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Academic year	Number of Publications
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# Certificate Based Secure Communication Scheme for Cluster Based Architecture in MANET

A. Annalakshmi and Dr.K.R. Valluvan

*Abstract*--- In mobile ad hoc networks (MANET), the secured clustering may result in high bandwidth connection, extensive computational power and massive storage capacity. Also maintaining security in the networks is a critical issue due to its characteristics causing attacks paying the way for hackers to pretend as one of the cooperative network node. Hence in this paper, a certificate based secure communication scheme for cluster based architecture in MANET has been proposed. In this technique, a cluster-based certificate revocation scheme is applied that enlists and removes the certificates of the detected malicious neighborhood nodes. This technique considers the attacker level of each malicious node. In order to provide the authentication and confidentiality in the network, a threshold signature scheme is used. By simulation results, it is shown that the proposed technique enhances the network security and minimizes the overhead.

## I. INTRODUCTION

### A. MANET

A Mobile Adhoc Network (MANET) is an independent system of mobile nodes coupled through wireless links. It does not have any fixed infrastructure. MANET is quite different from distributed wireless LAN and wired network. There is no centralized control, and it is difficult for any single mobile host to have an accurate picture of the topology of the whole network. Nodes in a MANET keep moving randomly at varying speeds, ensuing in constantly changing network topologies. Here each node in the network serves as a router that forwards packets to other nodes. The scarcity of bandwidth implies that there should not be high communication overhead among various nodes [1]. MANETs find their applications in many areas like battlefield and rescue operations, mobile conferencing, home based networking, virtual classrooms etc. They have the following inherent characteristics:

- 1) open medium,
- 2) lack of fixed central structure,
- 3) changing topology,
- 4) constrained capability,
- 5) less bandwidth,
- 6) rely on batteries etc

So MANETs are highly vulnerable to various security attacks. Providing secure Communication in MANET has proved to be significant challenge. Authentication and Trust Model which are developed for wired network cannot be used in wireless network. Common authentication schemes are not applicable in Ad hoc network since public key infrastructure is hard to deploy [2] [3].

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# GLOBAL JOURNAL OF ENGINEERING SCIENCE AND RESEARCHES

## THE MONOPHONIC DIAMETRAL PATH FIXING MONOPHONIC NUMBER OF A GRAPH

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### ABSTRACT

For a connected graph  $G = (V, E)$ , let  $P$  be a monophonic diametral path of  $G$ . A set  $M \subseteq V(G) - V(P)$  is called a  $P$ -monophonic set of  $G$  if every vertex of  $G$  lies on a  $x - y$  monophonic path where  $x \in P$  and  $y \in M$ . The minimum cardinality of a  $P$ -monophonic set of  $G$  is  $P$ -monophonic number of  $G$  denoted by  $m_p(G)$ . A monophonic set of cardinality  $m_p(G)$  is called a  $m_p$ -set of  $G$ .  $P$ -monophonic number of certain classes of graphs are studied. Connected graphs of order  $p$  with  $P$ -monophonic number 0 and  $p - 2$  are characterized. It is shown that for integers with  $2 \leq a \leq b$ , there exists a connected graph  $G$  of order  $p$ , with  $m(G) = a$  and  $m_p(G) = b$ .

**Keywords:** monophonic path, monophonic number,  $P$ -monophonic number  
**AMS subject classification:** 05C38

### I. INTRODUCTION

By a graph  $G = (V, E)$ , we mean a finite undirected connected graph without loops or multiple edges. The order and size of  $G$  are denoted by  $p$  and  $q$  respectively. For basic graph theoretic terminology we refer to Harary [1,3]. A chord of a path  $u_0, u_1, u_2, \dots, u_n$  is an edge  $u_i, u_j$  with  $j \geq i + 2, (0 \leq i, j \leq n)$ . An  $u - v$  path  $P$  is called a monophonic path if it is a chordless path. For two vertices  $u$  and  $v$  in a connected graph  $G$ , the monophonic distance  $d_m(u, v)$  is the length of the longest  $u - v$  monophonic path in  $G$ . A  $u - v$  monophonic path of length  $d_m(u, v)$  is called a  $u - v$  monophonic. For a vertex  $v$  of  $G$ , the monophonic eccentricity  $e_m(v)$  is the monophonic distance between  $v$  and a vertex farthest from  $v$ . The minimum monophonic eccentricity among the vertices is the monophonic radius,  $rad_m(G)$  and the maximum monophonic eccentricity is the monophonic diameter  $diam_m(G)$  of  $G$ . The monophonic distance of a graph is introduced in [4]. A monophonic set of  $G$  is a set  $M \subseteq V$  such that every vertex of  $G$  is contained in a monophonic path joining some pair of vertices in  $M$ . The monophonic number  $m(G)$  of  $G$  is the minimum order of its monophonic sets and any monophonic set of order  $m(G)$  is a minimum monophonic set or simply a  $m$ -set of  $G$ . The monophonic number of a graph is introduced in [2] and further studied in [5,6,7]. These concepts have many applications in location theory and convexity theory. There are interesting applications of these concepts to the problem of designing the route for a shuttle and communication network design. We further extend these concepts to the monophonic diametral path of  $G$  and present several interesting results.

The following theorem is used in sequel.

**Theorem 1.1.[5]** Each extreme vertex of a graph  $G$  belongs to every monophonic set of  $G$ .

### II. THE DIAMETRAL PATH FIXING MONOPHONIC NUMBER OF A GRAPH.

**Definition 2.1.** Let  $G$  be a connected graph and  $P$  be a monophonic diametral path of  $G$ . A set  $M \subseteq V(G)$  is said to be a  $P$ -monophonic set of  $G$  if every vertex of  $G$  lies on a monophonic path joining a vertex of  $M$  and a vertex of  $P$ . The  $P$ -monophonic number  $m_p(G)$  of  $G$  is the minimum order of its  $P$ -monophonic sets and any  $P$ -monophonic set of order  $m_p(G)$  is a minimum  $P$ -monophonic set or simply  $m_p$ -set.



