datas.start);  
            $("#end").val(datas.end);  
        }  
    }  
};
```

```

    });

    return false;
}

$('#calendar').fullCalendar('unselect');

},
editable: false,
eventLimit: true,
eventRender: function(event, element){

    element.popover({
        content: event.description,
        trigger: 'hover',
        placement: 'top',
        container: 'body'
    });

    element.append( "<span class='closeon'>X</span>" );
    element.find(".closeon").click(function() {
        $('#calendar').fullCalendar('removeEvents',event._id);
        $.getJSON('/delplan', {
            title: event.description,
        },
        function(datas) {
            $("#title").val(datas.title);

        });
    });

    return false;
}

```

```
    });
    },
events: [
    {%
        for plan in all_plan %
    {
        title: '{{plan.plan}}',
        description: '{{plan.plan}}',
        start: '{{plan.start}}',
        allDay:true
    },{%
        endfor %
}
],
});
</script>

</body>
</html>
```

```
#EstrusDetected.html
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="utf-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1">
    <meta name="description" content="">
    <meta name="author" content="">
    <title>Detection Overview</title>
    <link href="../static/bootstrap/css/bootstrap.css" rel="stylesheet">
    <link rel="shortcut icon" href="{{ url_for('static', filename='img/EZTECT_Logo.png') }}">
    <link href="../static/css/style.css" rel="stylesheet">
  </head>

  <body class="d-flex flex-column justify-content-start">
    <nav style="height: 100vh; background-color: #1e1e1e; z-index: 100; position: fixed; overflow: hidden; transition: 0.5s; width: 0;" class="overlay" id="overlay" data-pg-collapsed>
      <div style="width: 100vw; display: flex; flex-direction: column; align-items: center; transition: 0.5s;" id="mainOverlayContainer">
        <div style="height: 10vh; display: flex; flex-direction: row; align-items: center; justify-content: flex-start; padding: 1em; width: 100%; background-size: cover;" class="close&farm">
          
          <span style="color: #ffffff; margin-left: 1em; font-weight: lighter; font-style: normal; font-variant: normal; white-space: normal; font-size: 25px;" alt="Farm Name" class="text-capitalize font-weight-bolder">EzTECT Farm </span>
        </div>
      </div>
    </nav>
  </body>

```

```
</div><div class="row d-sm-flex flex-sm-column justify-content-sm-start align-items-sm-start" style="width: 100%; display: flex; height: 100vh;">

    <div class="col-sm-1 col-lg-8 col-md-8" style="height: 90vh; display: flex; align-items: flex-start; justify-content: space-around;">

        <div class="row lg-menu-items">
            <div class="col-md-6">
                <a style="text-decoration: none" href="/dashboard"><h3 class="link: hover link" style="cursor: pointer;">Dashboard</h3></a>
                <p class="hide-at-small">View Detected Cows on Estrus;<br>See Upcoming Estrus Events on Calendar</p>
            </div>
            <div class="col-md-6">
                <a style="text-decoration: none" href="/cattle"><h3 class="link: hover link" style="cursor: pointer;">Cattle Inventory</h3></a>
                <p class="hide-at-small">View Individual Cattle Information;<br>Register New Cows entering the barn<br/></p>
            </div>
            <div class="col-md-6">
                <a style="text-decoration: none" href="/analytics"><h3 class="link: hover link" style="cursor: pointer;">Analytics & Reports</h3></a>
                <p class="hide-at-small">View and Print Yearly, Monthly, or Individual Cattle Reports</p>
            </div>
            <div class="col-md-6">
                <a style="text-decoration: none" href="/locator"><h3 class="link: hover link" style="cursor: pointer;">Locator</h3></a>
                <p class="hide-at-small">Estimated Time of Arrival on Farm for Estrus Confirmation & Cow Insemination</p>
            </div>
        </div>
    </div>
</div>
```

```

<a style="text-decoration: none" href="/moonitor"><h3
class="link:hover link" style="cursor: pointer;">LiveView - Moonitor</h3></a>

<p class="hide-at-small">View Live Feed on Barn and Control the PTZ
Cameras</p>

</div>
</div>

<div class="row lg-menu-items" style="flex-direction: row; align-items:
flex-start; width: 100%;">

<div class="col-md-6">
<a style="text-decoration: none" href="/contact"><h3 class="link:hover
link" style="cursor: pointer;">About Us</h3></a>
</div>
<div class="col-md-6">
<a style="text-decoration: none" href="/help"><h3 class="link:hover
link" style="cursor: pointer;">Help & Support</h3></a>
</div>
</div>
</div>

<div class="col-md-4 menu-userinfobtns col-sm-1" style="display: flex; flex-
direction: column; justify-content: flex-start; align-items: center; margin: 1en; height:
90vh;">

<div style="width: 100%; flex-direction: column; align-items: center;
justify-content: center; display: flex; height: 40vh;" class="menu-usrinfo">


<span style="font-size: 25px; color: #f7f7f7; margin-top:
1em;">{{current_user.username}}</span>
{%
  if current_user.role_id == 1 %
}
<span style="font-size: 25px; color: #f7f7f7;">Admin</span>
{%
  else %
}

```

```

<span style="font-size: 25px; color: #f7f7f7;">User</span>
{ % endif %

</div>

<div style="display: flex; flex-direction: column; align-items: center; width: 100%; justify-content: space-around; margin-top: 2em; height: 50vh;" class="menu-btns">

    <button onclick="window.location.href = '/manage';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Manage My Account</button>{ % if current_user.role_id == 1 % } <button onclick="window.location.href = '/add';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Add Users</button>{ % endif % }<button onclick="window.location.href = '/logout';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Logout</button></a>

    </div>

    </div>

    </div>

    </div>

</nav>

<header style="height: 10vh; background-color: #e1e1e1; width: 100%; display: inline-flex;" id="headermain" data-pg-collapsed>

    <div style="width: 100vw; display: flex; flex-direction: column; align-items: center; height: 10vh;" id="mainHeaderContainer">

        <div style="height: 10vh; display: flex; flex-direction: row; align-items: center; justify-content: flex-start; padding: 1em; width: 100%; background-image: url('../static/img/header_bg.png'); background-size: cover; background-color: #f8f9ff;" class="navbar-header" id="header">

            <span style="color: #ffffff; margin-left: 1em; font-weight: lighter; font-style: normal; font-variant: normal; white-space: normal; font-size: 1.5em;">Open</span>
        
```

```

size: 25px;" alt="Farm Name" class="text-capitalize font-weight-bolder">Detection
Overview</span><div class="logo-ezrect" id="logo-ezrect">
    
    
</div>

</div>
</div>
</header>
{ % for cowt in cowt % }

<div style="background-color: #d5c2a4; z-index: 50; overflow: hidden; transition:
.5s ease; position: fixed; width: 100%; height: 0;" id="overlayCowInfot" class="margin-
3em"><div class="pg-empty-placeholder" style="width: 100vw; height: 100%; padding:
3em; transition: .4s ease;">
    <div style="width: 100%; height: 10vh; display: flex; flex-direction: row; align-
items: center;" id="cowinfoheader">
        <h2 style="color: #3c5158; margin-top: 0; margin-bottom: 0; font-size:
25px;">Cow Information</h2>
        <button type="button" aria-hidden="true" class="close" style="margin-left: auto;
line-height: 25px;" id="closeCowInfot">X</button>
    </div>
    <h3 style="color: #5c5c5c; font-size: 20px;">Cow {{cowt.cownumber}}</h3>
    <hr>
    <div class="pg-empty-placeholder" style="width: 100%; height: 60vh; overflow:
auto;">
        <div class="row cowinfosektion" style="display: flex; align-items: flex-start;
width: 100%;">
            <div class="col-md-6" style="width: 100%; flex-direction: row; flex-wrap:
wrap; align-items: flex-start; justify-content: flex-start; display: flex; height: 100%;">
                <div class="row" style="flex-direction: row; align-items: center; justify-
content: flex-start; flex-wrap: wrap; display: flex;">

```

```

<div style="padding: 10px;" class="col-md-6 img-size-sm">
    
</div>
</div>
</div>

<div class="col-md-5" style="font-size: 15px;">
    <div class="row" style="flex-direction: row; display: flex;">
        <div style="flex-direction: row; display: flex; width: 50%; align-items: flex-start; justify-content: space-between;" class="col-md-4">
            <p style="font-size: 15px; color: #605b57;">Gender(Status)</p>
            <p style="font-size: 20px; color: #605b57;">:</p>
        </div>
        <div class="col-md-4" style="font-size: 15px; color: #605b57; text-align: left;">
            <p style="font-size: 15px; color: #605b57;">{{ cowt.gender }}({{ cowt.status }})</p>
        </div>
    </div>
    <div class="row" style="flex-direction: row; display: flex;">
        <div class="col-md-4" style="flex-direction: row; display: flex; width: 50%; align-items: flex-start; justify-content: space-between;">
            <p style="font-size: 15px; color: #605b57;">Breed</p>
            <p style="font-size: 20px; color: #605b57;">:</p>
        </div>
        <div class="col-md-4" style="font-size: 15px; color: #605b57; text-align: left;">
            <p style="font-size: 15px; color: #605b57;">{{ cowt.breed }}</p>
        </div>
    </div>
</div>

```

```
<div class="row" style="flex-direction: row; display: flex;">
    <div class="col-md-4" style="flex-direction: row; display: flex; width: 50%; align-items: flex-start; justify-content: space-between;">
        <p style="font-size: 15px; color: #605b57;">Date Acquired</p>
        <p style="font-size: 20px; color: #605b57;">:</p>
    </div>
    <div class="col-md-4" style="font-size: 15px; color: #605b57; text-align: left;">
        <p style="font-size: 15px; color: #605b57;">{ {cowt.date_acquired} }</p>
    </div>
</div>

<div class="row" style="flex-direction: row; display: flex;">
    <div class="col-md-4" style="flex-direction: row; display: flex; width: 50%; align-items: flex-start; justify-content: space-between;">
        <p style="font-size: 15px; color: #605b57;">Last Estrus</p>
        <p style="font-size: 20px; color: #605b57;">:</p>
    </div>
    <div class="col-md-4" style="font-size: 15px; color: #605b57; text-align: left;">
        <p style="font-size: 15px; color: #605b57;">{ {cowt.last_estrus} }</p>
    </div>
</div>

<div class="row" style="flex-direction: row; display: flex;">
    <div class="col-md-4" style="flex-direction: row; display: flex; width: 50%; align-items: flex-start; justify-content: space-between;">
        <p style="font-size: 15px; color: #605b57;">Estimated Next Estrus</p>
        <p style="font-size: 20px; color: #605b57;">:</p>
    </div>
    <div class="col-md-4" style="font-size: 15px; color: #605b57; text-align: left;">
```

```

<p style="font-size: 15px; color: #605b57;">{ {cowt.next_estrus}}</p>
</div>
</div>
<div class="row" style="flex-direction: row; display: flex;">
<div class="col-md-4" style="flex-direction: row; display: flex; width: 50%; align-items: flex-start; justify-content: space-between;">
<p style="font-size: 15px; color: #605b57;">Physical Characteristic / Descriptor</p>
<p style="font-size: 20px; color: #605b57;">:</p>
</div>
<div class="col-md-4" style="flex-direction: row; display: flex; width: 50%; align-items: center; justify-content: space-around;">
<p style="font-size: 15px; color: #605b57; text-align: left;">{ {cowt.description}}</p>
</div>
</div>
</div>
</div>
</div>
</div>
</div>
</div></div>
{ % endfor %
{ % for cowb in cowb %
<div style="background-color: #d5c2a4; z-index: 50; overflow: hidden; transition: .5s ease; position: fixed; width: 100%; height: 0;" id="overlayCowInfob" class="margin-3em"><div class="pg-empty-placeholder" style="width: 100vw; height: 100%; padding: 3em; transition: .4s ease;">
<div style="width: 100%; height: 10vh; display: flex; flex-direction: row; align-items: center;" id="cowinfoheader">
<h2 style="color: #3c5158; margin-top: 0; margin-bottom: 0; font-size: 25px;">Cow Information</h2>
<button type="button" aria-hidden="true" class="close" style="margin-left: auto; line-height: 25px;" id="closeCowInfob">X</button>

```

```
</div>

<h3 style="color: #5c5c5c; font-size: 20px;">Cow {{cowb.cownumber}}</h3>

<hr>

<div class="pg-empty-placeholder" style="width: 100%; height: 60vh; overflow: auto;">

    <div class="row cowinfosection" style="display: flex; align-items: flex-start; width: 100%;">

        <div class="col-md-6" style="width: 100%; flex-direction: row; flex-wrap: wrap; align-items: flex-start; justify-content: flex-start; display: flex; height: 100%;">

            <div class="row" style="flex-direction: row; align-items: center; justify-content: flex-start; flex-wrap: wrap; display: flex;">

                <div style="padding: 10px;" class="col-md-6 img-size-sm">

                </div>

            </div>

        </div>

    </div>

<div class="col-md-5" style="font-size: 15px;">

    <div class="row" style="flex-direction: row; display: flex;">

        <div style="flex-direction: row; display: flex; width: 50%; align-items: flex-start; justify-content: space-between;" class="col-md-4">

            <p style="font-size: 15px; color: #605b57;">Gender(Status)</p>

            <p style="font-size: 20px; color: #605b57;">:</p>

        </div>

        <div class="col-md-4" style="font-size: 15px; color: #605b57; text-align: left;">

            <p style="font-size: 15px; color: #605b57;">{{cowb.gender}}({{cowb.status}})</p>

        </div>

    </div>

</div>

<div class="row" style="flex-direction: row; display: flex;">
```

```
<div class="col-md-4" style="flex-direction: row; display: flex; width: 50%; align-items: flex-start; justify-content: space-between;">  
    <p style="font-size: 15px; color: #605b57;">Breed</p>  
    <p style="font-size: 20px; color: #605b57;">:</p>  
  </div>  
  
<div class="col-md-4" style="font-size: 15px; color: #605b57; text-align: left;">  
    <p style="font-size: 15px; color: #605b57;">{ {cowb.breed} }</p>  
  </div>  
  
</div>  
  
<div class="row" style="flex-direction: row; display: flex;">  
  <div class="col-md-4" style="flex-direction: row; display: flex; width: 50%; align-items: flex-start; justify-content: space-between;">  
    <p style="font-size: 15px; color: #605b57;">Date Acquired</p>  
    <p style="font-size: 20px; color: #605b57;">:</p>  
  </div>  
  
<div class="col-md-4" style="font-size: 15px; color: #605b57; text-align: left;">  
    <p style="font-size: 15px; color: #605b57;">{ {cowb.date_acquired} }</p>  
  </div>  
  
</div>  
  
<div class="row" style="flex-direction: row; display: flex;">  
  <div class="col-md-4" style="flex-direction: row; display: flex; width: 50%; align-items: flex-start; justify-content: space-between;">  
    <p style="font-size: 15px; color: #605b57;">Last Estrus</p>  
    <p style="font-size: 20px; color: #605b57;">:</p>  
  </div>  
  
<div class="col-md-4" style="font-size: 15px; color: #605b57; text-align: left;">  
    <p style="font-size: 15px; color: #605b57;">{ {cowb.last_estrus} }</p>
```

```
</div>

</div>

<div class="row" style="flex-direction: row; display: flex;">

    <div class="col-md-4" style="flex-direction: row; display: flex; width: 50%; align-items: flex-start; justify-content: space-between;">

        <p style="font-size: 15px; color: #605b57;">Next Estrus</p>

        <p style="font-size: 20px; color: #605b57;">:</p>

    </div>

    <div class="col-md-4" style="font-size: 15px; color: #605b57; text-align: left;">

        <p style="font-size: 15px; color: #605b57;">{ {cowb.next_estrus} }</p>

    </div>

</div>

<div class="row" style="flex-direction: row; display: flex;">

    <div class="col-md-4" style="flex-direction: row; display: flex; width: 50%; align-items: flex-start; justify-content: space-between;">

        <p style="font-size: 15px; color: #605b57;">Physical Characteristic / Descriptor</p>

        <p style="font-size: 20px; color: #605b57;">:</p>

    </div>

    <div class="col-md-4" style="flex-direction: row; display: flex; width: 50%; align-items: center; justify-content: space-around;">

        <p style="font-size: 15px; color: #605b57; text-align: left;">{ {cowb.description} }</p>

    </div>

</div>

</div>

</div>

</div></div>
```

```

{ % endfor % }

<div id="mainContentDetection" class="mainContentDetection" style="min-height: 90vh; max-height: 100%;"><div class="row DetectionOvrvw" id="DetectionOvrvw" style="width: 100%; display: flex; min-height: 90vh; max-height: 100%;">

<div class="col-md-6" style="background-color: #ffffff; box-shadow: 5px 4px 5px 3px #a34242; flex-direction: column; height: 100%;" data-pg-collapsed>

{ % for eve in eve % }

<h2>Detected Estrus</h2><hr/><p>Date:&nbsp;{ {eve.last_estrus.date()} }</p><p>Time:&nbsp;{ {eve.last_estrus.time()} }</p><div style="border: 2px outset; margin-top: .5EM; margin-bottom: .5EM;">

<h4 style="text-align: center;">TIME REMAINING BEFORE THE END OF ESTRUS</h4>

<h5 style="text-align: center; font-size: 20px; text-transform: uppercase; color: #da4949;" id="dem{ {eve.cownumber} }">HH:MM:SS</h5>

</div></div><div class="col-md-6" data-pg-collapsed>

<div class="row" style="width: 100%; display: flex; flex-direction: column; justify-content: flex-start; align-items: center; align-content: center;">

{ % endfor % }

{ % for cowt in cowt % }

<div class="col-md-4" style="width: 100%; background-color: #ffffff; margin: 1.5em; box-shadow: 5px 4px 5px 3px #352e2e; max-height: 100%; min-height: 40VH;">

<form action="/estrus" method="POST">

<input type="hidden" value="{ {cowt.id} }" name="cow">

<h2>COW { {cowt.cownumber} }</h2>

<h4 style="color: #d12d2d;" id="demo{ {cowt.id} }"></h4>

<span>Description</span>

```

```

<p style="padding-left: 2em;">{ {cowt.description} }</p>
<span><a style="color:#65969f; border:none; background:none"
class="cowdetailst" id="cowdetailst">View Details</a> </span>
</form>
</div>
{ % endfor %

{ % for cowb in cowb %

<div class="col-md-4" style="width: 100%; background-color: #ffffff;
margin: 1.5em; box-shadow: 5px 4px 5px 3px #352e2e; max-height: 100%; min-height:
40VH;">

<form action="/estrus" method="POST">
<input type="hidden" value="{ {cowb.id} }" name="cow">
<h2>COW { {cowb.cownumber} }</h2>
<h4 style="color: #d12d2d;" id="demo{ {cowb.id} }"></h4>
<span>Description</span>
<p style="padding-left: 2em;">{ {cowb.description} }</p>
<span><a style="color:#65969f; border:none; background:none"
class="cowdetailsb" id="cowdetailsb">View Details</a> </span>
</form>
</div>
{ % endfor %

</div></div></div></div>

<script src="../static/assets/js/jquery.min.js"></script><script
src="../static/bootstrap/js/bootstrap.min.js"></script>
<script>
var overlay = document.getElementById('overlay');

```

```

        document.getElementById('open-menu').addEventListener('click',
function(){
    overlay.style.width="100%");

        document.getElementById('cancel-menu').addEventListener('click',
function(){
    overlay.style.width="0%");

</script>

{ % for eve in eve %

<script>

var countDownDate{{eve.id}} = new Date("{{eve.exp_estrus}}").getTime();
var x = setInterval(function() {
    var now = new Date().getTime();
    var distance = countDownDate{{eve.id}} - now;
    var hours = Math.floor((distance % (1000 * 60 * 60 * 24)) / (1000 * 60 * 60));
    var minutes = Math.floor((distance % (1000 * 60 * 60)) / (1000 * 60));
    var seconds = Math.floor((distance % (1000 * 60)) / 1000);
    document.getElementById("dem{{eve.cownumber}}").innerHTML = hours + "h "
+ minutes + "m " + seconds + "s ";
    if (distance < 0) {
        clearInterval(x);
    }
}, 1000);

</script>

{ % endfor %

<script>

var overlayCowInfot = document.getElementById('overlayCowInfot');
document.getElementById('cowdetailst').addEventListener('click',
function(){


```

```
        overlayCowInfot.style.height="90vh"});  
        document.getElementById('closeCowInfot').addEventListener('click',  
function(){  
        overlayCowInfot.style.height="0%"});  
  
    </script>  
    <script>  
  
        var overlayCowInfob = document.getElementById('overlayCowInfob');  
        document.getElementById('cowdetailsb').addEventListener('click',  
function(){  
        overlayCowInfob.style.height="90vh"});  
        document.getElementById('closeCowInfob').addEventListener('click',  
function(){  
        overlayCowInfob.style.height="0%"});  
  
    </script>  
    <script src="../static/assets/js/ie10-viewport-bug-workaround.js"></script>  
    <script type="text/javascript" src="../static/assets/js/popper.js"></script></body>  
</html>
```

```
#index.html
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="utf-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1, shrink-to-fit=no">
    <meta name="description" content="">
    <meta name="author" content="">
    <title>EzTECT</title>
    <link rel="shortcut icon" href="{{ url_for('static', filename='img/EZTECT_Logo.png') }}>
    <link href="../static/bootstrap/css/bootstrapindex.css" rel="stylesheet">
    <link href="../static/styleindex.css" rel="stylesheet">
    <link rel="stylesheet" href="../static/components/pg.blocks/css(blocks.css)">
    <link rel="stylesheet" href="../static/components/pg.blocks/css/plugins.css">
    <link rel="stylesheet" href="../static/components/pg.blocks/css/style-library-1.css">
    <link rel="stylesheet"
      href="http://fonts.googleapis.com/css?family=Open+Sans:300italic,400italic,600italic,700italic,400,300,600,700">
    <link rel="stylesheet"
      href="http://fonts.googleapis.com/css?family=Lato:300,400,700,300italic,400italic,700italic">
  </head>
  <body>
    <div style="background-size: cover; width: 100%; height: 100%; background-color: rgba(108, 99, 99, 0.31);>
      <header id="header-1" class="soft-scroll header-1" style="position: fixed; z-index: 500;">
        <nav class="main-nav navbar-fixed-top headroom headroom--pinned">
```

```
<div class="container">  
  <div class="navbar-header">  
    <button type="button" class="navbar-toggle" data-toggle="collapse"  
    data-target=".navbar-collapse">  
      <span class="sr-only">Toggle navigation</span>  
      <span class="icon-bar"></span>  
      <span class="icon-bar"></span>  
      <span class="icon-bar"></span>  
    </button>  
    <a href="#"> </a>  
  </div>  
  <div class="collapse navbar-collapse">  
    <ul class="nav navbar-nav navbar-right">  
      <li class="active nav-item">  
        <a href="#Home-index">Home</a>  
      </li>  
      <li class="nav-item">  
        <a href="#Features-index">Features</a>  
      </li>  
      <li class="nav-item">  
        <a href="#Pricing-index">Pricing</a>  
      </li>  
      <hr class="hidden-lg"/>  
      <li class="nav-item">  
        <a href="/login" style="color: #c8973d;">LOGIN</a>  
      </li>  
    </ul>  
  </div>
```

```
</div>

</nav>

</header>

<div class="container" style="width: 100%; background-image: url('../static/img/bg3.png'); background-size: cover;">

    <div style="width: 100%; height: 100vh; display: flex; align-items: center; flex-direction: column; justify-content: center;" id="Home-index">

        <h3 style="width: 60vw; text-align: center; font-size: 20px;">Automated Estrus Detection System for Dairy Cattle based on Faster-RCNN with<br>Surveillance and Notification System via Internet of Things (IoT)</h3>

        <p class="lead"><button class="btn btn-light" style="background-color: #ffffff; color: #546b7a;" type="button">

            <a href="#Features-index">Learn more</a>

        </button></p>

    </div>

</div>

<div id="Features-index" style="background-color: #ffffff; width: 100; margin: 1em; box-shadow: 5px 4px 3px #5a5e67; min-height: 90vh; max-height: 100%; text-align: justify;">

    <h2 style="padding: 2em 1em .5em;">Features<hr style="width: 95%;"></h2>

    <div style="width: 100%; display: flex; flex-direction: row; flex-wrap: wrap; align-items: flex-start;">

        <div class="row" style="width: inherit; display: flex; flex-direction: row; align-items: flex-start; flex-wrap: wrap;">

            <div class="col-md-4">

                <style>

                    img{

                        display: block;
                        margin-left: auto;
                        margin-right: auto;
                    }

                </style>

            </div>

        </div>

    </div>

</div>
```

```

        }

</style>

<img src = "../static/img/performance.png" style="width:128px;
height:128px" class = "center">

<h3 style="color: #000000; text-align: center;">CATTLE
PERFORMANCE REPORT</h3>

<p>Cattle Performance Report helps to keep track of automatic estrus
detection and insemination instances and to easily assess pregnancy and calving rates
through visualizations.</p>

</div>

<div class="col-md-4">

<style>

    img{

        display: block;
        margin-left: auto;
        margin-right: auto;
    }

</style>

<img src = "../static/img/web_dash.png" style="width:128px;
height:128px" class = "center">

<h3 style="color: #000000; text-align: center;">WEB BASED
DASHBOARD</h3>

<p>Web-based Dashboard shows the 8-hour Countdown Timer, the
Estrus Logs, and the interactive Event Calendar which reflect the date and time of current
estrus events, and the prediction of future signs as well.</p>

</div>

<div class="col-md-4">

<style>

    image {

        display: block;
        margin-left: auto;
    }


```

```
        margin-right: auto;  
    }  
  
    </style>  
  
    <img src = "../static/img/cow.png" style="width:128px; height:128px"  
class = "center">  
  
    <h3 style="color: #000000; text-align: center;">CATTLE  
INVENTORY</h3>  
  
    <p>The Cattle Inventory lets you view your livestock and the  
corresponding Cow IDs, Breed, Gender/Status, and recent estrus record.</p>  
  
    </div>  
  
    <div class="col-md-4">  
  
        <style>  
  
            image {  
  
                display: block;  
  
                margin-left: auto;  
  
                margin-right: auto;  
  
            }  
  
        </style>  
  
        <img src = "../static/img/pin.png" style="width:128px; height:128px"  
class = "center">  
  
        <h3 style="color: #000000; text-align: center;">IMPROVE  
DECISIONS</h3>  
  
        <p>The Locator informs you of the estimated travel time you will  
possibly take from your current location to your farm, ensuring you will arrive within the  
8-hour effective insemination period.</p>  
  
        </div>  
  
        <div class="col-md-4">  
  
            <style>  
  
                image {  
  
                    display: block;  
  
                    margin-left: auto;  
  
                }  
  
            </style>
```

```
        margin-right: auto;  
    }  
  
    </style>  
  
    <img src = "../static/img/report.png" style="width:128px; height:128px"  
class = "center">  
  
    <h3 style="color: #000000; text-align: center;">DOWNLOADABLE  
REPORTS</h3>  
  
    <p>The Cattle Performance Report allows you to download PDF-  
generated annual, monthly, or individual cattle estrus reports containing other relevant  
information.</p>  
  
    </div>  
  
    <div class="col-md-4">  
  
        <style>  
            image {  
                display: block;  
                margin-left: auto;  
                margin-right: auto;  
            }  
        </style>  
  
        <img src = "../static/img/cctv.png" style="width:128px; height:128px"  
class = "center">  
  
        <h3 style="color: #000000; text-align: center;">MOONITOR LIVE  
VIEW<br></h3>  
  
        <p>The Moonitor Live view allows you to access and control the  
surveillance cameras at ease. You can freely pan, tilt, and zoom the cameras to get a  
better view of the barn.</p>  
  
        </div>  
  
    </div>  
  
    </div>  
  
    </div>  
  
<div id="Pricing-index" style="background-color: rgba(147, 199, 241, 0.87);>
```

```
<section class="content-block pricing-table-1 pricing-table-1-1"
style="background-color: rgba(57, 68, 73, 0.71);">

<div class="container">
  <div class="underlined-title">
    <h1 style="color: #ffefd3;">Pricing</h1>
    <hr>
    <h2>It costs less than you think</h2>
  </div>
  <div class="row">
    <div class="col-md-3 col-sm-6 price-block">
      <div class="ribbon super-cool"></div>
      <h3>thesis Version</h3>
      <div class="price pastel-orange">
        <div class="price-figure">
          <h4>FREE</h4>
          <p>for thesis deployment</p>
        </div>
      </div>
      <ul class="features">
        <li>Lifetime License</li>
        <li>&lt;20 Cows / 1 Barn</li>
        <li>&nbsp;</li>
        <li>&nbsp;</li>
      </ul>
      <div class="price-footer">
        <a href="/inquire" class="btn btn-info">Inquire now</a>
      </div>
    </div>
    <div class="col-md-3 col-sm-6 price-block">
```

