PAMANTASAN NG LUNGSOD NG MUNTINLUPA

FACIAL POINTS PREDICTION OF MISSING PERSON THROUGH IMAGE PROCESSING

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CHAPTER 1

PAMANTASAN NG LUNGSOD NG MUNTINLUPA

INTRODUCTION

Face recognition through image processing is a computer-based method that utilizes an algorithm to identify or detect human faces, so this method is highly relevant to the specific problem of identifying the faces of missing children in the mall. Although there are many various facial recognition types of algorithms, many projects use edge or eye detection to identify a face, however, in this project, research teams decided on conducting CNN with many more facial points to find the missing person's face with high accuracy. Not only does image processing face recognition encounter a face, but too many algorithms also prove to the viewer the accurate image spot of the face inside the illustration, helping people find a specific face in a populated and poorly defined image.

In the entertainment world, facial recognition is being used for detecting the face in motion tracking, which is used for extra accurate animation, but similarly to the entertainment industry, researcher teams use facial recognition to help easily find the missing children in the future. Aside from locating a face, this recognition CNN algorithm basically shows the face's precise image location. In most users, particularly indecent pictures with a clearly visible face, this is not an issue. Recognizing the perfect image position can help users find and verify the identity of a child who was born years ago when searching through identifying the details of faces and clear images.

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Background of the Study

Each year, a growing number of children are separated from their families. This commonly happens in malls, restaurants, parks, and other crowded areas. The child, on the other hand, is confused since they are unfamiliar with the place, and the mall is just too huge for a young child. Because shoppers are not paying attention to their kids, some of them get separated from their families. The first instance is when the parents are busy shopping but the kids explore outside of a store. The second aspect is that while parents are concentrating on playing within the mall, they are unaware of what is going on with their children.

The fact of lost children is difficult to grasp. The statistics that accompany this situation are hard to analyze, as well as the reasons why children become missing, are frequently different. Approximately 24,584 kids have gone missing between 2017-2018. The Federal Bureau of Investigation received 36,676 reports of lost kids in 2019. Even though this is a huge reduction from the 18,228 observed in 2016, it does not make the situation any less concerning. Through this data, the researchers understand that accidents like this could be sometimes inevitable since a child's brain maturity is not yet fully developed. This is why the primary focus of this study is targeted at young people aged 3-10years old.

Statement of the Problem

The researchers conduct a further study in Festival Mall with Missing rates of Children to discover the causes for their ongoing rise. Some of the following problems were:

1. Some children are homeless after their parents' child goes missing years ago.

2. Lack of care and supervision to young kids is unable to distinguish between what is good and wrong. They wouldn't know which path to follow if they were stranded in an unknown area.

3. When children are separated from their parents, they are unsure of where to turn for help.

4. Not all children have cell phones or are familiar with using smartphones, they do not know how to contact their parents if they become separated.

5 Children are not good enough to become familiar with places such as malls, parks, crowded people, and other establishments.

Objective of the Study

The general aim of the study is to develop a mobile device that helps to identify the facial points of children that can help to increase the accuracy of finding missing children in Malls. These are the specific objectives of the studies:

1. To help the missing person's relatives by providing a basic description and identification

2. To produce an accurate report of the data for references of facial points missing Children.

3. To reduce the number of misidentifications of missing children.

4. To create a faster process of disseminating accurate information to the authorities.

5. To lessen the time consumed looking for missing children.

Significance of the Study

The importance of the study is to create an application that collects detailed information about eyeball color, skin color, and type of nose as well as other basic information using face recognition and image processing using CNN algorithms.

This will improve the Security management of missing children in the Festival mall of Alabang.

This study will benefit the Security Department in every mall in Muntinlupa City for having fast and reliable facial points detection of a missing person. It will support the institution with highly relevant information that will help to collect factual evidence to reduce poor percentages detection in facial points of a missing person.

This study may also help Security Department in every mall in Muntinlupa City to increase their understanding and information to recognize missing children's facial points for a clear objective in more efficient, accurate, and exact outcome from data mining, specifically Accuracy with image processing and CNN algorithms.

The residents of Muntinlupa city can be assured that they have a system that can help to find and locate their children in case they lost their child inside the mall using this platform by identifying the face of the target, the researchers make sure that the municipality of Muntinlupa can benefit most especially in crowded people, malls and other events place.

Scope and Limitations

The study aims to develop a system that can easily identify and recognize the facial points of a missing person. This application involves making a mobile

program that uses facial recognition technology for detection and identification. The system provides the following functions in extracting information that comes from the raw data through a survey.

The only users of the applications are the guards who are in charge of the public establishment. The system's face recognition will help the investigator to have a lead on the incident or case and it has more accuracy in finding a missing person. The system only renders a frontal view of the face, if the image is blurry or not, the application does not render multiple face detection, even side views can not continue in rendering the image.

The picture must be in the correct position that will show on the screen to have a guide if the face is in the proper position and ready to scan. The background of the image does not cause any error because it only focuses on the frontal face of the subject. The picture can be from the camera or from the files of the mobile device. The system only accepts the file formats .jpeg (JPG Files) & .png (Portable Network Graphics). The information on the facial points of the image can be printed if needed and can share exclusively with the person who is finding it. The facial points that the system will render are the type of nose, eye color and skin color. The application can only use on android platforms and can be available in IOS in the future. The application also shows the percentage of how accurate the picture is. The application will be relevant to the community because it can help malls security to

lessen the time of finding a missing person in a vast crowd and page the facial information.

Definition of Terms

Accuracy - Is how near or far off a particular collection of measurements is from its real value, whereas precision is how close or distant the measurements are to one another.

Algorithm - A technique for performing a mathematical problem (such as determining the highest common factor) in a couple of steps that frequently require an implementation recurrence.

