Forensic Human Identification using Dual Cross Patterns of Dental Panoramic Radiographs

*[1]Sagar V. Joshi, [2]Rajendra D. Kanphade, [3]Dinesh V. Bhalerao
[1,2]Department of E&TC Engineering, Dr. D. Y. Patil Institute of Technology, Sant Tukaram
Nagar, Pimpri, Pune-411 018, Maharashtra, India
[3]Department of Technology, Savitribai Phule Pune University, Pune-411 007, Maharashtra, India
Email: sagarvjoshi@gmail.com, kanphaderd2015@gmail.com, bhalerao.dinesh3@gmail.com

Abstract

Dental biometrics plays a very vital role in identifying the victims in natural and human-made disasters. The survivability and diversity of dental radiographs make them excellent alternatives over traditional biometric techniques using fingerprints, face, and iris. The main focus of this study is to deal with missing and unidentified person identification from a guide to automated based on dental panoramic radiographs using Dual Cross Pattern features that are complicated to be assessed only by visual examination. This paper seeks to identify an appropriate classifier amongst Feedforward Neural Network (FNN), Multiclass Support Vector Machine (m-SVM), k-Nearest Neighbor (k-NN) and Classification Tree (CT) based on retrieval accuracy of 10 adult subjects with 100 panoramic radiographs. The preliminary results on a small dataset are encouraging.

Introduction

In forensic radiography, the unlabeled post-mortem (PM) radiographs of the body including the skeleton, skull, and teeth of the deceased are compared with the ante-mortem (AM) records of a missing person to determine the similarities between them [1,2,3]. The recent catastrophes have shown how important it is to rely on biometric radiographs to attract public awareness. For instance, the activist assault in the United States on September 11, 2001 [2], 20% of 973 victims were identified in the first year using dental protocols [2]. A large number of victims from the Asian tsunami in 2004 were also identified based on dental information. In Thailand, 75% of tsunami fatalities were recognized based on dental radiographs, 10% from fingerprint records, and only 0.5% by DNA profiles [3.4]. For the identification of other victims, a combination of different techniques was used [4, 5].Radiographs have played a significant role in solving severe cases in forensic science [6,7,8]. Figure 2(a-c) explores most commonly used radiographs; the periapical, bitewing, and panoramic respectively. WinID [9,10] is dental software which has been demonstrated useful in major disasters and the creation and maintenance of individual databases [9,10]. The OdontoSearch 3.2 computer program provides a way to assess the frequency of dental procedures but cannot be used to find the identity of the victims [1,11]. Mahoor and Mottaleb [12] proposed Bayesian classification for bitewing radiographs using Fourier descriptors of contours based on universal numbering system used in dentistry. Jain and Chen [13] again developed a shape registration technique based on contours of teeth and dental work. Subjects were retrieved by matching tooth contours using a method of shape registration and on the overlapping work areas. Hofer and Marana [14] designed a human identification method based on panoramic dental radiographs by extracting &matching dental work of 22 PM radiographs with the 46 AM radiographs of the database. Nomir and Mottaleb [15] introduced a dental x-ray matching technique depends on Hierarchical chamfer distance algorithm. Nomir and Mottaleb [16] again introduced a technique using the fusion of matching algorithms for AM and PM radiographs by using tooth contour, hierarchical chamfer distance and combine features extracted from force field energy function and Fourier descriptors. For dental bitewing radiographs, an efficient classification system was proposed by Lin and Lai [17]. Lin and Kuo [18] used spatial domain features and frequency domain metric for matching PM image with positive AM image based on dental work. Harandi and Pourghassem [19] proposed low-level image processing techniques for measuring the length of the root canal. Oktay [20] proposed a probabilistic graphical model-based automatic human identification using panoramic radiographs. Ajaz and Kathirvelu [21] suggested a human identification technique using dental work from panoramic radiographs. Figure 1 represents sample pre-dental and post-dental work panoramic radiographs from dataset
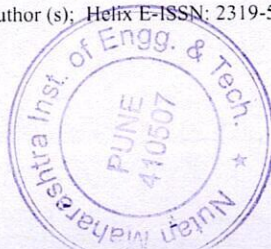
Forensic Approach of Human Identification Using Dual Cross Pattern of Hand Radiographs