```
<div class="ribbon popular"></div>
<h3>Tier 1</h3>
<div class="price pastel-red">
    <div class="price-figure">
        <p>starts at</p>
        <h4>Php. 7,000.00</h4>
        <p>per month</p>
    </div>
</div>
<ul class="features">
    <li>24-Month License</li>
    <li>&lt;20 Cows / 1 Barns</li>
    <li>&nbsp;</li>
</ul>
<div class="price-footer">
    <a href="/inquire" class="btn btn-info">INQUIRE NOW</a>
</div>
</div>
<div class="col-md-3 col-sm-6 price-block">
    <div class="ribbon premium"></div>
    <h3>tier 2</h3>
    <div class="price pastel-green">
        <div class="price-figure">
            <p>Starts at</p>
            <h4>php.13,250.00</h4>
            <p>per month</p>
        </div>
    </div>
```

```
<ul class="features">
    <li>24-Month License</li>
    <li>21-60 Cows / 4 Barns</li>
</ul>
<div class="price-footer">
    <a href="/inquire" class="btn btn-info">INQUIRE NOW</a>
</div>
</div>
<div class="col-md-3 col-sm-6 price-block">
    <div class="ribbon best-value"></div>
    <h3>Tier 3</h3>
    <div class="price pastel-blue">
        <div class="price-figure">
            <p>Starts at</p>
            <h4>php. 18,750.00</h4>
            <p>one-off payment</p>
        </div>
    </div>
    <ul class="features">
        <li>24-Month License</li>
        <li>&gt;80 Cows</li>
    </ul>
    <div class="price-footer">
        <a href="/inquire" class="btn btn-info">INQUIRE NOW</a>
    </div>
    </div>
</div>
```

```
</section>

</div>

</div>

<script src="../static/assets/js/jquery.min.js"></script>
<script src="../static/assets/js/popper.js"></script>
<script src="../static/bootstrap/js/bootstrap.min.js"></script>
<script type="text/javascript"
src="../static/components/pg.blocks/js/plugins.js"></script>
<script type="text/javascript" src="../static/components/pg.blocks/js/bskit-
scripts.js"></script>
<script type="text/javascript"
src="https://maps.google.com/maps/api/js?sensor=true"></script>
</body>
</html>
```

```

#indivpdf.html

<!DOCTYPE html>

<html xmlns="http://www.w3.org/1999/xhtml" lang="" xml:lang="">
<head>
<title>Individual Report</title>

<meta http-equiv="Content-Type" content="text/html; charset=UTF-8"/>
<br/>
<style type="text/css">
<!--

    p {margin: 0; padding: 0;}    .ft10{font-size:14px;font-family:Times;color:#000000;}
    .ft11{font-size:35px;font-family:Times;color:#000000;}
    .ft12{font-size:26px;font-family:Times;color:#3a3838;}
    .ft13{font-size:11px;font-family:Times;color:#3a3838;}
    .ft14{font-size:12px;font-family:Times;color:#000000;}
    .ft15{font-size:14px;line-height:20px;font-family:Times;color:#000000;}

-->
</style>
</head>
<body bgcolor="white" vlink="blue" link="blue">

    <div id="page1-div" style="position:relative;width:918px;height:1296px;">
        
        <p style="position:absolute;top:57px;left:108px;white-space:nowrap"
class="ft15">&#160;<br/>&#160;</p>
        <p style="position:absolute;top:1225px;left:143px;white-space:nowrap"
class="ft10">&#160;</p>

```

<p style="position:absolute;top:121px;left:566px;white-space:nowrap" class="ft11">Individual Cattle Report </p>

<p style="position:absolute;top:165px;left:713px;white-space:nowrap" class="ft12">De Belen Dairy Farm </p>

<p style="position:absolute;top:1269px;left:457px;white-space:nowrap" class="ft13">EZTECT | TUP </p>

<p style="position:absolute;top:1285px;left:449px;white-space:nowrap" class="ft13">All Rights Reserved </p>

<p style="position:absolute;top:111px;left:108px;white-space:nowrap" class="ft14"> </p>

<p style="margin-bottom: 0;">P LANG="en-PH" ALIGN="CENTER">{{cow.gender}} {{cow.cownumber}}</P></p>	
<p style="margin-bottom: 0;"><P LANG="en-PH" STYLE="margin-bottom: 0in"> Date Acquired:{{cow.date_acquired}}</P></p>	

```

<P LANG="en-PH" STYLE="margin-bottom: 0in">    <FONT
FACE="Arial, serif"><FONT SIZE=3><B>Breed:</B></FONT></FONT><FONT
FACE="Arial, serif"><FONT SIZE=3>

{ {cow.breed} }</FONT></FONT></P>

<P LANG="en-PH" STYLE="margin-bottom: 0in">    <FONT
FACE="Arial, serif"><FONT SIZE=3><B>Gender/Status:

```

```

of Estrus</B></FONT></FONT></P>
</TD>
<TD WIDTH=394 STYLE="border: 1px solid #bfbfbf; padding: 0in 0.08in">
    <P LANG="en-PH" ALIGN=CENTER><FONT FACE="Arial, serif"><FONT SIZE=3><B>Insemination
        Date</B></FONT></FONT></P>
    </TD>
</TR>
{ % for cow in all_logs % }

<TR>
    <TD WIDTH=387 HEIGHT=13 STYLE="border: 1px solid #bfbfbf; padding: 0in 0.08in">
        <P LANG="en-PH" ALIGN=CENTER><FONT FACE="Arial, serif"><FONT SIZE=3>{{cow.estrus}}</FONT></FONT></P>
    </TD>
    <TD WIDTH=394 STYLE="border: 1px solid #bfbfbf; padding: 0in 0.08in">
        <P LANG="en-PH" ALIGN=CENTER><FONT FACE="Arial, serif"><FONT SIZE=3>{{cow.insday}}</FONT></FONT></P>
    </TD>
</TR>
{ % endfor % }

</TABLE>
</body>
</html>

```

#Inquire.html

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="utf-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1">
    <meta name="description" content="">
    <meta name="author" content="">
    <title>Contact Us</title>
    <link href="../static/bootstrap/css/bootstrap.css" rel="stylesheet">
    <link rel="shortcut icon" href="{{ url_for('static', filename='img/EZTECT_Logo.png') }}">
    <link href="../static/css/style.css" rel="stylesheet">
  </head>

  <body class="d-flex flex-column justify-content-start">

    <nav style="height: 100vh; background-color: #1e1e1e; z-index: 100; position: fixed; overflow: hidden; transition: 0.5s; width: 0;" class="overlay" id="overlay" data-pg-collapsed>
      <div style="width: 100vw; display: flex; flex-direction: column; align-items: center; transition: 0.5s;" id="mainOverlayContainer">

        <div style="height: 10vh; display: flex; flex-direction: row; align-items: center; justify-content: flex-start; padding: 1em; width: 100%; background-size: cover;" class="close&farm">
          
```

```
<span style="color: #ffffff; margin-left: 1em; font-weight: lighter; font-style: normal; font-variant: normal; white-space: normal; font-size: 25px;" alt="Farm Name" class="text-capitalize font-weight-bolder">Ezetect Farm </span>

</div><div class="row d-sm-flex flex-sm-column justify-content-sm-start align-items-sm-start" style="width: 100%; display: flex; height: 100vh;">

    <div class="col-sm-1 col-lg-8 col-md-8" style="height: 90vh; display: flex; align-items: flex-start; justify-content: space-around;">

        <div class="row lg-menu-items">
            <div class="col-md-6">
                <a style="text-decoration: none" href="/dashboard"><h3 class="link-hover link" style="cursor: pointer;">Dashboard</h3></a>
                <p class="hide-at-small">View Detected Cows on Estrus;<br>See Upcoming Estrus Events on Calendar</p>
            </div>
            <div class="col-md-6">
                <a style="text-decoration: none" href="/cattle"><h3 class="link-hover link" style="cursor: pointer;">Cattle Inventory</h3></a>
                <p class="hide-at-small">View Individual Cattle Information;<br>Register New Cows entering the barn<br/></p>
            </div>
            <div class="col-md-6">
                <a style="text-decoration: none" href="/analytics"><h3 class="link-hover link" style="cursor: pointer;">Analytics & Reports</h3></a>
                <p class="hide-at-small">View and Print Yearly, Monthly, or Individual Cattle Reports</p>
            </div>
            <div class="col-md-6">
                <a style="text-decoration: none" href="/locator"><h3 class="link-hover link" style="cursor: pointer;">Locator</h3></a>
            </div>
        </div>
    </div>
</div>
```

```
<p class="hide-at-small">Estimated Time of Arrival on Farm for Estrus  
Confirmation && Cow Insemination</p>  
</div>  
  
<div class="col-md-6">  
    <a style="text-decoration: none" href="/moonitor"><h3  
    class="link:hover link" style="cursor: pointer;">LiveView - Moonitor</h3></a>  
  
    <p class="hide-at-small">View Live Feed on Barn and Control the PTZ  
    Cameras</p>  
  
</div>  
</div>  
  
<div class="row lg-menu-items" style="flex-direction: row; align-items:  
flex-start; width: 100%;">  
    <div class="col-md-6">  
        <a style="text-decoration: none" href="/contact"><h3 class="link:hover  
        link" style="cursor: pointer;">Contact Us</h3></a>  
        </div>  
        <div class="col-md-6">  
            <a style="text-decoration: none" href="/help"><h3 class="link:hover  
            link" style="cursor: pointer;">Help & Support</h3></a>  
            </div>  
        </div>  
    </div>  
    <div class="col-md-4 menu-userinfobtns col-sm-1" style="display: flex; flex-  
    direction: column; justify-content: flex-start; align-items: center; margin: 1en; height:  
    90vh;">  
  
        <div style="width: 100%; flex-direction: column; align-items: center;  
        justify-content: center; display: flex; height: 40vh;" class="menu-usrinfo">  
              
            <span style="font-size: 25px; color: #f7f7f7; margin-top:  
            1em;">{{current_user.username}}</span>  
        </div>  
    </div>  
</div>
```

```

{ % if current_user.role_id == 1 % }

<span style="font-size: 25px; color: #f7f7f7;">Admin</span>

{ % else %

<span style="font-size: 25px; color: #f7f7f7;">User</span>

{ % endif %

</div>

<div style="display: flex; flex-direction: column; align-items: center; width: 100%; justify-content: space-around; margin-top: 2em; height: 50vh;" class="menu-btns">

    <button onclick="window.location.href = '/manage';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Manage My Account</button>{ % if current_user.role_id == 1 % } <button onclick="window.location.href = '/add';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Add Users</button>{ % endif % }<button onclick="window.location.href = '/logout';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Logout</button></a>

</div>

</div>

</div>

</div>

</nav>

<header style="height: 10vh; background-color: #1e1e1e; width: 100%; display: inline-flex;" id="headermain" data-pg-collapsed>

    <div style="width: 100vw; display: flex; flex-direction: column; align-items: center; height: 10vh;" id="mainHeaderContainer">

        <div style="height: 10vh; display: flex; flex-direction: row; align-items: center; justify-content: flex-start; padding: 1em; width: 100%; background-image:

```

```
url('../static/img/header_bg.png'); background-size: cover; background-color: #f8f9ff;" class="navbar-header" id="header">

    <span style="color: #ffffff; margin-left: 1em; font-weight: lighter; font-style: normal; font-variant: normal; white-space: normal; font-size: 25px; font-family: Century Gothic;" alt="Farm Name" class="text-capitalize font-weight-bolder">Contact Us</span><div class="logo-ezrect" id="logo-ezrect">

    </div>

</div>

</div>

</header><div class="mainContentContactUs" id="mainContent" style="background-color: #ffffff; width: 100%;>

<section class="content-block contact-1" data-pg-collapsed>

    <div class="container text-center">

        <div class="col-sm-10 col-sm-offset-1">

            <div class="underlined-title">

                <h1 style="line-height: 5vh;">Get in Touch</h1>

                <hr style="width: 40vw;">

                <h2 spellcheck="true" data-medium-editor-element="true" role="textbox" aria-multiline="true" data-medium-editor-editor-index="1" medium-editor-index="8b8e0b27-77f6-f005-0aca-deb9c2ab3417" data-placeholder="Type your text" data-medium-focused="true" style="font-size: 20px; margin-top: 2em; margin-bottom: 2em;"></h2>

            </div>

            <div class="contact-info" style="display: flex; flex-direction: column; align-items: center; justify-content: center;">
```

```
<div class="row" style="flex-direction: column; align-items: flex-start; align-content: center; width: 80%; margin-top: 1em; margin-bottom: 1em; justify-content: space-around;">

    <span>THE EZTECT GROUP</span>

    <span>      |      </span>

    <span>TUP Manila - Ayala Blvd., Ermita, Manila,  
Philippines</span>

    <p data-pg-collapsed style="text-align: center;"><a href="https://www.google.com/gmail/" target="_blank" style="font-size: 15px;">estrusdetection@gmail.com</a></p>

</div>

</div>

</div>

</div>

</section></div>

<script src="../static/assets/js/jquery.min.js"></script><script src="../static/bootstrap/js/bootstrap.min.js"></script>

<script src="../static/assets/js/ie10-viewport-bug-workaround.js"></script>
<script type="text/javascript" src="../static/assets/js/popper.js"></script></body>

</html>
```

```

#Locator.html

<!DOCTYPE html>

<html lang="en">
  <head>
    <meta charset="utf-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1">
    <meta name="description" content="">
    <meta name="author" content="">
    <title>Locator</title>
    <link href="../static/bootstrap/css/bootstrap.css" rel="stylesheet">
    <link rel="shortcut icon" href="{{ url_for('static', filename='img/EZTECT_Logo.png') }}">
    <link href="../static/css/style.css" rel="stylesheet">
  </head>

  <body class="d-flex flex-column justify-content-start">

    <nav style="height: 100vh; background-color: #1e1e1e; z-index: 100; position: fixed; overflow: hidden; transition: 0.5s; width: 0;" class="overlay" id="overlay" data-pg-collapsed>

      <div style="width: 100vw; display: flex; flex-direction: column; align-items: center; transition: 0.5s;" id="mainOverlayContainer">

        <div style="height: 10vh; display: flex; flex-direction: row; align-items: center; justify-content: flex-start; padding: 1em; width: 100%; background-size: cover;" class="close&farm">

```

```
<span style="color: #ffffff; margin-left: 1em; font-weight: lighter; font-style: normal; font-variant: normal; white-space: normal; font-size: 25px;" alt="Farm Name" class="text-capitalize font-weight-bolder">Ezetect Farm </span>

</div><div class="row d-sm-flex flex-sm-column justify-content-sm-start align-items-sm-start" style="width: 100%; display: flex; height: 100vh;">

    <div class="col-sm-1 col-lg-8 col-md-8" style="height: 90vh; display: flex; align-items: flex-start; justify-content: space-around;">

        <div class="row lg-menu-items">

            <div class="col-md-6">
                <a style="text-decoration: none" href="/dashboard"><h3 class="link-hover link" style="cursor: pointer;">Dashboard</h3></a>
                <p class="hide-at-small">View Detected Cows on Estrus;<br>See Upcoming Estrus Events on Calendar</p>
            </div>

            <div class="col-md-6">
                <a style="text-decoration: none" href="/cattle"><h3 class="link-hover link" style="cursor: pointer;">Cattle Inventory</h3></a>
                <p class="hide-at-small">View Individual Cattle Information;<br>Register New Cows entering the barn<br/></p>
            </div>

            <div class="col-md-6">
                <a style="text-decoration: none" href="/analytics"><h3 class="link-hover link" style="cursor: pointer;">Analytics & Reports</h3></a>
                <p class="hide-at-small">View and Print Yearly, Monthly, or Individual Cattle Reports</p>
            </div>

            <div class="col-md-6">
                <a style="text-decoration: none" href="/locator"><h3 class="link-hover link" style="cursor: pointer;">Locator</h3></a>
            </div>
        </div>
    </div>
</div>
```

<p class="hide-at-small">Estimated Time of Arrival on Farm for Estrus Confirmation & Cow Insemination</p>

</div>

<div class="col-md-6">

<h3 class="link-hover">LiveView - Moonitor</h3>

<p class="hide-at-small">View Live Feed on Barn and Control the PTZ Cameras</p>

</div>

</div>

<div class="row lg-menu-items" style="flex-direction: row; align-items: flex-start; width: 100%;>

<div class="col-md-6">

<h3 class="link-hover">About Us</h3>

</div>

<div class="col-md-6">

<h3 class="link-hover">Help & Support</h3>

</div>

</div>

</div>

<div class="col-md-4 menu-userinfobtns col-sm-1" style="display: flex; flex-direction: column; justify-content: flex-start; align-items: center; margin: 1en; height: 90vh;">

<div style="width: 100%; flex-direction: column; align-items: center; justify-content: center; display: flex; height: 40vh;" class="menu-usrinfo">

Admin

{ % else %

User

{ % endif %

</div>

<div style="display: flex; flex-direction: column; align-items: center; width: 100%; justify-content: space-around; margin-top: 2em; height: 50vh;" class="menu-btns">

 <button onclick="window.location.href = '/manage';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Manage My Account</button>{ % if current_user.role_id == 1 % } <button onclick="window.location.href = '/add';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Add Users</button>{ % endif % }<button onclick="window.location.href = '/logout';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Logout</button>

 </div>

 </div>

</div>

</div>

</nav>

<header style="height: 10vh; background-color: #1e1e1e; width: 100%; display: inline-flex;" id="headermain">

 <div style="width: 100vw; display: flex; flex-direction: column; align-items: center; height: 10vh;" id="mainHeaderContainer">

 <div style="height: 10vh; display: flex; flex-direction: row; align-items: center; justify-content: flex-start; padding: 1em; width: 100%; background-image:

```

```

url('../static/img/header_bg.png'); background-size: cover; background-color: #f8f9ff;" class="navbar-header" id="header">

 Locator<div class="logo-ezTECT" id="logo-ezTECT">

 </div>

</div>
</div>
</header>

<style>

#map {
 position: absolute;
 height: 100%;
 width: 100%;
}

</style>

<div style="padding: 1em; font-size: 14px; background-color: #ffffff;">

</div>
<div id="map" style="z-index: -1; background-color: #ffffff;"></div>

```

```
<script>

function initMap() {
 if (navigator.geolocation) {

 navigator.geolocation.getCurrentPosition(function(position) {
 var pos = {
 lat: position.coords.latitude,
 lng: position.coords.longitude
 };

 window.pos = pos;

 var directionsService = new google.maps.DirectionsService;
 var directionsDisplay = new google.maps.DirectionsRenderer;
 var map = new google.maps.Map(document.getElementById('map'), {
 zoom: 7,
 center: {lat: pos.lat, lng: pos.lng}
 });
 directionsDisplay.setMap(map);

 calculateAndDisplayRoute(directionsService, directionsDisplay);

 });
 } else {
 handleLocationError(false, infoWindow, map.getCenter());
 }
}
```

```
}
```

```
function calculateAndDisplayRoute(directionsService, directionsDisplay) {

 console.log("Testing : "+pos);

 directionsService.route({
 origin: new google.maps.LatLng(pos.lat, pos.lng),
 destination: "Brgy Bagong Barrio Rd, San Ildefonso, Bulacan",
 travelMode: 'DRIVING'
 }, function(response, status) {
 if (status === 'OK') {
 directionsDisplay.setDirections(response);
 } else {
 window.alert('Directions request failed due to ' + status);
 }
 });

 var bounds = new google.maps.LatLngBounds;
 var markersArray = [];

 var origin1 = new google.maps.LatLng(pos.lat, pos.lng);
 var destinationA = "Brgy Bagong Barrio Rd, San Ildefonso, Bulacan";

 var destinationIcon = 'https://chart.googleapis.com/chart?' +
 'chst=d_map_pin_letter&chld=D|FF0000|000000';
 var originIcon = 'https://chart.googleapis.com/chart?' +
```

```
'chst=d_map_pin_letter&chld=O|FFFF00|000000';

var map = new google.maps.Map(document.getElementById('map'), {
 center: {lat: 55.53, lng: 9.4},
 zoom: 10
});

var geocoder = new google.maps.Geocoder;

var service = new google.maps.DistanceMatrixService;
service.getDistanceMatrix({
 origins: [origin1],
 destinations: [destinationA],
 travelMode: 'DRIVING',
 unitSystem: google.maps.UnitSystem.METRIC,
 avoidHighways: false,
 avoidTolls: false
}, function(response, status) {
 if (status !== 'OK') {
 alert('Error was: ' + status);
 } else {
 var originList = response.originAddresses;
 var destinationList = response.destinationAddresses;
 var outputDiv = document.getElementById('output');
 outputDiv.innerHTML = "";
 deleteMarkers(markersArray);

 var showGeocodedAddressOnMap = function(asDestination) {
 var icon = asDestination ? destinationIcon : originIcon;
 return function(results, status) {

```

```

 if (status === 'OK') {
 map.fitBounds(bounds.extend(results[0].geometry.location));
 markersArray.push(new google.maps.Marker({
 map: map,
 position: results[0].geometry.location,
 icon: icon
 }));
 } else {
 alert('Geocode was not successful due to: ' + status);
 }
 };
};

for (var i = 0; i < originList.length; i++) {
 var results = response.rows[i].elements;
 geocoder.geocode({ 'address': originList[i] },
 showGeocodedAddressOnMap(false));
 for (var j = 0; j < results.length; j++) {
 geocoder.geocode({ 'address': destinationList[j] },
 showGeocodedAddressOnMap(true));
 outputDiv.innerHTML += "It will take you ' + results[j].duration.text + ' to reach ' +
 + destinationList[j] +
 '. It is ' + results[j].distance.text + ' away from your current location." ';
 }
}
});
}

```

```
function deleteMarkers(markersArray) {
 for (var i = 0; i < markersArray.length; i++) {
 markersArray[i].setMap(null);
 }
 markersArray = [];
}

</script>

<script async defer
src="https://maps.googleapis.com/maps/api/js?key=AIzaSyD8UW-Xsg37t9L3ehBhT1HtzeaOd0-olcE&callback=initMap">
</script>

<script src="../static/assets/js/jquery.min.js"></script><script
src="../static/bootstrap/js/bootstrap.min.js"></script>

<script>

 var overlay = document.getElementById('overlay');

 document.getElementById('open-menu').addEventListener('click',
function(){

 overlay.style.width="100%");

 document.getElementById('cancel-menu').addEventListener('click',
function(){

 overlay.style.width="0%");

</script>

<script src="../static/assets/js/ie10-viewport-bug-workaround.js"></script>
<script type="text/javascript" src="../static/assets/js/popper.js"></script></body>
</html>
```

```

#login.html

<!DOCTYPE html>

<html lang="en">
 <head>
 <meta charset="utf-8">
 <meta http-equiv="X-UA-Compatible" content="IE=edge">
 <meta name="viewport" content="width=device-width, initial-scale=1, shrink-to-fit=no">
 <meta name="description" content="">
 <meta name="author" content="">
 <title>Log-in</title>
 <link rel="shortcut icon" href="{{ url_for('static', filename='img/EZTECT_Logo.png') }}>
 <link href="../static/bootstrap/css/bootstrap.css" rel="stylesheet">
 <link href="../static/css/style.css" rel="stylesheet">
<script src="https://cdn.onesignal.com/sdks/OneSignalSDK.js" async=""></script>

 </head>

<body style="background-size: cover; background-image: url('../static/img/bg3.png');">

 <div class="container" style="width: 100%; height: 100vh; display: flex; flex-direction: column; align-items: center; justify-content: center;">
 <form method="POST" action="/login" role="form" style="display: flex; flex-direction: column; align-items: center; padding: 2em; justify-content: space-between; background-color: rgba(255, 255, 255, 0.31); border-radius: 2em; box-shadow: 5px 5px 4px rgba(73, 60, 60, 0.79);;" class="loginmain">
 {{ form.hidden_tag() }}
 <div class="form-group credwidth" data-pg-collapsed>
 <label for="exampleInputEmail1">Username</label>

```

```
{% if form.username.errors %}

{{ form.username(class="form-control form-control-lg is-invalid") }}

<div class="invalid-feedback" disabled>

 {% for error in form.username.errors %}

 {{ error }}

 {% endfor %}

</div>

{% else %}

<input name="username" type="text" class="form-control"
id="exampleInputEmail1" placeholder="Enter Username">

{% endif %}

</div>

<div class="form-group credwidth" data-pg-collapsed>

 <label for="exampleInputPassword1">Password</label>

 {% if form.password.errors %}

 {{ form.password(class="form-control form-control-lg is-invalid") }}

 <div class="invalid-feedback" disabled>

 {% for error in form.password.errors %}

 {{ error }}

 {% endfor %}

 </div>

 {% else %}

 <input name="password" type="password" class="form-control"
id="exampleInputPassword1" placeholder="Password">

 {% endif %}

</div>

<div class="form-check" data-pg-collapsed>
```

```
</div>

 <button type="submit" class="btn btn-primary" style="width: 25vw;">Login</button>
</form></div>

<script src="../assets/js/jquery.min.js"></script>
<script src="../assets/js/popper.js"></script>
<script src="../bootstrap/js/bootstrap.min.js"></script>
</body>
</html>
```

```
#ManageAccounts.html
<!DOCTYPE html>
<html lang="en">
 <head>
 <meta charset="utf-8">
 <meta http-equiv="X-UA-Compatible" content="IE=edge">
 <meta name="viewport" content="width=device-width, initial-scale=1">
 <meta name="description" content="">
 <meta name="author" content="">
 <title>Manage My Account</title>
 <link href="../static/bootstrap/css/bootstrap.css" rel="stylesheet">
 <link rel="shortcut icon" href="{{ url_for('static', filename='img/EZTECT_Logo.png') }}">
 <link href="../static/css/style.css" rel="stylesheet">
 <link href="../static/css/simplePagination.css" type="text/css" rel="stylesheet">
 <style>
 .light-theme .current {
 background: #00BFFF;
 color: #FFF;
 border-color: #0492c2;
 box-shadow: 0 1px 0 rgba(255,255,255,1), 0 0 2px rgba(0, 0, 0, 0.3) inset;
 cursor: default;
 }
 </style>
 </head>

 <body class="d-flex flex-column justify-content-start">
```

```

<nav style="height: 100vh; background-color: #1e1e1e; z-index: 100; position: fixed; overflow: hidden; transition: 0.5s; width: 0;" class="overlay" id="overlay" data-pg-collapsed>

 <div style="width: 100vw; display: flex; flex-direction: column; align-items: center; transition: 0.5s;" id="mainOverlayContainer">

 <div style="height: 10vh; display: flex; flex-direction: row; align-items: center; justify-content: flex-start; padding: 1em; width: 100%; background-size: cover;" class="close&farm">

 Eztec Farm

 </div><div class="row d-sm-flex flex-sm-column justify-content-sm-start align-items-sm-start" style="width: 100%; display: flex; height: 100vh;">

 <div class="col-sm-1 col-lg-8 col-md-8" style="height: 90vh; display: flex; align-items: flex-start; justify-content: space-around;">

 <div class="lg-menu-items">

 <div class="col-md-6">
 <h3 class="link-hover" style="cursor: pointer;">Dashboard</h3>
 <p class="hide-at-small">View Detected Cows on Estrus;
See Upcoming Estrus Events on Calendar</p>
 </div>
 <div class="col-md-6">
 <h3 class="link-hover" style="cursor: pointer;">Cattle Inventory</h3>
 <p class="hide-at-small">View Individual Cattle Information;
Register New Cows entering the barn
</p>
 </div>
 </div>
 </div>
 </div>
 </div>
</nav>

```

```
<div class="col-md-6">
 <h3 class="link: hover link" style="cursor: pointer;">Analytics & Reports</h3>
 <p class="hide-at-small">View and Print Yearly, Monthly, or Individual Cattle Reports</p>
</div>

<div class="col-md-6">
 <h3 class="link: hover link" style="cursor: pointer;">Locator</h3>
 <p class="hide-at-small">Estimated Time of Arrival on Farm for Estrus Confirmation & Cow Insemination</p>
</div>

<div class="col-md-6">
 <h3 class="link: hover link" style="cursor: pointer;">LiveView - Moonitor</h3>
 <p class="hide-at-small">View Live Feed on Barn and Control the PTZ Cameras</p>
</div>

</div>
</div>

<div class="row lg-menu-items" style="flex-direction: row; align-items: flex-start; width: 100%;>
 <div class="col-md-6">
 <h3 class="link: hover link" style="cursor: pointer;">About Us</h3>
 </div>
 <div class="col-md-6">
 <h3 class="link: hover link" style="cursor: pointer;">Help & Support</h3>
 </div>
</div>
```

```

 </div>

 <div class="col-md-4 menu-userinfobtns col-sm-1" style="display: flex; flex-direction: column; justify-content: flex-start; align-items: center; margin: 1en; height: 90vh;">

 <div style="width: 100%; flex-direction: column; align-items: center; justify-content: center; display: flex; height: 40vh;" class="menu-usrinfo">

 {{current_user.username}}

 {% if current_user.role_id == 1 %}

 Admin

 {% else %}

 User

 {% endif %}

 </div>

 <div style="display: flex; flex-direction: column; align-items: center; width: 100%; justify-content: space-around; margin-top: 2em; height: 50vh;" class="menu-btns">

 <button onclick="window.location.href = '/manage';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Manage My Account</button>{% if current_user.role_id == 1 %} <button onclick="window.location.href = '/add';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Add Users</button>{% endif %}<button onclick="window.location.href = '/logout';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Logout</button>

