ZKG INTERNATIONAL ISSN: 2366-1313

AI-ASSISTED SEARCH FOR IDENTIFYING MISSING PERSONS BY FACIAL RECOGNITION

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Abstract: *The integration of AI-driven facial recognition technology in identifying missing personsrepresents a significant advancement in search and rescue operations. By harnessing sophisticatedalgorithms, our system swiftly and accurately matches facial features with stored data, expeditingreunificationeffortsandenhancingpublicsafety.Throughmeticulousdatabasescanning, weensuremaximumaccuracyinpinpointingmissingindividuals.Ourprojectfocusesonleveraging AI to streamline the identification process and overcome the limitations of traditional methods. Bycombiningfacialrecognitiontechnologywithreal-timevideosurveillance systems,we aimtocreateanefficientstrategyforlocatingmissingpersons.Thisinvolvesmaintainingacomprehe nsivedatabase offacialimages,continuouslyupdated andanalyzedusingAIalgorithms.*

Keywords: AI-driven facial recognition, Artificial Intelligence, facial images, AI Algorithms.

I. INTRODUCTION

Facialrecognitiontechnologystandsatthefor efrontofmodernsearchandrescueoperations, offering unprecedented capabilities in identifying missing individuals. Through theutilization of advanced AI algorithms, this technology has the capacity to rapidly and accuratelyanalyze unique facial features, enabling efficient matching with existing data in comprehensivedatabases. This transformative approach significantly enhances the effectiveness of search efforts,particularlywhencomparedtotraditio nalmethodsplaguedbytimeconstraintsand humanerror.

The core focus of our project lies in harnessing the power of AI-driven facial recognition toredefine the search for missing persons. Drawing inspiration from industry-leading algorithms, oursystem is designed to meticulously scan vast databases, facilitating precise and swift

ISSN: 2366-1313

identificationof potential matches. Emphasizing the importance of robust data management, we prioritize thedevelopment of secure database infrastructure to ensure the availability of high-quality facial dataforanalysis.

Furthermore, our system is engineered to seamlessly integrate with existing law enforcementdatabases, fostering seamless collaboration among various agencies involved in search and rescueoperations.By amalgamating cutting-edge AI algorithmswithfacial recognitiontechnology,weaim to pioneer a transformative framework for identifying missing persons, ultimately enhancingpublicsafety andexpediting reunification efforts.

Through innovation and collaboration, our project endeavours to unlock the full potential oftechnology in safeguarding communities and reuniting families. This comprehensive exploration offacial recognition technology in the context of search and rescue operations will delve into itsunderlyingprinciples,applications,benefits,challenges,andethicalconsiderations,providingvaluableinsights into itsroleasagame-changer in modern searchandrescueefforts.

II. LITERATURE SURVEY

Theliteratureonmissingpersondetectionencompassesvariousapproachesandmethodologiesaimedatimprovingtheaccuracyandefficiencyofidentifyingindividualsindifferentscenarios.

Feature Discovery and Augmentation: Yang et al. [1] proposed a method for rich featurediscoveryusingclassactivationmapsaugmentation,enhancingpersonre-identification.Thisapproachleveragesdeeplearningtechniquestoaugmentfeature maps,therebyimprovingthediscriminative powerofthemodel.

AttributeLearning: Linetal.[2]focusedonimprovingpersonre-identificationthroughattribute and identity learning. By incorporating attribute informationinto the re-identificationprocess,themodelachievesbetterperformanceindistinguishingindividualsbasedontheircharacteristics.

SurveillanceSystems: Ferisetal.[3]discussedattribute-basedpeoplesearchinpracticalsurveillancesystems,highlightinglessonslearnedandinsightsgainedfromreal-worldimplementations. This research emphasizes the importance of integrating attributes into searchalgorithmsforeffectiveperson retrieval.

Multi-Attribute Queries: Siddiquie et al. [4] proposed an image ranking and retrieval systembased on multi-attribute

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queries, enabling users to search for individuals using a combination ofdifferent attributes.Thisapproachenhancestheflexibility andaccuracyof personretrievalsystems.