Facial Points - Also known as the primary emphasis. Optics. either of two locations on the axis of a mirror, lens, or another optical system, one of which causes rays diverging from it to deviate parallel to the axis upon refraction or reflection by the system, and the other of which causes rays parallel to the axis to converge to the point upon refraction or reflection by the system.

Facial Recognition - Is one that person figures from a pair of images structured against a database of images. It is often used to verify users via integrated security care and operates by locating and analyzing face shapes from an input image.

Image Processing - A strategy for performing actions on a picture to improve it or get important information from this. It is a sort of signal processing in which the image is created and the output might be an image or image character traits.

Convolutional Neural Network (ConvNet/CNN) - It is a Deep Learning method that can take in an input image, give importance to various aspects/objects in the image, and distinguish one from the other.

CHAPTER 2

RELATED LITERATURE AND STUDIES

Local Literature

Face Recognition Systems (FRS) can be used to match faces in images for a specific purpose, such as comparing reports of recovered people with missing people. Despite the high number of missing people in the Philippines each year, the Philippine National Police (PNP) lacks a centralized database. As a result, unless told by the precinct handling the case, police from other precincts may be unaware of reports of missing persons from one precinct, The study will assess the system's false acceptance rate (FAR) and false rejection rate (FRR) at various distal varying angles; face recognition speed; the accuracy of the system in locating the location of the missing person; and SMS notification capacity. [1]. Facial recognition is a typical approach for determining the emotions displayed. It is regarded by an individual as a critical component in emotion recognition systems. A new technique is required to make this procedure more effective, particularly in distinguishing good from negative emotions.

The study proposes an alternate face recognition algorithm for categorizing emotions in Filipino laughter.[2]. Most studies focus solely on manual signals. Non-manual signals, on the other hand, play an important part in Sign Language Recognition (SLR) since they may be freely blended with manual signals, frequently altering the meaning of the signs. Although it is possible to use FSL without using facial expressions, conversing would be difficult, especially when presenting a tale or conveying the intensity of suffering, both of which need distinct sorts of facial expressions. Recognizing non-manual signals, particularly facial expressions, would considerably improve the performance of SLR systems for FSL[3].

Face recognition is continuously increasing. the payment face recognition they do not require a device to perform transactions, modern card, smartphone, and biometric payment systems are less complicated than the traditional card, smartphone, and biometric payment systems. It is also dependable, safe, and efficient. As a result, saving both the client and the retailer. The former method employs face identification using Eigenfaces and Euclidean Distance payment. For face recognition, we suggest using Haar cascades. Our proposed method is more efficient in terms of factors like noise reduction, threshold, and training. As noise levels rise, so do time, confidence, and accuracy. Decrease in training time and accuracy with lower threshold confidence[4].

Foreign Literature

Face recognition has received a lot of attention in recent years as one of the most promising applications in the field of image analysis, Facial detection can account for a significant portion of face recognition procedures. Depending on its strength, it can direct computing resources to a portion of an image containing a face. Because of the variety contained in human faces, such as attitude, expression, position and orientation, skin color, the existence of spectacles or facial hair, variances in camera gain, lighting conditions, and image quality, the process of face identification in photos is challenging[6]. The performance of one-to-one face recognition algorithms used for identity verification and the performance of one-to-many face recognition methods used in picture data stores to identify persons this publication expands on earlier evaluations by documenting variances in accuracy across demographic groupings. According to the experimental findings, in the event of random 100 face images per student, the best recognition performance accuracy was 92 percent. This system can also read historical record data and transfer it to a document file. The most crucial feature in recognizing somebody is their face.[7] Face recognition aids in verifying any person's identification by using his particular traits because it acts as an individual identity for everyone. The whole technique for authenticating any face data is separated into two stages. In the first phase, the face is detected fast unless in circumstances when the item is put relatively far away, and then the second phase begins in which the face is

identified as an individual. The entire process is then repeated, assisting in the development of a face recognition model, which is regarded to be one of the most

meticulously planned biometric technologies[8]. A biometric application that can only identify and substantiate a person by collecting and analyzing data, and evaluating elements that support a person's outlines from a distance. Though there are various ways for facial recognition, to enable the recognition system to function, they collect and analyze data. Studying certain characteristics of a given picture is correct. Also described as an AI-based biometric application that discovers a person by recognizing facial traits and texture. A face recognition system maps the face using biometrics, a photograph or video of a person's face 3D face animation 3D sensors are used in recognition to record details about the contour of the person's face[9]. This information is then utilized to locate the distinctive facial feature on a face's facet, similar to the shape of the neck and chin. The main benefit of 3D facial recognition over previous approaches is that it is not affected by illumination. It discovers facial characteristics from various perspectives, including the entire profile of the subject. The usage of 3D improves the accuracy of facial recognition. The data points were gathered from the face's facet. A revolutionary approach is provided that is utilized to capture the 3D profile picture with the aid of tracking cameras that are positioned at different angles; that is, a camera that is pointed to the left, right, and front view of the person's face[10].

Local Studies

The Philippine National Police lacks a mechanism for compiling missing people reports and continues to rely on crude methods of advertising the identity of missing individuals and wanted fugitives. The method begins with filtering the

picture to remove extraneous components, followed by segmentation to identify the region containing the lesion. A class group image will be recorded, and recognized faces will be segmented from the acquired image[11]. Face recognition technology has the potential to be a disaster. The investigation is ongoing. It comprises the contents. Among several topics such as digital image processing, pattern recognition, computer vision, and nerve net, Examples include psychology, physiology, and mathematics. It also assists security professionals in identifying and solving crimes by examining recorded videos. Unfortunately, going through the tape took a long time. As a result, our equipment Hybrid Document Scanner Camera (HD-SC) allows the homeowner to be alerted in real-time through the Internet and send a short message service[12]. In the Philippines, face recognition is a technique capable of recognizing or authenticating an individual based on a picture, video, or any audiovisual part of his face. This identifier is often used to get access to an application, system, or service. It is a biometric identification approach that employs body measurements, in this case, the face and head, to authenticate a person's identity using facial biometric patterns and data. To identify, verify, and authenticate a person, the system captures a collection of unique biometric data related to their face and facial expression.[13] Face recognition recognizes the distinctive characteristics of the human face and compares them to images in an existing database. Face forms are detected and identified by sensors based on the color of the eye, nose shape, and so on. Identifying the human face entails focusing on specific traits such as the jaw, cheekbones, facial shape, and so on. When an image in the database matches the face of the person in question, the face is validated. This solution's non-contact feature