 </div>

 </div>

```

```

 </div>
 </div>
</nav>

<header style="height: 10vh; background-color: #1e1e1e; width: 100%; display: inline-flex;" id="headermain">
 <div style="width: 100vw; display: flex; flex-direction: column; align-items: center; height: 10vh;" id="mainHeaderContainer">

 <div style="height: 10vh; display: flex; flex-direction: row; align-items: center; justify-content: flex-start; padding: 1em; width: 100%; background-image: url('../static/img/header_bg.png'); background-size: cover; background-color: #f8f9ff;" class="navbar-header" id="header">
 Manage My Account<div class="logo-ezTECT" id="logo-ezTECT">

 </div>
 </div>
 </div>
</header><div id="mainContent" class="mainContentManageAcct" style="min-width: 100vw; max-width: 100%; min-height: 90vh; max-height: 100%;"><div class="MyAccount" style="background-color: #ffffff; display: flex; flex-direction: column; align-items: flex-start; justify-content: flex-start; padding: 2em; box-shadow: 6px 5px 6px #252121; flex-wrap: wrap;" data-pg-collapsed>
 <div style="width: 100%; display: flex; flex-direction: row; flex-wrap: wrap; align-items: center; justify-content: space-between;" class="modifysave">
 <h2 style="color: #000000; margin-top: 0; margin-bottom: 0;">Manage My Account</h2>

```

```

<div class="pg-empty-placeholder" style="padding-left: 1em; padding-right: 1em; margin-top: 1em;">
 Modify
<form role="form" method="POST" action="/edit" enctype="multipart/form-data">
 {{ form.hidden_tag() }}

 <input id="save" style="margin-left: 1em; background: none; border:none;color:#3d6c7c;font-size: 20px;" data-pg-collapsed hidden type="submit" value="Save">
</div>
</div>

<hr style="width: 100%;"/>
<div class="row UsrRegForm" id="UsrRegForm" style="height: 100%; width: 100%; padding: 0;">

<div class="col-md-6">
 <h4 style="color: #3d6c7c;">Account Information</h4>
 <div style="padding-left: 2em;">
 <div class="form-group">
 <label for="acctusername">Username</label>
 {% if form.username.errors %}
 {{ form.username(class="form-control form-control-lg is-invalid") }}
 <div class="invalid-feedback">
 {% for error in form.username.errors %}
 {{ error }}
 {% endfor %}
 </div>
 {% endif %}
 </div>
 </div>
</div>

```

```

{ % else % }

<input style="padding-left: 2em; border:none; background:none; box-
shadow: none;" name="username" type="text" class="form-control" id="acctusername"
placeholder="{{current_user.username}}" disabled>

{ % endif %}

</div>

<div class="form-group">

<label for="acctpass">Password</label>

{ % if form.password.errors % }

{{ form.password(class="form-control form-control-lg is-invalid") }}

<div class="invalid-feedback">

{ % for error in form.password.errors % }

 {{ error }}

{ % endfor %}

</div>

{ % else %}

<input style="padding-left: 2em; border:none; background:none; box-
shadow: none;" name="password" type="password" class="form-control" id="acctpass"
placeholder="*****" disabled>

{ % endif %}

<div class="form-check">

<input class="form-check-input" type="checkbox" id="check" value="option1"
onclick="showPass();" disabled>

<label class="form-check-label" for="formInput3"> View Password
</label>

</div></div>

<div class="form-group" style="display: flex; flex-direction: column;">

<label for="acctpic">Profile Picture</label>

<input onchange="readURL(this);;" type="file" name="picture" class="form-control-
file" id="acctpic" disabled>

```

```
{% if form.picture.errors %}

{% for error in form.picture.errors %}

{{ error }}

{% endfor %}

{% endif %}

</div>

</div>

</div><div class="col-md-6"><h4 style="color: #3d6c7c;">Personal
Information</h4>

<div style="padding-left: 2em;">

<div class="form-group">

<label for="acctfname">Role</label>

{% if current_user.role_id == 1 %}

<input style="padding-left: 2em; border:none; background:none; box-shadow:
none;" name="role_id" type="text" class="form-control" id="acctrole"
placeholder="Admin" disabled>

{% else %}

<input style="padding-left: 2em; border:none; background:none; box-shadow:
none;" name="role_id" type="text" class="form-control" id="acctrole"
placeholder="User" disabled>

{% endif %}

</div>

<div class="form-group">

<label for="acctfname">Full Name</label>

<input style="padding-left: 2em; border:none; background:none; box-shadow:
none;" name="fullname" type="text" class="form-control" id="acctfname"
placeholder="{{ current_user.fullname }}" disabled>

</div>

<div class="form-group">

<label for="acctfname">Gender</label>
```

```
<input style="padding-left: 2em; border:none; background:none; box-shadow: none;" name="gender" type="text" class="form-control" id="acctfname" placeholder="{{current_user.gender}} disabled>
</div>
<div class="form-group">
<label for="acctemail">Email address</label>
{ % if form.email.errors % }
{ { form.email(class="form-control form-control-lg is-invalid") } }
<div class="invalid-feedback">
{ % for error in form.email.errors % }
 {{ error }}
{ % endfor %}
</div>
{ % else %}
<input style="padding-left: 2em; border:none; background:none; box-shadow: none;" name="email" type="email" class="form-control" id="acctemail" placeholder="{{current_user.email}} disabled>
{ % endif %}
</div>
<div class="form-group">
<label for="acctcpnum">Mobile Number</label>
{ % if form.mobilenumbers.errors % }
{ { form.mobilenumbers(class="form-control form-control-lg is-invalid") } }
<div class="invalid-feedback" disabled>
{ % for error in form.mobilenumbers.errors % }
 {{ error }}
{ % endfor %}
</div>
{ % else %}
```

```

<input style="padding-left: 2em; border:none; background:none; box-shadow: none;" name="mobilenumber" type="number" class="form-control" id="acctcpnum" placeholder="{{current_user.mobilenumber}} disabled>
{ % endif %

</div>

</div></div></div>

</div>

</form>

{ % if current_user.role_id == 1 %

<div class="MyAccount" style="background-color: #ffffff; display: flex; flex-direction: column; align-items: flex-start; justify-content: flex-start; padding: 2em; box-shadow: 6px 5px 6px 2px #252121; flex-wrap: wrap;" data-pg-collapsed>

<div style="width: 100%; display: flex; flex-direction: row; flex-wrap: wrap; align-items: center; justify-content: space-between;" class="modifysave">

<h2 style="color: #000000; margin-top: 0; margin-bottom: 0;">Manage
Users</h2>

<button type="button" class="btn btn-light" style="margin-bottom: 0; width: auto; padding-left: 2em; padding-right: 2em; margin-top: 1em;" onclick="window.location.href = '/add';">Add Users</button>

</div>

<hr style="width: 100%;">

<div class="row" id="ManageUsers" style="height: 100%; width: 100%; padding: 0; overflow-x: auto;">

<table class="table">

<thead>

<tr>

<th style="padding-left: 45px">Full Name</th>

```

```

<th style="padding-left: 70px">Username</th>
<th style="padding-left: 24px">Password</th>
<th style="padding-left: 50px">Show PW</th>
<th style="padding-left: 50px">Mobile #</th>
<th style="padding-left: 45px">Action</th>
</tr>
</thead>

<tbody>
{ % for user in all_user % }
<form method="POST" action="/deluser">
<tr>
<input type="hidden" value="{{ user.username }}" name="user">
<th scope="row">{{ user.fullname }}</th>
<td>{{ user.username }}</td>
<td><input type="password" value="{{ user.password }}" id="pwd{{ user.id }}" style="color:#404040;background-color: none; border: none; background: none;"></td>
<td data-pg-collapsed>
<input type="checkbox" id="check{{ user.id }}" onclick="showPass{{ user.id }}();">
</td>
<td>{{ user.mobilenumber }}</td>
<td>
<button style="background-color: none; border: none; background: none;" onclick="return confirm('Are you sure you want to delete User {{ user.username }}')>Remove</button>
</td>
</tr>
</form>
{ % endfor % }

```

```

</tbody>
</table></div>
</div>
</div>

{ % endif % }

{ % if current_user.role_id == 1 % }

<div class="MyAccount" style="background-color: #ffffff; display: flex; flex-direction: column; align-items: flex-start; justify-content: flex-start; padding: 2em; box-shadow: 6px 5px 6px 2px #252121; flex-wrap: wrap;">

<div style="width: 100%; display: flex; flex-direction: row; flex-wrap: wrap; align-items: center; justify-content: space-between;" class="modifysave">

<h2 style="color: #000000; margin-top: 0; margin-bottom: 0;">Account Activities</h2>

</div>

<hr style="width: 100%;" />

<div class="row" id="ManageUsers" style="height: 100%; width: 100%; padding: 0; overflow-x: auto;">

<table class="table" id="content">

<thead>

<tr>

<th style="padding-left: 60px">Date & Time</th>

<th style="padding-left: 100px">User</th>

<th style="padding-left: 280px">Action</th>

</tr>

</thead>

<tbody>

{ % for user in all_act % }

<tr>

<th scope="row">{ {user.date} }</th>

<td>{ {user.user} }</td>

```

```

<td>{ {user.action} }</td>
</tr>
{ % endfor %

</tbody>
</table>

<div style="position: relative; left:0%" id="pagination" class="light-theme
simple-pagination"><ul id="pag"><li class="active"><span class="current
prev">Prev<li class="active">12<a href="#page-3" class="page-
link">3<a href="#page-2" class="page-link
next">Next</div>

</div>
</div>
</div>

{ % endif %

{ % for user in all_user %

<script src="../static/js/jquery-1.10.2.min.js"></script>
<script src="../static/js/jquery.simplePagination.js"></script>

<script>

var x = { {act} };

if (x < 4){

document.getElementById("pagination").hidden=true;
document.getElementById("pag").hidden=true;
}

else{

jQuery(function($){

var items = $("#content tbody tr");

var numItems = items.length;

```

```

var perPage = 3;

// Only show the first 2 (or first `per_page`) items initially.
items.slice(perPage).hide();

// Now setup the pagination using the `#pagination` div.
$("#pagination").pagination({
 items: numItems,
 itemsOnPage: perPage,
 cssStyle: "compact-theme",

 // This is the actual page changing functionality.
 onPageClick: function(pageNumber) {
 // We need to show and hide `tr`s appropriately.
 var showFrom = perPage * (pageNumber - 1);
 var showTo = showFrom + perPage;

 // We'll first hide everything...
 items.hide()
 // ... and then only show the appropriate rows.
 .slice(showFrom, showTo).show();
 }
});

});}

</script>
<script>

function showPass{{user.id}}(){
 var pass = document.getElementById('pwd{{user.id}}');

```

```

if(document.getElementById('check{{user.id}}').checked){
 pass.setAttribute('type','text');
} else{
 pass.setAttribute('type', 'password')
}
}

</script>
{ % endfor %

<script>
 function showPass(){
 var pass = document.getElementById('acctpass');
 if(document.getElementById('check').checked){
 pass.setAttribute('type','text');
 } else{
 pass.setAttribute('type', 'password')
 }
 }
</script>
<script>
 function readURL(input) {
 if (input.files && input.files[0]) {
 var reader = new FileReader();

reader.onload = function (e) {
 $('#show')
 .attr('src', e.target.result)
};


```

```
 reader.readAsDataURL(input.files[0]);
}

}

</script>

<script>
function able() {
 document.getElementById("acctusername").disabled=false;
 document.getElementById("acctusername").style=false;
 document.getElementById("acctpass").disabled=false;
 document.getElementById("acctpass").style=false;
 document.getElementById("check").disabled=false;
 document.getElementById("acctemail").disabled=false;
 document.getElementById("acctemail").style=false;
 document.getElementById("acctcpnum").disabled=false;
 document.getElementById("acctcpnum").style=false;
 document.getElementById("acctpic").disabled=false;
 document.getElementById("acctpic").style=false;
 document.getElementById("save").hidden=false;
 document.getElementById("save").hidden=false;
}
</script><script src="../static/bootstrap/js/bootstrap.min.js"></script>
<script>
var overlay = document.getElementById('overlay');

document.getElementById('open-menu').addEventListener('click',
function(){
 overlay.style.width="100%"});

```

```
document.getElementById('cancel-menu').addEventListener('click',
function(){
 overlay.style.width="0% "});

</script>
<script src="../static/assets/js/ie10-viewport-bug-workaround.js"></script>
<script type="text/javascript" src="../static/assets/js/popper.js"></script></body>
</html>
```

```
#monthlypdf.html

<!DOCTYPE html>

<html xmlns="http://www.w3.org/1999/xhtml" lang="" xml:lang="">
<head>
<title>Monthly Report</title>

<meta http-equiv="Content-Type" content="text/html; charset=UTF-8"/>

<style type="text/css">
<!--
 p {margin: 0; padding: 0;} .ft10{font-size:14px;font-family:Times;color:#000000;}
 .ft11{font-size:35px;font-family:Times;color:#000000;}
 .ft12{font-size:26px;font-family:Times;color:#3a3838;}
 .ft13{font-size:11px;font-family:Times;color:#3a3838;}
 .ft14{font-size:12px;font-family:Times;color:#000000;}
 .ft15{font-size:14px;line-height:20px;font-family:Times;color:#000000;}
-->
</style>
</head>
<body bgcolor="white" vlink="blue" link="blue">

 <div id="page1-div" style="position:relative;width:918px;height:1296px;">

 <p style="position:absolute;top:57px;left:108px;white-space:nowrap" class="ft15">
 </p>
 <p style="position:absolute;top:1225px;left:143px;white-space:nowrap" class="ft10"> </p>
```

{ { mo } } { { year } }&#160;Performance&#160;Report&#160;:</p>

De Belen&#160;Dairy&#160;Farm&#160;:</p>

EZTECT&#160;:&#160;TUP&#160;:</p>

All&#160;Rights Reserved&#160;:</p>

&#160;:</p>


<p>&lt;P LANG="en-PH" ALIGN=CENTER&gt;&lt;FONT FACE="Arial, serif"&gt;&lt;FONT SIZE=3&gt;&lt;B&gt;Date of Detection&lt;/B&gt;&lt;/FONT&gt;&lt;/FONT&gt;&lt;/P&gt;</p>
<p>&lt;P LANG="en-PH" ALIGN=CENTER&gt;&lt;FONT FACE="Arial, serif"&gt;&lt;FONT SIZE=3&gt;&lt;B&gt;Insemination Date&lt;/B&gt;&lt;/FONT&gt;&lt;/FONT&gt;&lt;/P&gt;</p>
<p>&lt;P LANG="en-PH" ALIGN=CENTER&gt;&lt;FONT FACE="Arial, serif"&gt;&lt;FONT SIZE=3&gt;&lt;B&gt;Other Information&lt;/B&gt;&lt;/FONT&gt;&lt;/FONT&gt;&lt;/P&gt;</p>
<p>&lt;/TD&gt;</p>
<p>&lt;/TR&gt;</p> <p>{% for cow in all_logs %}</p>
<p>&lt;TR VALIGN=TOP&gt;</p> <p>&lt;TD WIDTH=81 HEIGHT=13 STYLE="border: 1px solid #bfbfbf; padding: 0in 0.08in"&gt;</p> <p>&lt;P LANG="en-PH" ALIGN=CENTER&gt;&lt;FONT FACE="Arial, serif"&gt;&lt;FONT SIZE=3&gt;{{cow.cow.cownumber}}&lt;/FONT&gt;&lt;/FONT&gt;&lt;/P&gt;</p>
<p>&lt;/TD&gt;</p> <p>&lt;TD WIDTH=100 STYLE="border: 1px solid #bfbfbf; padding: 0in 0.08in"&gt;</p> <p>&lt;P LANG="en-PH" ALIGN=CENTER&gt;&lt;FONT FACE="Arial, serif"&gt;&lt;FONT SIZE=3&gt;{{cow.cow.status}}&lt;/FONT&gt;&lt;/FONT&gt;&lt;/P&gt;</p>
<p>&lt;/TD&gt;</p> <p>&lt;TD WIDTH=136 STYLE="border: 1px solid #bfbfbf; padding: 0in 0.08in"&gt;</p>

```

<P LANG="en-PH" ALIGN=CENTER><FONT FACE="Arial,
serif">{ {cow.estrus.date()} }</P>

</TD>

<TD WIDTH=196 STYLE="border: 1px solid #bfbfbf; padding: 0in
0.08in">

<P LANG="en-PH" ALIGN=CENTER><FONT FACE="Arial,
serif">{ {cow.insday} }</P>

</TD>

<TD WIDTH=227 STYLE="border: 1px solid #bfbfbf; padding: 0in
0.08in">

<P LANG="en-PH" STYLE="margin-bottom: 0in"> Date
Acquired: <FONT FACE="Arial,
serif">{ {cow.cow.date_acquired} }</P>
<P LANG="en-PH"> Breed:
{ {cow.cow.breed} }</P>
</TD>
</TR>
{ % endfor % }

</TABLE>
</body>
</html>

```

```

#Moonitor-LiveView.html

<html lang="en" style="background-color: #ffffff;">

 <head>

 <meta charset="utf-8">
 <meta http-equiv="X-UA-Compatible" content="IE=edge">
 <meta name="viewport" content="width=device-width, initial-scale=1">
 <meta name="description" content="">
 <meta name="author" content="">
 <title>Moonitor - Live View</title>
 <link rel="shortcut icon" href="{{ url_for('static', filename='img/EZTECT_Logo.png') }}">
 <link href="../static/bootstrap/css/bootstrap.css" rel="stylesheet">
 <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/fullcalendar/3.10.0/fullcalendar.css">
 <script src="https://ajax.googleapis.com/ajax/libs/jquery/3.4.0/jquery.min.js"></script>
 <script src="https://cdnjs.cloudflare.com/ajax/libs/moment.js/2.8.2/moment.min.js"></script>
 <link href="../static/css/style.css" rel="stylesheet">
 <link href="../static/php/dahua_cam.php">
 <script>

```

```

function cam1_cardinal(Code, action){
 document.getElementById("Code").value = Code;
 document.getElementById("action").value = action;
 document.getElementById("argu1").value = "0";
 document.getElementById("argu2").value =
document.getElementById("tiltspeed_sel").value;
}

function cam1_pantilt(Code, action){

```

```
 document.getElementById("Code").value = Code;
 document.getElementById("action").value = action;
 document.getElementById("argu1").value =
document.getElementById("tiltspeed_sel").value;
 document.getElementById("argu2").value =
document.getElementById("panspeed_sel").value;
}

function cam1_zoom(Code, action){
 document.getElementById("Code").value = Code;
 document.getElementById("action").value = action;
 document.getElementById("argu1").value = '0';
 document.getElementById("argu2").value = 'multiple';
}

function cam1_focus(Code, action){
 document.getElementById("Code").value = Code;
 document.getElementById("action").value = action;
 document.getElementById("argu1").value = '0';
 document.getElementById("argu2").value = 'multiple';
}

function cam1_Home(Code, action){
 document.getElementById("Code").value = Code;
 document.getElementById("action").value = action;
 document.getElementById("argu1").value = '0';
 document.getElementById("argu2").value = '10';
};

</script>
<script>
```

```

$(function () {
 $('.ptzbutones')
 .bind('mousedown',function () {
 $.getJSON('/moo', {
 code: $('input[name="Code"]').val(),
 action: 'start',
 cha: $('select[name="cam_number"]').val(),
 arg1: $('input[name="arg1"]').val(),
 arg2: $('input[name="arg2"]').val(),
 arg3: $('input[name="arg3"]').val(),
 },
 function (data) {
 $("#cod").val(data.code);
 $("#act").val(data.action);
 $("#cha").val(data.cha);
 $("#arg1").val(data.arg1);
 $("#arg2").val(data.arg2);
 $("#arg3").val(data.arg3);
 });
 return;
 })
 .bind('mouseup',function () {
 $.getJSON('/moo', {
 code: $('input[name="Code"]').val(),

```

```
 action: 'stop',
 cha: $('select[name="cam_number"]').val(),
 arg1: $('input[name="arg1"]').val(),
 arg2: $('input[name="arg2"]').val(),
 arg3: $('input[name="arg3"]').val(),
 },
}

function (data) {
 $("#cod").val(data.code);
 $("#act").val(data.action);
 $("#cha").val(data.cha);
 $("#arg1").val(data.arg1);
 $("#arg2").val(data.arg2);
 $("#arg3").val(data.arg3);

});

return;

})

;

});

</script>
</head>
<script id="javaone"></script>
<body class="d-flex flex-column justify-content-start">
<input name="cod" id="cod" hidden>
```

```
<input name="act" id="act" hidden>
<input name="cha" id="cha" hidden>
<input name="argu1" id="arg1" hidden>
<input name="argu2" id="arg2" hidden>
<input name="argu3" id="arg3" hidden>
<input name="Code" id="Code" hidden>
<input name="action" id="action" hidden>
<input name="arg1" id="argu1" hidden>
<input name="arg2" id="argu2" hidden>
<input name="arg3" id="argu3" value="0" hidden>
<!-- <input name="cod" id="cod" >
<input name="act" id="act" >
<input name="cha" id="cha" >
<input name="argu1" id="arg1" >
<input name="argu2" id="arg2" >
<input name="argu3" id="arg3" >
<input name="Code" id="Code" >
<input name="action" id="action" value="stop" >
<input name="arg1" id="argu1" >
<input name="arg2" id="argu2" >
<input name="arg3" id="argu3" value="0" > -->
<nav style="height: 100vh; background-color: #1e1e1e; z-index: 100; position: fixed; overflow: hidden; transition: 0.5s; width: 0;" class="overlay" id="overlay">
 <div style="width: 100vw; display: flex; flex-direction: column; align-items: center; transition: 0.5s;" id="mainOverlayContainer">
 <div style="height: 10vh; display: flex; flex-direction: row; align-items: center; justify-content: flex-start; padding: 1em; width: 100%; background-size: cover;" class="close&farm">

```

```
Ezetect Farm

</div>

<div class="row d-sm-flex flex-sm-column justify-content-sm-start align-items-sm-start" style="width: 100%; display: flex; height: 100vh;">

 <div class="col-sm-1 col-lg-8 col-md-8" style="height: 90vh; display: flex; align-items: flex-start; justify-content: space-around;">

 <div class="row lg-menu-items">

 <div class="col-md-6">

 <h3 class="link-hover link" style="cursor: pointer;">Dashboard</h3>

 <p class="hide-at-small">View Detected Cows on Estrus; See Upcoming Estrus Events on Calendar</p>

 </div>

 <div class="col-md-6">

 <h3 class="link-hover link" style="cursor: pointer;">Cattle Inventory</h3>

 <p class="hide-at-small">View Individual Cattle Information, Register New Cows entering the barn
</p>

 </div>

 <div class="col-md-6">

 <h3 class="link-hover link" style="cursor: pointer;">Analytics & Reports</h3>

 <p class="hide-at-small">View and Print Yearly, Monthly, or per Cow ID Analytical Reports</p>

 </div>

 <div class="col-md-6">

 <h3 class="link-hover link" style="cursor: pointer;">Locator</h3>

 <p class="hide-at-small">ETA on Farm for Estrus Confirmation & Cow Insemination</p>

 </div>

 </div>

 </div>

</div>
```

```

 </div>

 <div class="col-md-6">
 <h3
 class="link:hover link" style="cursor: pointer;">LiveView - Moonitor</h3>
 <p class="hide-at-small">View Live Feed on Barn, abd Control PTZ
 Camera</p>
 </div>

 </div>

 <div class="row lg-menu-items" style="flex-direction: row; align-items:
 flex-start; width: 100%;">
 <div class="col-md-6">
 <h3
 class="link:hover link" style="cursor: pointer;">Contact Us</h3>
 </div>
 <div class="col-md-6">
 <h3 class="link:hover
 link" style="cursor: pointer;">Help & Support</h3>
 </div>
 </div>
 </div>
 </div>

 <div class="col-md-4 menu-userinfobtns col-sm-1" style="display: flex;
 flex-direction: column; justify-content: flex-start; align-items: center; margin: 1em;
 height: 90vh;">
 <div style="width: 100%; flex-direction: column; align-items: center;
 justify-content: center; display: flex; height: 40vh;" class="menu-usrinfo">

 <span style="font-size: 25px; color: #f7f7f7; margin-top:
 1em;">{{current_user.username}}
 { % if current_user.role_id == 1 %}
 Admin
 { % else %}

```

```

User
{ % endif %

</div>

<div style="display: flex; flex-direction: column; align-items: center;
width: 100%; justify-content: space-around; margin-top: 2em; height: 50vh;" class="menu-btns">

 <button onclick="window.location.href = '/manage';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Manage My Account</button>
{ % if current_user.role_id == 1 %

 <button onclick="window.location.href = '/add';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Add Users</button>
{ % endif %

 <button onclick="window.location.href = '/logout';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Logout</button>

</div>

</div>

</div>

</div>

</nav>

<header style="height: 10vh; background-color: #1e1e1e; width: 100%; display: inline-flex;" id="headermain">

 <div style="width: 100vw; display: flex; flex-direction: column; align-items: center; height: 10vh;" id="mainHeaderContainer">

 <div style="height: 10vh; display: flex; flex-direction: row; align-items: center; justify-content: flex-start; padding: 1em; width: 100%; background-image: url('../static/img/header_bg.png'); background-size: cover; background-color: #f8f9ff; z-index: 2; position: fixed;" class="navbar-header" id="header">

```

```


Moonitor - Live View

<div class="logo-ezTECT" id="logo-ezTECT">

 </div>

</div>

</div>

</header>

<div class="mainContent" id="mainContent" style="flex-direction: column;">

 <div class="row ptz-main" style="width: 100%; min-height: 90vh; max-height: 100%;">

 <div class="ptz-screen col-md-10">

 <div class="form-group">

 <label for="cam_number">Please select camera: </label>

 <select id="cam_number" name="cam_number" class="form-control">

 <option></option>
 <option value="7">Camera 1</option>
 <option value="1">Camera 2</option>
 <option value="3">Camera 3</option>

 </select>

 </div>

 <div id="sample" style="max-width: 100%; min-height: 60vh; max-height: 100%; background-color: rgba(68, 68, 68, 0.21); margin-top: 1em; margin-bottom: 2em;">
```

```
</p>
<div style="width: 100%; height: 80vh; min-height: 80vh; max-height: inherit;">
 <video id="videoplayer" style="width: 100%; height: inherit; max-height: inherit; border: 1px solid black; margin: auto; border-radius: 10px; background-color: #f0f0f0; position: relative; z-index: 1; "></video>
</div>

<div class="col-md-3" style="height: inherit; background-color: #ffffff; position: relative; z-index: 2; padding: 10px; border: 1px solid black; border-radius: 10px; margin-top: -10px; margin-bottom: 10px; ">
 <ul class="nav nav-tabs" role="tablist">
 <li class="nav-item">
 PTZ

 <li class="nav-item">
 Playback

 <div class="tab-content" style="height: inherit; position: relative; z-index: 1; ">
 <div id="controls" class="tab-pane active fade in">
 <div class="PTZ_Controls tab-pane fade in active" style="display: flex; flex-direction: row; align-items: center; justify-content: space-around; flex-wrap: wrap; height: inherit; id="ptz-controls">
 <div style="flex-direction: column; display: flex; padding: 1em;">
 <h4 id="ptz_cont_lbl">PTZ Controller</h4>
 <table id="PTZ_controller_tbl" width="auto" border="0" align="center" cellspacing="0">
 <tbody>
 <tr class="controls-row">
 <td></td>
 </tr>
 </tbody>
 </table>
 </div>
 </div>
 </div>
 </div>
</div>
```

```

<td> <a onmousedown="cam1_cardinal('Up', 'start')"
onmouseup="cam1_cardinal('Up', 'stop','a','b')" class="ptzbutones">
<td> <a onmousedown="cam1_pantilt('RightUp', 'start')"
onmouseup="cam1_pantilt('RightUp', 'stop')" class="ptzbutones">
&nbsp </td>
</tr>
<tr class="controls-row">
<td> <a onmousedown="cam1_cardinal('Left', 'start')"
onmouseup="cam1_cardinal('Left', 'stop')" class="ptzbutones">
&nbsp </td>
<td> <a onclick="cam1_Home('GotoPreset','start');"
class="ptzbutones">
&nbsp </td>
<td> <a onmousedown="cam1_cardinal('Right', 'start')"
onmouseup="cam1_cardinal('Right', 'stop')" class="ptzbutones">
&nbsp </td>
</tr>
<tr class="controls-row">
<td> <a onmousedown="cam1_pantilt('LeftDown', 'start')"
onmouseup="cam1_pantilt('LeftDown', 'stop')" class="ptzbutones">
&nbsp </td>
<td> <a onmousedown="cam1_cardinal('Down', 'start')"
onmouseup="cam1_cardinal('Down', 'stop')" class="ptzbutones">
&nbsp </td>
<td> <a onmousedown="cam1_pantilt('RightDown',
'start')" onmouseup="cam1_pantilt('RightDown', 'stop')" class="ptzbutones">
&nbsp </td>

```