## Energy Collection Efficiency of Solar Collector with Nano Carbon-Cr<sub>2</sub>O<sub>3</sub> Coated Absorber

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**Abstract:** The experimentation on solar absorber and collector is mandatory so as to have their effective utilization in energy intensive sectors. In this connection, experimentation in connection with the characterization of nano carbon and Cr<sub>2</sub>O<sub>3</sub> (60:40) coated solar absorber was carried out. In addition, experimentation in connection with the estimation of efficiency of solar collector and device was carried out as per BIS specifications. The outcomes of experimentation on solar absorber revealed that the crystallite sizes in the carbon and Cr<sub>2</sub>O<sub>3</sub> (60:40) coating on absorber were in nano ranges. The outcomes of experimentation on solar collector and device revealed that the instantaneous thermal performances of solar flat plate collector ranged between 66.9% and 68.6% and energy collection efficiency of solar heating device was 51.4%. As the thermal performances of the solar collector and device could distinctively depend on the optical characteristics of the absorbers, it could be concluded that nano carbon and Cr<sub>2</sub>O<sub>3</sub> (60:40) coated solar absorbers would be effectively used in solar collectors and heating devices.

**Keywords:** Nanostructured absorber, Solar collectors and devices, Improved thermal performances

### I. INTRODUCTION

Solar heating device is one of the technically matured solar thermal devices. It has two major components such as flat plate collector and storage tank [2]. It has been reported that the thermal performance of solar device can be improved by incorporating metal absorbers with relatively higher thermal conductivity. It has also been reported that the thermal performance of solar device can be further improved by incorporating metal absorbers with nanostructured coating on them [3]. In this connection, the present research work was carried out (i) to assess the structural characteristics of the nano carbon and Cr<sub>2</sub>O<sub>3</sub> (60:40) coated absorber, (ii) to estimate the instantaneous thermal performance of flat plate collector with nano carbon and Cr<sub>2</sub>O<sub>3</sub> (60:40) coated absorber and (iii) to evaluate the energy collection efficiency of solar heating device. The standard materials, BIS test methods and calibrated test instruments were used for materializing all these objectives. The research outcomes have been recorded in the present research paper for the benefits of researchers, manufacturers and end users of solar thermal devices. As far as the organization of the research paper is concerned, the first section provides the introduction and the second section provides the materials and methods of the present research work. The third and fourth sections provide the results, discussion and conclusion of the present research work.

### II. MATERIALS AND METHODS

The test samples of the present research included (i) nano carbon and Cr<sub>2</sub>O<sub>3</sub> (60:40) coated absorber (ii) solar flat plate collector with nano carbon and Cr<sub>2</sub>O<sub>3</sub> (60:40) coated absorber and (iii) solar heating device. While the nano carbon and Cr<sub>2</sub>O<sub>3</sub> (60:40) coated absorber was characterized through XRD, the flat plate collector was tested as per BIS specifications and the solar heating device was tested as per energy collection efficiency test procedures [1]. It is to be noted that the steady state conditions and test conditions were strictly maintained for testing the flat plate collector and solar heating device. It is also to be noted that the flat plate collector and solar heating device were tested in outdoor conditions and the influencing parameters were recorded. The thermal performance of flat plate collector and solar heating device was individually calculated with the formulae such as

$$\eta = m_f C_p (T_o - T_i) / A_s G \quad \dots(1)$$

$$\eta = m_f C_p (T_b - T_a) / A_s G_i \quad \dots(2)$$

Where  $\eta$  = efficiency (%),  $m_f$  = mass flow rate of working fluid (kg/s),  $C_p$  = specific heat capacity (J/kg°C),  $T_o$  = outlet temperature of the working fluid (°C),  $T_i$  = inlet temperature of the working fluid (°C),  $T_b$  = final temperature of the

# Performance Characteristics of Solar Collector With Nano-structured Absorber Configurations

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**Abstract**— Carbon and metal oxide based coatings are widely used for photo thermal conversion. In the present research work, carbon and NiO based coating was prepared and the coating was effected on metal plates. The coating on the metal absorber was characterized and it was found that the sizes of crystallites in the coating were in nanoranges. The prepared nano-structured absorbers were integrated in solar collector and its performance characteristics were experimentally assessed. It was found that the temperature of working fluid varied from 16.4 to 21.9 °C in the developed solar air heating collector. It was also found that the performance characteristics of the solar air heating collector could satisfy the standard specifications. It could be concluded that nano-structured components would be integrated in solar air heating collectors not only to enhance their performance characteristics but also to utilize them in energy-intensive sectors.

**Keywords**— Solar Collector, Nano Structured Absorber, Absorptive Coating, Thermal Efficiency, Improved Thermal Performances

## I. INTRODUCTION

The solar collector is an integral part of any solar thermal device. Its central component is absorber and the material characteristics of the absorber mainly determine the performance characteristics of the solar collector and hence the solar thermal device [1]. So, it is essential to improve the material characteristics of the absorber so as to improve the performance characteristics of the solar collector and the connected solar thermal device [2]. In this connection, the present research work was devoted (i) to prepare the nano-structured absorber, (ii) to develop the solar collector with nano-structured absorber and (iii) to experimentally assess the performance characteristics of solar collector with nano-structured absorber configurations. The standard materials and methods were adopted for materializing these research objectives [3]. The research outcomes have been documented in this research paper for the benefits of researchers, manufacturers and end users of solar thermal devices.