allows identifying and verifying a person's identity considerably easier and requires less processing than any other identification system. [14] Image processing is important in facial recognition systems. Image processing is used by government entities to improve the quality of pictures they own. Facial recognition and image processing are mutually beneficial; one without the other is nearly worthless. If face recognition software doesn't even have a competent picture processing system, it will have a difficult time recognizing a person. Better image processing leads to improved facial recognition. Similarly, even if your image processing system is excellent, if your facial recognition technology is obsolete, you may encounter several issues. [15]

Foreign Studies

The Face recognition system has several applications, including but not limited to human behavior understanding, diagnosis of mental sickness disorders, and manufactured human emotions. Human primary biometric, face recognition, has risen in prominence over the last two decades. Since 1990, automated recognition of human Faces has been a hot topic in the field of image processing and pattern recognition, with several commercial and security applications in identity validation and recognition[16].

The availability of practical technology, as well as the growing demand for reliable security solutions in today's environment, has pushed many researchers to develop new methods for face recognition. Sensor technology has progressed in recent years and it also combines data storage, data processing, data transport, and

other processes based on the core "perception" function, allowing it to do analysis and better present information. The technical level has reached previously unheard-of heights[17].

Early intelligent recognition depended on the distinctness of finger and palm lines to scan and contrast, however, these systems had limitations due to weather or skin texture constraints. This study presents a unique computer vision-based approach that is based on face detection and recognition technologies. Face detection systems mostly employ the OpenCV technique. According to the study, combining the zero-space technique with the kernel discriminant analysis method improves the ability of discriminant analysis to extract non-linear properties[18].

Face expressions are differences in facial expressions brought on by a guy's inner joyful sentiments, ambitions, or social interactions are examined by computer frameworks, which seek to analyze and recognize face movements and facial expressions component changes based on visual data. Face Feeling has often been misled with expression recognition. Computer vision research leads to impolite conduct. Support for the recognition process, such as face detection allows for feature recognition and expression recognition. Resulting in difficulties with identifying obstacles, awareness, postural alterations, recognition, and a decrease in Dimensionality, for example. Regardless, precise computation and prediction of outcomes increase facial expression execution recognition[19]. Facial recognition technology has the potential to do wonderful things, but it can also severely impact our privacy.[20]

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Synthesis

Many studies have been conducted on how to use facial recognition algorithms to locate a missing person. Other literature puts the spotlight on how the process works in terms of real-world remedies. The correlation between the regional and international literature is in the algorithm they use, as most researchers were using a Haar Cascade algorithm for images with high accuracy but the research teams chose the CNN algorithm for a better process to identify the children. However, one more significant difference between regional and international literature is their budget, wide range, and investment of time. Even though it is apparent that the researchers in the local region do not have a large budget due to the high cost of the equipment and other necessary items. And the wide area, as well as the time is taken to complete, is linked to the financial plan; unless professionals do not have a good financial position in your research study, this decreases the amount of time and the field where you examine. Due to the public low cost and high quality of machinery and equipment in their locations, international is really the leading research scientist in this century.

The previous works on facial recognition are focused on biometrics; however, in other research articles, researchers have investigated facial recognition that used image processing by locating every facial point to get a high accuracy rate of an image. All in all, the studies and literature will support our research by invalidating and establishing each step required for our project.

CHAPTER 3

THEORETICAL BACKGROUND

This chapter covers general theories and concepts closely linked to face recognition, beginning with a brief history. Following that, many strategies for increasing the face detection generally required before utilizing recognition are explored. In the 1970s, research on automated machine identification of faces began to develop. Previously, most studies in the field of psychology concentrated on human vision technology. Face recognition by machine can be broadly defined as identification or verification employing a recorded database of faces, of one or more people in a sequence of images. Following the rising relevance of this type of technology, interest in it Increased significantly in airport surveillance technology and other threat protection applications. Considering recent developments, the demand for improved 2D systems remains a significant issue today based on 3D facial recognition. One reason for development is that new application areas for computational computing have emerged.

Mobile devices still have limited capacity. One of the key challenges is the picture capture method for 3D face recognition since it necessitates costly scanning equipment that is unstable. Before learning and authentication can proceed, faces must be identified and cropped. Scanning photos with an expanding window is a technique that has already become standard. Images are also represented in a distinct way called integrated images quick processing. In the integral pictures, each pixel represents the total of the pixel values above and to the left of the pixel. This allows

you to calculate any rectangle sum in an image using only four corner values from its integral pictures.