```

 </tr>
 </tbody>
</table>
</div>

<div style="display: flex; flex-direction: column; justify-content: center; align-items: center; padding-top: 1em; padding-bottom: 1em;">
 <div class="Zoom">
 <button type="button" class="btn btn-light ptzbutones"
onmousedown="cam1_zoom('ZoomWide', 'start')"
onmouseup="cam1_zoom('ZoomWide', 'stop')" style="max-width: 40px; max-height: 40px; margin-top: .5em; margin-bottom: .5em;">-</button>
 Zoom
 <button type="button" class="btn btn-light ptzbutones"
onmousedown="cam1_zoom('ZoomTele', 'start');" onmouseup="cam1_zoom('ZoomTele', 'stop')" style="max-width: 40px; max-height: 40px; margin-top: .5em; margin-bottom: .5em;">+</button>
 </div>
 <div class="Focus">
 <button type="button" class="btn btn-light ptzbutones"
onmousedown="cam1_focus('FocusFar', 'start');" onmouseup="cam1_focus('FocusFar', 'stop')" style="max-width: 40px; max-height: 40px; margin-top: .5em; margin-bottom: .5em;">-</button>
 Focus
 <button type="button" class="btn btn-light ptzbutones"
onmousedown="cam1_focus('FocusNear', 'start');"
onmouseup="cam1_focus('FocusNear', 'stop')" style="max-width: 40px; max-height: 40px; margin-top: .5em; margin-bottom: .5em;">+</button>
 </div>
</div>
<div class="speed-range" style="padding: 1em;">
 <div class="custom-control" id="TiltSpeed">
 <div class="form-group" style="width: 100%;">
 <label for="tiltspeed_sel">Tilt Speed:</label>

```

```
<select id="tiltspeed_sel" class="form-control"
name="tiltspeed_sel">
 <option value="1">1 (Slow)</option>
 <option value="2">2</option>
 <option value="3">3</option>
 <option value="4">4</option>
 <option value="5">5</option>
 <option value="6">6</option>
 <option value="7">7</option>
 <option value="8" selected>8 (Fast)</option>
</select>
</div>
</div>

<div class="custom-control" id="panspeed">
 <div class="form-group" style="width: 100%;">
 <label for="panspeed_sel">Pan Speed:</label>
 <select id="panspeed_sel" class="form-control"
name="panspeed_sel">
 <option value="1">1 (Slow)</option>
 <option value="2">2</option>
 <option value="3">3</option>
 <option value="4">4</option>
 <option value="5">5</option>
 <option value="6">6</option>
 <option value="7">7</option>
 <option value="8" selected>8 (Fast)</option>
</select>
</div>
</div>
```

```
</div>

<iframe id="myFrame" width="50" marginwidth="0" height="50"
marginheight="0" align="middle" scrolling="none" style="display: none;"></iframe>

</div>

</div>

<div class="tab-pane fade ptz-playbk" id="playback">

 <div class="ptz-playbk" style="display: flex; padding: 1em;">
 <div id="playbck">

 <div id="startd&t">

 <h4>Start Date/TIme</h4>

 <div class="form-group">
 <label for="formInput4">Date</label>
 <input type="date" class="form-control" id="formInput4"
placeholder="Start Date" style="max-width: 100%;"/>
 </div>

 <div class="form-group">
 <label for="formInput4">Time</label>
 <input type="time" class="form-control" id="formInput4"
placeholder="Start Time"/>
 </div>

 </div>

 <div id="endd&t">

 <h4>End Date/TIme</h4>

 <div class="form-group">
 <label for="formInput4">Date</label>
 <input type="date" class="form-control" id="formInput4"
placeholder="End Date"/>
 </div>

 <div class="form-group">
 <label for="formInput4">Time</label>

```

```

 <input type="time" class="form-control" id="formInput4"
placeholder="End Time">
 </div>
 </div>
 <button type="button" class="btn btn-light" style="width: 10vw;
height: auto;">Go</button>
 </div>
 </div>
 </div>
 </div>
 </div>
 </div>
 </div>
<script src="../static/assets/js/jquery.min.js"></script>
<script src="../static/bootstrap/js/bootstrap.min.js"></script>
<script>
 var overlay = document.getElementById('overlay');

 document.getElementById('open-menu').addEventListener('click',
function(){
 overlay.style.width="100% "});

 document.getElementById('cancel-menu').addEventListener('click',
function(){
 overlay.style.width="0% "});

</script>
<script>
 var video_player = document.getElementById('videoplayer');
 var cam_number = document.getElementById('cam_number');

 cam_number.addEventListener('change', function(){
 video_player.setAttribute('src',"https://172.94.88.47:808"+cam_number.value);

```

)

```
</script>
<script src="../static/assets/js/ie10-viewport-bug-workaround.js"></script>
<script type="text/javascript" src="../static/assets/js/popper.js"></script>
</body>
```

```

#Moonitor-LiveView2.html

<!DOCTYPE html>

<html lang="en">
 <head>
 <meta charset="utf-8">
 <meta http-equiv="X-UA-Compatible" content="IE=edge">
 <meta name="viewport" content="width=device-width, initial-scale=1">
 <meta name="description" content="">
 <meta name="author" content="">
 <title>Moonitor - Live View</title>
 <link rel="shortcut icon" href="{{ url_for('static', filename='img/EZTECT_Logo.png') }}">
 <link href="../static/bootstrap/css/bootstrap.css" rel="stylesheet">

 <link rel="stylesheet"
 href="https://cdnjs.cloudflare.com/ajax/libs/fullcalendar/3.10.0/fullcalendar.css">
 <script src="https://ajax.googleapis.com/ajax/libs/jquery/3.4.0/jquery.min.js"></script>

<script
src="http://cdnjs.cloudflare.com/ajax/libs/moment.js/2.8.2/moment.min.js"></script>
<link href="../static/css/style.css" rel="stylesheet">
<link href="../static/php/dahua_cam.php">
<script>
 var cam_number = document.getElementById("cam_number").value
 var tiltspeed_sel = document.getElementById("tiltspeed_sel").value
 var panspeed_sel = document.getElementById("panspeed_sel").value
 function cam1_cardinal(Code, action){
 var loc = "http://admin:admin123@172.94.88.47:12380/cgi-bin/ptz.cgi?action=" + action + "&channel=" + cam_number + "&code=" + Code +
 "&arg1=0&arg2=" + tiltspeed_sel + "&arg3=0";

```

```

 document.getElementById('myFrame').setAttribute('src', loc);
 }

 function cam1_pantilt(Code, action){
 var loc = "http://admin:admin123@172.94.88.47:12380/cgi-
bin/ptz.cgi?action=" + action + "&channel=" + cam_number + "&code=" + Code +
"&arg1=" + tiltspeed_sel + "&arg2=" + panspeed_sel + "&arg3=0";
 document.getElementById('myFrame').setAttribute('src', loc);
 }

 function cam1_zoom(Code, action){
 var loc = "http://admin:admin123@172.94.88.47:12380/cgi-
bin/ptz.cgi?action=" + action + "&channel=" + cam_number + "&code=" + Code +
"&arg1=0&arg2=multiple&arg3=0";
 document.getElementById('myFrame').setAttribute('src', loc);
 }

 function cam1_focus(Code, action){
 var loc = "http://admin:admin123@172.94.88.47:12380/cgi-
bin/ptz.cgi?action=" + action + "&channe"+ cam_number + "=1&code=" + Code +
"&arg1=0&arg2=multiple&arg3=0";
 document.getElementById('myFrame').setAttribute('src', loc);
 }

 function cam1_Home(Code, action){
 var loc = "http://admin:admin123@172.94.88.47:12380/cgi-
bin/ptz.cgi?action=" + action + "&channe"+ cam_number + "=1&code=" + Code +
"&arg1=0&arg2=10&arg3=0";
 document.getElementById('myFrame').setAttribute('src', loc);
 }

}

</script>

```

```

</head>
<script id="javaone"></script>
<body class="d-flex flex-column justify-content-start">
```

```

<nav style="height: 100vh; background-color: #1e1e1e; z-index: 100; position: fixed; overflow: hidden; transition: 0.5s; width: 0;" class="overlay" id="overlay" data-pg-collapsed>

 <div style="width: 100vw; display: flex; flex-direction: column; align-items: center; transition: 0.5s;" id="mainOverlayContainer">

 <div style="height: 10vh; display: flex; flex-direction: row; align-items: center; justify-content: flex-start; padding: 1em; width: 100%; background-size: cover;" class="close&farm">

 Eztec Farm

 </div><div class="row d-sm-flex flex-sm-column justify-content-sm-start align-items-sm-start" style="width: 100%; display: flex; height: 100vh;">

 <div class="col-sm-1 col-lg-8 col-md-8" style="height: 90vh; display: flex; align-items: flex-start; justify-content: space-around;">

 <div class="lg-menu-items">

 <div class="col-md-6">
 <h3 class="link-hover" style="cursor: pointer;">Dashboard</h3>
 <p class="hide-at-small">View Detected Cows on Estrus; See Upcoming Estrus Events on Calendar</p>
 </div>
 <div class="col-md-6">
 <h3 class="link-hover" style="cursor: pointer;">Cattle Inventory</h3>
 <p class="hide-at-small">View Individual Cattle Information, Register New Cows entering the barn
</p>
 </div>
 </div>
 </div>
 </div>
 </div>
</nav>

```

```
<div class="col-md-6">
 <h3
class="link:hover link" style="cursor: pointer;">Analytics & Reports</h3>
 <p class="hide-at-small">View and Print Yearly, Monthly, or per Cow
ID Analytical Reports</p>
</div>

<div class="col-md-6">
 <h3 class="link:hover
link" style="cursor: pointer;">Locator</h3>
 <p class="hide-at-small">ETA on Farm for Estrus Confirmation &
Cow Insemination</p>
</div>

<div class="col-md-6">
 <h3
class="link:hover link" style="cursor: pointer;">LiveView - Moonitor</h3>
 <p class="hide-at-small">View Live Feed on Barn, abd Control PTZ
Camera</p>
</div>
</div>

<div class="row lg-menu-items" style="flex-direction: row; align-items:
flex-start; width: 100%;>
 <div class="col-md-6">
 <h3 class="link:hover
link" style="cursor: pointer;">Contact Us</h3>
 </div>
 <div class="col-md-6">
 <h3 class="link:hover
link" style="cursor: pointer;">Help & Support</h3>
 </div>
</div>
```

```

 </div>

 <div class="col-md-4 menu-userinfobtns col-sm-1" style="display: flex; flex-direction: column; justify-content: flex-start; align-items: center; margin: 1en; height: 90vh;">

 <div style="width: 100%; flex-direction: column; align-items: center; justify-content: center; display: flex; height: 40vh;" class="menu-usrinfo">

 {{current_user.username}}
 {% if current_user.role_id == 1 %}
 Admin
 {% else %}
 User
 {% endif %}
 </div>

 <div style="display: flex; flex-direction: column; align-items: center; width: 100%; justify-content: space-around; margin-top: 2em; height: 50vh;" class="menu-btns">
 <button onclick="window.location.href = '/manage';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Manage My Account</button>
 {% if current_user.role_id == 1 %}
 <button onclick="window.location.href = '/add';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Add Users</button>
 {% endif %}
 <button onclick="window.location.href = '/logout';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Logout</button>
 </div>
 </div>

```

```

 </div>
 </div>
</nav>

<header style="height: 10vh; background-color: #1e1e1e; width: 100%; display: inline-flex;" id="headermain" data-pg-collapsed>
 <div style="width: 100vw; display: flex; flex-direction: column; align-items: center; height: 10vh;" id="mainHeaderContainer">

 <div style="height: 10vh; display: flex; flex-direction: row; align-items: center; justify-content: flex-start; padding: 1em; width: 100%; background-image: url('../static/img/header_bg.png'); background-size: cover; background-color: #f8f9ff; z-index: 2; position: fixed;" class="navbar-header" id="header">
 Moonitor - Live View<div class="logo-ezTECT" id="logo-ezTECT">

 </div>
 </div>
 </div>
</header>

<div class="mainContent" id="mainContent" style="background-clip: 100%; flex-direction: column; max-height: 100%; min-height: 100%; height: 100%;">
 <div class="row ptz-main" style="width: 100%; min-height: 90vh; max-height: 100%;"><div class="ptz-screen col-md-10">
 <div class="form-group">
 <label for="cam_number">Please select camera: </label>

```

```
<select id="cam_number" name="cam_number" class="form-control">
 <option></option>
 <option value="7">Camera 1</option>
 <option value="1">Camera 2</option>
 <option value="3">Camera 3</option>
</select>
</div>

<div id="sample" style="max-width: 100%; min-height: 60vh; max-height: 100%; background-color: rgba(68, 68, 68, 0.21); margin-top: 1em; margin-bottom: 2em;">
 <p style="width: 100%;"><video id="videoplayer" style="width: 100%; height: 100%;" autoplay="true">Your browser doesn't support HTML5 video tag.</video></p>
 </div>
</div><div class="col-md-3"> <ul class="nav nav-tabs" role="tablist">
 <li class="nav-item">
 PTZ

 <li class="nav-item">
 Playback

<div class="tab-content">
 <div id="controls" class="tab-pane active fade in"><div class="PTZ_Controls tab-pane fade in active" style="display: flex; flex-direction: row; align-items: center; justify-content: space-around; flex-wrap: wrap;" id="ptz-controls">
```

```

<div class="pg-empty-placeholder" style="flex-direction: column; display: flex;
padding: 1em;">

 <h4 id="ptz_cont_lbl">PTZ Controller</h4>

 <table id="PTZ_controller_tbl" width="auto" border="0" align="center"
cellspacing="0">

 <tbody>

 <tr class="controls-row">

 <td>

 </td>

 <td>

 </td>

 <td>

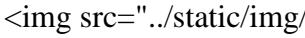
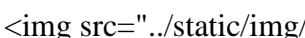
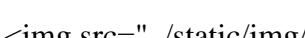
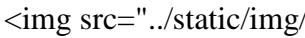
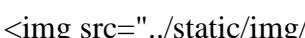
 </td>

 </tr>

 <tr class="controls-row">

 <td>


```

	&ampnbsp
<a href="#" onclick="cam1_Home('GotoPreset','start')">  </a>	&ampnbsp
<a href="#" onclick="cam1_cardinal('Right', 'start')">  </a>	&ampnbsp
<a href="#" onclick="cam1_pantilt('LeftDown', 'start')">  </a>	&ampnbsp
<a href="#" onclick="cam1_cardinal('Down', 'start')">  </a>	&ampnbsp

```

<td>

</td>
</tr>
</tbody>
</table>
</div>

<div style="display: flex; flex-direction: column; justify-content: center; align-items: center; padding-top: 1em; padding-bottom: 1em;">
 <div class="Zoom">
 <button type="button" class="btn btn-light"
onclick="cam1_zoom('ZoomWide', 'start')" style="max-width: 40px; max-height: 40px;">-</button>
 Zoom
 <button type="button" class="btn btn-light" onclick="cam1_zoom('ZoomTele',
'start');" style="max-width: 40px; max-height: 40px;">+</button>
 </div>
 <div class="Focus">
 <button type="button" class="btn btn-light" onclick="cam1_focus('FocusFar',
'start');" style="max-width: 40px; max-height: 40px;">-</button>
 Focus
 <button type="button" class="btn btn-light" onclick="cam1_focus('FocusNear',
'start');" style="max-width: 40px; max-height: 40px;">+</button>
 </div>
</div>
<div class="speed-range" style="padding: 1em;">
 <div class="custom-control" id="TiltSpeed">
 <div class="form-group" style="width: 100%;">

```

```
<label for="tiltspeed_sel">Tilt Speed:</label>
<select id="tiltspeed_sel" class="form-control" name="tiltspeed_sel">
 <option value="1">1 (Slow)</option>
 <option value="2">2</option>
 <option value="3">3</option>
 <option value="4">4</option>
 <option value="5">5</option>
 <option value="6">6</option>
 <option value="7">7</option>
 <option value="8" selected>8 (Fast)</option>
</select>
</div>
</div>
<div class="custom-control" id="panspeed">
 <div class="form-group" style="width: 100%;>
 <label for="panspeed_sel">Pan Speed:</label>
 <select id="panspeed_sel" class="form-control" name="panspeed_sel">
 <option value="1">1 (Slow)</option>
 <option value="2">2</option>
 <option value="3">3</option>
 <option value="4">4</option>
 <option value="5">5</option>
 <option value="6">6</option>
 <option value="7">7</option>
 <option value="8" selected>8 (Fast)</option>
 </select>
 </div>
</div>
```

```
</div>

<iframe id="myFrame" width="50" marginwidth="0" height="50"
marginheight="0" align="middle" scrolling="none" style="display: none;"></iframe>
</div></div><div class="tab-pane fade ptz-playbk" id="playback">

<div class="ptz-playbk" style="display: flex; padding: 1em;" id="playback">
<div id="startd&t">
 <h4>Start Date/TIme</h4>
 <div class="form-group">
 <label for="formInput4">Date</label>

 <input type="date" class="form-control" id="formInput4" placeholder="Start
Date" style="max-width: 100%;">
 </div>
 <div class="form-group">
 <label for="formInput4">Time</label>

 <input type="time" class="form-control" id="formInput4" placeholder="Start
Time">
 </div>
</div>
<div id="endd&t">
 <h4>End Date/TIme</h4>
 <div class="form-group">
 <label for="formInput4">Date</label>

 <input type="date" class="form-control" id="formInput4" placeholder="End
Date">
 </div>
```

```
<div class="form-group">
 <label for="formInput4">Time</label>

 <input type="time" class="form-control" id="formInput4" placeholder="End
Time">
 </div>
 </div><button type="button" class="btn btn-light" style="width: 10vw; height:
auto;">Go</button>
</div></div>

</div>
</div></div></div>

<script src="../static/assets/js/jquery.min.js"></script><script
src="../static/bootstrap/js/bootstrap.min.js"></script>

<script>
 var overlay = document.getElementById('overlay');

 document.getElementById('open-menu').addEventListener('click',
function(){
 overlay.style.width="100% "});

 document.getElementById('cancel-menu').addEventListener('click',
function(){
 overlay.style.width="0% "});

</script>
<script>
 var video_player = document.getElementById('videoplayer');
 var cam_number = document.getElementById('cam_number');

 cam_number.addEventListener('change', function(){

 video_player.setAttribute('src','http://192.168.43.112:808'+cam_number.value);
```

```
})
```

```
</script>
<script src="../static/assets/js/ie10-viewport-bug-workaround.js"></script>
<script type="text/javascript" src="../static/assets/js/popper.js"></script></body>
</html>
```

```
#UserRegistration.html
<!DOCTYPE html>
<html lang="en">
 <head>
 <meta charset="utf-8">
 <meta http-equiv="X-UA-Compatible" content="IE=edge">
 <meta name="viewport" content="width=device-width, initial-scale=1">
 <meta name="description" content="">
 <meta name="author" content="">
 <title>User Registration</title>
 <link href="../static/bootstrap/css/bootstrap.css" rel="stylesheet">
 <link rel="shortcut icon" href="{{ url_for('static', filename='img/EZTECT_Logo.png') }}">
 <link href="../static/css/style.css" rel="stylesheet">
 </head>

 <body class="d-flex flex-column justify-content-start">

 <nav style="height: 100vh; background-color: #1e1e1e; z-index: 100; position: fixed; overflow: hidden; transition: 0.5s; width: 0;" class="overlay" id="overlay" data-pg-collapsed>
 <div style="width: 100vw; display: flex; flex-direction: column; align-items: center; transition: 0.5s;" id="mainOverlayContainer">
 <div style="height: 10vh; display: flex; flex-direction: row; align-items: center; justify-content: flex-start; padding: 1em; width: 100%; background-size: cover;" class="close&farm">

 </div>
 </div>
 </nav>
 </body>

```

```
Ezetect Farm

</div><div class="row d-sm-flex flex-sm-column justify-content-sm-start align-items-sm-start" style="width: 100%; display: flex; height: 100vh;">

 <div class="col-sm-1 col-lg-8 col-md-8" style="height: 90vh; display: flex; align-items: flex-start; justify-content: space-around;">

 <div class="row lg-menu-items">
 <div class="col-md-6">
 <h3 class="link-hover link" style="cursor: pointer;">Dashboard</h3>
 <p class="hide-at-small">View Detected Cows on Estrus;
See Upcoming Estrus Events on Calendar</p>
 </div>
 <div class="col-md-6">
 <h3 class="link-hover link" style="cursor: pointer;">Cattle Inventory</h3>
 <p class="hide-at-small">View Individual Cattle Information;
Register New Cows entering the barn
</p>
 </div>
 <div class="col-md-6">
 <h3 class="link-hover link" style="cursor: pointer;">Analytics & Reports</h3>
 <p class="hide-at-small">View and Print Yearly, Monthly, or Individual Cattle Reports</p>
 </div>
 <div class="col-md-6">
 <h3 class="link-hover link" style="cursor: pointer;">Locator</h3>
 </div>
 </div>
 </div>
</div>
```

<p class="hide-at-small">Estimated Time of Arrival on Farm for Estrus Confirmation & Cow Insemination</p>

</div>

<div class="col-md-6">

<a href="/moonitor"><h3 class="link-hover">LiveView - Moonitor</h3></a>

<p class="hide-at-small">View Live Feed on Barn and Control the PTZ Cameras</p>

</div>

</div>

<div class="row lg-menu-items" style="flex-direction: row; align-items: flex-start; width: 100%;>

<div class="col-md-6">

<a href="/contact"><h3 class="link-hover">About Us</h3></a>

</div>

<div class="col-md-6">

<a href="/help"><h3 class="link-hover">Help & Support</h3></a>

</div>

</div>

</div>

<div class="col-md-4 menu-userinfobtns col-sm-1" style="display: flex; flex-direction: column; justify-content: flex-start; align-items: center; margin: 1en; height: 90vh;">

<div style="width: 100%; flex-direction: column; align-items: center; justify-content: center; display: flex; height: 40vh;" class="menu-usrinfo">

Admin</span>

{ % else %

<span style="font-size: 25px; color: #f7f7f7;">User</span>

{ % endif %

</div>

<div style="display: flex; flex-direction: column; align-items: center; width: 100%; justify-content: space-around; margin-top: 2em; height: 50vh;" class="menu-btns">

    <button onclick="window.location.href = '/manage';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Manage My Account</button>{ % if current_user.role_id == 1 % } <button onclick="window.location.href = '/add';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Add Users</button>{ % endif % }<button onclick="window.location.href = '/logout';" type="button" class="btn" style="width: 85%; border-radius: 2em; border-left: 3px solid #65969f; border-top: 3px solid #65969f; border-bottom: 3px solid #65969f; border-style: solid; border-right: 3px solid #65969f; color: #ffffff; white-space: normal;">Logout</button></a>

    </div>

    </div>

    </div>

</div>

</nav>

<header style="height: 10vh; background-color: #1e1e1e; width: 100%; display: inline-flex;" id="headermain" data-pg-collapsed>

    <div style="width: 100vw; display: flex; flex-direction: column; align-items: center; height: 10vh;" id="mainHeaderContainer">

        <div style="height: 10vh; display: flex; flex-direction: row; align-items: center; justify-content: flex-start; padding: 1em; width: 100%; background-image:

```

```

url('../static/img/header_bg.png'); background-size: cover; background-color: #f8f9ff;" class="navbar-header" id="header">

    <span style="color: #ffffff; margin-left: 1em; font-weight: lighter; font-style: normal; font-variant: normal; white-space: normal; font-size: 25px;" alt="Farm Name" class="text-capitalize font-weight-bolder">User Registration</span><div class="logo-ezrect" id="logo-ezrect">

    </div>

</div>
</div>
</header>

<form role="form" method="POST" action="/add" enctype="multipart/form-data" autocomplete="off">

    {{ form.hidden_tag() }}

    <div class="mainContentUsrReg" id="mainContent" style="background-color: #ffffff; box-shadow: 5px 4px 4px 3px #352c2c;">

        <div class="row UsrRegForm" id="UsrRegForm" style="height: 100%; width: 100%;" data-pg-collapsed>

            <div class="col-md-6" data-pg-collapsed>

                <h4>Account Information</h4>

                <div style="padding-left: 2em;">

                    <input id="username" type="text" name="username" style="color:white;background-color:white; border:white; position: absolute;top: -9999px;left: -9999px;">

                    <input id="password" type="password" name="fakepasswordremembered" style="color:white;background-color:white; border:white; position: absolute;top: -9999px;left: -9999px;">

                <div class="form-group" data-pg-collapsed>

```

```

<label for="formInput8">Username</label>

{ % if form.user.errors %

  {{ form.user(class="form-control form-control-lg is-invalid") }}

  <div class="invalid-feedback">

    { % for error in form.user.errors %

      <span style="color:red"> {{ error }}</span>

    { % endfor %

  </div>

{ % else %

  <input autocomplete="nope" name="user" type="text" class="form-
control" id="formInput8" placeholder="Enter Username">

{ % endif %

</div>

<div class="form-group" data-pg-collapsed>

<label for="exampleInputPassword1">Password</label>

{ % if form.password.errors %

  {{ form.password(class="form-control form-control-lg is-invalid") }}

  <div class="invalid-feedback">

    { % for error in form.password.errors %

      <span style="color:red"> {{ error }}</span>

    { % endfor %

  </div>

{ % else %

  <input autocomplete="nope" name="password" type="password"
class="form-control" id="exampleInputPassword1" placeholder="Password">

{ % endif %

</div>

<div class="form-group">

<label for="exampleInputPassword1">Confirm Password</label>

```

```

{ % if form.confirmpassword.errors % }

    {{ form.confirmpassword(class="form-control form-control-lg is-
invalid") }}

<div class="invalid-feedback">

    { % for error in form.confirmpassword.errors % }

        <span style="color:red"> {{ error }}</span>

    { % endfor % }

</div>

{ % else % }

<input name="confirmpassword" type="password" class="form-
control" id="exampleInputPassword1" placeholder="Confirm Password">

{ % endif %}

</div>

</div>

<div style="padding-left: 2em;" class="form-group">

<label for="formFile30">Upload Profile Picture</label>

<input onchange="readURL(this); name="picture" type="file" class="form-control-
file" id="formFile30" style="width: 100%;">

{ % if form.picture.errors % }

{ % for error in form.picture.errors % }

    <span class="text-danger" style="color:red"> {{ error }}</span>

{ % endfor % }

{ % endif %}

</div>

</div>

<div data-pg-collapsed class="col-md-6"><h4>Personal Information</h4>

<div style="padding-left: 2em;">

```

```

<div class="form-group" data-pg-collapsed>
    <label for="formInput6">Role</label><div class="form-row">
        {% if form.role_id.errors %}
            {{ form.role_id }}
            <div class="invalid-feedback">
                {% for error in form.role_id.errors %}
                    <span style="color:red">{{ error }}</span>
                {% endfor %}
            </div>
        {% else %}
            <div class="form-check col-md-6" data-pg-collapsed>
                <input value="1" class="form-check-input" type="radio" name="role_id"
id="formInput24">
                    <label class="form-check-label" for="formInput24">
Admin
                    </label>
                </div>
            <div class="form-check col-md-6" data-pg-collapsed>
                <input value="2" class="form-check-input" type="radio" name="role_id"
id="formInput26">
                    <label class="form-check-label" for="formInput26">
User
                    </label>
                </div>
            {% endif %}
        </div>
    </div><div class="form-group" data-pg-collapsed>
        <label for="formInput8">Full Name</label>
        {% if form.fullname.errors %}
            {{ form.fullname(class="form-control form-control-lg is-invalid") }}

```

```

<div class="invalid-feedback">
    { % for error in form.fullname.errors %}
        <span style="color:red"> {{ error }}</span>
    { % endfor %
</div>
{ % else %

<input name="fullname" type="text" class="form-control" id="formInput8"
placeholder="Cardo Dalisay">

{ % endif %

</div>
<div class="form-group" data-pg-collapsed>
    <label for="formInput14">Gender</label>
    { % if form.gender.errors %
        {{ form.gender }}
        <div class="invalid-feedback">
            { % for error in form.gender.errors %
                <span style="color:red"> {{ error }}</span>
            { % endfor %
        </div>
    { % else %

<div class="form-row" data-pg-collapsed>
    <div class="form-check col-md-6" data-pg-collapsed>
        <input class="form-check-input" type="radio" name="gender"
id="formInput17" value="Male">
            <label class="form-check-label" for="formInput17"> Male
        </label>
    </div>
    <div class="form-check col-md-6" data-pg-collapsed>
        <input class="form-check-input" type="radio" name="gender"
id="formInput21" value="Female">

```

```
<label class="form-check-label" for="formInput21"> Female
</label>

</div>

</div>

{ % endif %

</div>

<div class="form-group" data-pg-collapsed>

<label for="exampleInputEmail1">Email address</label>

{ % if form.email.errors %

{ { form.email(class="form-control form-control-lg is-invalid") } }

<div class="invalid-feedback">

{ % for error in form.email.errors %

<span style="color:red"> { { error } }</span>

{ % endfor %

</div>

{ % else %

<input autocomplete="nope" name="email" type="email" class="form-control"
id="exampleInputEmail1" placeholder="Ex. cardo.dalisay@angprobinyano.forever">

{ % endif %

</div>

<div class="form-group" data-pg-collapsed>

<label for="exampleInputPassword1">Mobile Number</label>

{ % if form.mobilenumbers.errors %

{ { form.mobilenumbers(class="form-control form-control-lg is-invalid") } }

<div class="invalid-feedback" disabled>

{ % for error in form.mobilenumbers.errors %

<span style="color:red"> { { error } }</span>

{ % endfor %

</div>
```

```

{ % else % }

<input name="mobilenumber" type="text" class="form-control"
id="exampleInputPassword1" placeholder="Ex. 09987654321">

{ % endif %

</div>

</div></div></div><div class="row" id="regButton" style="height: 100%; width: 100%;">
display: flex; align-items: center; justify-content: center;">

<button type="submit" class="btn btn-light btn-lg" style="box-shadow: 4px 3px 4px
#494545;">Register</button></div>

</div></form>

<script>

function readURL(input) {

if (input.files && input.files[0]) {

var reader = new FileReader();

reader.onload = function (e) {

$('#img')

.attr('src', e.target.result)

};

reader.readAsDataURL(input.files[0]);
}

}

</script>

<script src="../static/assets/js/jquery.min.js"></script><script
src="../static/bootstrap/js/bootstrap.min.js"></script>

```

```
<script>

    var overlay = document.getElementById('overlay');

        document.getElementById('open-menu').addEventListener('click',
function(){

    overlay.style.width="100%");

    document.getElementById('cancel-menu').addEventListener('click',
function(){

    overlay.style.width="0%");

</script>
<script src="../static/assets/js/ie10-viewport-bug-workaround.js"></script>
<script type="text/javascript" src="../static/assets/js/popper.js"></script></body>
</html>
```

APPENDIX B

Project Documentation



Figure 1: The research team meeting with Mr. Arcadio Francisco De Belen Jr.