## II. MATERIALS AND METHODS

In the present research work, the nano carbon and nickel oxide were commercially procured. They were blended with solar emulsion in different proportions. The developed emulsion was spray coated on metal plates and the nano-structured solar absorbers were developed. The coatings effected on metal plates were characterized through XRD analysis and the crystallite sizes in the absorptive coatings were calculated by using Scherrer's formula [4].

The copper plate of suitable size was commercially procured. It was found that the procured copper plate had homogeneous surface with constant thickness and sufficient roughness. The baffles of length 750 mm, breadth 30 mm, and thickness 0.50 mm were prepared separately. These copper baffles were fixed on both sides of the copper plate at equi-distances of 250 mm. The plate with baffles was coated with copper and NiO mixed solution by spray-coating technique. The prepared absorber plate was integrated subsequently in the solar air-heating collector. It should be noted that solar air-heating collector had the other integral components such as nano-textured glass cover, rock wool insulation and aluminium channel sections in suitable dimensions [5].

  
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# Thermal Analyses On Solar Collector With Heat Transfer Configurations

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**Abstract:** The solar collectors with heat transfer configurations can be developed for their effective utilization in application sectors. In this connection, the present research work was conducted not only to prepare and incorporate heat transfer configurations with solar collector but also to experimentally assess the thermal characteristics of solar collector with the same heat transfer configurations. The research results revealed that heat transfer configurations with ribs, baffles and nano structured fins could be effectively integrated in solar collector. The research results also revealed that the temperature rise of working fluid was in the range of 16.8 to 28.4°C in solar collector with heat transfer configurations. It could be concluded that the thermal characteristics of solar collector would be substantially enhanced with rib, baffle and nano structured fin based heat transfer configurations.

**Index Terms –** Heat transfer configurations, Temperature enhancement of fluid, Performance improvement of solar collector

## I. INTRODUCTION

Solar collector is the integral part of solar thermal devices [1]. Its efficiency is to be improved so as to match partially the demand and supply of hot fluids in photo thermal application sectors. It is reported that the efficiency of solar thermal device can be improved by improving the optical absorption of incident radiation through nano structured fins [2]. It is also reported that the efficiency of solar thermal device can be enhanced by improving the heat transfer from fin to fluid through ribs and baffles [2]. In this connection, the present research work was conducted not only to develop and incorporate heat transfer configurations with solar collector but also to experimentally assess the thermal characteristics of solar collector with the same heat transfer configurations. The standard materials, methods and test instruments were used for materializing these objectives [3]. The research outcomes along with their scientific interpretation have been documented in this research paper for the benefits of producers, researchers and end users of solar thermal devices.

## II. MATERIALS AND METHODS

The conventional solar collector was taken. It was attached with heat transfer configurations such as ribs, baffles and nano structured fins. In fact, the 'V' shaped metal ribs were separately prepared and they were integrated on the fin of the solar collector. The rectangular shaped metal baffles were also separately prepared and they were integrated on the fin of the same solar collector. The metal substrate of the solar collector was spray coated with nano carbon and metal carbide based nano composite. It is worth mentioning that the ribs and baffles were also coated with the same nano composite so as to reap the enhanced optical and thermal benefits.

The developed collector with heat transfer configurations was kept in the test set up and it was tested in field conditions as per specifications. It is to be noted that the parameters such as incident solar radiation, inlet temperature of fluid, outlet temperature of fluid and flow rate of fluid were periodically measured during sun shine hours. It is also to be noted that the thermal performance of solar collector was calculated by substituting the measured parameters in the formula of thermal performance [4].

## III. RESULT AND DISCUSSION

The present research work was conducted not only to prepare and incorporate heat transfer configurations with solar collector but also to experimentally assess the thermal characteristics of solar collector with the same heat transfer configurations. The results of thermal analyses on solar collector have been presented in Table 1 and Table 2 respectively.

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# Thermal Analysis On Solar Collector For Supplementary Heating Of Hot Fluid

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**Abstract-** Stagnation temperature, temperature enhancement of fluid and thermal performance are the key parameters and so these parameters are to be monitored in solar collector applications in connection with supplementary heating of hot fluid. In this connection, the present research was devoted to have studies on solar absorber, solar collector in stagnant conditions and solar collector in operative conditions. The research results showed that the crystallite size in absorptive coating effected on solar absorber was 36 nm. The research results also showed that the stagnation temperature of solar collector with nano structured absorber was 85.0 °C. The observation on research results revealed not only the temperature enhancement of fluid that varied from 5.3 to 5.7 °C but also the instantaneous performance of collector that ranged between 53.0 to 54.0%. It could be concluded that the solar collector with nano-structured absorber would be used for supplementary heating of hot fluid with improved thermal performances.

**Index Terms-** Solar collector, Stagnation temperature, Temperature of fluid, Thermal performance.

## 1. INTRODUCTION

The physical properties of solar absorbers determine the instantaneous thermal performances of solar collector [1]. It has been reported that the physical properties can be improved by using suitable chemical constituents in the absorptive coatings effected on solar absorbers [2]. It has also been reported that the physical properties can also be improved by using suitable sizes of chemical constituents in absorptive coatings effected on absorbers [3]. In these perspectives, the present research work was devoted (i) to estimate the crystallite sizes in the absorptive coating effected on solar absorber, (ii) to evaluate the thermal enhancements in solar collector at stagnant conditions and (iii) to assess the instantaneous thermal performances of solar collector for supplementary heating of hot fluid. The standard materials, standardized methodology and calibrated instruments were used for materializing all these objectives of the present research [4]. The research outcomes have been documented in this research paper for the benefits of researchers, manufacturers and end users of solar thermal gadgets worldwide.

