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Find the Missing

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***Abstract*—In India, more than 200 children go missing every day, amounting to 73,000 missing children every year. To address this massive issue, We have created an application that would assist parents in locating their missing child. This android/iOS application employs a Facial Recognition technology, Google Geo, SMS, email services, and the Missing Child's database maintained by the Ministry of Women and Child Development to identify their child's location. If a common citizen finds a lost child on the street without any guardian or parents, they can take a picture of their child; if the child's face is detected in the database, this application will send an SOS message to the Police and Childs Parents. When the child's face is identified, this application sends all data to the server and from the server to the police department. When a face is identified, police as well as parents can obtain a geolocation of the child. To acquire information and identify existing problems, a study of a few existing child facial recognition system was conducted. The Rational Unified Process (RUP) paradigm was used in this project's methodology. To obtain user requirements and needs for the system, data collecting methods such as questionnaires and interviews were used. Based on user feedback, the results were analyzed. The majority of users (parents) agree and look forward to implementing the system.**

I. INTRODUCTION

A few months ago in India, a 10-year-old boy named 'Shivam' got lost with his mother in a relatively busy market area. Noticing his missing, his mother did everything she could to find him, but she was of no avail. As a last resort, she rushed to the local police station and filed a missing persons report. Police searched the area for 48 hours but found no young children. This happened seven months ago, and we still don't know anything about his condition or whereabouts. There are few examples in India. Police should prioritize missing child cases as they may be linked to human trafficking (Datuk Masir Kujat, Deputy Home Minister, Thursday 24 March 2016). According to The Star newspaper, a 17-year-old boy has disappeared from his home in Taihei and has since disappeared. Using facial recognition, any member of the public can identify a missing child. When our system detects a child's face, it records the child's location so that it can be tracked.

II. Previous Efforts

Several technology projects and initiatives aimed at finding missing persons are taking place in India. Here are some examples:

Lost child alert "LCA" system:

The LCA system is an initiative by Indian Railways to reunite missing children with their families. The system uses facial recognition technology to match images of

missing children with images in a database of rescued children.

Koya Paya:
Khoya Paya is a web-based platform developed by the Ministry of Women and Child Development to track missing children and reunite them with their families. The platform uses a database of missing children and provides a platform for NGOs, police, and the general public to share information about missing children and assist in finding them.

TrackChild:
TrackChild is a national portal developed by the Ministry of Women and Child Development to track missing and vulnerable children. The portal provides a platform for police, child protection boards, and non-governmental organizations to share information and coordinate efforts to find missing children.

Darpan:
DARPAN is a national missing person tracing database developed by the Home Office. This database can be accessed by law enforcement agencies and provides information on missing persons and unidentified bodies.

Smart India Hackathon:
The Smart India Hackathon is an initiative by the Government of India to foster innovation and find technological solutions to various challenges, including missing person searches. Several projects were developed as part of the hackathon, including an app that uses facial recognition to identify missing children and a system that uses drones to search for missing people in remote areas.
These are just a few examples of technology projects aimed at finding missing persons in India. There are likely other initiatives

as well, with governments and the private sector continuing to look for new ways to use technology to improve missing person search success rates.

III. ADVANTAGES OF FIND THE MISSING OVER OTHER PROJECTS

Facial recognition apps, commonly used to find missing children, have several advantages over other projects aimed at finding missing children. Here are some examples:

Real-time identification:
Facial recognition apps can quickly identify missing children in real time, allowing law enforcement and the public to respond quickly to the situation. This greatly increases the chances of finding a missing child before harm occurs.

Wide range:
Since anyone with a smartphone can use the facial recognition app, a wide range of people can participate in the search for missing children. This increases the reach and visibility of your search, increasing the chances of finding your missing child.

Cost efficient:
Facial recognition apps can be developed and implemented at relatively low cost compared to other technology projects that may require significant investments in infrastructure and resources. This will allow more people access and may lead to more effective searches for missing children.

Data protection:
A well-designed facial recognition app can protect people's privacy by only using data voluntarily provided by users. It also ensures that your data is stored securely and cannot be accessed by unauthorized persons.

ease of use:
Facial recognition apps can be designed to be user-friendly and easy to use, making them accessible to people of all ages and backgrounds. This will increase involvement in the search for missing children and may lead to more effective results.

Overall, facial recognition apps commonly used to find missing children have several advantages over other projects. Inexpensive, widely accessible, and real-time identity verification make it a powerful tool for finding missing children.