Figure 2: The Milking station of the De Belen Dairy Farm



Figure 3: The Main barn which houses most of the milking and calving cows



Figure 4: The research team measuring the dimensions of the front-side of the barn



Figure 5: The research team measuring the dimensions of the sides of the barn



Figure 6: The research team disassembling the CCTV cameras for trial



Figure 7: Reassembling the CCTV cameras for initial setup



Figure 8: The exterior/front-side of the Equipment housing



Figure 9: The setup of the farm-installed devices inside the housing

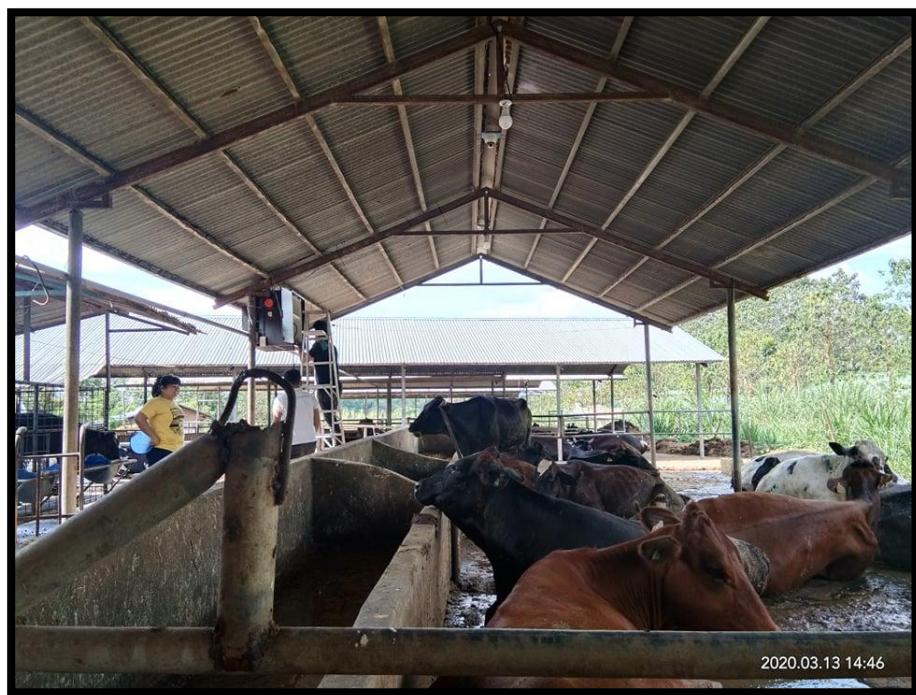


Figure 10: Rear-view of the experimental setup



Figure 11: Another rear-view of the experimental setup



Figure 12: Project Deployment



Figure 13: Signing of the agreements between the research team and the proprietors namely Mr. Arcadio Francisco De Belen, jr., and Ms. Carine L. Relente

APPENDIX C

Proponents' Profile

CHRIS I. ALVAREZ



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Email: chrisalvarez223@gmail.com
Address: Block 10 A Purok 1, Brgy. Bayanan, Muntinlupa City

PERSONAL INFO

- | **Date of Birth:** August 10, 1998
- | **Place of Birth:** Muntinlupa City
- | **Nationality:** Filipino
- | **Gender:** Male

TECHNICAL SKILLS

- | **Expert:** MS Office Apps, NI Multisim, Proteus DS, Circuit Wizard, ExpressPCB
- | **Intermediate:** Python, Arduino, Adobe Photoshop, Microsoft Tools
- | **Learning:** Video Editing, Other Programming Languages

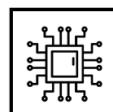
SEMINARS ATTENDED

- "Capability Building program for University Employees, Students, and other Stakeholders in the utilization of the TECH4ED"
by Dr. Olga M. Ong and Ms. Fidela Aranes
(July 30, 2018)
- "Research Themes and Trends in Electronics Engineering"
by Dr. Ronnie Serfa Juan
(July 30, 2018)
- "EST Talk 101: Future of Philippine Broadcasting and Telecommunications Industry"
by Engr. Benz Sevilla, DICT
(February 8, 2019)

OBJECTIVE

"To be able to use my knowledge and skills in the field of engineering and harness it through various experiences and training."

AREAS OF INTEREST



ELECTRONICS



PROGRAMMING



TELECOMMUNICATIONS

ACADEMIC BACKGROUND

- **TECHNOLOGICAL UNIVERSITY OF THE PHILIPPINES -MANILA**
| Bachelor of Science in Electronics Engineering
| 2015-Present
| Location: Ayala Blvd., Ermita, Manila
- **MUNTINLUPA SCIENCE HIGH SCHOOL**
| Graduated Class of 2015
| Location: 999 Buendia Street, Muntinlupa City
- **BAYANAN ELEMENTARY SCHOOL**
| Graduated Class of 2011
| Location: National Road, Bayanan, Muntinlupa City

SEMINARS ATTENDED (CONT'D)

- "Board Exam Awareness Seminar"
by Engr. Timothy M. Amado
and Engr. Ronnie Yu
(September 7, 2019)
- "First Aid Seminar"
by TUP-Red Cross
(October 16, 2019)
- "Maxim Int.'s Technical Refresher
Course in Electronics"
by Engr. Michael Coscos
(January 23, 2020)

WORK EXPERIENCES

- Carenett Philippines, Inc.
- Intern | April - June 2019

OTHER SKILLS

- Fast-Learner
- Flexible
- Hard-working

AFFILIATIONS

- INSTITUTE OF ELECTRONICS ENGINEERS OF THE PHILIPPINES - MANILA STUDENT CHAPTER (IECEP-MSC)
- Student Member | August 2017 - Present
- ORGANIZATION OF ELECTRONICS ENGINEERING STUDENTS (OECES)
- Student Member | June 2015 - Present
- Artist Committee Head | June 2018 ~ August 2019
- INSTITUTE OF ELECTRONICS ENGINEERS OF THE PHILIPPINES - MANILA
- Associate Member | November 2018 - Present
- TUP- COMMISSION ON STUDENT ELECTIONS
- Commission Volunteer | January 2019 - Present
- DOST SEI RA.7687
- Scholar | S.Y. 2015-2018
- ELECTRONICS TECHNICIAN BOARD EXAMINATION
- Board Passer | October 2018 - Present

CHARACTER REFERENCE

Engr. Lean Karlo S. Tolentino
Instructor, Technological University of the Philippines
Email: leankarlitolentino@gmail.com
Contact No.: 09938925845

I hereby certify that all the above information is true and correct according to the best of my knowledge and belief.


CHRIS I. ALVAREZ
Applicant

CHARL G. LEGISTA

Mobile: +63977787694
Email: charl.legista@gmail.com
Address: 14 Saint Peter St., Brgy. 179,
Maricaban, Pasay City



PERSONAL INFO

- | **Date of Birth:** May 10, 1994
- | **Place of Birth:** Pasay City
- | **Nationality:** Filipino
- | **Gender:** Male

TECHNICAL SKILLS

- | **Expert:** MS Office Apps, NI Multisim, Circuit Wizard, ExpressPCB
- | **Intermediate:** Python, Fluidsim, MATLAB, Octave
- | **Learning:** Visual Basic Studio, SQLite

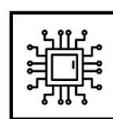
SEMINARS ATTENDED

- "Research Themes and Trends in Electronics Engineering"
by Dr. Ronnie Serfa Juan
(July 30, 2018)
- "Swarm Intelligence"
by Dr. Angelo A. Beltran, Jr.
(July 30, 2018)
- "Network Engineering"
by Engr. Mark Anthony V. Melendres
(July 30, 2018)
- "LoRaWan Technology"
by Packetworx
(February 12, 2019)

OBJECTIVE

"To gain experience and perform well in the field of electronics engineering, which offers professional development while being resourceful, creative, and versatile."

AREAS OF INTEREST



ELECTRONICS



PROGRAMMING



TELECOMMUNICATIONS

ACADEMIC BACKGROUND

- **TECHNOLOGICAL UNIVERSITY OF THE PHILIPPINES -MANILA**
 - | Bachelor of Science in Electronics Engineering
 - | June 2017 – Present
 - | June 2010 – May 2014 (Stopped due to work)
 - | Location: Ayala Blvd., Ermita, Manila
- **PASAY CITY WEST HIGH SCHOOL (DOST-ESEP)**
 - | Graduated Class of 2010
 - | Orator of the Year; Math & Science Quiz Bee Rep.
 - | Location: Figueroa St., Pasay, Metro Manila
- **TIMOTEO PAEZ ELEMENTARY SCHOOL**
 - | Graduated Class of 2006
 - | Any honors awards?
 - | Location: Pasay City, Manila

WORK EXPERIENCES

- **JPMORGAN CHASE BANK N.A.-PGSC**
- Branch Operations Specialist |
August 2015 - May 2017
- **IBEX GLOBAL**
- Sales Representative |
September 2014 - March 2015
- **SITEL**
- Customer Service Representative |
April 2013 - August 2014
- **COMMSEC Inc.**
- Intern | April - June 2019

OTHER SKILLS

- Strong organizational and multitasking skills
- Fast Learner
- Excellent intrapersonal and communication skills
- Good Navigation skills
- Billing
- Complaint Escalations
- Team Worker

AFFILIATIONS

- **INSTITUTE OF ELECTRONICS ENGINEERS OF THE PHILIPPINES - MANILA STUDENT CHAPTER (IECEP-MSC)**
- Student Member | August 2017 - Present
- **ORGANIZATION OF ELECTRONICS ENGINEERING STUDENTS (OECES)**
- Student Member | June 2010 - Present
- **TUP- COMMISSION ON STUDENT ELECTIONS**
- Commission Volunteer | January 2019 - Present
- **ELECTRONICS TECHNICIAN BOARD EXAMINATION**
- Board Passer | October 2018 - Present

CHARACTER REFERENCE

[Available Upon Request]

I hereby certify that all the above information is true and correct according to the best of my knowledge and belief.


CHARL G. LEGISTA
Applicant

ANGELITA G. MABALE

Mobile: +639161368707

Email: cuthie.15@gmail.com

Address: 29 Katarungan St., Bagong Barrio,
Caloocan City.



PERSONAL INFO

- | Date of Birth: January 15, 1998
- | Place of Birth: Manila, Philippines
- | Nationality: Filipino
- | Gender: Female

TECHNICAL SKILLS

- | Expert: MS Office Apps, NI Multisim, ExpressPCB, Motor Control, Building Wiring, Adobe-Editing Apps
- | Intermediate: Python, MATLAB, Octave, Rstudio, Arduino, HTML/CSS, SQL, Java
- | Learning: Visual Basic Studio, SublimeText 3, Google Cloud

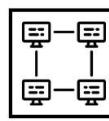
SEMINARS ATTENDED

- "TRENDS: Topics for Research in 'Electronics, Networking, and Data Science'"
by Dr. Ronnie O. Serfa Juan, et.al
(July 30, 2018)
- "ACROSS BORDERS: Electronics Engineering in the Philippines and the ASEAN Economic Community"
by Dr. Ronnie O. Serfa Juan, et. al
(November 24, 2018)
- "EST Talk 101: Future of Philippine Broadcasting and Telecommunications Industry"
by Engr. Benz Sevilla, DICT
(February 8, 2019)

OBJECTIVE

"To obtain valuable knowledge and skills that will enable me to use and enhance my ability in the field of engineering. Work with passion and seek a responsible for the goodness of this organization."

AREAS OF INTEREST



DATA
COMMUNICATION



PROGRAMMING



DATA
ANALYSIS

ACADEMIC BACKGROUND

- TECHNOLOGICAL UNIVERSITY OF THE PHILIPPINES -MANILA
 - | Bachelor of Science in Electronics Engineering
 - | June 2014 –Present
 - | Location: Ayala Blvd., Ermita, Manila
- SALVADOR ARANETA MEMORIAL INSTITUTE
 - | Graduated Class of 2014
 - | 2nd Honorable Mention
 - | Location: Reparo Rd, Potrero, Malabon, Metro Manila
- BAGONG BARIO ELEMENTARY SCHOOL
 - | Graduated Class of 2010
 - | 8th Honorable Mention
 - | Location: Malolos Ave,
Bagong Barrio West,
Caloocan, Metro Manila

SEMINARS ATTENDED (CONT'D)

- "LoRaWAN Technology"
by Packetworx
(February 12, 2019)
- "First Aid Seminar"
by TUP-Red Cross
(February 13, 2019)

WORK EXPERIENCES

- ABSCBN Corporation
- Intern | April - June 2019

OTHER SKILLS

- Good in dealings, marketing and management
- Hardworking
- Determined
- Fast learner
- Flexible
- Highly dependable
- Proven leadership skills
- Has ability to motivate others
- Good at multi-tasking

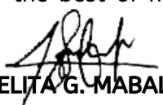
AFFILIATIONS

- INSTITUTE OF ELECTRONICS ENGINEERS OF THE PHILIPPINES - MANILA STUDENT CHAPTER (IECEP-MSC)
- Student Member | August 2016 - Present
- ORGANIZATION OF ELECTRONICS ENGINEERING STUDENTS (OECES)
- Student Member | June 2014 - Present
- SAMING DULAAN THEATER ARTS
- Stage Manager | June 2011-2014
- ELECTRONICS TECHNICIAN BOARD EXAMINATION
- Board Passer | October 2018 - Present

CHARACTER REFERENCE

Sarah Jane De Mesa-Manabat, CPA, CrFA, CIA
Manager, Advisory Service - Risk Consulting
KPMG Philippines, R.G. Manabat & CO.
Contact No.: 09363765404

I hereby certify that all the above information is true and correct according to the best of my knowledge and belief.


ANGELITA G. MABALE
Applicant

NICOLE E. REPISO

Mobile: +639655608462
Email: repisonicole2@gmail.com
Address: 192 Toclong, Kawit, Cavite



PERSONAL INFO

- | **Date of Birth:** October 12, 1997
- | **Place of Birth:** San Sebastian, Kawit, Cavite
- | **Nationality:** Filipino
- | **Gender:** Female

TECHNICAL SKILLS

- | **Expert:** MS Office Word & Powerpoint
- | **Intermediate:** HTML/CSS, SQL, Java, Python, Multisim
- | **Learning:** Packet Tracer, Pinegrow, Google Cloud, Arduino

SEMINARS ATTENDED

- "T.R.E.N.D.S.: Topics in Research, Electronics, Networking, and Data Science"
(July 30, 2018)
- "Virtual Reality of Things"
by Dr. Ronnie O. Serfa Juan
(November 24, 2018)
- "Internet of Things and Telecom: The New Golden Era"
by Engr. Christian P. Enoval
(November 24, 2018)

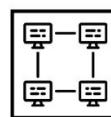
OBJECTIVE

"To find a challenging job that will surely develop my skills and interpersonal relationship, to gain wisdom in life."

AREAS OF INTEREST



WEB
DEVELOPMENT



DATA
COMMUNICATIONS



DATA
ANALYSIS

ACADEMIC BACKGROUND

- **TECHNOLOGICAL UNIVERSITY OF THE PHILIPPINES -MANILA**
 - | Bachelor of Science in Electronics Engineering
 - | June 2014 –Present
 - | Location: Ayala Blvd., Ermita, Manila
- **EMILIANO TRIA TIRONA MEMORIAL NATIONAL HIGH SCHOOL**
 - | Graduated Class of 2014
 - | Location: Gahak, Kawit, Cavite
- **TOCLONG ELEMENTARY SCHOOL**
 - | Graduated Class of 2010
 - | Class Salutatorian
 - | Location: Toclong, Kawit, Cavite

SEMINARS ATTENDED (CONT'D)

- "Impact and Benefits of Industry 4.0: A Smart Factory Automation"
by Engr. Rally G. Uminga
(November 24, 2018)
- "Get Licensed 2019"
(February 02, 2019)
- "EST Talk 101: Future of Philippine Broadcasting and Telecommunications Industry"
by Engr. Benz Sevilla, DICT
(February 8, 2019)

WORK EXPERIENCES

- **Globe Telecom**
- Intern | April - June 2019

OTHER SKILLS

- Teamwork
- Detail-oriented
- Emotional Intelligence

AFFILIATIONS

- INSTITUTE OF ELECTRONICS ENGINEERS OF THE PHILIPPINES - MANILA STUDENT CHAPTER (IECEP-MSC)
- Student Member | August 2017 - Present
- ORGANIZATION OF ELECTRONICS ENGINEERING STUDENTS (OECES)
- Student Member | June 2015 - Present
- ELECTRONICS TECHNICIAN BOARD EXAMINATION
- Board Passer | October 2018 - Present

CHARACTER REFERENCE

Mark O. Gendive, RME
Production Supervisor, Izumi Tech
Contact No.: 0939-774-3662

I hereby certify that all the above information is true and correct according to the best of my knowledge and belief.


NICOLE E. REPISO
Applicant

RODNEY RAFAEL A. ROBLES

Mobile: +639206637578

Email: roadney99@gmail.com

Address: B6 L9 Chesapeake Village, Brgy.
Buhay na Tubig, Imus, Cavite



PERSONAL INFO

| Date of Birth: August 8, 1999

| Place of Birth: Hafar Al- Batin,
Saudi Arabia

| Nationality: Filipino

| Gender: Male

TECHNICAL SKILLS

| Expert: MS Office Apps, NI Multisim,
Proteus DS, Circuit Wizard, ExpressPCB

| Intermediate: Python, Electric, Sketchup
WinSPICE, MATLAB, Octave, Photoshop

| Learning: Visual Basic Studio,
Android Studio

SEMINARS ATTENDED

- "Site Acquisition Training"
by Huawei Technologies
(May 3, 2019)

- "Big Data: Tools and Equipment"
by Dr. Ira Valenzuela
(July 10, 2019)

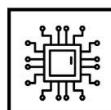
- "Making Sense of Machine Learning
Model Predictions"
by Mr. Abraham Camba
(July 10, 2019)

- "Parallel Computing"
by Engr. Randy Joseph Fernandez
(July 10, 2019)

OBJECTIVE

"To pursue a position gearing towards continuous learning and professional growth in Electronics Engineering while being flexible and resourceful in utilizing my knowledge and skills in the field."

AREAS OF INTEREST



ELECTRONICS



PROGRAMMING



COMPUTER
VISION

ACADEMIC BACKGROUND

• TECHNOLOGICAL UNIVERSITY OF THE PHILIPPINES -MANILA

- | Bachelor of Science in Electronics Engineering
- | June 2015 – August 2020
- | Location: Ayala Blvd., Ermita, Manila

• JESUS GOOD SHEPHERD SCHOOL

- | Graduated Class of 2015
- | 9th Honorable Mention
- | Location: Palico II, Imus, Cavite

• ST. JOHN BOSCO SCHOOL

- | Graduated Class of 2011
- | Class Salutatorian
- | Location: Villa de Primarosa,
Brgy. Buhay na Tubig, Imus,
Cavite

SEMINARS ATTENDED (CONT'D)

- "Modern Cybersecurity"
by Mr. Anfernee S. Sodusta
(July 10, 2019)
- "The Current Cellular Technology in the Philippines "
by Engr. Christian P. Enoval
(November 15, 2019)
- "Maxim Int.'s Technical Refresher Course in Electronics"
by Engr. Michael Coscos
(January 23, 2020)

WORK EXPERIENCES

- COMMSEC Inc.
- Intern | April - June 2019

OTHER SKILLS

- Good Communicator
- Fast-Learner
- Flexible
- Hard-working
- Passion-driven
- Excellent multi-tasking skills
- Works under Pressure

AFFILIATIONS

- INSTITUTE OF ELECTRONICS ENGINEERS OF THE PHILIPPINES - MANILA STUDENT CHAPTER (IECEP-MSC)
- Student Member | August 2017 - Present
- ORGANIZATION OF ELECTRONICS ENGINEERING STUDENTS (OECES)
- Student Member | June 2015 - Present
- Scholastic and Academics Committee Head | June 2018 - August 2019
- IEEE and Extension Division Chairman | August 2019 - Present
- INSTITUTE OF ELECTRONICS ENGINEERS OF THE PHILIPPINES - MANILA
- Associate Member | November 2018 - Present
- TUP- COMMISSION ON STUDENT ELECTIONS
- Commission Volunteer | January 2019 - Present
- ELECTRONICS TECHNICIAN BOARD EXAMINATION
- Board Passer | October 2018 - Present

CHARACTER REFERENCE

Engr. Jessica S. Velasco

Instructor, Technological University of the Philippines
Email: Jeck.velasco76@gmail.com
Contact No.: 301-3001 loc 501

I hereby certify that all the above information is true and correct according to the best of my knowledge and belief.


RODNEY RAFAEL A. ROBLES
Applicant

APPENDIX D

EZTECT User Manual

**EZTECT: Automated Estrus Detection System for
Dairy Cattle based on Faster-RCNN with
Surveillance and Notification System
via Internet of Things (IoT)**



User Manual

Version 1.0

02/15/2020



INTRODUCTION

This User Manual (UM) provides the information necessary for dairy cattle farm owners and cow caretakers to effectively use the Automated Estrus Detection System's web application, referred to as the 'EZTECT Web App'.

If you have any questions not covered in this user guide, please contact the Chief Technical Officer at 0920-663-7578, or email us at estrusdetection@gmail.com

OVERVIEW

The EZTECT Web App is a computer program that uses a web browser to perform specific tasks on the Internet. The app's key features are – Dashboard, Cattle Inventory, Analytics & Reports, Locator, and LiveView-Moonitor.

- Dashboard - Shows the 8-hour Countdown Timer, the Estrus Logs, and the interactive Event Calendar which reflect the date and time of current estrus events, and the prediction of future signs as well;
- Cattle Inventory - Views your livestock and the corresponding Cow IDs, Breed, Gender/Status, and recent estrus record.
- Analytics & Reports - Helps to keep track of automatic estrus detection and insemination instances and to easily assess pregnancy and calving rates through visualizations. The app also allows you to download PDF-generated annual, monthly, or individual cattle estrus reports containing other relevant information.
- Locator - Informs you of the estimated travel time you will possibly take from your current location to your farm, ensuring you will arrive within the 8-hour effective insemination period.
- LiveView-Moonitor – Lets you access and control the surveillance cameras at ease. You can freely pan, tilt, and zoom the cameras to get a better view of the barn.

GETTING STARTED

In order to use and/or access the EZTECT Web app, you must at least have an Internet Browser installed on your computer, laptop, smart phone, or any other powerful device capable of having a Browser installed on it. Most computers have “Internet Explorer” browsers installed, but you can still use other available browsers such as “Google Chrome”, “Mozilla Firefox”, “Safari”, “Opera”, and many more.

To access using a computer:

1. (Double) Click on an Internet Browser, in this case, the Opera Browser. Refer to Figure 1 below.

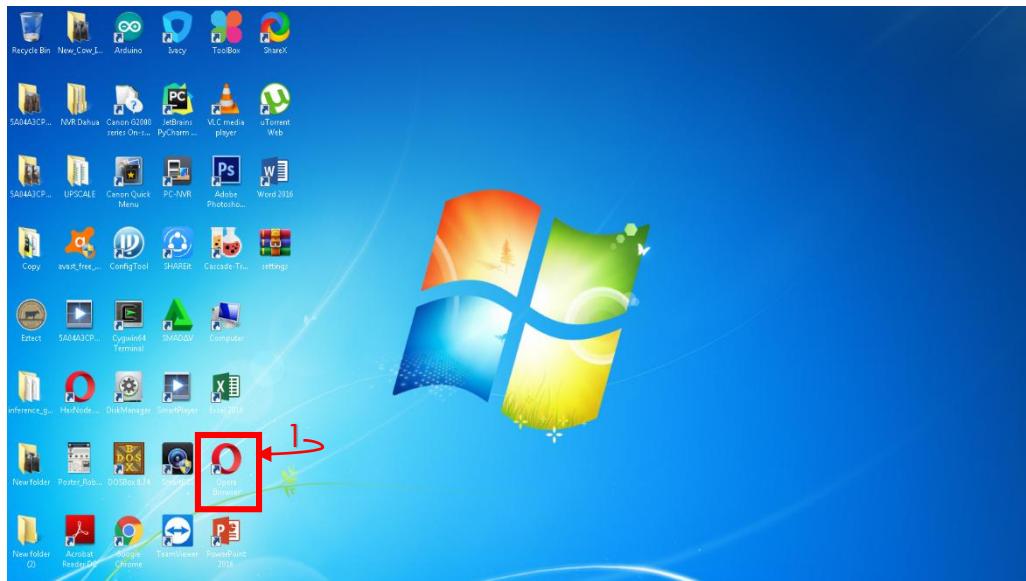


Figure 1: Clicking an Internet Browser

2. Once the browser is opened, Go to www.ez-tect.xyz as shown on Figure 2 below.

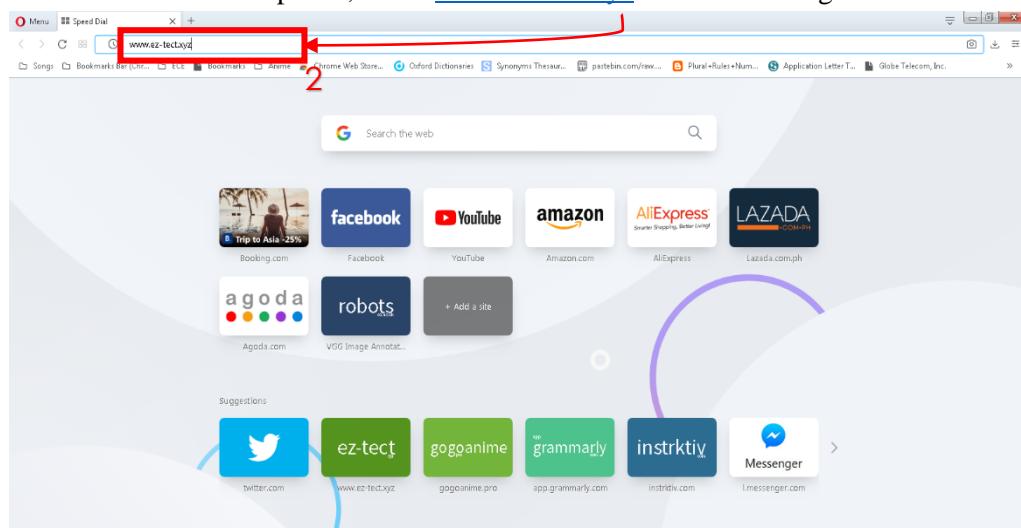


Figure 2: Accessing the web app site

GETTING STARTED

3. Afterwards, you will see the landing page of the EZTECT Web App which portrays its key features and price rates. Refer to Figures 3-5.