## 2. MATERIALS AND METHODS

In the present research work, the nano structured absorber and solar collector were tested. The structural and thermal properties of nano structured absorber were studied through characterization and outdoor testing techniques respectively. The instantaneous thermal performances of the solar collector were calculated by using the formula  $\eta = m_f C_p (T_o - T_i) / A_g G$  where  $\eta$  = efficiency (%),  $m_f$  = mass flow rate of working fluid (Kg/s),  $C_p$  = specific heat capacity (J/kg°C),  $T_o$  = outlet temperature of the working fluid

(°C),  $T_i$  = inlet temperature of the working fluid (°C),  $A_g$  = gross area of collector (m<sup>2</sup>) and  $G$  = incident solar radiation (W/m<sup>2</sup>) [5].

## 3. RESULT AND DISCUSSION

The present research was conducted to study the physical properties with special reference to structural and thermal properties of solar absorber and collector. While the stagnation temperature has been presented in Table 1, the temperature enhancement of hot fluid and thermal performances of solar collector for supplementary heating of hot fluid have been presented in Table 2 and Table 3 respectively.

Table 1. Stagnation temperature in solar collector.

Time	Solar radiation (W/m <sup>2</sup> )	Stagnation temperature (°C)	Time	Solar radiation (W/m <sup>2</sup> )	Stagnation temperature (°C)
08:30	321.6	37.2	12:30	795.6	82.0
09:00	346.7	40.5	13:00	798.3	85.0
09:30	380.5	46.8	13:30	720.4	85.0
10:00	461.8	54.1	14:00	682.2	85.0
10:30	510.5	65.9	14:30	534.6	84.1
11:00	622.3	72.0	15:00	428.7	82.0
11:30	680.9	79.7	15:30	361.9	81.8
12:00	730.2	81.6	16:00	310.1	81.0

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# Recent Advances in Color Image De-Hazing Using Structural and Statistical Features

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**Abstract** – In real world scenario due to bad weather conditions the presence of fog and haze, the particles in the outdoor environment or atmosphere (e.g., droplets, smoke, sand, snow, mist, volcanic ash, liquid dust or solid dust) greatly reduces the visibility of the scene. As a consequence, the clarity of an image would be seriously degraded, which may decrease the performance of many image processing applications. Image Dehazing methods try to alleviate these problems by estimating a haze free version of the given hazy image. Traditionally the task of image dehazing can be processed as recovering the scene radiance from a noisy hazy image by estimating the atmospheric light and transmission properties. In those kinds of techniques, it additionally needs some more information regarding the image such as scene depth, weather condition parameters and so on. But this is not suitable for real world scenario. This research focus on proposing an approach to fully capture the intrinsic attributes of a hazy image and improves the performance of dehazing. Statistical and Structural attributes plays vital role in dehazing process. Hence this research focus on recovering dehaze version of the input image. So that all methods are comes under the categories image enhancement, image fusion image restoration based on statistical and structural features of the hazed image.

**Keywords**—Image Restoration, Statistical and Structural Features, Image Dehazing, Visibility Enhancement.

## I. INTRODUCTION

The Land, water, air, sky, fire are our main five resources surrounding in earth. The Earth is a watery place. About 71 percent of the Earth's surface is water-covered, and the oceans hold about 96.5 percent of all Earth's water. Water also exists in the air as water vapor, in rivers and lakes, in icecaps and glaciers, in the ground as soil moisture and in aquifers. We didn't take photos every day in sea water. In casual life we take lot of photos in land only. Due to image destruction, socking up, disperse in the environment and the presence of haze in the atmosphere degrades the quality of images captured by visible camera sensors. The visibility of outdoor images [4] is often degraded due to the presence of haze, fog, sandstorms, and so on. Bad weather condition [8] such as haze, mist, fog and smoke degrade the quality of the outdoor scene. It diminishes the visibility of the scenes and it is a threat to the reliability of many applications [10] like outdoor surveillance, object detection, it also decreases the clarity of the satellite images and underwater images. For surveillance [10] we need correct reference images. So removing haze from images is an imperative and broadly demanded area in computer vision and computer graphics. Every person likes the clarity of images. To ameliorate or detach of haze, called "dehazing". The decision is taken by eyes only in major times. If vision is not clear, it will be diagnose by any method.

Therefore, it is necessary need for vision to improve the image. It is also called as "haze removal" or "defogging" [12]. Image dehazing methods try to alleviate the problems. From the light the object is getting reflected and getting disturbed for the observer. For example the observer is camera means the original image is getting disturbed by illumination and the scattered particles. Fig. 1 Shows the original image and dehaze image.

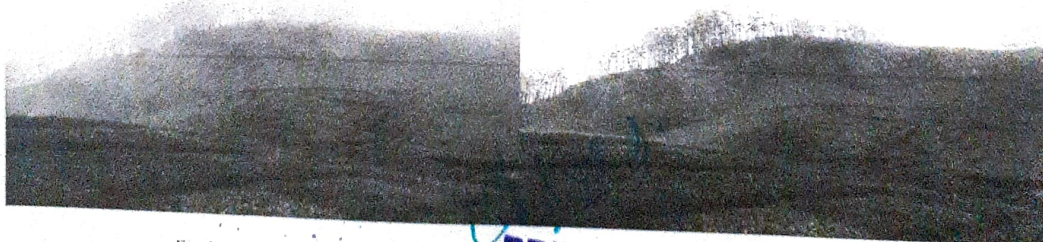
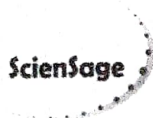


Fig.1 (a) Haze Image

(b) Dehaze Image

Fig. 1 Comparison of Haze image and Dehaze Image

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## EXPERIMENTAL STUDY ON THE PERFORMANCE OF SOLAR COLLECTOR WITH NANO SIZED MATERIALS