Sagar V. Joshi[(✉)] and Rajendra D. Kanphade

Department of E&TC Engineering, Dr. D. Y. Patil Institute of Technology,
Sant Tukaram Nagar, Pimpri, Pune 411 018, Maharashtra, India
sagarvjoshi@gmail.com, kanphaderd2015@gmail.com

Abstract. The demand for personal identification systems has augmented in recent years, due to serious accidents and required for criminal investigation. Under natural calamity and human-made disasters sometimes it is impossible to use traditional biometric techniques based on fingerprints, iris, and face; in such cases, biometric radiographs like dental, hand and skull are the great alternatives for the victim's identification. The key objective of this study is to present a unique technique to deal with missing and unidentified person identification based on hand radiographs using Dual Cross Pattern (DCP). The proposed system has two main stages: feature vector extraction, and classification. In this paper, an attempt has been made to find out the most suitable classifier among k-nearest neighbor (k-NN) and Classification Tree based on the accuracy of retrieval of 10 subjects with 100 right-hand radiographs. The result achieved from experiments on a small primary database of radiographs reveals that matching hand radiographs based on DCP can be significantly used for human identification.

Keywords: Ante-mortem (AM) radiographs · Biometrics ·
Dual Cross Pattern · Postmortem (PM) radiographs

1 Introduction

The process of human identification is of great importance for the procedures in the different areas of law and is demanded by the community for cultural or religious reasons. Biometric authentication has played an important role in identifying individuals. Biometrics refers to the measurement of attributes or specific characteristics of the human body, such as fingerprints, retina, iris, and even the voice to distinguish that person from others. These features are unique to each person, making them an access password for the user. On the other hand, for the identification of mass disaster victims, such as earthquakes, fires, tsunami, etc., conventional biometric features may not be applicable. Forensic radiography is a part of forensic medicine that covenants the detection of personnel with PM radiological metaphors of a mixture of a component of the body counting the skeleton, skull, and teeth [1–14]. The unlabeled PM radiographs of the body of the deceased are compared with the AM records of a missing person to determine the similarities between them [1–3]. There are a lot of techniques available

Secure Re-Encrypted PHR Shared to Users Efficiently in Cloud Computing

Surabhi Panchal[1], Harshal Pawar[2], Shubham Mahajan[3], Prof. Nitin Dhawas[4]

[1,2,3]*Student, Department of Information Technology, Nutan Maharashtra Institute of Engineering and Technology, Talegaon Dabhade, Maharashtra, India*

[4]*Professor, Department of Information Technology, Nutan Maharashtra Institute of Engineering and Technology, Talegaon Dabhade, Maharashtra, India*

---***---

Abstract - The health care sector has resulted in the price-effective and convenient exchange of personal Health Records (PHRs) among several collaborating entities of the e-Health systems. still, storing the confidential health information to cloud servers is vulnerable to revelation or stealing and demand the event of methodologies that make certain the privacy of the PHRs. Therefore, we have a tendency to tend to propose a way cited as SeSPHR for the secure sharing of the PHRs among the cloud. The SeSPHR theme ensures patient-centric management on the PHRs and preserves the secrecy of the PHRs. The patients store the encrypted PHRs on the un-trusted cloud servers and selectively grant access to differing kinds of users on whole totally different components of the PHRs. A semi-trusted proxy cited as Setup and Re-encryption Server (SRS) is introduced to line up the public/private key pairs and to provide the re-encryption keys. Moreover, the methodology is secure against executive director threats and put together enforces forward and backward access management. Moreover, we have a tendency to tend to formally analyze and verify the operation of SeSPHR methodology through the High-Level Petri Nets (HLPN). put together we have a tendency to tend to Implement as a contribution throughout this paper time Server, Secure Auditing Storage, in Time Server PHR Owner add the beginning and Ending time attach to uploaded Encrypted files, and put together implement the TPA Module for verify the PHR Record its hack or corrupted for the opposite hacker and bad person if data hack from hacker side discover all system details of bad person like Macintosh Address and knowledge science Address it's our contribution in our project.

Key Words: **Access control, cloud computing, Personal Health Records, privacy, Time Server, Auditing, Proxy Server**.