Fundamental Algorithm

The research teams employ the Convolutional Neural Network (CNN) Algorithm, which employs feature models to describe the appearance of the missing children and identify them. Detection methods instruct classifiers in the missing kids and data sets to identify missing children parameters from the implementation. Furthermore, machine learning (particularly CNN) enables neural networks to identify characterizations from dataset for particular image classification tasks and recognition. In other sectors, it performed better than other methods, especially when the data - set was too large. Convolutional neural models have effective knowledge, optimized feature interpretation functionality, and more advanced semantic features that significantly simplify **robotic - assisted device recognition** and **monitoring in MIS**. Traditional CNN's have an input image, a convolutional, a max - pooling, a fully - connected layers, and an output layer. Figure represents CNN's architecture.
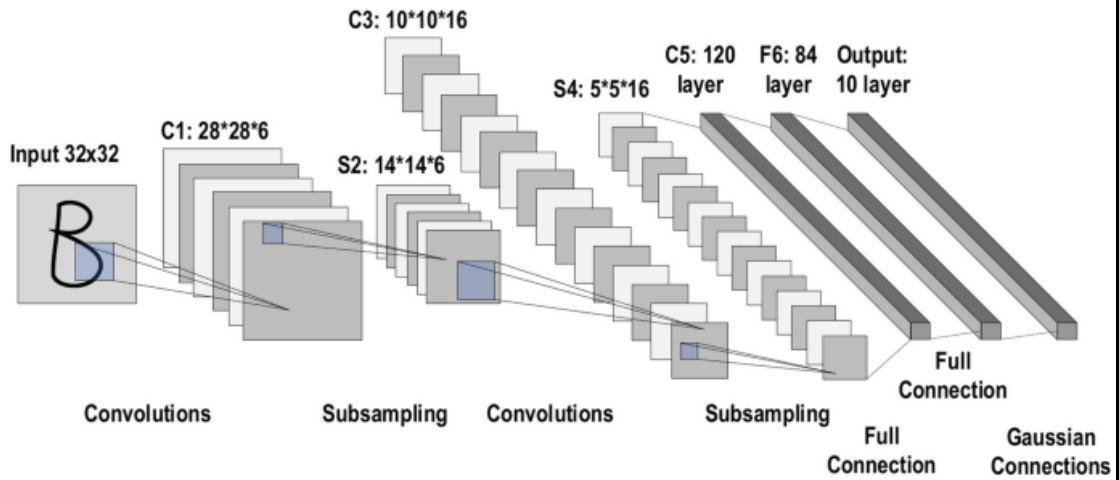
Even though Convolutional networks use both responsive and strength properties, multi - dimensional pictures were used as system inputs. It also reduces the computational complexity of data restructuring through extracting the features and constraints, the effect of evolution and standardizing. As a result, Convolutional neural extracted features are now more innovative in the field of image processing than old methods feature extraction techniques.

The CNN algorithm is abstracted from the following table, along with the configurations required for soil classification based on our training data set gathered from various sources.

Mathematical Model/Formula

In this section, research teams selected ReLU as the learning algorithm concerned for converting the data type summed scaled input into the data type hidden neurons or outcome of an input. Furthermore, ReLU is a piece - wise linear transformation which will immediately show the input if it is positive; or else, it will return 0. It

became the standard algorithm for several kinds of neural networks since it is more straightforward to train and frequently results in better functionality. The model can be written by y = max(0, x), where y represents the output class while x represents the input class. The method compares the

 input x to 0; if x is higher than zero, y equals x. If x is less than zero, then y is equivalent to 0. This method is called one by one in every layer. Different variables are accepted by the Convolutional Neural Network. These values are updated to fine-tune the model based on the desired outcome and develop in order. In this review, the research teams have come up with the following data points or use case of classifying a child's face from a 400 x 500 pixel input image.

The model used in this research has three convolutional layers. For every layer includes a set of filters, the parameters of which must be learned during learning. The filters are typically smaller in size than the actual photo. Each filter interacts with the image to generate a convolution. The number of dense layers is the next parameter to consider. The model consists of two dense layers. The layer shape is the next parameter. The algorithm's layer size is critical because it determines how heavy the system would be. The model, in general, has 28 layers. A larger layer length will cause the model will become even.

CHAPTER 4

DESIGN AND METHODOLOGY/PROPOSED SOLUTION TO THE

PROBLEM

The project proposes a facial recognition process that combines image processing and a CNN algorithm to quickly search for a missing child in the mall using this platform to achieve and identify the facial mark of the missing child. The research teams established a system for the mall establishment services in the future which could instantly understand their appearances by simply giving a picture of the child and optional detailed information to the mall's surveillance; this benefited public establishments in searching a child and simply avoiding a child exiting the mall after the short time of the incident. The proposed technique reduces the difficulties in finding children involved in the mall and can also fulfill families who have concerns about their kids going missing in the mall through facial recognition and image processing using CNN.

The methodology offers recommendations and initiatives for missing children in order to keep kids from leaving the mall alone or becoming involved with the other syndicate. The solution can use pictures to quickly identify the faces of missing children. The answer focuses on the factors of a missing child throughout the mall. The final methodology provides a visual image to determine the facial points of the children in order to get accurate image data of missing children.
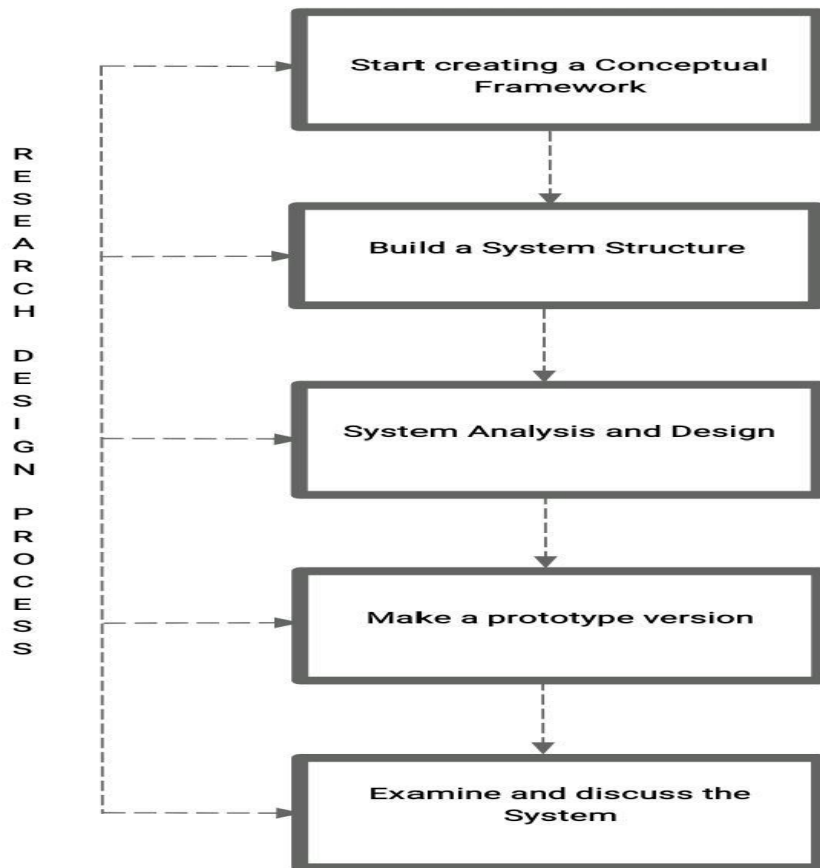
Research Design