Dataset Annotation: Li et al. [5] introduced a richly annotated pedestrian dataset for personretrieval in real surveillance scenarios. This dataset serves as a valuable resource for training andevaluatingperson re-identificationmodels, facilitating advancementsin the field.

III. SYSTEM ANALYSIS

Existing system:

Theexistinglandscapeofmissingpersondetectionencompassesawiderangeofmethodologies, including traditional search methods and advanced technological solutions. Whiletraditionalsearchandrescueoperations, facialrecognitionsystems,onlinedatabases,andcommunity-basedinitiativesallcontributesignificantly,challengespersist.Thesechallengesincludeprivacyissues,technologicalconstraints,andthenecessityforimprovedcoordinationamong stakeholders. Although some existing systems employ facial recognition technology, theymay lack integration with sophisticated algorithms. Moving forward continued innovation andcollaborationacrosssectorsareessentialforaddressingthesechallengesandenhancingtheeffectivenessof missing person detection efforts.

DisadvantagesoftheExistingSystem:

Limited Technological Integration: Existing systems often lack integration with advanced AIalgorithms, hindering their accuracy in identifying missing persons, especially in challengingconditions.

Reliance on Traditional Methods: Some systems rely heavily on manual searches or physicalflyers,which arelessefficient,particularlyin large-scaleoperationsor urbanenvironments.

Manual Search Methods: Sticking posters, Complaining polices doesn't look any serious inidentifyingtheperson which looks as adisadvantageto it.

IV. PROPOSEDSYSTEM

In this proposed system revolutionizes missing person searches with AI algorithms and facialrecognition. Integrating Algorithms and Classifiers, it detects and outlines facial features crucial forprecise matching against stored data. Refined facial recognition algorithms meticulously analyzedistinct features, ensuring accurate identification. Upon a match, real-time alerts are sent to lawenforcement and guardians, expediting

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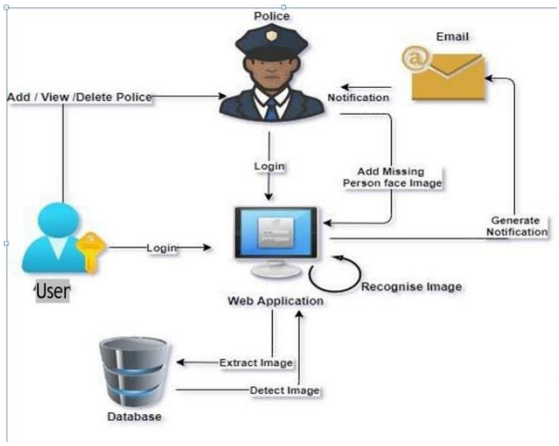
reunification. With AI optimization, our system achievesunparalleled accuracy,expediting searchandrescueoperations

V. SYSTEM DESIGN

SYSTEM ARCHITECTURE



Use case Diagram:

A Use Case Diagram is a vital tool in system design, it provides a visual representation of how users interact with a system. It serves as a blueprint for understanding the functional requirements of a system from a user's perspective, aiding in the communication between stakeholders and guiding the development process.

A Use Case Diagram is a type of Unified Modeling Language (UML) diagram that represents the interaction between actors (users or external systems) and a system under consideration to accomplish specific goals.

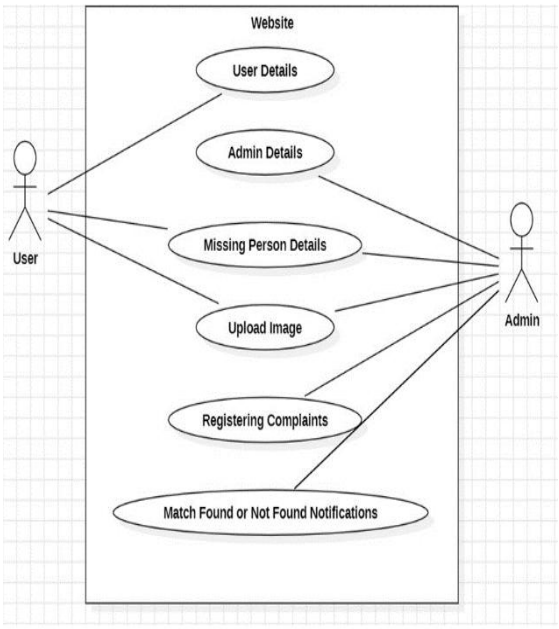


Fig2:-Use caseDiagram of MP

ComponentDiagram

A componentdiagramisusedtobreakdownа large object-orientedsystemintothe smallercomponents, so as to make them more manageable. It models the physical view of a system such asexecutables,files, libraries, etc. that resides within the node.