1. INTRODUCTION

Cloud computing has emerged as an important computing paradigm to produce pervasive and on-demand convenience of assorted resources at intervals the type of hardware, software, infrastructure, and storage. Consequently, the cloud computing paradigm facilitates organizations by relieving them from the extended job of infrastructure development and has galvanized them to trust the third-party knowledge Technology (IT) services. to boot, the cloud computing model has incontestable vital potential to increase coordination among several aid stakeholders and in addition to form positive continuous convenience of health knowledge and amount ability. what's additional, the cloud computing, in addition, integrates various very important entities of aid domains, like patients, hospital workers additionally because of the doctors, nursing workers, pharmacies, and clinical laboratory personnel, insurance suppliers, and thus the service suppliers. Therefore, the mix of a for mentioned entities lands up within the evolution of a price effective and cooperative health system where the patients can merely manufacture and manage their Personal Health Records (PHRs).

1.1 Literature Survey

Paper 1. Privacy-Preserving Multi-Channel Communication in Edge-of-Things

Author Name: Keke Gaia, MeikangQiub, ZenggangXiongb, MeiqinLiud

Description: The contemporary booming growth of the Internet-based techniques has up a revolution of network-oriented applications. A connected setting any drives the combination of varied techniques, like edge computing, cloud computing and Internet-of-Things (IoT). Privacy problems have appeared throughout the tactic of information transmissions, a variety of that unit caused by the low-security communication protocols. In follow, high-security protection protocols usually would like a higher-level computing resource thanks to plenty of computation workloads and communication manipulations. The implementation of high-security communications is restricted once information size becomes huge. This work focuses on the matter of the conflict between privacy protection and efficiency and proposes the latest approach for providing higher-level security transmission victimization multi-channel communications. we have an inclination to implement experiment evaluations to appear at the performance of the planned approach.

Paper 2. A Survey on FinTech

Author Name: KekeGai, Meikang Qiucor1 b, a Xiaotong Sun a

Description: As a fresh term among the financial business, FinTech has become the most popular term that describes novel technologies adopted by the financial service

Advanced Water Quality Monitoring with IoT

Chetna Gawade[1], Shreya Haveli[2], Harshal Attarde[3], Nitin Dhawas[4]

[1,2,3]*Student, Department of Information Technology, Nutan Maharashtra Institute of Engineering and Technology, Talegaon Dabhade, Maharashtra, India*
[4]*Professor, Department of Information Technology, Nutan Maharashtra Institute of Engineering and Technology, Talegaon Dabhade, Maharashtra, India*

---***--

Abstract - *Water covers over 70% of the Earth's surface **and is** a very important resource for people and the environment. The polluted water affects drinking water, rivers, lakes and oceans all over the world. To prevent this, necessary steps are to be taken. This system is based on detecting the change in water quality parameters in real time, quantify its importance and determine the most appropriate actions to be taken to limit its effects. First, the proposed approach starts with estimating the water parameters like pH, water flow, etc., as the variations in the values of these parameters point towards the presence of pollutants. Later, the processing of Sensor values is done. Finally, a water quality monitoring and management system is proposed based on the IOT concept and which use different sensors to manage the water.*

Key Words: Internet Of Things, pH Sensor, Flow Sensor, Ultrasonic Sensor, ESP8266, Cloud Data Storage

1. INTRODUCTION

Water is one of the most important basic need for all living beings, but unfortunately, a huge amount of water is being wasted because of uncontrolled use and due to which a very small amount of drinkable water is available. According to [1], in 2018, 2,439 people died because of four major water-borne cholera, acute diarrhea diseases (ADD), typhoid and viral hepatitis. Overall, more than 1.3 crore people were diagnosed with these diseases. ADD is known to affect children below 5 years the most and was the biggest killer, accounting for 1,450 (60%) of the 2,439 deaths in 2018. In the previous five years, 11,768 individuals have passed on due to these illnesses, while 7.6 crore individuals were determined to have them during a similar time. Hepatitis killed 584 people in 2018. One of the reason for the water shortage is poor management of water. Overflowing water tanks in residents, schools, colleges, Municipal overhead tanks, etc. can contribute to the large amount of water wastage. If we can control this we can save large amount of water. Conventional water tanks can neither monitor nor control the water level in the tank. As of now, the water level has to be manually checked. So, this paper will solve all the above mentioned problems with automatic detection of water level and sensors with the help of Internet of Things (IoT).