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### ABSTRACT

Carbon and metal oxide based coatings are widely used for photo thermal conversion. The collectors collect the sun's energy, transform this radiation into heat, and then transfer this heat into a fluid, water or air, which has many applications in household and industries. In the present investigation, carbon and metal oxide based coatings were prepared and the coatings were affected on metal absorbers. The coatings on the metal absorbers were characterized and it was found that the sizes of constituents in the coatings were in nanoranges. The coated absorbers were integrated in solar collectors and the thermal efficiency of the solar heating collectors was experimentally found. It was found that the thermal enhancements in working fluid varied from 18.4 to 25.5 °C, 19.0 to 26.9°C and 22.3 and 29.9°C in solar collectors with three different nano-structured absorbers. It was also found that the thermal performances of these solar heating collectors were as per standard specifications. The research revealed that the thermal performances of the solar heating collector with nano-structured absorbers were 1.2%, 1.4% and 1.5% higher than that of the conventional solar heating collector. On the basis of the research outcomes of the present investigation, it could be concluded that the nano-sized carbon and metal oxide coated absorbers would be utilized in solar collectors so as to harvest their enhanced thermal performances.

**Keywords:** Nano structured absorber, Solar collector, Temperature of fluid, Thermal efficiency, Thermal performance

### 1. INTRODUCTION

Energy is primary agent for economic development. The absorbed heat transferred to the air as it flows along the channel increases its temperature. Solar energy widely available on the earth is used to convert into thermal energy. World demand for energy is expected to more than double by 2050 and to more than triple by the end of the century. The way to increment in network of producing energy is not sufficient to develop sustainable energy. Finding sufficient supplies of clean energy for the future is challenging [1]. There are many ways to utilize energy but solar air heater have an important role in the energy storage and utilization [2]. Performance improvement can be achieved using nano coating absorber materials with different ratios and layouts [3]. Many researchers have attempted to increase heat transfer rate from absorber plate to flowing air by adding fins on absorber plate.

In this research the standard materials, BIS test methods and calibrated test instruments were used for materializing all these objectives. The research outcomes have been recorded in the present research paper for the benefits of researchers, manufacturers and end users of solar thermal devices [4-6].

### 2. MATERIALS AND METHODS

The conventional solar collector was taken. The solar air heating collector was developed by using plain glass cover, nano carbon and tungsten oxide particle coated absorber and rock wool insulator. The developed solar air heating collector was kept in outdoor conditions and it was tested as per standard specifications [7, 8]. The incident solar radiation, ambient temperature, wind speed, inlet temperature of working fluid and outlet temperature of working fluid were measured during the

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# Color Image De-Hazing Method In Challenging Condition Using Structural And Statistical Features Based on IQA

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**Abstract-** In real world scenario due to bad weather conditions the presence of fog and haze, the particles in the outdoor environment or atmosphere (e.g., droplets, smoke, sand, snow, mist, volcanic ash, liquid dust or solid dust) greatly reduces the visibility of the scene. As a consequence, the clarity of an image would be seriously degraded, which may decrease the performance of many image processing applications. Image Dehazing methods try to alleviate these problems by estimating a haze free version of the given hazy image. Traditionally the task of image dehazing can be processed as recovering the scene radiance from a noisy hazy image by estimating the atmospheric light and transmission properties. In those kinds of techniques, it additionally needs some more information regarding the image such as scene depth, weather condition parameters and so on. But this is not suitable for real world scenario. This research focus on proposing an approach to fully capture the intrinsic attributes of a hazy image and improves the performance of dehazing. Statistical and Structural attributes plays vital role in dehazing process. Hence this research focus on recovering dehaze version of the input image by Image Quality Assessment (IQA). So that all methods are comes under the categories image enhancement, image fusion image restoration based on statistical and structural features of the hazed image.

**Keywords-** Image Restoration, Statistical and Structural Features, Image Dehazing, Visibility Enhancement, IQA – Image Quality Assessment.

## I. INTRODUCTION

The Land, water, air, sky, fire are our main five resources surrounding in earth. The Earth is a watery place. About 71 percent of the Earth's surface is water-covered, and the oceans hold about 96.5 percent of all Earth's water. Water also exists in the air as water vapor, in rivers and lakes, in icecaps and glaciers, in the ground as soil moisture and in aquifers. We didn't take photos every day in sea water. In casual life we take lot of photos in land only. Due to image

destruction, socking up, disperse in the environment and the presence of haze in the atmosphere degrades the quality of images captured by visible camera sensors. The visibility of outdoor images [4] is often degraded due to the presence of haze, fog, sandstorms, and so on. Bad weather condition [8] such as haze, mist, fog and smoke degrade the quality of the outdoor scene. It diminishes the visibility of the scenes and it is a threat to the reliability of many applications [10] like outdoor surveillance, object detection, it also decreases the clarity of the satellite images and underwater images. For surveillance [10] we need correct reference images. So removing haze from images is an imperative and broadly demanded area in computer vision and computer graphics. Every person likes the clarity of images. To ameliorate or detach of haze, called "dehazing". The decision is taken by eyes only in major times. If vision is not clear, it will be diagnose by any method.

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Fig.1. (a) Haze Image (b) Dehaze Image

Fig. 1. Comparison of Haze image and Dehaze Image.

# Identification of Fictitious Messages in Social Network using E-Hits and Newsapi

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*Abstract:* Social network has become a primary resource for users to send and receive the foremost up-to-date data and trend the present events. Currently, most of the social network contains the fictional content that was created by the influential spreaders wherever the message originality and therefore the spreader identity cannot be found which affects the end users. The proposed models to discover fictitious messages are verifying the contextual integrity with the trained classifier using large datasets. But the problem lies in updating of datasets with the recent or trending events from trusted sources in a regular interval. In the existing model, Hypertext-Induced Topic Search (HITS) method has been used for rating posts based on hub score and authority score. The hub score is calculated based on how many posts are posted or liked or tagged by the user and authority score is calculated based on how many users liked or tagged a post. If the user who ranks high in hub score tries to trend the low ranked post in authority score, the user will be marked as spreader. But the problem lies in the identification and verification of the posts that ranks in authority score. In our proposed system, we have enhanced the HITS algorithm by adding a third mechanism called top score which assigns weightage for every post based on the time they have posted. The time and content of the post has been verified by the integrated new model NewsAPI. Based on the three scores, the posts are filtered and matched with the news collected from NewsAPI. The news or posts that have not been matched either with the context or with the time will be marked as fictitious.