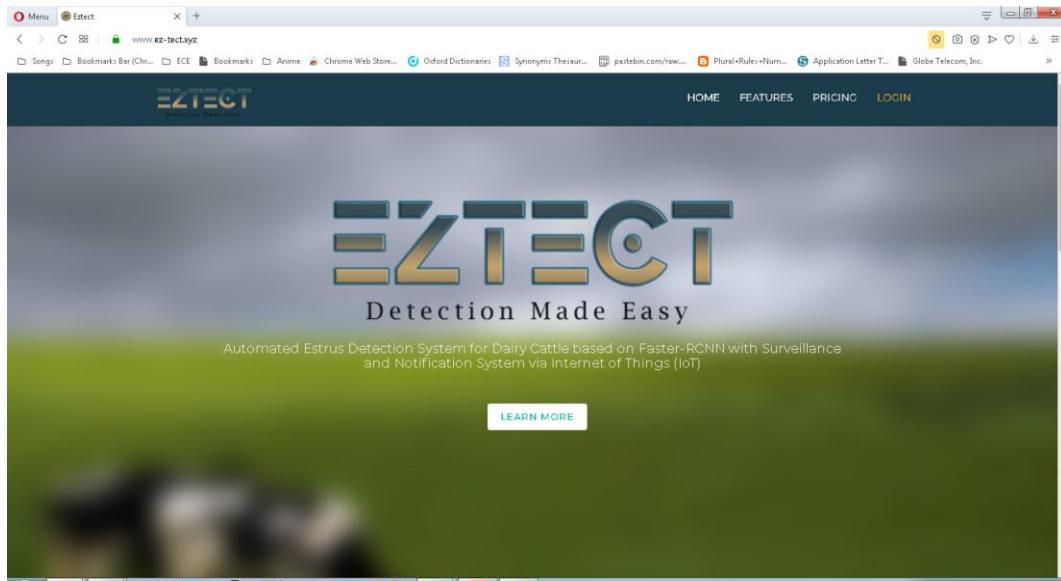


Figure 3: The landing page of EZTECT

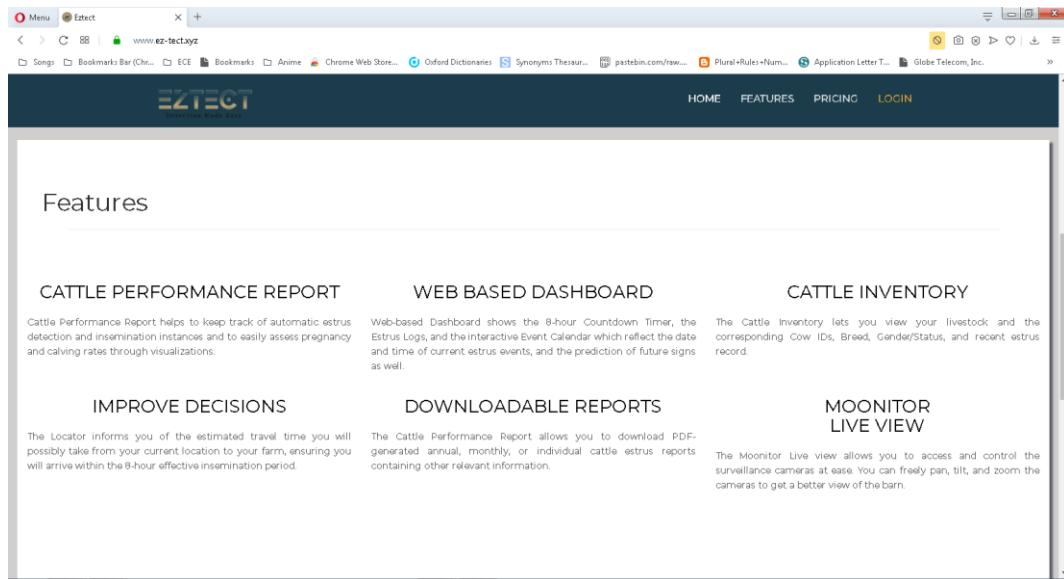


Figure 4: EZTECT Web App Features

GETTING STARTED

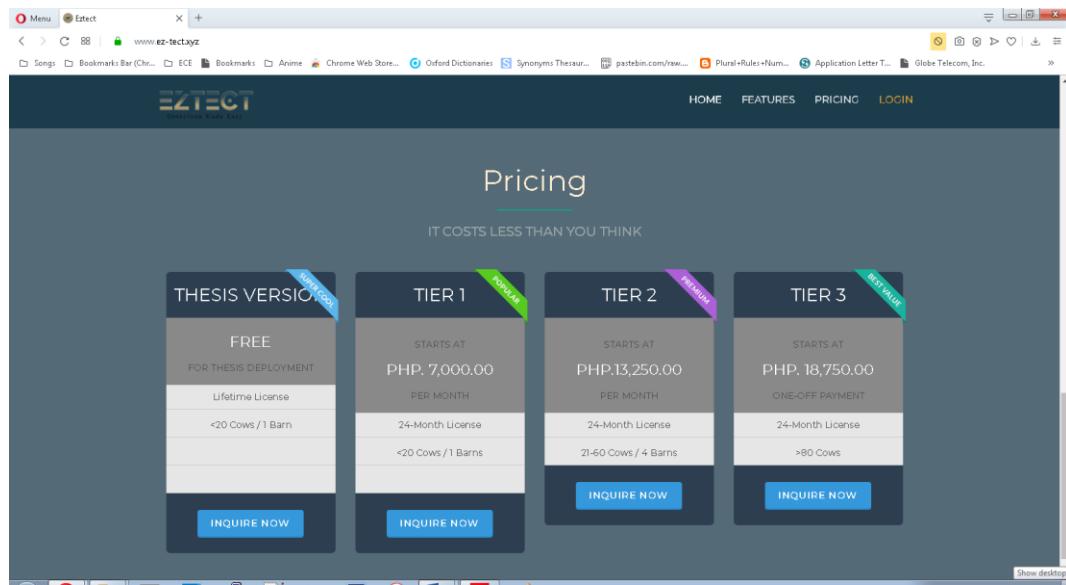


Figure 5: Varying Price points of the EZTECT System

LOGIN

To login at the website:

1. Contact the Administrators, so they could help you create a unique username for your account. Then, create a unique password of yours.
2. Once an account is made, click the “LOGIN” section at the landing page of the website, as shown on Figure 6.

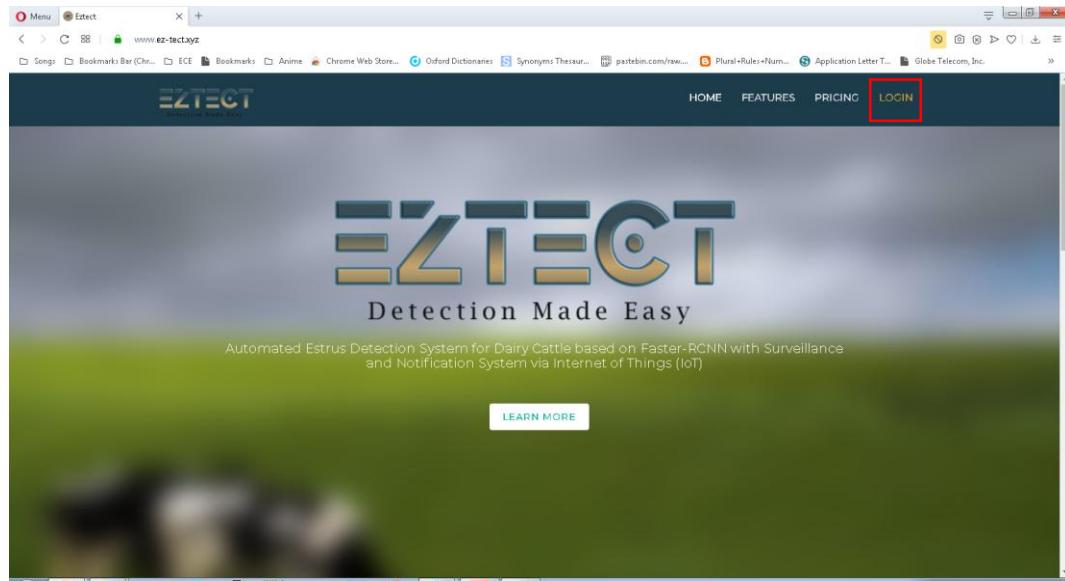


Figure 6: Login Button at the Landing page

3. Type-in your ‘Username’ and ‘Password’ on the free spaces as shown on Figure 7.

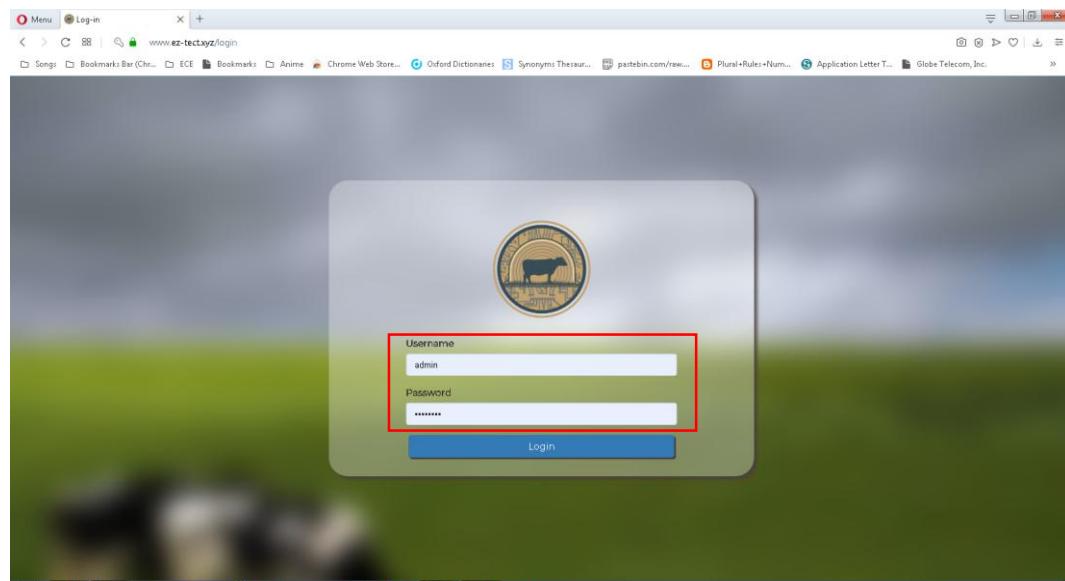


Figure 7: Login Section (Username and Password)

LOGIN

4. Click the ‘Login’ button as shown on Figure 8:

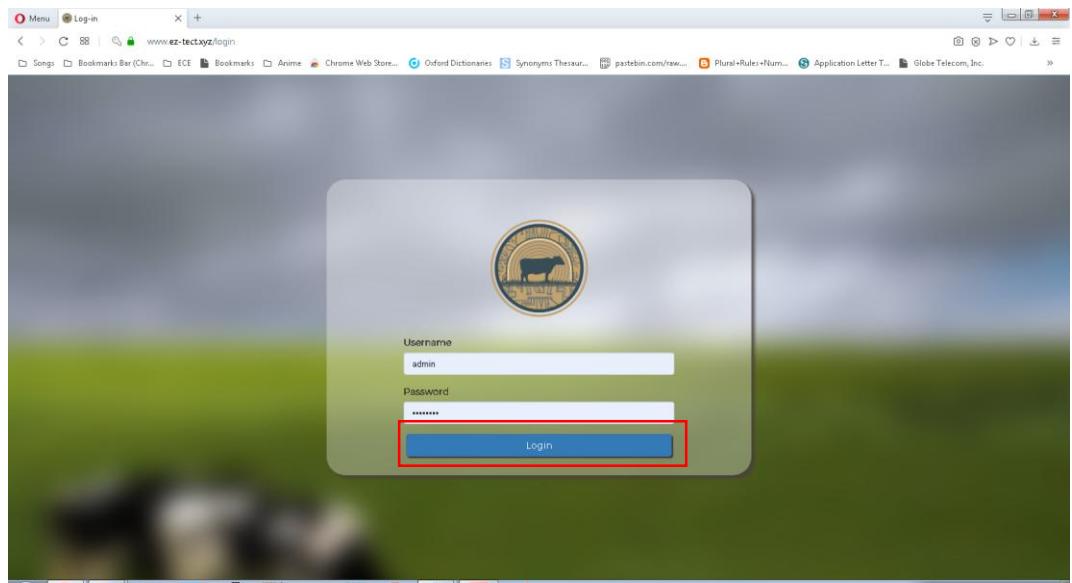


Figure 8: Login Section (Button)

MENU

Once logged in, you will be directed at the “Dashboard” section of the web application. To access other features of the EZTECT Web App, click the highlighted icon as shown below.

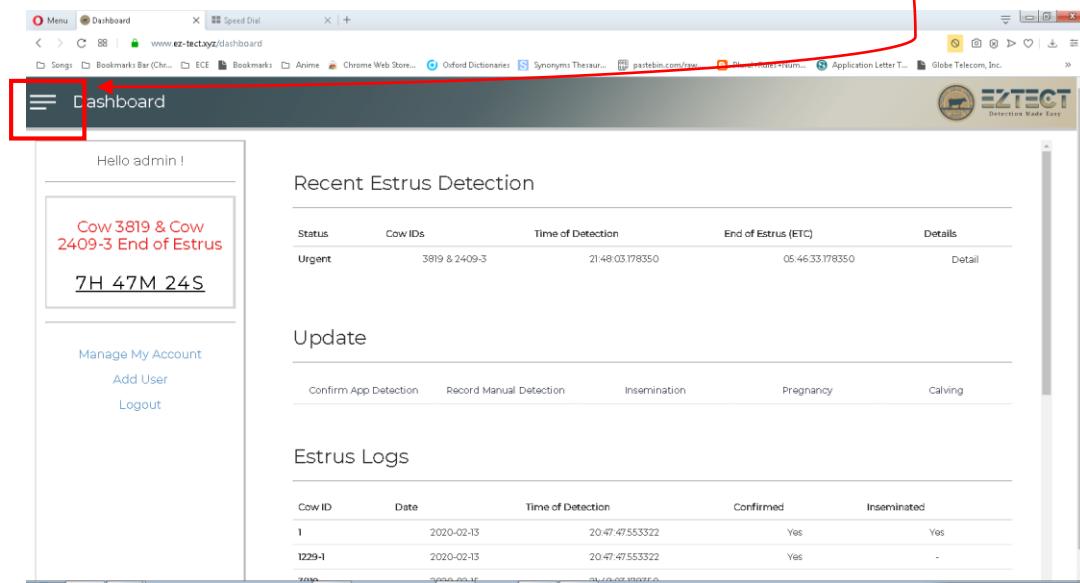


Figure 9: Menu Icon

Then you will see the rest of the app's features. As shown below, you may click on ‘Dashboard’, ‘Cattle Inventory’, ‘Analytics & Reports’, ‘Locator’, and ‘LiveView – Moonitor’ as the main features of the web application. For the Setting configurations particularly managing your account and adding other users to access your records, you may click on the ‘Manage My Account’ and/or ‘Add Users’ buttons. To logout of your session, click on the ‘Logout’ Button. For further inquiries and technical support, the ‘Contact Us’ and ‘Help & Support’ would be useful to go.

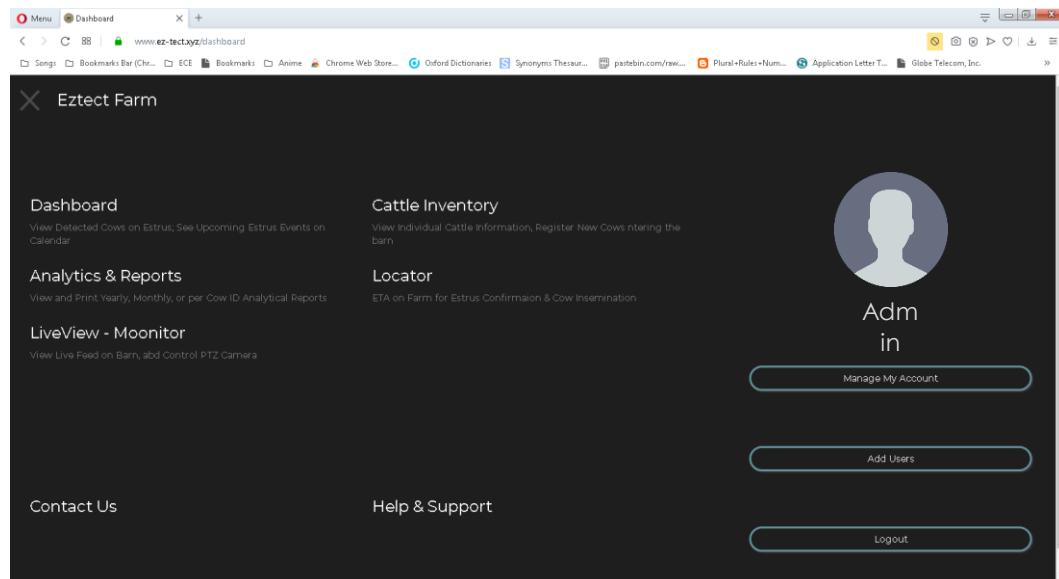


Figure 10: Contents of the Web App through the Menu

MANAGE MY ACCOUNT

In this particular section, you may modify your account information such as Username, Password, Profile Picture, ‘Role’, ‘Full Name’, ‘Gender’, ‘Email address’, and ‘Mobile Number’ by clicking the ‘Modify’ button on the upper right corner of the window. Refer to the figure below.

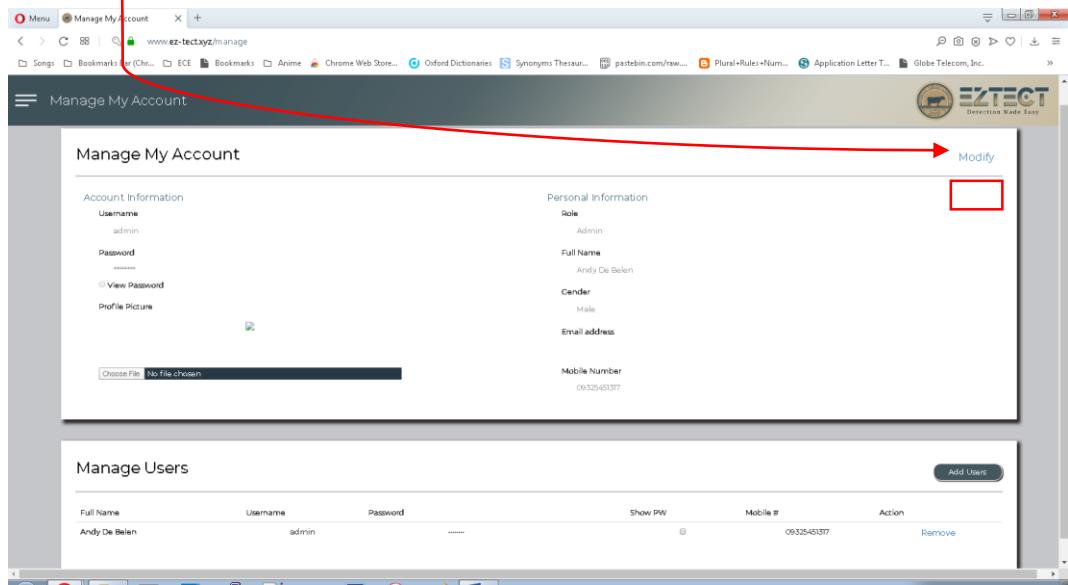


Figure 11: MANAGE MY ACCOUNT

USER REGISTRATION

In this particular section, you may add a user account. The Account Information section contains the ‘Username’, ‘Password’, and ‘Profile Picture’ of the user to be registered. Meanwhile on the Personal Information section contains the ‘Role’, ‘Full Name’, ‘Gender’, ‘Email address’, and ‘Mobile Number’ of the user.

To add in the necessary details, click on the boxes and type-in the information.

To Upload Profile Picture, click the ‘Choose File’ button, as shown below.

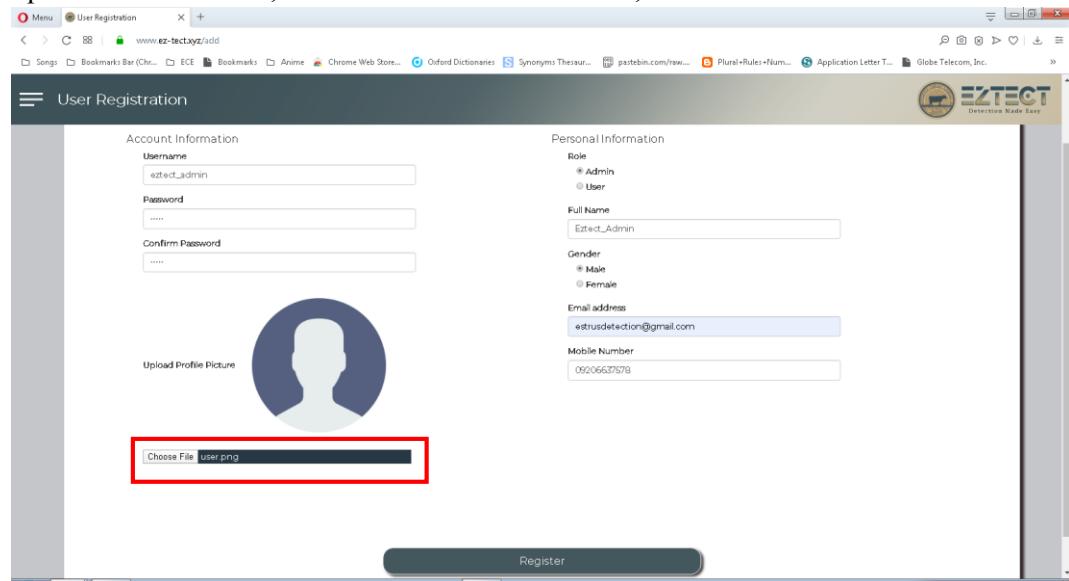


Figure 12: Upload Profile Picture

To fully register the user, click the Register button, as shown below.

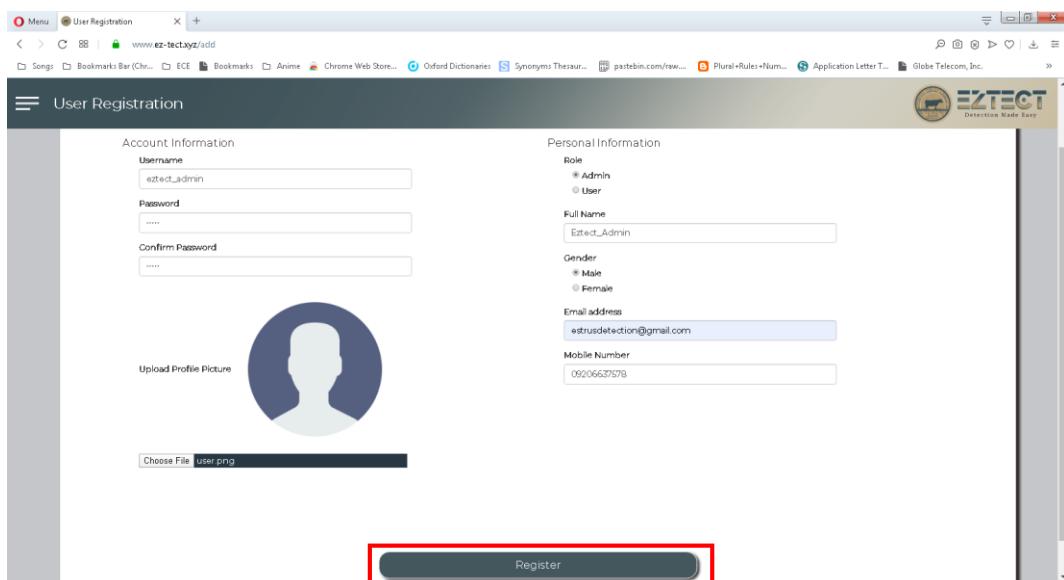


Figure 13: Registering the User

DASHBOARD

In this particular section you can see the sub-features such as Recent Estrus Detection, Estrus Logs, Update, and Upcoming on Calendar as shown on Figure 9 and 10.

The screenshot shows the EZTECT Web App's Dashboard. On the left, there is a sidebar with a 'Hello admin!' message, 'Manage My Account', 'Add User', and 'Logout' links. The main area has three main sections:

- Recent Estrus Detection:** A table showing a single row for 'Urgent' detection of cows 3819 & 2409-3 at 21:48:03 on 17/02/2020, with an 'End of Estrus (ETC)' time of 05:46:33 on the same day. A 'Detail' link is available.
- Update:** A section with five buttons: 'Confirm App Detection', 'Record Manual Detection', 'Insemination', 'Pregnancy', and 'Calving'.
- Estrus Logs:** A table listing two entries: cow 1 on 2020-02-13 at 20:47:47 and cow 1229-1 on the same date at the same time. Both entries have 'Confirmed' and 'Inseminated' status set to 'Yes'.

Figure 14: EZTECT Web App's Dashboard sub-features

The screenshot shows the EZTECT Web App's Calendar for February 2020. The calendar grid shows days from Sunday 26 to Saturday 1. A yellow box highlights the 'Upcoming on Calendar' section. Below the calendar, a list of events is displayed:

- 8:56p Cow 1 Last Estrus
- 8:56p Cow 102-1 Last E
- 9:01p Cow 1 Last Estrus
- 9:01p Cow 102-1 Last E

Figure 15: EZTECT Web App's Calendar

COUNTDOWN TIMER

Once an estrus event has been detected by the system, the web app will automatically initiate its 8-hr countdown timer to remind you of the remaining time for conducting insemination. Refer to the highlighted box shown on Figure 11.

The screenshot shows the EZTECT dashboard interface. At the top, there's a navigation bar with 'Menu' and 'Dashboard'. Below it is a toolbar with various icons. The main content area is titled 'Recent Estrus Detection'. It displays a table with two rows of data:

Status	Cow IDs	Time of Detection	End of Estrus (ETC)	Details
Urgent	3819 & 2409-3	21:48:03.178350	05:46:33.178350	Detail
Urgent	1&1229-1	22:20:20.849561	06:18:50.849561	Detail

Below this section is an 'Update' button followed by five links: 'Confirm App Detection', 'Record Manual Detection', 'Insemination', 'Pregnancy', and 'Calving'. Further down is an 'Estrus Logs' section with a table:

Cow ID	Date	Time of Detection	Confirmed	Inseminated
3819	2020-02-15	21:48:03.178350	-	-

A red box highlights the first two rows of the 'Recent Estrus Detection' table, specifically the entries for Cow 3819 & Cow 2409-3 and Cow 1 & Cow 1229-1. A red arrow points from the text in the preceding paragraph to the top-left corner of this highlighted box.

Figure 16: 8-hr Countdown Timer

RECENT ESTRUS DETECTION

Once an estrus event has been detected by the system, the web app will automatically record recent estrus detections and will show insemination status, Cow IDs, time of estrus, and estimated end time of estrus as shown on the figure below.

The screenshot shows the EZTECT web application dashboard. On the left sidebar, there are notifications for two cows: "Cow 3819 & Cow 2409-3 End of Estrus" and "Cow 1 & Cow 1229-1 End of Estrus". The main content area is titled "Recent Estrus Detection" and displays a table of detected events:

Status	Cow IDs	Time of Detection	End of Estrus (ETC)	Details
Urgent	3819 & 2409-3	21:48:03 17/8350	05:46:33 17/8350	Detail
Urgent	1&1229-1	22:20:20 849561	06:18:50 849561	Detail

Below this section is an "Update" button followed by tabs for "Confirm App Detection", "Record Manual Detection", "Insemination", "Pregnancy", and "Calving". The "Estrus Logs" section shows a single entry for cow 3819 on 2020-02-15 at 21:48:03 17/8350.

Figure 17: The Recent Estrus Detection Record

To view other relevant information of the cows with the actual photo of mounting instance of the cows involved, click on 'Detail' as shown below.

This screenshot is identical to Figure 17, but it includes a red arrow pointing from the text "click on 'Detail'" in Figure 17 to the "Detail" link in the "Recent Estrus Detection" table. The "Detail" link for the first row (cow 3819) is highlighted with a red box.

Figure 18: The Recent Estrus Detection Record – Details

RECENT ESTRUS DETECTION

The cows involved, and the capture photo during the estrus event were displayed, as shown below, for you to see and validate.

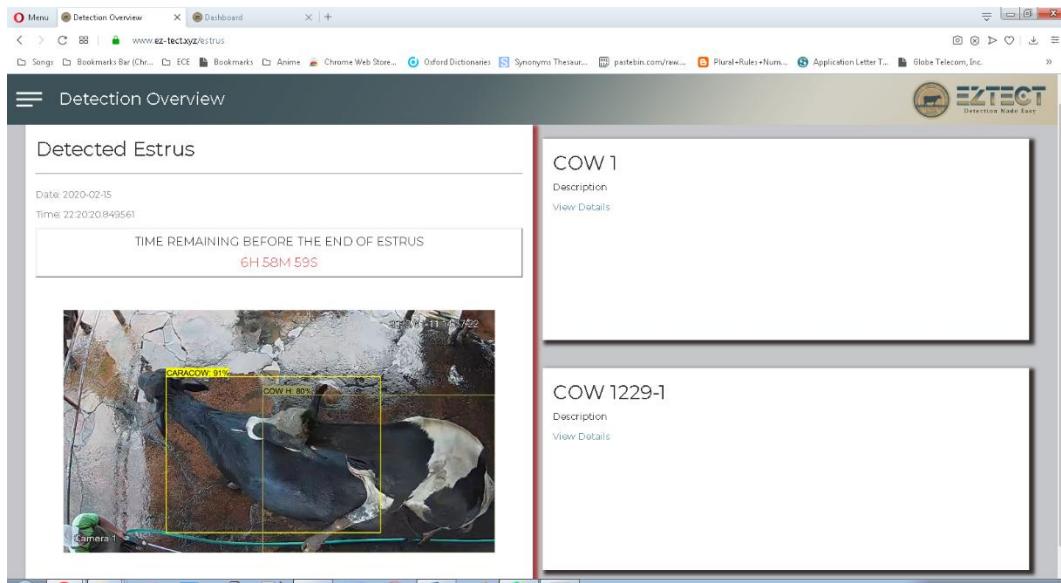


Figure 19: Detected Estrus

UPDATE

Once estrus is detected, you may check the results through the ‘Update’ section. You may choose from the “Confirm App Detection” Tab, the ‘Estrus Date’, ‘Cow ID (Top)’, ‘Cow ID (Bottom)’, and ‘Estrus’ containing the lists of Estrus Times and Cows involved as confirmation of the results by clicking the downward arrow. After entering the necessary information, click the ‘Submit’ button, as shown below.