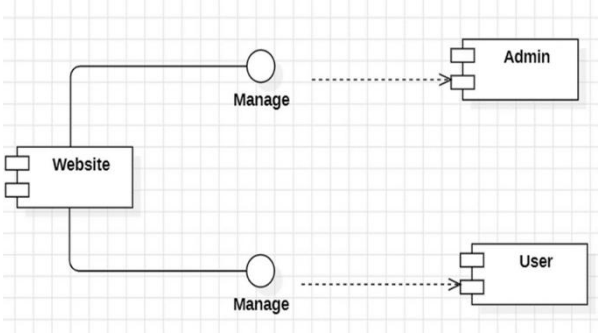


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Fig8:-ComponentDiagramofMP

VI. IMPLEMENTATION

Python Programming Language

Python serves as the primary programming language for developing the backendalgorithmsand functionalities of the AI-assisted search system. Its extensive libraries for image processing(e.g., OpenCV), machine learning (e.g., TensorFlow, PyTorch), and web development (e.g., Flask)make it well-suited for implementing facial recognition systems. Python's simplicity, readability,and versatility contribute to the rapid development and deployment of robust facial recognitionalgorithms.

VisualStudioCodeIDE

Visual Studio Code emerges as the preferred integrated development environment (IDE) forcoding, testing, and debugging the system's software components. Its user-friendly interface, richcode editor features, and compatibility with various programming languages make itan idealchoice for software development tasks. Visual Studio Code provides developers with a seamlessdevelopment experience, enabling efficient collaboration and iteration in the creation of AI-assistedsearchsystems for identifying missing persons.

Open CVforFacialRecognition

OpenCV(OpenSourceComputerVisionLibrary)isapowerfullibrarythatprovidescomprehensive tools and algorithms for image processing and computer vision tasks. In the contextof facial recognition, OpenCV offers functionalities for facial detection, feature extraction, andmatching. The library's Python bindings enable seamless integration with Python code, allowingdeveloperstoleverageits capabilitiesfor implementing facialrecognition algorithms.

HyperTextMark-upLanguage(HTML)

HTML stands for Hyper Text Mark-up Language. It is used to design web pages using a mark-uplanguage.HTMLis acombination ofHypertextand Mark-uplanguage.

Hypertext defines the link between web pages. A mark up language is used to define the textdocumentwithinthe tag whichdefinesthe structure of webpages.Thislanguage isusedtoannotate (make notes for the computer) text so that a machine can understand it and manipulate textaccordingly. Most mark-up languages (e.g. HTML) are human-readable. The language uses tags

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todefinewhat manipulationhas to bedoneon the text.

HTML is a mark-up language used by the browser to manipulate text, images, and othercontent, in order to display it in the required format. HTML was created by Tim Berners-Lee in1991. The first-ever version of HTML was HTML 1.0, but the first standard version was HTML2.0, publishedin 1995.

CascadingStylesheets(CSS)

Cascading Style Sheets, fondly referred to as CSS, is a simply designed language intended tosimplify the process of making web pages presentable. CSS allows you to apply styles to webpages. More importantly, CSS enables you to do this independently of the HTML that makes upeach web page. It describes how a webpage should look: it prescribes colours, fonts, spacing, andmuch more. In short, you can make your website look however you want. CSS lets developers anddesignersdefinehowit behaves, includinghow elements arepositioned inthe browser.

While HTMLusestags,CSSusesrule sets.CSSiseasytolearnandunderstand,butitp rovidespowerful control overthe presentationofan HTML document.