IV. TECHNOLOGY USED

Facial Recognition

The process of recognizing faces involves the application of algorithms and machine learning to authenticate and validate a person's identity by analyzing their facial characteristics. This process entails capturing an individual's image or video and utilizing diverse computer vision methods to extract and scrutinize unique facial features such as the gap between the eyes, the shape of the nose, the outline of the jawline, and other distinct features.

Facial recognition technology can be utilized for various objectives, including security and law enforcement, identity authentication for financial transactions, and customized marketing. It is frequently integrated into security systems to spot and monitor individuals who may pose a risk to public safety, for instance, criminals or terrorists.

However, there are apprehensions about the possible misapplication of facial recognition technology, such as privacy violations and partiality. Certain studies have indicated that facial recognition systems could be less precise when recognizing individuals with darker skin tones or women, leading to biased outcomes. Consequently, many nations and institutions have adopted guidelines to guarantee that facial recognition technology is employed ethically and with adequate measures to safeguard individual rights and privacy.

V. PACKAGES USED FOR FACIAL RECOGNITION

OpenCV:

OpenCV (Open Source Computer Vision) is a software library for computer vision and machine learning that is free to use and open-source. Originally created by Intel in 1999, it is now maintained by Willow Garage and Itseez.

Developers can use OpenCV to create applications for tasks such as image processing, object detection, and face recognition. It offers a variety of algorithms and tools and supports multiple programming languages including C++, Python, and Java. OpenCV is also compatible with different operating systems such as Windows, Linux, and Mac OS.

OpenCV provides a range of features such as video and image processing, object recognition and detection, feature detection and matching, camera calibration, and machine learning algorithms. It is widely used in both academia and industry for research and development in computer vision and machine learning.

Face_recognition

The Python package, face_recognition, has been designed specifically for face recognition purposes. It is based on the OpenCV library and presents a simple interface for developers to perform face detection and recognition in images and video streams.

The face_recognition package comprises of two primary functions, namely face_locations() and face_encodings(). The face_locations() function is employed to locate faces in an image or video stream, while the face_encodings() function is used to generate a numerical encoding for each face detected in the image. These encodings can be utilized to compare faces and determine if they match.

The package also provides a compare_faces() function that allows users to compare two face encodings and confirm if they match. Furthermore, it has a face_distance() function that returns the distance between two face encodings, which can be used to gauge the similarity between two faces.

face_recognition is extensively used in the development of various applications that involve facial recognition, including security systems, access control systems, and photo tagging applications. It is an effective tool that simplifies the implementation of face recognition functionality in Python applications.

VI. TECHNOLOGY FOR DEVELOPMENT

PROGRAMMING LANGUAGE:

Python

Python is a programming language that is interpreted and high-level, and it is widely used in numerous fields, including computer vision and machine learning. Python's popularity in facial recognition application development is due to its extensive range of libraries and packages that make working with images and video streams easier.

As mentioned earlier, the face_recognition package is a well-known and widely used Python package for facial recognition tasks, and it offers developers a straightforward and user-friendly interface. Along with face_recognition, Python has other packages such as scikit-image, dlib, and OpenCV that are suitable for various computer vision tasks, including facial recognition.

Python is also a simple language to learn, and it has a supportive community of developers who contribute to open-source projects related to machine learning and computer vision. This implies that developers can access numerous resources and documentation online to assist them in developing their facial recognition app.

In conclusion, Python's user-friendliness and the availability of powerful libraries and packages make it an excellent choice for developing facial recognition applications. With the right tools and knowledge, developers can swiftly create robust and accurate facial recognition systems using Python..

APP MAKING FRAMEWORK FOR PYTHON

Kivy Framework

Kivy is an open-source and free framework that facilitates the development of multi-touch applications using Python. It enables programmers to create cross-platform apps for mobile and desktop devices by utilizing a unified codebase. The emphasis of Kivy is on user interface (UI) and user experience (UX) design, and it provides an extensive range of functionalities to build interactive and visually attractive applications.

One of the noteworthy aspects of Kivy is its ability to handle multi-touch input, which empowers developers to create apps that can react to several simultaneous touches on the screen. This attribute makes it an excellent choice for creating touch-based applications for mobile devices, like tablets and smartphones.

Moreover, Kivy offers an impressive collection of widgets for designing UIs, including buttons, labels, sliders, and text input fields. These widgets can be personalized through a flexible styling system that enables developers to create exclusive and visually engaging interfaces.