Update

Confirm App Detection	Record Manual Detection	Insemination	Pregnancy	Calving
Estrus Date 2020-02-15 21:48:03.178350	Cow ID (Top) 3819	Estrus Yes	Cow ID (Bottom) 2409-3	Estrus Yes
<input type="button" value="Submit"/>				

Figure 20: Confirm App Detection

If the detection was incorrect and invalid, you may select the correct ‘Estrus Date’, ‘Cow ID (Top)’, and/ or ‘Cow ID (Bottom)’ by clicking the arrow. After entering the necessary information, click the ‘Submit’ button, as shown below.

Update

Confirm App Detection	Record Manual Detection	Insemination	Pregnancy	Calving
Estrus Date mm/dd/yyyy February, 2020	Cow ID (Top)	Cow ID (Bottom)		
<input type="button" value="Submit"/>				

Figure 21: Record Manual Detection

Once validated and confirmed, from the ‘Insemination’ tab, you may select the ‘Insemination Date’, ‘Insemination Type’ (whether Natural, Artificial, or Both techniques were administered), and the ‘Cow ID’s. In addition to that, the name of the person who did the insemination may be entered by typing in the name at the empty space below the ‘Administered By:’ section. After entering the necessary information, click the ‘Submit’ button, as shown below.

Update

Confirm App Detection	Record Manual Detection	Insemination	Pregnancy	Calving
Insemination Date mm/dd/yyyy	Insemination Type Natural	Cow ID 3819	Administered By: Enter Name	
<input type="button" value="Submit"/>				

Figure 22: Insemination

UPDATE

After the estrus cycle of the cows, you may select from the ‘Pregnancy’ tab the date of pregnancy of the recorded cows. After entering the necessary information, click the ‘Submit’ button, as shown below.

Update

Confirm App Detection	Record Manual Detection	Insemination	Pregnancy	Calving
Pregnancy Date	Cow ID			
<input type="text" value="mm/dd/yyyy"/>	<input type="text"/>			
<input type="button" value="Submit"/>				

Figure 23: Pregnancy

You may also select from the ‘Calving’ tab the ‘Calving Date’, ‘Calf ID’, and the ‘Mother Cow ID’. After entering the necessary information, click the ‘Submit’ button, as shown below.

Update

Confirm App Detection	Record Manual Detection	Insemination	Pregnancy	Calving
Calving Date	Calf ID	Mother Cow ID		
<input type="text" value="mm/dd/yyyy"/>	<input type="text" value="Calf Cow ID"/>	<input type="text"/>		
<input type="button" value="Submit"/>				

Figure 24: Calving

ESTRUS LOGS

In this particular section, you will see the report summary of the detected estrus events containing the confirmation of estrus and the record of insemination, as shown below.

The screenshot shows a web-based dashboard titled "Dashboard". On the left sidebar, under "Hello admin!", there are two entries: "Cow 3819 & Cow 2409-3 End of Estrus" with a duration of "5H 39M 23S" and "Cow 1 & Cow 1229-1 End of Estrus" with a duration of "6H 11M 40S". Below these entries are links for "Manage My Account", "Add User", and "Logout". The main content area is titled "Update" and contains tabs for "Confirm App Detection", "Record Manual Detection", "Insemination", "Pregnancy", and "Calving". The "Insemination" tab is active, displaying a table titled "Estrus Logs". The table has columns: Cow ID, Date, Time of Detection, Confirmed, and Inseminated. The data is as follows:

Cow ID	Date	Time of Detection	Confirmed	Inseminated
3819	2020-02-15	21:48:03.878350	Yes	Yes
2409-3	2020-02-15	21:48:03.178350	Yes	Yes
1	2020-02-15	22:20:20.849561	Yes	-
1229-1	2020-02-15	22:20:20.849561	Yes	-

Below the table, there is a section titled "Upcoming on Calendar" with a red circular icon containing a white bell symbol.

Figure 25: Estrus Logs

UPCOMING ON CALENDAR

In this particular section, you may save a date to do a certain task in mind. The estimated estrus time will also be recorded in this section.

To create an event (task):

1. Click a date. In this example, February 18 is selected as shown below.

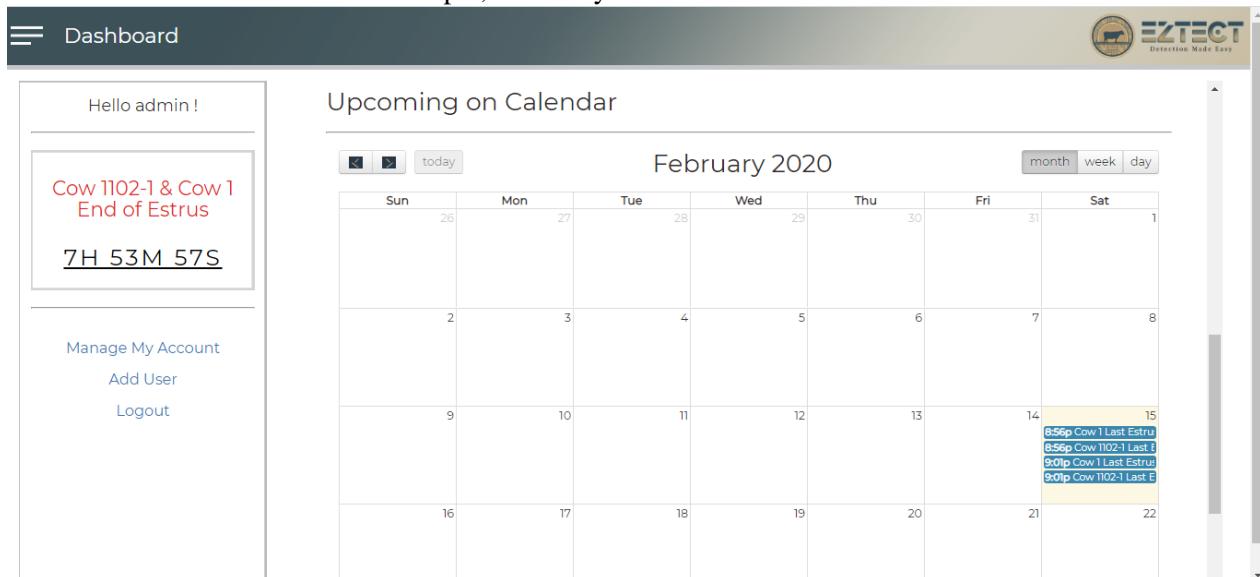


Figure 26: Date Selection

2. A pop-up flash message will appear on your screen where you could type-in the 'Event Title' of your choice then click the 'Ok' button. Refer to the figure below.

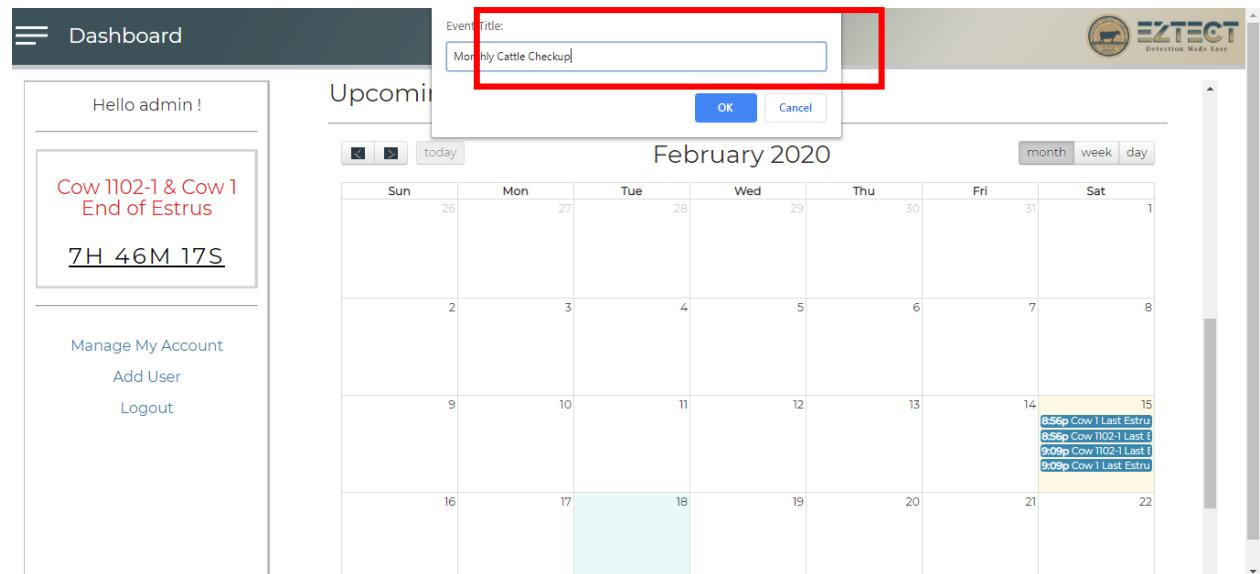


Figure 27: Entering an Event Title

UPCOMING ON CALENDAR

3. As shown in the figure below, an event is saved at February 18, 2020.

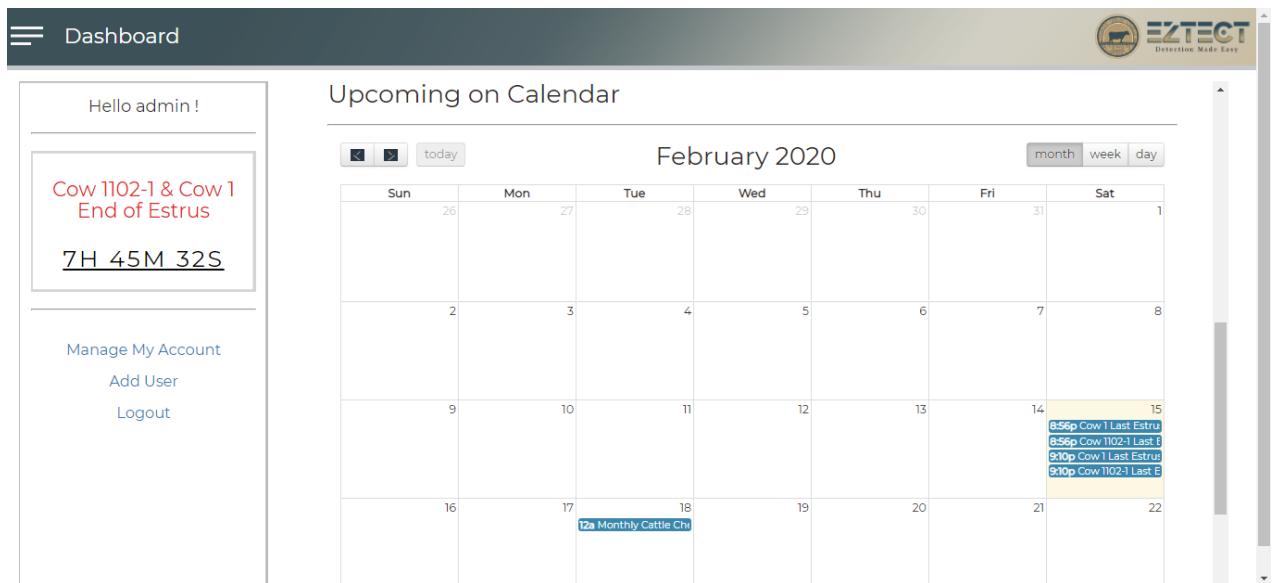


Figure 28: Saved Calendar Event

CATTLE INVENTORY

In this particular section, you can see the dairy cattle inventory being observed on your barn. If you wish to add more cows on the detection system, click the ‘+’ button as shown below. Then, contact the Administrators to render additional slots for estrus detection.

BULL	COW	CALVES	OTHER
1	17	0	1

Cow ID	Breed	Gender/Status	Details	Action
1102-I	Holstein-Sahiwal	Bull/	Details	Remove
1	Local	CaraCow/Milking	Details	Remove
3819	Imported NZ	Cow/Milking	Details	Remove
2409-3	Holstein-Sahiwal	Cow/Milking	Details	Remove
485-3	Holstein-Sahiwal	Cow/Milking	Details	Remove
2264-2	Holstein-Sahiwal	Cow/Milking	Details	Remove
4030-2-2	Holstein-Sahiwal	Cow/Milking	Details	Remove
1000-I	Holstein-Sahiwal	Cow/Milking	Details	Remove
7021-2	Holstein-Sahiwal	Cow/Milking	Details	Remove

+

Figure 29: Cattle Inventory Catalog

To remind you of your cattle statuses, click the ‘Details’ as shown below.

BULL	COW	CALVES	OTHER
1	17	0	1

Cow ID	Breed	Gender/Status	Details	Action
1102-I	Holstein-Sahiwal	Bull/	Details	Remove
1	Local	CaraCow/Milking	Details	Remove
3819	Imported NZ	Cow/Milking	Details	Remove
2409-3	Holstein-Sahiwal	Cow/Milking	Details	Remove
485-3	Holstein-Sahiwal	Cow/Milking	Details	Remove
2264-2	Holstein-Sahiwal	Cow/Milking	Details	Remove
4030-2-2	Holstein-Sahiwal	Cow/Milking	Details	Remove
1000-I	Holstein-Sahiwal	Cow/Milking	Details	Remove
7021-2	Holstein-Sahiwal	Cow/Milking	Details	Remove

+

Figure 30: Cow Details-Button

CATTLE INVENTORY

Once clicked, you will be directed at your chosen cow, and a Cow Information Window will be prompted to show you the cow's photo, gender/status, last detected estrus, next estrus (estimated), and its physical characteristics. Refer to the figure below.

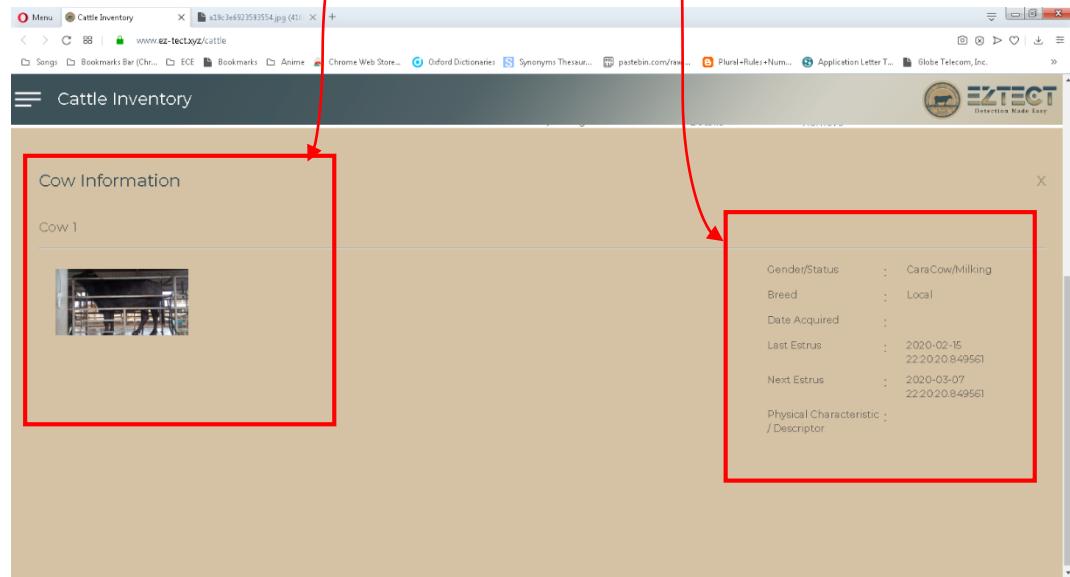


Figure 31: Cow Information Window

ANALYTICS AND REPORTS

In this particular section, you will initially see the Annual Performance Report which contains the performance report between manual and automated detection of estrus, the pregnancy and calving rates, and insemination records of the cows as shown on the figures below.

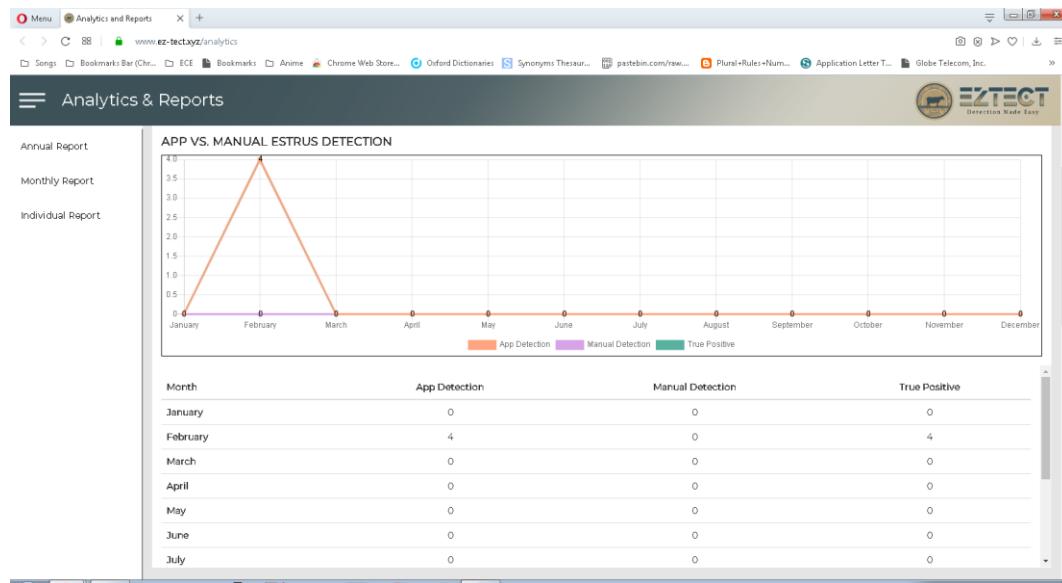


Figure 32: Annual Performance Report: APP VS. MANUAL ESTRUS DETECTION

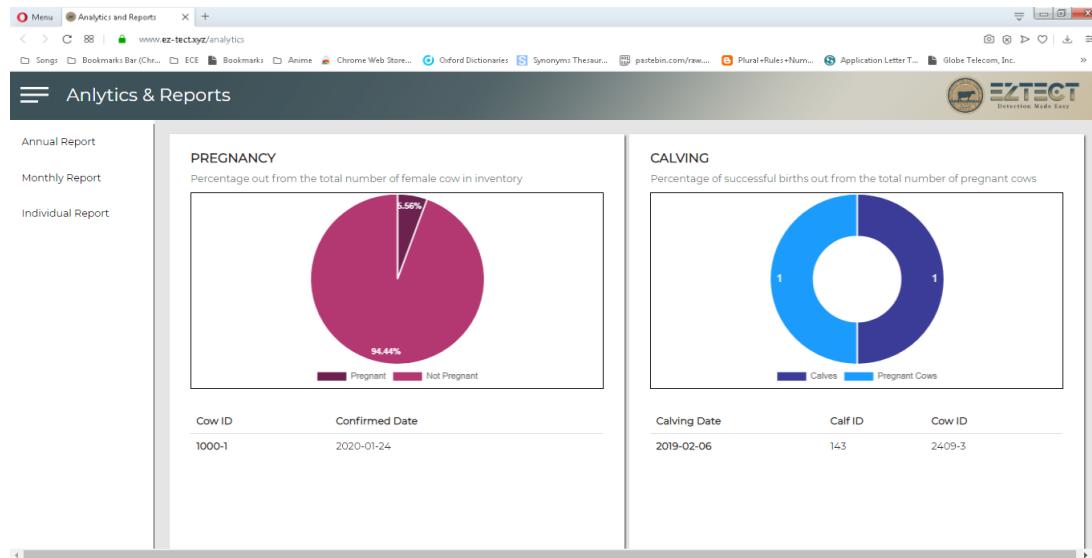


Figure 33: Annual Performance Report: PREGNANCY AND CALVING Rate Charts

ANALYTICS AND REPORTS

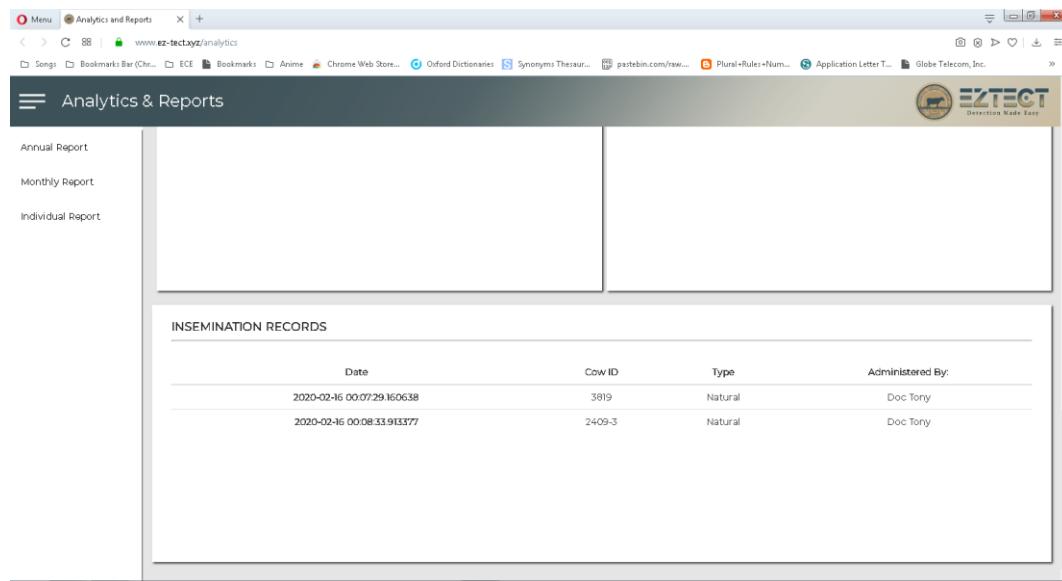


Figure 34: Annual Performance Report: INSEMINATION RECORDS

To analyze and see the details and information plotted by the charts and graphs, just drag in your cursor on the respective area needed for further investigation. Refer to the figure below.

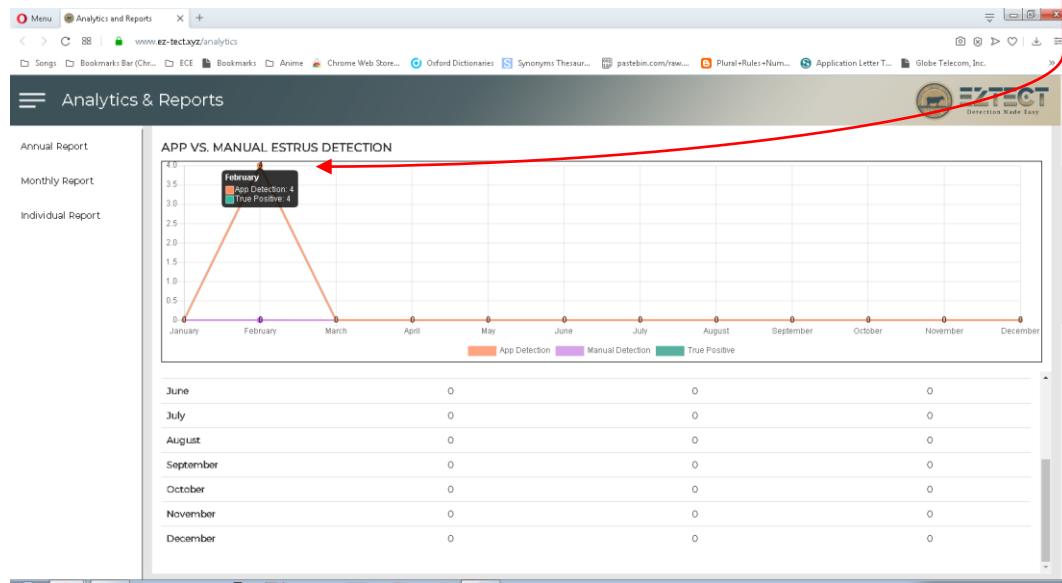


Figure 35: Checking Graphs and Charts in detail

ANALYTICS AND REPORTS

To access the monthly performance reports, click on the ‘Monthly Report’ button on the left side of your screen, as shown below.

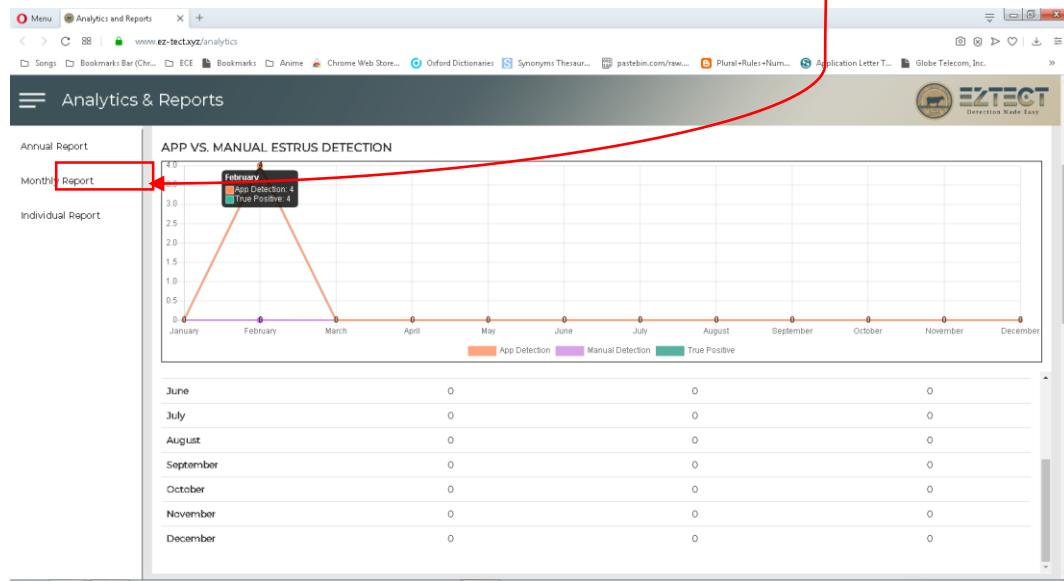


Figure 36: Monthly Report – Button

Then, you will be directed to the Monthly Performance Report window, similar to the figure shown below. In this particular section, you can see the monthly estrus activities, the expected date and time of estrus after 21 (twenty-one) days of detection with the plus-minus tolerance of 3 (three) days for, and similar with the annual side, the insemination records of the cows. Refer to the figures shown on this page and the succeeding one.

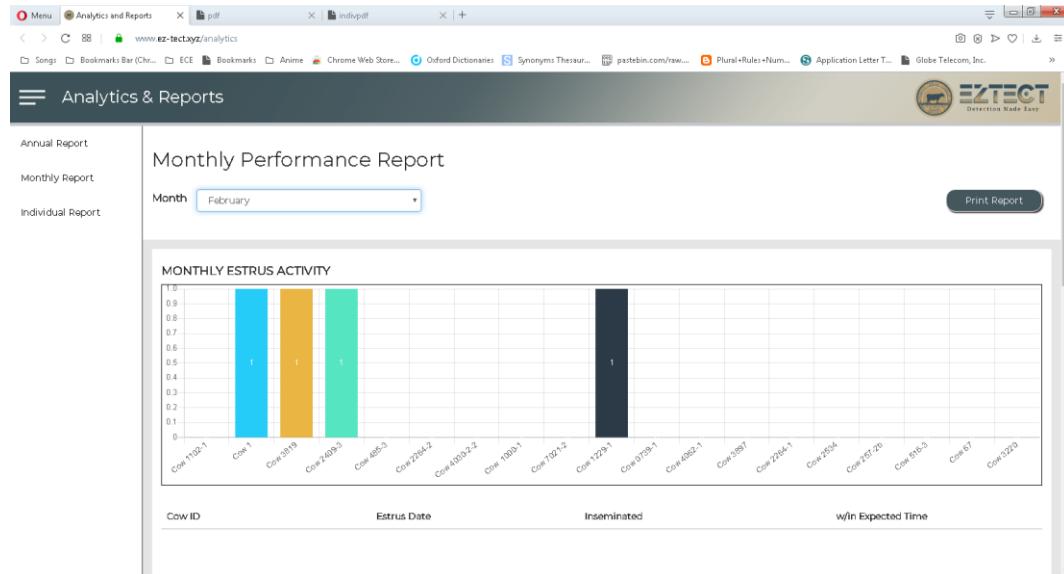


Figure 37: Monthly Performance Report: MONTHLY ESTRUS ACTIVITY

ANALYTICS AND REPORTS

The screenshot shows a web-based analytics and reporting application. On the left, a sidebar menu includes 'Annual Report', 'Monthly Report', and 'Individual Report'. The main content area displays two tables: 'EXPECTED ESTRUS' and 'INSEMINATION RECORDS'.