Figure 1: Research Design Process

The layout research methodology indicates that the method is usually guided to provide each of the necessities to start building and discussing the research information. The first methodology is to explain creating a Conceptual Framework.

The current study aims for all applicable regional and international studies as well as

literature to become linked articles in order to generate its whole idea of facial points via image processing. The important terms were applied in this research by relying on a review of related literature. The research scientist takes into account the following input parameters: facial points, uncleared image factors, collecting data sets, and constructing facial recognition to achieve high accuracy on the face of a kid.

The second methodology used in this study recommended software's system structure, which is focused on the proposed application to be established and improves on what is needed in the previous system which provides recommendations and treatments to worry about missing child scenarios in the mall. The proposed software solution is to recognize missing child scenarios via an application that the user can easily access. The CNN algorithm results for future usage and helps in providing continuous security for missing children using face recognition through the use of image processing and CNN.

The third methodology is system analysis and design of current manual strategies that do not have meaningful answers, how the application runs, how the system functions relevant information, how the program gives guidelines and practices using image processing with CNN, and so on. The computer scientist finally creates an architecture that is responsive to the demands of a shopper inside a mall, acknowledging the statement of the problem. The original study aim is the

research target, which is connected to the research problem. Python serves as the software's front-end development final act, respectively, to achieve the purpose of this study.

The fourth methodology creates a prototype depending on the design as well as a fundamental principle. The application is based on application development and computer-aided syntax, and it was developed by the research scientist to test its capabilities and accessibility.

Examining and discussing the System is the final methodology. The computer scientist is certain to perform sentiment analysis. The accuracy of the CNN algorithm is observed whereas the software is being used by the account holder, and the software is determined based on the user reports using application performance measures. The scientists are utilized to validate the software using a system testing platform for software appreciation to ensure that the system provides a framework via user requirements. Then to begin testing, a qualitative approach is used to collect information through the questionnaire.

This method was used in the entire study structured questionnaire since it is usually observable and quantifiable in a large population. As a result of using random selection to identify study participants, evaluating large samples becomes more realistic, resulting in quantitative prediction when examining different parameters.

The questionnaire consists of two categories, one for account holders for ease of use and usefulness and another one for the computer scientist for the testing process.

The assessment will be performed by 8 respondents, including 6 security guards, from the mall establishment, and 2 IT Professionals from various fields of knowledge and expert knowledge, Such as educators and technology developers

Respondents of the Study

Security Guard

The security guard is the first person who approaches customers who have reported a missing child. In order to easily identify the face of a missing child, the security guard informs a security officer, and also the shopper who needs support must go to the security head office located, where security compiles all information and evidence.

IT Professional

When it comes to the level of satisfaction throughout the field of Information Technology, an IT professional is important. The IT professionals from mall in Muntinlupa City were chosen to conduct the testing in this project. The author chose two IT professionals, five security guards, and two security officers from the sector who work in Information Technology as database administrators and programmers.

**Table 1. Respondent of the Study**

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RESPONDENT	NO. OF RESPONDENTS
Security Guards	6
IT Experts	2

Requirements Analysis

The Requirements Analysis Document contains the outcomes of the requirements and analysis operations. This document explains the system in detail in terms of functional and non-functional requirements and acts as a contractual foundation between the client and the developer.
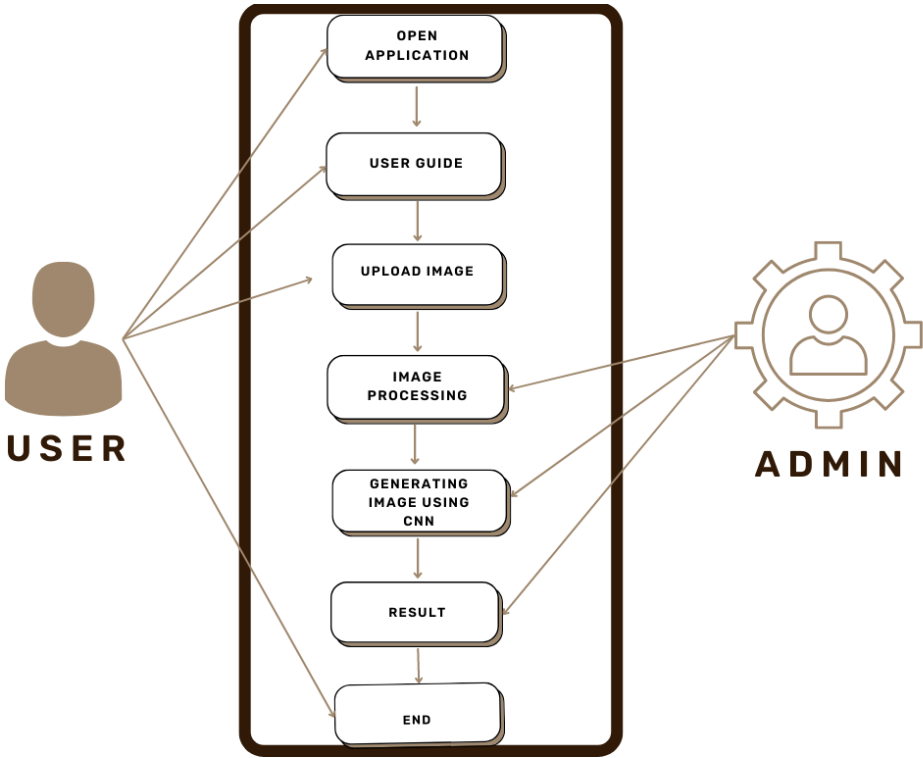
Figure 2: Use Case Diagram of facial point's prediction of a missing person through image processing