The Internet of Things, can be defined as billions of interrelated physical gadgets all over the globe that are presently associated with the web, gathering and sharing information. There are several methods of IoT communication available. According to [2], device-to-device and device-to-cloud are the two types of communication that are applied in IoT system.

1.1 Problem statement:

To develop an IOT system with the help of a Controller[ESP8266] which address all water distribution and monitoring problems and reduce man power as well as consume less time and energy.

2. LITERATURE REVIEWS

This system reviews the relevant works of water quality monitoring and management system using the IoT platform.

A. The real time monitoring of water quality in IoT environment.

The work of [3] studied the development of low cost system for real time monitoring of water quality in IoT environment. The parameters measured in the system are pH, temperature, turbidity, conductivity, dissolved oxygen which are present in the water. And later, the sensor data can be viewed on the internet using cloud computing.

B. Smart Water Monitoring System using IoT

Gowthamy J [4] studied the theory of real time monitoring of water quality and quantity using IoT. The system consists of Arduino microcontroller, different type of sensors. Arduino is the main controller of the system which control and process the data generated by the sensors. A Wi-Fi module is connected to the Arduino controller which help to transfer the data to the cloud over internet. The ultrasonic sensor assists with estimating the water level when the water stream arrive at certain level then the water flow can be halted automatically by turning the motor off.

C. IoT Based Low Cost System for Monitoring of Water Quality in Real Time

The work of [5] studied the estimation of the water parameters like pH, turbidity, temperature and TDS. The measured values from the sensors can be processed by the controller i.e. the Raspberry Pi. The Raspberry Pi model is used as a core controller. Finally, the sensor data can be viewed on internet using ThingSpeak API.

6

Eutectic Al-Si alloy metal matrix composite: A Review

Rahul Arun Patil[1*], Ekanath Raghunath Deore[2],
[1]Research Scholar, Pune, Maharashtra, India

ABSTRACT: The Eutectic Al-Si alloy used in automobile parts like engine cylinder, piston due to it good castabilty, high strength properties. Aluminium matrix composite are providing superior properties than the conventional material with ceramics, oxides, boride and minerals as a reinforcement. This paper is presenting a review on AMC composite material which improves the mechanical and tribological properties of base eutectic Al-Si alloy. Special focus is given on to improve the base Al-Si alloy properties with reinforcement at elevated temperature. Graphite wt.% is also reviewed in order to achieve better wear and coefficient of friction resistance. Selection of fabrication method for AMC is discussed
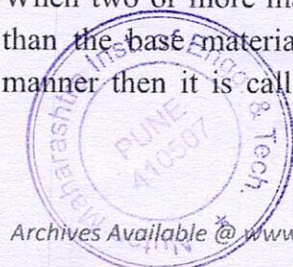
Keywords: AMC, Eutectic Al-Si Alloy,stir. casting, reinforcements, Graphite

1. INTRODUCTION

Today's researcher and industries are attracted towards Aluminium due to its high strength to weight ratio, ductility, durability and availability on earth upto 8% by weight of the earth surface as mineral. [1]Still in order to meet requirement of superior properties of material which a monolithic and base alloy material limited. A composite of Aluminium as matrix and reinforcement as ceramic, oxides, agriculture waste, minerals etc. are used. Currently, many automotive components like cylinder liners, piston, connecting rods, camshafts, brake calipers, rotors etc. high-performance component made up of MMC have high cost. the paper focusing on study of the eutectic alloy of Aluminium and silicon with reinforcements material. the relationship between the microstructure and mechanical properties of Aluminium -silicon alloy is investigated for several years. When the Si contain is 12% in the Al-Si alloy then the Al-Si alloy termed as eutectic alloy. due to the high fluidity, high corrosion resistance, reduction in shrinkage, low coefficient of thermal expansion and good weldability etc. properties of Al-Si alloy constitute of 80% of aluminum casting alloy at 577o C. [2]The eutectic alloys (11-13% Si) finds application in Automobiles like piston, cylinders, block and heads of IC engine and in aeronautical industries.

1.1. Composite Materials

When two or more materials added in order to improve physical and mechanical properties than the base material is called composite materials. If the phase present in continuous manner then it is called as Matrix the other one appears in discontinues is called