*Keywords:* Authority score, HITS, Hub score, NewsAPI, Spreader, Top score

## I. INTRODUCTION

The wide accessibility of computerized information in social network and the colossal client pool offers an intriguing inquiry on evaluating the impact of clients dependent on the user cooperation after some time. This online connection over the social network offers ascend to an ongoing association arrange that speaks to a basic mechanism for spreading and catches significant qualities on how data can diffuse. A noticeable model is Facebook in which the computerized parts (e.g., user status, posts, photographs, recordings and connections) of a Facebook client are visible on a Facebook Timeline by other people who can communicate with them. (for example, tapping the Facebook Like support button for a post). These online communications are recorded on the Facebook Timeline that again prompted more cooperation.

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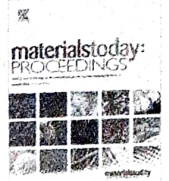
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Here, the spreading procedure expands the vulnerability of different clients to the equivalent; this outcomes in the progressive spread of a computerized message from a couple of clients to some more. It is fascinating to examine the spreading stimulus of an advanced verbal motor turning over from a chose not many. It is reasonable to expect that a particular Facebook user who has a digital message in the past that has garnered many other Facebook users' interaction (say using the Facebook Like endorsement button) is likely to attract similar level of interaction with future posting of similar digital messages. This is because this digital interaction (e.g., the Facebook "Like") captures the desire to share similar opinions or disposition, and typically comes from Facebook users who are already socially close or shows the willingness to interact. Also, it captures the connectivity relationship among users in the online social network. This is useful such as when this particular Facebook user wants to schedule a cascade of endorsement for a digital marketing message or is a business entity that maintains a Facebook presence and wants to spread the word of new commercial products. By examining the past record on Facebook Timeline, this particular Facebook user can determine other Facebook users who are deemed influential enough in a viral marketing strategy Online social networks (OSNs) have billions of clients and they have been a dynamic hotspot for different research disciplines. OSNs' lens furnishes analysts and researchers with excellent prospects to comprehend people at scale and to break down human standards of conduct, generally unthinkable. The data generated by OSNs users have been used in different applications. The huge rise of OSNs driven by communication technology revolution seriously remodeled the stage of human connections. Human communications facilitated by OSNs could defy the worldly and spatial impediments of conventional correspondences in a remarkable way, in this manner displaying subjectively new layers of social interactions, which concurs and works together with current connection layers to rethink the multiplex informal organizations. These several network layers or communication channels in a multiplex network don't act totally independently or conditionally. Similarly, identifying influential spreaders in an OSN by demonstrating a single layer interaction network and disregarding the other interaction will create an incomplete relationship data portrayal, and therefore, unverifiable distinguishing proof outcomes. Therefore, various sorts of interaction between users ought to be considered for better understanding the

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## An experimental investigation of tool wear rate in end mill HSS-AL with nickel coated tool

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### ABSTRACT

End milling is the most flexible type of processing that can be utilized to machine spaces, shoulders, shapes and profiles. An end milling process comprises a round and hollow shaper that has different front lines on the two its outskirts and its tip, allowing end cutting and fringe cutting. A portion of the significant activities should be possible utilizing processing machines they are as per the following external keyway, slotting, sawing, profile milling, helical milling, thread milling, gang milling, face milling, angular milling, end milling. In this venture work, we have utilized the electroplating procedure of nickel on the HSS-AL end mill tool. As indicated by this procedure, Ni is act as anode, HSS-AL end factory instrument is going about as cathode and Ni salt shower is go about as an electrolytic answer for covering. In the wake of covering the measurements, for example, length, the distance across and weight of the instrument have been checked and it is contrasted and the component of ordinary HSS-AL end mill tool. Experimental work has been done in the vertical processing machine with various speeds and the tool used is HSS-AL and HSS-AL Nickel coated end mill tool and the workpiece utilized for the work is gentle steel. The surfaces in the wake of machining were checked utilizing the hardware named surface roughness analyzer to locate the nature of the surface finish. The components of the two tools were noted down after the processing activity. The performance of Ni coated HSS-AL tool has superior to uncoated HSS-AL end mill tool has estimated and the coated tool has got wear opposition and furthermore it reduces the hour of work to make benefit than the uncoated HSS-AL end mill tool.

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### 1. Introduction

These days, types of machinery assume a crucial job in production. One of the machines utilized among them is the milling machine. Issues of machining are tool wear, tool breakage, poor surface quality on the workpiece, device cost and overheating. The hardest tool at any point known on earth is a diamond, however, because of its cost, a large number of the production areas can't manage. Still, a portion of the material blends can give prop-

erties like the precious stone. In this paper, the tool to be a specific end mill made up of HSS-AL. There are numerous sorts of distinctively covered HSS end mill is accessible in the commercial. A portion of the promptly accessible covered end mills is TiN, TiCN, TiAlN, TiAlCrN and so on. The Nickel (Ni) is one of the modest materials accessible which has high wear quality, heat opposing property contrasted with HSS-AL. In this work, we coated Ni on HSS-AL end mill by an electroplating technique. Electroplating is principally used to change the exterior of an object. As per this technique, end mill is kept as an anode, nickel plate is kept as the cathode and electrolytic arrangement is Ni salt shower. Before beginning the procedure both the end mill has been checked for its measurement and weight. At that point, the nickel covered HSS-AL

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# Single Color Image De-Hazing Using Dark Channel Prior