DatabaseManagementSystem(DBMS)

DatabaseManagementSystemisasoftwareor technologyusedtomanagedatafromadatabas e. Some popular databases are MySQL, Oracle, MongoDB, etc. DBMS provides manyoperations e.g. creating a database, Storing in the database, updating an existing database, deletefrom the database. DBMS is a system that enables you to store, modify and retrieve data in anorganizedway.It also provides security tothe database

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VII. OUTPUTSCREENS

Screens

HomePage

InthisHomepageistologinandsignupforbothadminandplayers.It'sthefirststepintheregistration.

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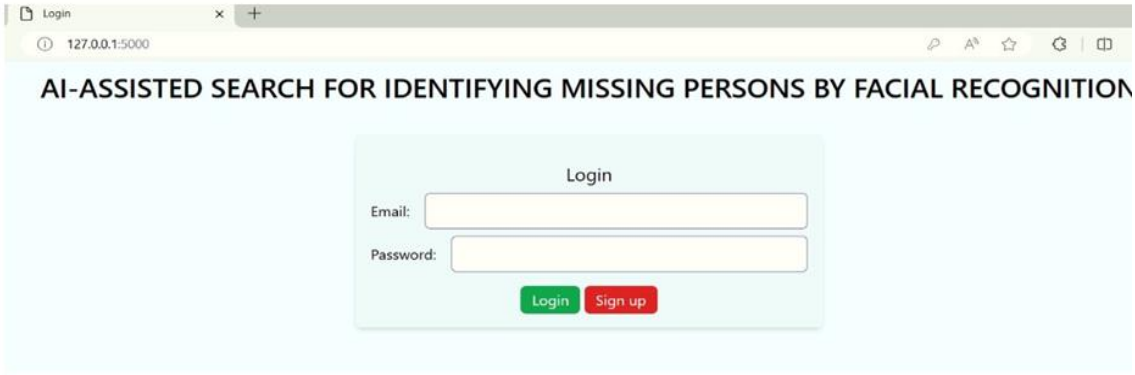

Fig 9 :- Home Page

New signup page

This is for new users login purpose,to register with full details.

New signup page

This is for new users login purpose,to register with full details.

Fig 10 :- New Signup Page

DetailsUpload page

Inthispageallthedetailsrelatedtothemissingpersonsisuploadedlikeage,name,gender,haircolour, eyecolourandotherdetails etc…

ISSN: 2366-1313

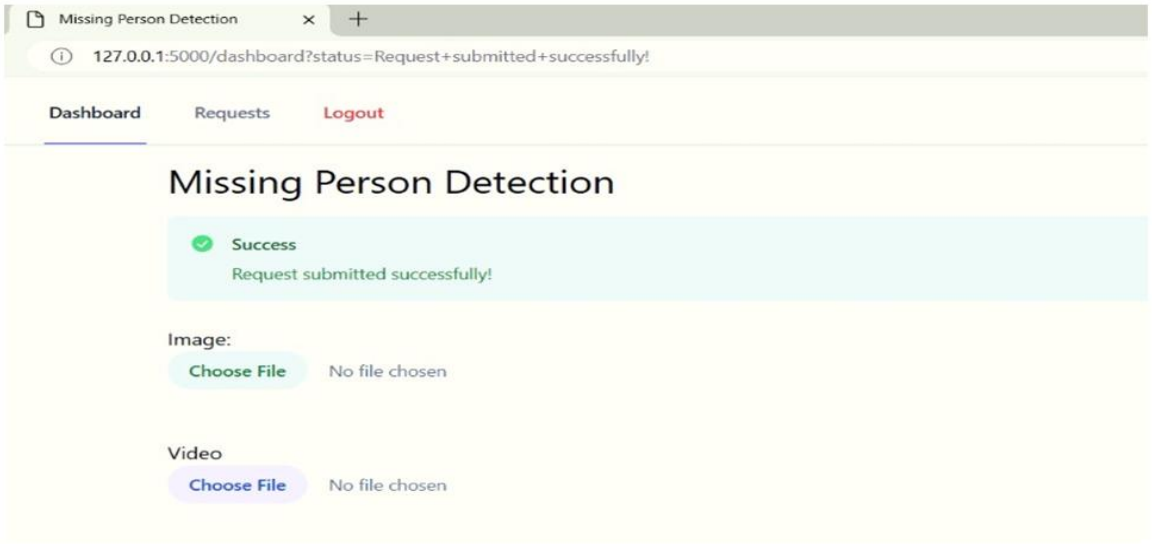

Fig 12 :- Upload Successfully Page

ResultsPage

Theresultspageshowsthemissingstatusofthemissingpersonsbymatchfoundornot,inprogr essand theallthe upload details likeimage,video and personalinformation.