Shows the interaction between the proposed system and the user. The diagram portrays how the user will access the system and how the system operates.
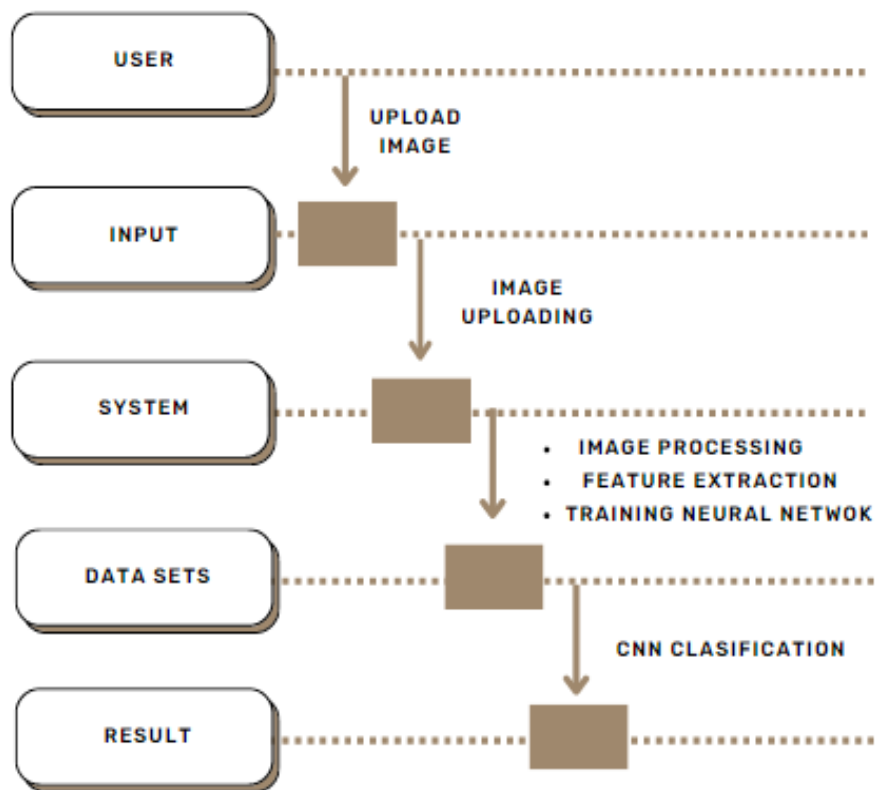

Figure 3. Sequence Diagram facial point's prediction of a missing person through image processing

Illustrates the process of detecting focal points in the proposed system through the use of image processing. The user begins to enter and upload the image into the

software, and the system begins to process the image. To analyze a picture and cluster multiple sections of the image, use the cnn algorithm called.

Requirement Document

The requirement document illustrates many explanations of the process and diagram, as well as the technical process of the proposed system. The researchers' objective is to explain how the system actually works to users and viewers, as well as how it may be accessed and presented to functional and non-functional needs.

Functional Requirements

Figure 2 shows the created system's functionality. The user can launch the program and submit an image to identify basic information about missing person. The procedure will be a guided thorough user manual, and the software can access all smartphones.

Non-Functional Requirements

1. Usability — the system has a user guide to make sure that the use of the system is extremely accurate.

2. Maintainability + Manageability – the system can easily adapt the changes that the developer required in the future.

3. Compatibility — the system can run in specification android device 8.0.0 Oreo and up to present android version 4GB ram, 8GB ROM, and 12 megapixels.

4. Reliability and Availability — the system doesn't have time requirements the user can access every time that they are missing persons.

5. Capacity — the system capable to adopt in the future what the developer and user need.

Design of Software, System, Products, and Processes

The design of software, systems, products, and processes are methodically described in order to focus on the suggested system and research. It is founded on requirements and assumptions derived from the system's observation and analysis.
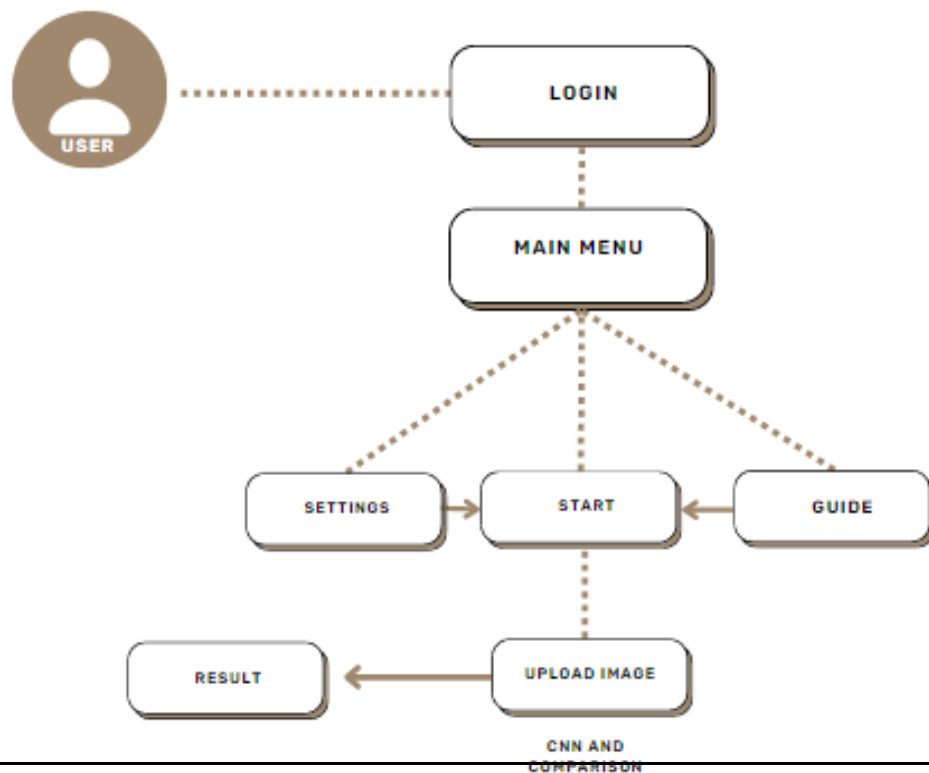
Figure 4: System Design of Focal point detection of the missing person using