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**Abstract:** In real world scenario due to bad weather conditions the presence of fog and haze, the particles in the outdoor environment or atmosphere (e.g., droplets, smoke, sand, snow, mist, volcanic ash, liquid dust or solid dust) greatly reduces the visibility of the scene. As a consequence, the clarity of an image would be seriously degraded, which may decrease the performance of many image processing applications. Image Dehazing methods try to alleviate these problems by estimating a haze free version of the given hazy image. Traditionally the task of image dehazing can be processed as recovering the scene radiance from a noisy hazy image by estimating the atmospheric light and transmission properties. In those kinds of techniques, it additionally needs some more information regarding the image such as scene depth, weather condition parameters and so on. But this is not suitable for real world scenario. This research focus on proposing an approach to fully capture the intrinsic attributes of a hazy image and improves the performance of dehazing. Dark Channel Prior plays vital role in dehazing process. Hence this research focus on recovering dehaze version of the input image by CNN. So that all methods are comes under the categories image enhancement, image fusion image restoration based on statistical and structural features of the hazed image.

**Keywords:** Image Restoration, Image Dehazing, Visibility Enhancement

## I. INTRODUCTION

The Land, water, air, sky, fire are our main five resources surrounding in earth. The Earth is a watery place. About 71 percent of the Earth's surface is water-covered, and the oceans hold about 96.5 percent of all Earth's water. Water also exists in the air as water vapor, in rivers and lakes, in icecaps and glaciers, in the ground as soil moisture and in aquifers. We didn't take photos every day in sea water. In casual life we take lot of photos in land only. Due to image destruction, socking up, disperse in the environment and the presence of haze in the atmosphere degrades the quality of images captured by visible camera sensors. The visibility of outdoor images [4] is often degraded due to the presence of haze, fog, sandstorms, and so on. Bad weather condition [8] such as haze, mist, fog and smoke degrade the quality of the outdoor scene. It diminishes the visibility of the scenes and it is a threat to the reliability of many applications [10] like outdoor surveillance, object detection, it also decreases the clarity of the satellite images and underwater images. For surveillance [10] we need correct reference images. So removing haze from images is an imperative and broadly demanded area in computer vision and computer graphics. Every person likes the clarity of images. To ameliorate or detach of haze, called “dehazing”. The decision is taken by eyes only in major times. If vision is not clear, it will be diagnose by any method.

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# EFFICIENT AND RECENT ADVANCES FOR FACE SPOOFING DETECTION USING CONVOLUTIONAL NEURAL NETWORK BASED FEATURE EXTRACTION

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## Abstract

Feature extraction plays an important role in the area of pattern recognition, machine learning and computer vision. The performance of visible light face recognition is limited by varying illumination conditions. Major factors affecting the recognition accuracy of the visible light in the face recognition system. So the face spoofing can easily occurred in the face recognition. Even though many face anti-spoofing methods have been proposed, they cannot generalize well on unforced attacks. In this proposed system, in order to recognize the face spoofing by Convolution Neural Network (CNN) based feature extraction is used to detect the fake faces.

*Index Terms*— Feature extraction, Convolution Neural Network (CNN).

## I. Introduction

Traditional biometric identification is based on the chemical features of a person, such as hair, DNA and so on. Nowadays, more and more biometric intelligent recognition systems are used for security targets, such as face recognition, iris recognition, fingerprint recognition and so on. Compared with traditional biometric identification methods, intelligent biometric methods are more user-friendly and convenient. However, these systems can be easily spoofed without special anti-spoofing detections. Some sophisticated methods, such as video and mask, can be used to spoof face recognition systems. One of the most challenging problems in biometric systems is the identity of theft. These barriers hinder the popularity of biometric authentication systems, which means there is a strong need

# A New Ken-Ken Puzzle Pattern Based Reconfiguration Technique for Maximum Power Extraction in Partial Shaded Solar PV Array

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**ABSTRACT** Solar Photovoltaic array may often be subjected to partial shading, which may lead to uneven row current and creates local maximum power point on the power-voltage characteristics. One of the effective approaches to dilute the concentration of partial shading is the array reconfiguration technique. This study proposes a ken-ken puzzle-based reconfiguration technique for  $4 \times 4$  total-cross-tied configuration to rearrange the position of modules within the array and to improve the maximum power under partial shading conditions. Further, the performance of the ken-ken puzzle arrangement is compared with the total-cross-tied configuration and existing reconfiguration techniques namely odd-even, Latin Square, and Sudoku reported in the literature. The performance of all these configurations is evaluated in terms of fill factor, mismatch loss, power loss, execution ratio, and performance enhancement ratio. The proposed ken-ken puzzle-based reconfiguration technique mitigates the occurrence of local maximum power point and eliminates the need for a complex algorithm to track the global maximum power point. The simulation result shows that the KK puzzle-based reconfiguration technique has obtained an improved PE of 10.85 % compared to TCT configuration, followed by LS, Sudoku, and OE. Also, the experimental result shows the effectiveness of the ken-ken in diluting the effects of partial shading when the rows of the photovoltaic array are shaded. The ken-ken puzzle-based reconfiguration technique reduces the complexity, maintenance and increases reliability, scalability of the PV array.

**INDEX TERMS** Shade dispersion, ken-ken puzzle pattern, global maximum power point, local maximum power point, and performance enhancement ratio.