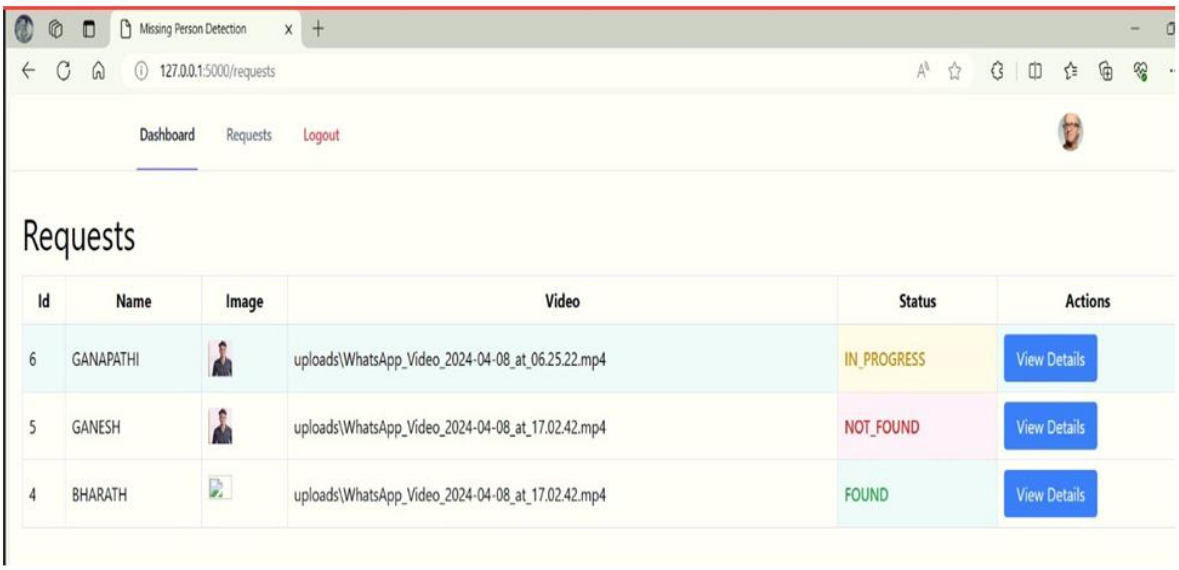

Fig 13 :- Results Page

VIII. CONCLUSION

TheintegrationofAlgorithmsandClassifiersi nAI-

ISSN: 2366-1313

assistedmissingpersondetectionsignifiesamajorbreakthrough.Thismethodinvolvessystematicdatacollection,modelconstruction, and testing, offering robust identification even under challenging conditions. Whilerequiring extensive data and deep learning expertise, continual advancements promise enhancedprecision. Additionally, our approach addresses large crowd scenarios by proposing video-basedtracking, optimizing search operations. Overall, this integration not only boosts search efficiencybut also paves the way for addressing complex scenarios. With ongoing AI advancements, weanticipatefurtherenhancementsinpublicsafetyandfamilyreunificationthroughimproveddetectionmethodologies.

TheresultssectionoftheAI-assistedsearchsystemforidentifyingmissing personsthrough facial recognition presents the outcomes of system development, testing, and evaluation.This section provides insights into the performance, accuracy, and effectiveness of the system inreal-worldscenarios.

IX. FUTUREENHANCEMENT

In the future, Image and Video recognition with the use of one-shot learning has becomevery powerful. This technology when put into good use, can be beneficial. It can even be used inHotels, Hospitals, etc., to find criminals instantly. Process of identifying the missing people isfastened.Thefutureworkonwhichwearefocusingnowistoimplementandmeasuretheperformance of our proposed system so that we can justify that our proposed system is better inFindingMissing Person than all the previous proposedsystem.

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