EXPECTED ESTRUS

Cow ID	Date (21 Days)	Early (-3Days)	Late (+3Days)
3819	2020-03-07	2020-03-04	2020-03-10
2409-3	2020-03-07	2020-03-04	2020-03-10
1	2020-03-07	2020-03-04	2020-03-10
I229-I	2020-03-07	2020-03-04	2020-03-10

INSEMINATION RECORDS

Date	Cow ID	Type	Administered By:
2020-02-16 00:07:29.160638	3819	Natural	Doc Tony
2020-02-16 00:08:33.913377	2409-3	Natural	Doc Tony

Figure 38: Monthly Performance Report: EXPECTED ESTRUS & INSEMINATION RECORDS

ANALYTICS AND REPORTS

To access the individual cattle reports, click on the ‘Individual Report’ button on the left side of your screen, as shown below.

The screenshot shows a web browser window titled 'Analytics & Reports'. On the left sidebar, there are three report options: 'Annual Report', 'Monthly Report', and 'Individual Report'. A red box highlights the 'Individual Report' button. The main content area displays two tables: 'EXPECTED ESTRUS' and 'INSEMINATION RECORDS'. The 'EXPECTED ESTRUS' table lists cows by ID, their expected estrus date (21 days from now), and early and late dates relative to the expected date. The 'INSEMINATION RECORDS' table lists insemination dates, cow IDs, types, and administered by. The EZTECT logo is visible in the top right corner.

Figure 39: Individual Report – Button

Then, you will be directed to the Individual Cattle Report window, similar to the figure shown below. In this particular section, you can see the individual estrus activities, pregnancy and calving records, and insemination records of the cows. Refer to the figures shown on this page and the succeeding one.

The screenshot shows the 'Individual Cattle Report' window. On the left, there is a sidebar with 'Annual Report', 'Monthly Report', and 'Individual Report' buttons. The main area has a 'Cow ID' dropdown set to '1229-1' and a 'Print Report' button. Below this is the 'INDIVIDUAL ACTIVITY REPORT' chart, which is a line graph showing activity levels from January to December. A sharp peak is visible in February, and a small red bar at the bottom indicates a 'Standing Heat'. At the bottom of the screen, there is a 'INSEMINATION RECORDS' section.

Figure 40: Individual Cattle Report: INDIVIDUAL ACTIVITY REPORT

ANALYTICS AND REPORTS

The screenshot shows a web-based application titled "Analytics & Reports" from the "EZTEC" platform. The interface is organized into several sections:

- Left Sidebar:** Includes links for "Annual Report", "Monthly Report", and "Individual Report".
- Insemination Records:** A table with columns "Date", "Cow ID", "Type", and "Administered By". It lists two entries: one for 2020-02-16 at 00:07:29 with Cow ID 3819 and Type Natural, Administered by Doc Tony; another for 2020-02-16 at 00:08:33 with Cow ID 2409-3 and Type Natural, Administered by Doc Tony.
- Pregnancy Records:** A table with columns "Cow ID" and "Confirmed Date". It currently has no data.
- Calving Records:** A table with columns "Calving Date", "Calf ID", and "Cow ID". It currently has no data.

Figure 41: Individual Cattle Report: PREGNANCY RECORDS and CALVING RECORDS

ANALYTICS AND REPORTS

To download and print either the Annual Performance, Monthly Performance, and Individual Report of your choice:

1. Click the ‘Print Report’ button as shown below.

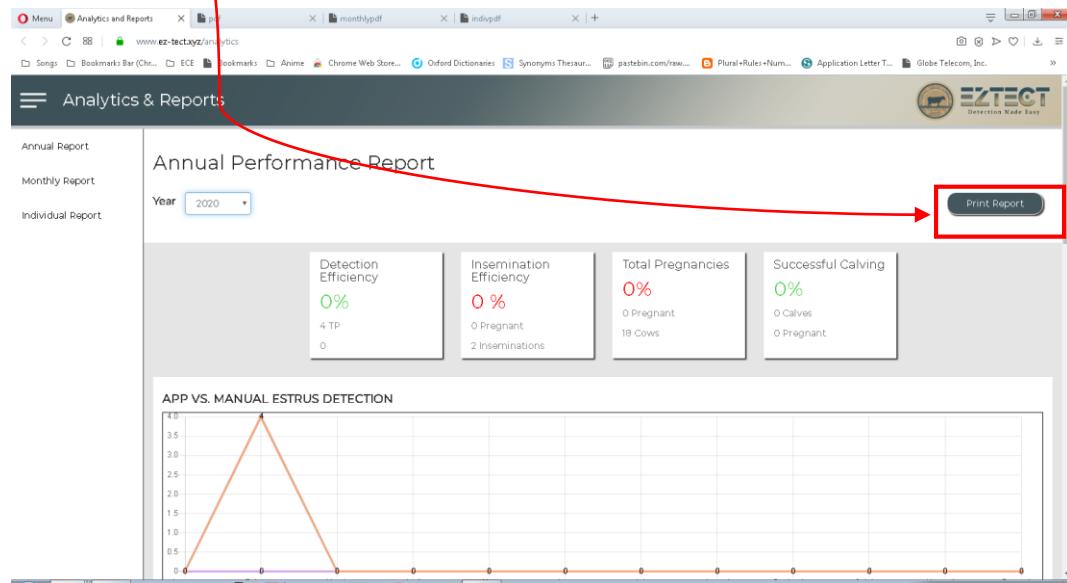


Figure 42: Print Report- Button

2. Click the download icon, and wait until it the download process is done. Refer to the figure shown below.

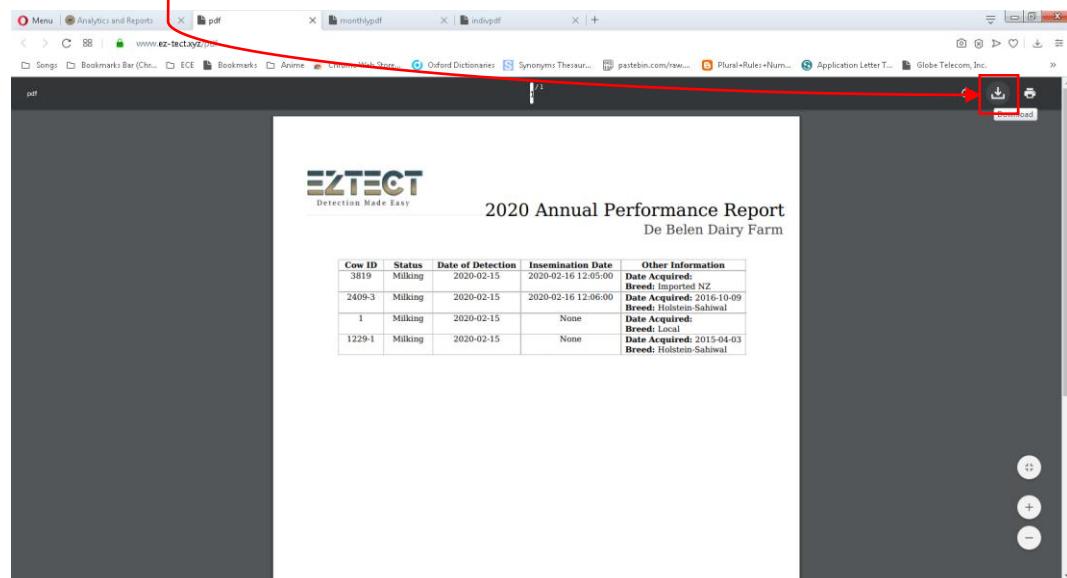


Figure 43: PDF Download

LOCATOR

In this particular section, you can view your current location and your estimated travel time from the current location to the registered farm location. With this, you can make better decisions on the administering of natural/artificial insemination of in-heat cows.

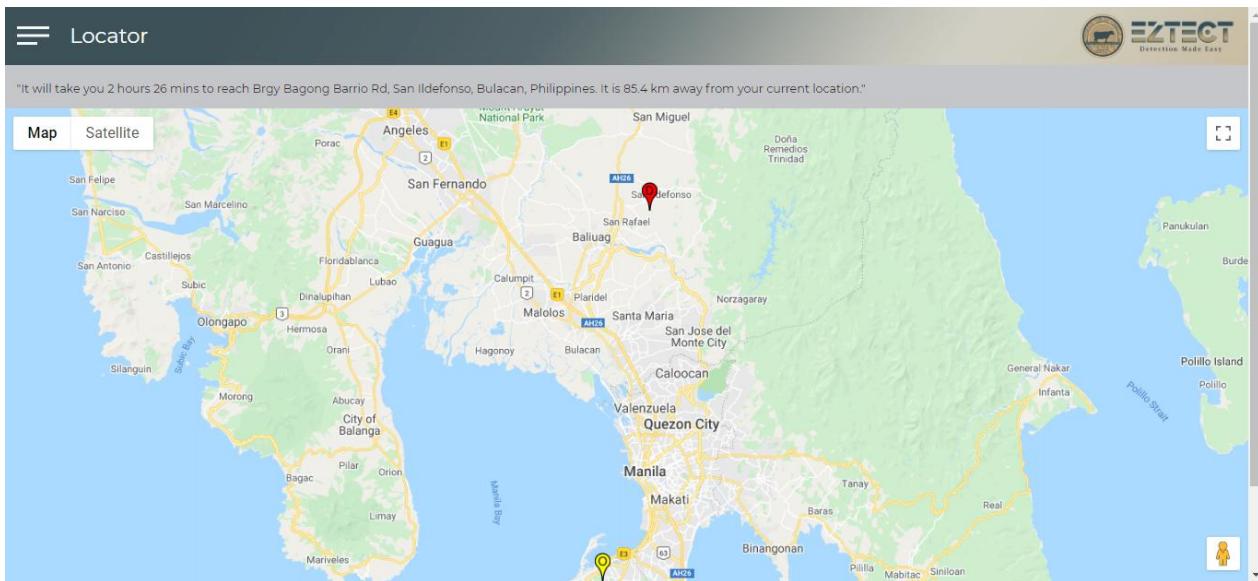


Figure 44: Locator (Geolocation)

As shown on the figure above, an estimated time of arrival (ETA) of '2 hours 26 mins' to reach the destination is pre-calculated considering normal traffic conditions for your guide.

LIVEVIEW - MOONITOR

To select a camera, click the downward arrow as shown below. A list of cameras will be dropped down. You may choose among three camera options to use.

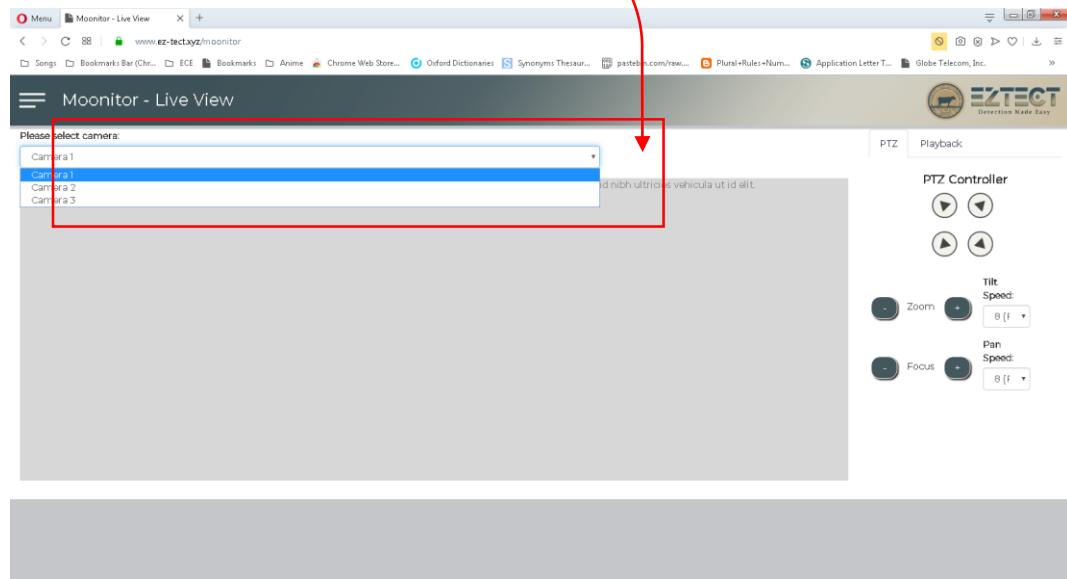


Figure 45: LiveView-SELECTING CAMERA

To control the selected camera, just click on any multi-directional arrows on the right side of the screen. You may also zoom-in or zoom-out the camera, and define its tilt and pan speed for your preference.

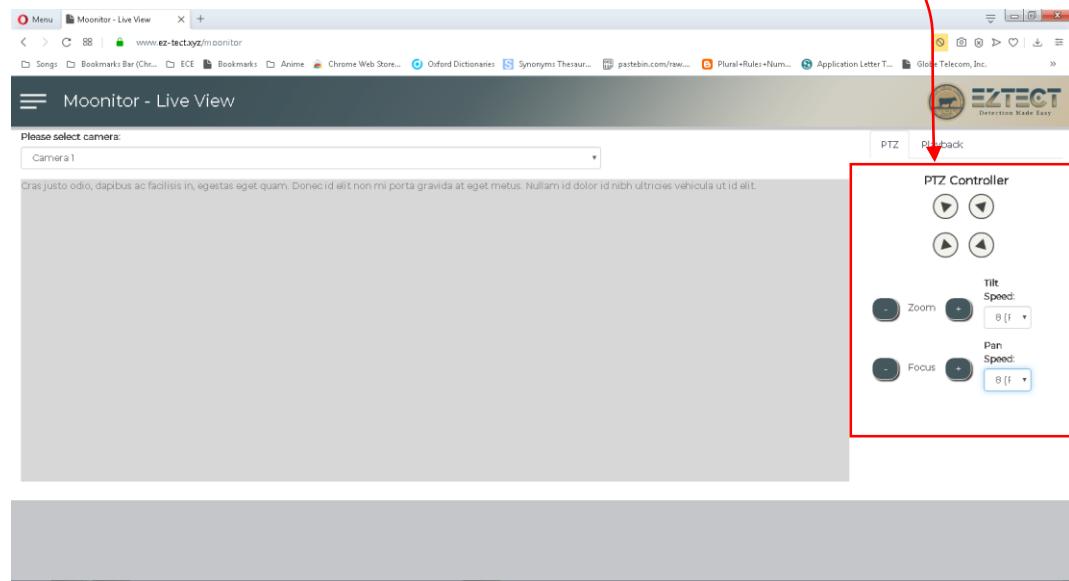


Figure 46: LiveView-PTZ CONTROLLER, ZOOM, & PAN and TILT SPEED

SUPPORT

For inquiries and concern, refer to the support point of contact tabulated below.

Contact	Email	Role
Engr. Nilo M. Arago	nilo_arago@tup.edu.ph	Founder and Project Lead
Chris I. Alvarez	chris.alvarez@tup.edu.ph	Web Developer and Arduino Programmer
Charl G. Legista	charl.legista@tup.edu.ph	Web Designer and Network Programmer
Angelita G. Mabale	angelita.mabale@tup.edu.ph	Web Developer
Nicole E. Repiso	nicole.repiso@tup.edu.ph	Web Developer
Rodney Rafael A. Robles	rodneyrafael.robles@tup.edu.ph	Project Manager, and Machine Learning Developer

Table 1: Support Point of Contact

APPENDIX E

Specifications

DAHUA 4MP 4x PTZ Network Camera (DH-SD22404T-GN)



Figure 1: The Pan-tilt-zoom camera

Specifications:

Camera

Image Sensor:	1/3" CMOS
Effective Pixels:	2592(H) x 1520(V), 4 Megapixels
RAM/ROM:	256M/128M
Electronic Shutter Speed:	1/1s~1/30,000s
Scanning System:	Progressive
Minimum Illumination:	Color: 0.05Lux @F1.6; B/W: 0.005Lux @F1.6
S/N Ratio:	More than 50dB

Lens

Focal Length:	2.7mm~11mm
Max. Aperture:	F1.6 ~ F2.8
Angle of View:	H: 112.5° ~ 30°
Optical Zoom:	4x
Focus Control:	Auto/Manual
Close Focus Distance:	100mm~ 1000mm

PTZ

Pan/Tilt Range:	Pan: 0° ~ 355°; Tilt: 0° ~ 90°
Manual Control Speed:	Pan: 0.1° ~100° /s; Tilt: 0.1° ~60° /s
Preset Speed:	Pan: 100° /s; Tilt: 60° /s
Presets:	300
PTZ Mode:	5 Pattern, 8 Tour, Auto Pan ,Auto Scan

Video

Compression:	H.265/H.264
Streaming Capability:	3 Streams
Resolution:	4M (2592×1520)/3M(2304×1296)/1080P (1920×1080)/720P(1280×720)/D1(704×576/704×480)/CIF(352×288/352×240) Main stream: 4M/3M/1080P/ 1.3M/720P(1~25/30fps)
Frame Rate:	Sub stream1: D1/CIF(1~25/30fps) Sub stream2: 720P/D1/CIF(1~25/30fps)
Bit Rate Control:	CBR/VBR
Bit Rate:	H.265/H.264: 448K ~ 8192Kbps
Day/Night:	Auto(ICR) / Color / B/W
Backlight Compensation:	BLC / HLC / WDR (120dB)
White Balance:	Auto, ATW, Indoor, Outdoor, Manual
Gain Control:	Auto / Manual
Noise Reduction:	Ultra DNR (2D/3D)
Motion Detection:	Support
Region of Interest:	Support
Electronic Image Stabilization (EIS):	N/A
Defog:	Support
Digital Zoom:	16x
Flip:	180°
Privacy Masking:	Up to 24 areas

Network

Ethernet:	RJ-45 (10XBase-T/100Base-TX)
Wi-Fi:	N/A
Protocol:	IPv4/IPv6, HTTP, HTTPS, SSL, TCP/IP, UDP, UPnP, ICMP, IGMP, SNMP, RTSP, RTP, SMTP, NTP, DHCP, DNS, PPPOE, DDNS, FTP, IP Filter, QoS, Bonjour, 802.1x
Interoperability:	ONVIF Profile S&G, API
Streaming Method:	Unicast / Multicast
Max. User Access:	20 users

Edge Storage:	NAS (Network Attached Storage), Local PC for instant recording, Micro SD card 256GB
Web Viewer:	IE, Chrome, Firefox, Safari
Management Software:	Smart PSS, DSS, DMSS
Smart Phone:	IOS, Android

Electrical

Power Supply:	DC 12V/1.5A, PoE(802.3af)
Power Consumption:	10W

Environmental

Operating Conditions:	-30°C ~ 60°C (-22°F ~ +140°F) / Less than 95% RH
Ingress Protection:	IP66
Vandal Resistance:	IK10

Construction

Casing:	Metal
Dimensions:	Φ122 (mm)*89 (mm)
Net Weight:	0.66kg(1.46lb)
Gross Weight:	0.71kg(1.57lb)

Dahua Network Video Recorder
(DHI-NVR4816/4832-16P-4KS2)



Figure 2: The Network Video Recorder (NVR)

Specifications:

System

Main Processor:	Quad-core embedded processor
Operating System:	Embedded LINUX

Audio and Video

IP Camera Input:	16/32 Channel
Two-way Talk:	1 Channel Input, 1 Channel Output, RCA

Display

Interface:	1 HDMI, 1 VGA
Resolution:	HDMI: 3840×2160, 1920×1080, 1280×1024, 1280×720 VGA: 1920×1080, 1280×1024, 1280×720
Decoding Capacity:	2ch@4K 30fps, 8ch@1080P 30fps
Multi-screen Display:	16CH: 1/4/8/9/16 32CH: 1/4/8/9/16/25/36
OSD:	Camera title, Time, Video loss, Camera

Recording

Compression:	Smart H.265+/H.265/Smart H.264+/H.264
Resolution:	8Mp/ 6Mp/ 5MP/ 4MP/ 3MP/ 1080P/ 1.3MP/ 720P etc.
Record Rate:	200Mbps
Bit Rate:	16Kbps ~ 20Mbps Per Channel
Record Mode:	Manual, Schedule (Regular, Continuous), MD (Video detection: Motion Detection, Tampering, Video Loss), Stop
Record Interval:	1 ~ 120 min (default: 60 min), Pre-record: 1 ~ 30 sec, Post-record: 10 ~ 300 sec

Playback and Backup

Playback:	1/4/9/16
Search Mode:	Time /Date, MD and Exact Search (accurate to second), Smart search
Playback Function:	Play, Pause, Stop, Rewind, Fast play, Slow Play, Next File, Previous File, Next Camera, Previous Camera, Full Screen, Backup Selection, Digital Zoom
Backup Mode:	USB Device/Network

Network

Interface:	1 RJ-45 Port(10/100/1000Mbps)
PoE:	16 ports (IEEE802.3af/at)
Network Function:	HTTP, HTTPS, TCP/IP, IPv4/IPv6, UPnP, RTSP, UDP, SMTP, NTP, DHCP, DNS, IP Filter, PPPoE, DDNS, FTP, SNMP, IP Search (Support Dahua IP camera, DVR, NVS, etc.), Easy4ip
Max. User Access:	128 users
Smart Phone:	iPhone, iPad, Android
Interoperability:	ONVIF 2.4, SDK, CGI

Storage

Internal HDD:	8 SATA III Ports, Up to 6 TB cap. Per HDD
---------------	---

Electrical

Power Supply:	AC100V ~ 240V, 50 ~ 60 Hz
Power Consumption:	NVR: <13.7W (Without HDD)
	PoE: Max 25.5w for single port,

Environmental

Operating Conditions:	-10°C ~ +55°C (+14°F ~ +131°F), 86 ~ 106kpa
Storage Conditions:	-20°C ~ +70°C (-4°F ~ +158°F), 0 ~ 90% RH

Construction

Dimensions:	17.3(in)*17.7(in)*3.7(in)
Weight:	9.5kg(20.9 lb)(without HDD)

HP Elitebook 8470p

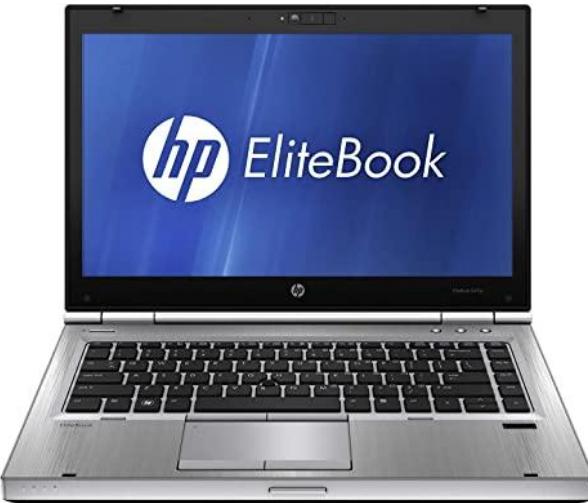


Figure 3: The System Unit

Specifications:

Processor:

Type: 3rd Generation Intel Core i7-3720QM
Speed: @ 2.60GHz (8 CPUs), ~2.6GHz

Graphics:

Integrated: Intel HD Graphics 4000
Discrete: AMD Radeon HD 7570M, with 1GB dedicated GDDR5 video memory

Display

Internal: 14.0-inch diagonal LED-backlit HD+ 16:9 anti-glare (1600 x 900)
External: Up to 32-bit per pixel color depth

Storage and Drives

Hard drive: 500GB 7200 rpm SMART SATA II
Solid State Drive: SATA 6 Gb/s 256 GB SED Solid State

Optical Drive

Support: CD, DVD, DVD-R

Memory

Standard: Standard memory up to 8192MB

Networking/Communications

Wireless:	Integrated WLAN and WWAN options
Broadband Wireless:	HP hs2350 HSPA+ Mobile Broadband module
Communications:	Integrated Intel 82579LM Gigabit network connection

Audio/Multimedia

Audio:	Stereo Speakers
Webcam:	Video capture at 1280 x 720 resolution and up to 30 f/s

Electrical

Power Supply:	External 90 W HP Smart AC adapter for models with discrete graphics and models with integrated graphics with quad-core processor; HP 9-cell Lithium-Ion battery (100 WHr)
Primary Battery:	

Ports

Available ports:	(1) VGA; (1) Microphone port; (1) Headphone port; (1) RJ-45 (Ethernet); (1) RJ-11 (Modem); (2) USB 3.0; (1) USB 2.0; (1) Batter Connector
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Construction

Dimensions:	13.31(in)*9.11(in)*1.34(in)
Weight:	2.25 kg (4.95 lb) with DVD-ROM drive

ASUS RT-N12 Wi-Fi Router



Figure 4: The Wi-Fi Router

Specifications:

Networking/Communications

Interface Type:	(1) WAN Port and (4) LAN ports
Antenna:	(2) 5dbi Antennas
Operating Frequency:	2.4GHz
Data Rate	802.11b : 1, 2, 5.5, 11Mbps 802.11g : 6,9,12,18,24,36,48,54Mbps 802.11n : up to 300Mbps
Encryption:	64/128-bit WEP
Management:	Quality of Service; DHCP Server; Web-based administration; System event log; Parental control; Guest network; IPTV Support; IPv6

Electrical

Power Supply:	AC Input: 100V~240V(50~60Hz) DC Output: 5 V with max. 1.0 A current
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Construction

Dimensions:	146(mm)*111(mm)*28(mm) (WxDxH)
Weight:	168.9g

Arduino UNO Rev3



Figure 5: The Arduino UNO R3

Device Specifications:

Microcontroller:	ATmega328P
Operating Voltage:	5V
Input Voltage (recommended):	7-12V
Input Voltage (limit):	6-20V
Digital I/O Pins:	14 (of which 6 provide PWM output)
PWM Digital I/O Pins:	6
Analog Input Pins:	6
DC Current per I/O Pin:	20 mA
DC Current for 3.3V Pin:	50 mA
Flash Memory:	32 KB (ATmega328P) of which 0.5 KB used by bootloader
SRAM:	2 KB (ATmega328P)
EEPROM:	1 KB (ATmega328P)
Clock Speed:	16 MHz
LED_BUILTIN:	13

Construction

Dimensions:	68.6(mm)*53.4(mm) (LxW)
Weight:	25g

GSM Module (SIM800L)



Figure 6: The GSM Module

Specifications:

Networking/Communications

Frequency Bands	Quad-band: GSM850, EGSM 90, DCS 1800, PCS 1900
Transmitting Power	Class 4 (2W) and Class 1(1W)
GPRS Connectivity	GPRS multi-slot class 12
Data GPRS	GPRS data downlink transfer: 85.6 kbps; GPRS data uplink transfer: 85.6 kbps; Uses Coding schemes: CS-1,CS-2,CS-3,CS-4
SMS	MT, MO, CB, Text and PDU mode; Uses SIM Card as the SMS Storage Supports SIM cards: 1.8V and 3V
SIM Interface	Antenna Pad
External Antenna	Supports RTC
Real time clock	Uses AT command set
Timing Functions	

Audio

Speech codec modes:	Half-rate (ETS 0.6.20); Full-rate (ETS 0.6.10); Enhanced Full Rate (ETS 06.50/06.60/06.80); Echo Cancellation; Noise Suppression;
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Serial Port and Debug port

Serial Port:	Rate (1200bps ~ 115200bps); Can be used for AT commands; Support RTS/CTS hardware handshake and software ON/OFF flow control; Multiplex ability according to GSM 07.10 multiplexer protocol USB_DM and USB_DP
Debug Port:	

Electrical

Power Supply:	3.4V ~ 4.4V
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Construction

Dimensions:	15.8(mm)*17.8(mm)*2.4(mm)
Weight:	1.35g

HUAWEI 4G Router B315



Figure 7: The Prepaid Wi-Fi Router

Specifications:

Networking/Communications

Network bandwidth	150Mbps DL / 50Mbps UL
Transmission Standard	802.11b/g/n
Wireless Frequency band	32
Antenna	(2) SMA

Electrical

Power Supply:	AC Input: 100V~240V(50~60Hz) DC Output: 5 V with max. 1.0 A current
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Construction

Dimensions:	139(mm)*186(mm)*46 (mm) (W*H*D)
Weight:	275g

APPENDIX F

Certification of Proofreading

C E R T I F I C A T I O N

This is to certify that the project study entitled, **EZTECT: AUTOMATED ESTRUS DETECTION SYSTEM FOR DAIRY CATTLE BASED ON FASTER R-CNN WITH SURVEILLANCE AND NOTIFICATION SYSTEM VIA INTERNET OF THINGS (IOT)** written by the following undergraduate students from Technological University of the Philippines, College of Engineering – Department of Electronics Engineering namely *Alvarez, Chris I., Legista, Charl G., Mabale, Angelita G., Repiso, Nicole E., and Robles, Rodney Rafael A.* was proofread, edited, and revised.

This certification is being issued upon the request of the aforementioned names in partial fulfillment of their course requirements for the degree of Bachelor of Science in Electronics Engineering.

Issued on this 9th day of November 2020.

Certified by:


Mr. John George P. Pastor, LPT, MAELEd(c)

Extended Essay Coordinator
International Baccalaureate Diploma Programme
Southville International School and Colleges