Image Processing and CNN algorithm

Figure 4 shows the flow chart diagram of the system using the Convolutional Neural Network in detecting disease. The system classified the image of the missing person to show basic information.
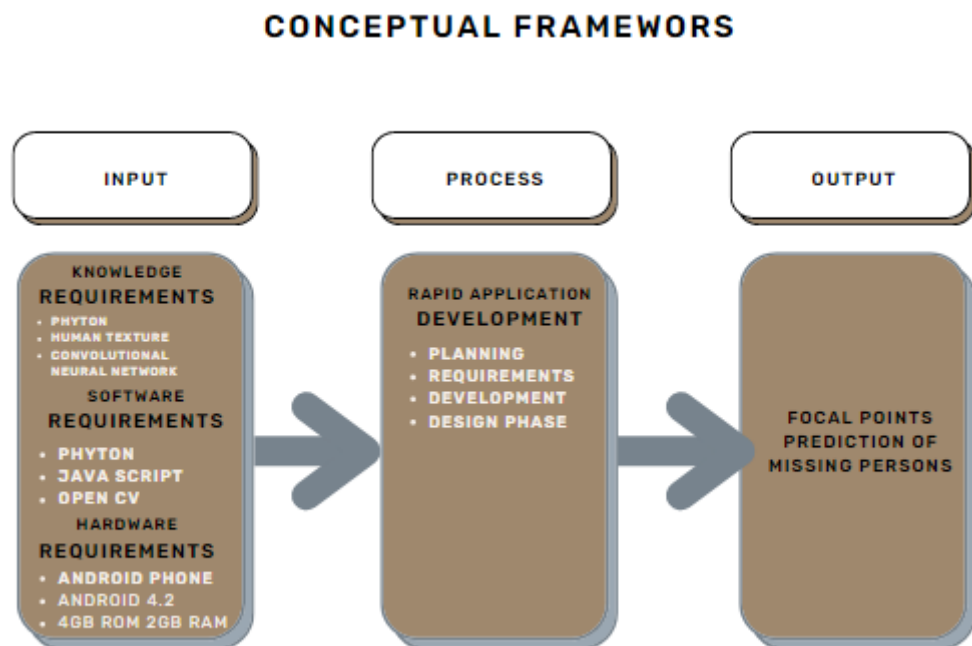
Conceptual Framework

Figure 5. Conceptual Framework Focal Points Predict of Missing Persons

It demonstrates how the researcher used a methodical approach to design the system. The figure represents the system requirements for developing the system as well as the study's approach to system operation. It is used in rapid application development to examine the design, testing, and deployment in the system output given by the researchers.

Development and Testing

In developing the system, the researchers plan first for what are the functions of the system and to determine if somebody is missing, a facial recognition procedure has been created. The four procedures are face detection, face alignment, feature extraction, and face recognition. To evaluate the performance of our system we use 30 different face images with different characteristics for the data sets. The primary purpose is to identify the exact area of the picture or video. It recognizes and depicts the location of these faces. The output of this phase may then turn the given data into patches that utilise the various faces of the input image. In this second stage, the system normalizes the face to make it more consistent by identifying geometry and photometric data in a database. To put it another way, the system evaluates the picture of a certain face. To better match pictures with public images and databases, most facial recognition systems use 2-D rather than 3-D. When the system scans the image, it looks for information such as an individual's eye depth, skin color, eye color, lips, and nose, and the alignment process analyzes the scales, resolution, brightness, zoom levels, and orientations. The testing stage is important in order for the model to correctly select the weights that most closely match the input data and the output

classification. As a result, these weights are constantly tweaked to get the optimum outcomes class. during the training method, training data was separated into smaller batches. The batch size is determined by breaking the total dataset into a series of smaller bits of data, each of which is separately entered into the model time. Batching the training data speeds up model training and improves model control.
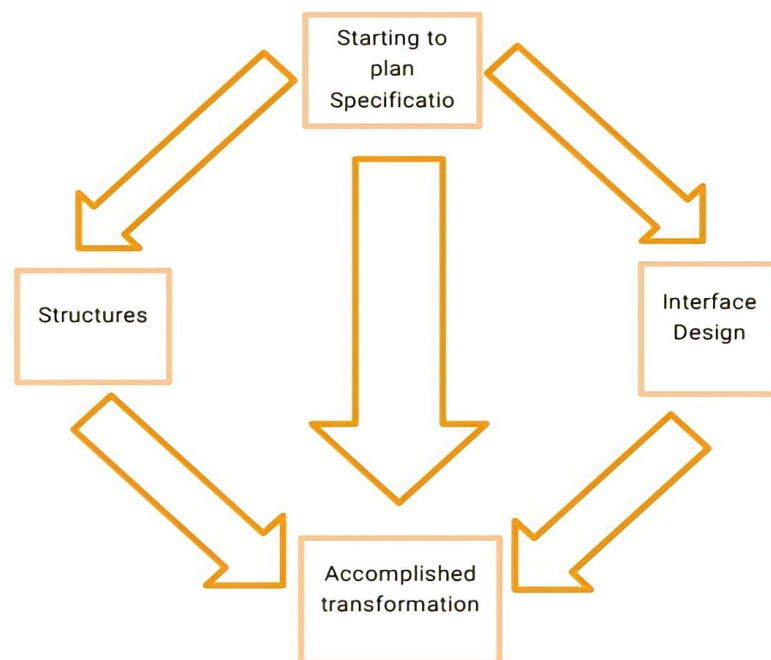
Methodology