Kivy is compatible with various input devices, such as touchscreens, keyboards, mice, and even game controllers. It also features a potent graphics engine that supports OpenGL and provides advanced rendering capabilities.

Kivy is intended to be cross-platform, which implies that apps developed using this framework can be deployed on multiple operating systems, such as macOS, Windows, Linux, Android, and iOS. This quality makes it an ideal option for developers who want to create apps that can be launched on different devices and platforms using a single codebase.

In conclusion, Kivy is an adaptable and robust framework for developing multi-touch applications using Python. Its focus on UI and UX design, cross-platform support, and broad range of features make it a prevalent choice among developers for building interactive and visually appealing applications.

INTEGRATED DEVELOPMENT ENVIRONMENT

Visual Studio Code

Microsoft has developed Visual Studio Code (VS Code) as a well-liked source-code editor that is compatible with Windows, Linux, and macOS. It is an open-source tool that is available for free and provides a broad range of features for developers to use.

VS Code has several notable features including:

- Cross-platform support: VS Code can be used by developers on any operating system, including Windows, Linux, and macOS.
- User-friendly interface: The user interface of VS Code is straightforward and uncomplicated. The layout is well-organized and the tool offers a wide range of customization choices to suit individual preferences.
- Integrated Development Environment: VS Code is an integrated development environment that supports multiple programming languages like JavaScript, TypeScript, Python, C#, and many others. It also features built-in support for Git, a well-known version control system.
- Extensibility: VS Code grants developers the ability to extend its functionality by installing extensions. These extensions can add support for additional programming languages, tools, and frameworks. The VS Code marketplace has thousands of extensions available, which makes it easy to customize the tool to fit specific development needs.
- Debugging: VS Code provides debugging capabilities for a wide variety of programming languages. It supports both local and remote debugging, which makes it easy to debug applications running on a remote server or in a container.

All in all, VS Code is a potent tool that is extensively used by developers worldwide. Its wide range of features, user-friendly interface, and extensibility make it an excellent choice for developing applications of all types.

DATABASE

Firebase

Firebase Database is a NoSQL database hosted on the cloud and is a component of the Firebase platform developed by Google. It is a database that is adaptable, expandable, and extensively accessible, allowing developers to store and synchronize data in real-time between mobile devices, servers, and clients.

Firebase Database is intended to store and manage structured data in the form of JSON objects. It supports real-time data synchronization between clients and servers, which implies that any alterations made to the data on one device will be

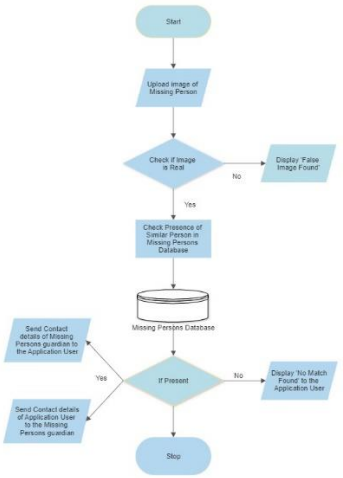
quickly reflected on other devices connected to the same database.

Developers can use Firebase Database's straightforward and user-friendly API to interact with the database. The API enables developers to read and write data, as well as track changes to the data. Firebase Database also provides a security rules engine that allows developers to specify rules for limiting access to the database based on user authentication and authorization.

Firebase Database is scalable, allowing it to handle massive amounts of data and a large number of concurrent connections. Additionally, it provides offline support, enabling clients to read and write data even when they are not connected to the network.

Overall, Firebase Database is an adaptable and potent database solution for creating real-time web and mobile applications. Its real-time data synchronization capabilities, simple API, and scalability make it a popular choice for developers seeking to create applications that require real-time data updates and synchronization across devices.

VII. Block Diagram



VIII. CONCLUSION

This model suggests a standardized method to streamline the assessment and tracking of efforts aimed at enhancing the efficacy of initiatives directed towards the welfare of minors and the elderly. It recommends a comprehensive strategy for the planning, execution, supervision, appraisal, and revision of such undertakings. The model is not meant to be rigid and can be adapted to suit the unique circumstances of each region. The objective is to encourage a shared comprehension of the principles behind the operation of interventions aimed at locating and retaining beneficiaries, with a systemic outlook. It commences with a common set of benchmarks that enable cross-comparison of diverse scenarios and facilitates the review of published research. Thus, it can be employed to monitor and evaluate interventions, utilizing either a technique-based or a virtual-based appraisal method, with a specific set of markers.

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