Figure 6 Facial recognition Application for missing children in the Festival Mall of Alabang.

Facial recognition was constructed by Woodrow W. Bledsoe conducted a series of experiments to see whether 'computer program computers' might identify facial images. The professionals were using a primitive detector to visualize the individual's hairline, eyes, and nose. The machine's role should be to the right frequency.

Starting to plan the Specifications Phase, is there a current strategy for enhancing the precision of facial recognition for missing persons. The study team will use this to determine if the current security monitoring capabilities in the malls really provide the best services to the customers. According to a question and answer session with several executive security officers who already have experience with the manual process of determining the faces of children, that is crucial. Additionally, as mentioned in the study's background, manual classification of children's faces has downsides according to literature and studies.

The research study is using Python for both the front-end and back-end final act of the developed framework during the interface design phase. The authors have developed a structure of the system to ensure the software's reliable execution. The use case diagram is also generated to see how the user accesses the system through facial point recognition. The method involves identifying the aspects by using facial recognition and is improved using the CNN algorithm and software tool.

Structures Phase During this phase, the software will have its own site for reasonable test execution. The software is put on the desktop since workers can easily

enter the overall system and meet the expectations and desires of the mall in Muntinlupa city.

Accomplished transformation Phase This process concerns the system implementation through facial recognition application entered by the viewer. There are a few diagnostics tests performed for user approval and platform measurement by

information and technology professionals to help the prototype open to the public of defects and potential errors to optimize efficiency. The software development services are not just to ensure the configuration of the implementation for use by individual shoppers, but they are also in charge of system expansion and improvement

as desired.

Evaluation tool

A Lickert's Scale was utilized by the researchers to assess if each participant expressed their answer by declaring agreeing or disagreeing ideas.

Table 2 Lickert's Scale

RATING	SCALE
5	STRONGLY AGREE
4	AGREE
3	UNDECIDED
2	DISAGREE
1	STRONGLY DISAGREE

Testing and Procedures

The testing technique is required in order to determine the error that happened in the proposed system when testing software. While it cannot provide the present error in a program, it can reduce the number of potential problems. Our IT Experts from the IT industry will conduct the testing and assess the system's operation in terms of dependability, efficiency, compatibility, and maintainability.

Statistical Treatment

To effectively analyze the data, the researcher applied the statistical technique described below. where the mean and Standard deviation, the Percentage, and T-test are used to interpret data. As a result, the statistical data are also given in tables and figures to help interpretation.

Statistical Treatment

The statistical treatment is beneficial to make use of such information in a structured form. Collected information is only one objective of every research project. The final procedure is also critical in order to gain findings and conclusions.

A frequencies and percentages representation is a type of statistical visual analysis in which the percentage of findings by each set of data or ratio-level independent variables are measured.

Presenting a percentage distribution and frequency range valuation means measuring the maximum number of iterations to be recognized as well as the maximum frequency of data point groupings or associations among the independent variables.

FORMULA: fa

$$P = \frac{f}{N} \ X \ 100\%$$

Where:

P- percentage

F- frequency

N- number of respondents

CHAPTER 5

RESULTS AND DISCUSSION

This section summarized the results of the researcher teams' assessments and the creation of the proposed solution. The findings will reveal the effectiveness and inconsistencies of the CNN algorithm in determining the kind of nose, eye color, and skin color. The conclusions described in this section clearly show that CNN can

identify facial marks based on image large datasets, appearance, and shape. This section will explain the project's structure, the functions conducted in the field to meet the goal, and the analysis of the system using test data of child pictures.

Project Description

The research study is a technology platform in the form of a smartphone and browser app which can capture and upload images of children. The program's primary objective is to analyze the face of young people in terms of nose, skin, and eye color. In addition, the usage generates the following features and details about recognizing; the model's optimism, colors, size, texture, how to prove the type of nose, skin color, and eye color, and how to recognize a child's face. The application's output information is what security requires to assist them in searching a missing child in the mall. The research teams collect practice data in the form of pictures in order to improve the CNN model. The research team gathered lots of photos from the internet as well as hundreds of images captured from children. These images are arranged in order of looks. They are divided by files to facilitate the application development. The application can be accessed through an internet browser or even a native Mobile apps. Users can install the android apk from the official site or access the online application in the internet browser.

Project Structure

Classification Technique using the Algorithm

Implementation and Results of the Algorithm

Source Code of the Algorithm

Results of Project Evaluation

Statistical Result

CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

Summary of Findings

Conclusions

Recommendation

PAMANTASAN NG LUNGSOD NG MUNTINLUPA

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REVISION/ DOUBLE CHECK CHAPTERS 1-4	Chapter 5	Chapter 6	FINALIZING THE SYSTEM	System Evaluation
DUE: September 18, SUN 11:59 pm	Sunday to Wednesday, Sept, 18 to 21	Wednesday to Sunday, Sept 21-25	Monday to Sat September 29-30	October 1-9