## I. INTRODUCTION

The partial shading can occur in a photovoltaic (PV) module due to shading of nearby buildings, clouds, dust, and

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dirt, etc. The shaded modules consume power from the non-shaded modules and dissipate energy in the form of heat. Therefore, the bypass diodes are connected across the modules [1]-[3]. However, this introduces local maximum power point (LMPP) in power-voltage (P-V) characteristics which misleads the maximum power point tracking

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## Experimentation on Effective Materials for Photo Thermal Applications

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### Abstract

Glass cover, safeguard and protector are the significant parts utilized in sunlight-based gatherers for photograph warm applications. These parts with powerful materials were industrially acquired and furthermore natively ready. The experimentation on nano finished glass cover showed that the conveyance, reflectance and absorptance of nano finished glass cover were 90.3%, 4.5% and 5.2% individually. The experimentation on nano organized safeguard showed that the temperature of safeguard fluctuated from 30.6°C to 56.7°C in outside conditions. The experimentation on novel separator showed that the warm opposition of the novel material was 0.96 W/mat 2°C. The experimentation on sun-oriented gatherer with nano based and novel parts showed that the stagnation temperature of sun-based authority was 86.4°C. It additionally showed that the warm exhibition was 72%. It very well may be presumed that the successful materials would be utilized in sun-oriented authorities in order to have upgraded warm exhibitions.

## Fabrication and characterization of nano structured honeycomb absorbers and thermal analyses on solar air heating collector

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**ABSTRACT :** Fabrication of nano structured absorber is mandatory for reaping the enhanced thermal performance of solar collectors. In this connection, the nano carbon and aluminium composite was coated on aluminium substrate, which was similar to the hexagon shaped honey comb, and the solar absorber was developed. It was characterized through X-ray Diffractometer (XRD), Fourier Transform Infrared (FTIR) spectrometer and UV-Visible spectrophotometer (UV). It was also thermally analyzed not only in outdoor conditions but also in stagnant conditions in solar air heating collector. The research results pertaining to characterization of solar absorber showed that the crystallite size was in nano ranges and the nano particles had face-centre cubic structure. The research results pertaining to characterization of solar absorber also showed that the nano composite had excellent absorption in UV and visible region. The research result related to thermal analysis in outdoor environment revealed that the enhancements of temperature on solar absorbers coated with carbon and aluminium nano composite in the mass ratio of 60:40, 70:30 and 80:20 were 23.5°C, 25.1°C and 24.4°C respectively. The research result related to thermal analysis in stagnation environment also revealed that the enhancements of temperature on glass cover, carbon and aluminium nano composite coated absorber and working fluid were 69.4°C, 110.6°C and 99.0°C respectively. On the basis of research outcomes, it could be concluded that nano carbon and aluminium composite coated solar absorber would be used for photo thermal applications due to their desirable optical and thermal properties. It could also be concluded that nano carbon and aluminium composite coated solar absorbers would be used in photo thermal appliances due to their positive impact on thermal performances.

**Keywords:** Nano structured honey comb absorber, Fabrication, Characterization, Integration with solar air heating collector, Thermal characteristics

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### 1. Introduction

Solar absorber is a central component of any photo thermal collector. It influences significantly the thermal performance of photo thermal collector and related gadgets [1]. It is desirable to prepare energy efficient, environmental friendly and economically feasible solar absorbers. It is also desirable to characterize the prepared absorbers and evaluate the thermal efficacy of these absorbers in field conditions. It is worth mentioning here that many researchers have studied the properties of solar absorbers and their influences on thermal characteristics of solar collectors. Katumba *et al.* (2008) carried out research on the optical characteristics of solar absorptive coatings with the chemical composition of nano carbon and metal oxides. The research result revealed that the solar absorptance of nano carbon and nickel oxide coating deposited on metal substrate was 84%. The research result also revealed that the same solar absorptance of nano carbon and zinc oxide coating deposited on the same metal substrate was 71% [2]. Sudharlin Paul *et al.* (2017) carried out research on the thermal characteristics of solar collector integrated with absorber that had nano carbon mixed absorptive coating on copper substrate. The research result revealed that the sizes of carbon crystallites in absorptive coating were in nano ranges that were confirmed through SEM analysis. The research result also revealed that the maximum temperature elevation of working fluid was 13.5°C in solar collector integrated with the similar brand of absorber that had the same nano carbon mixed absorptive coating on copper substrate [3]. Vasantha Malliga *et al.* (2017) carried out research on the thermal characteristics of nano carbon and ZnO coated absorber and evaluated the

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## Thermal Characteristics of Solar Collector with Improved Absorber Configurations

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### Abstract:

Solar absorber is the central component of any solar thermal device. It influences the thermal characteristics and performances of all solar thermal devices. The improved absorber with honeycomb structure can enhance the thermal characteristics of solar thermal collector. The improved absorber with nano composite coatings can also enhance the thermal characteristics of solar thermal collector. In this connection, the present investigation was devoted not only to test the improved absorber with honeycomb structure and nano composite coatings but also to test the solar collector integrated with improved absorber. The outcomes of experimentation on solar absorber revealed that the crystallite sizes in the carbon and Fe<sub>2</sub>O<sub>3</sub> (70:30) coating on absorber were in nano ranges. The outcomes of experimentation on solar collector and device revealed that the instantaneous thermal performances of solar air heating collector ranged between 65.3% and 70.1% and efficiency of solar air heating device was 51.4%. As the solar collector with improved solar absorber contributed substantial thermal enhancements of working fluid, it could be concluded that the solar collector with honeycomb structured and nano composite coated absorber would be utilized in application sectors as per the temperature requirements of end users.

**Keywords:** Honey comb structured absorber; Improved absorber; Nano composite coated

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## Detection of False Ranking Apps Using Level Aggregation

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**Abstract:** Each platform of mobile devices has its app store which is the source for apps, games, movies, books, etc. The apps are categorized under predefined labels based on the rules formulated in the app store. The apps have been ranked based on the ratings, reviews, downloads, and no. of installs. It helps the user to download the top-ranked app in a specific category. That ranking of an app makes them think that it will work better than others in an effective way. The evidence aggregation of the above attributes has less variation that doesn't reflect the current status of an app which influences the ranking. For that, the attributes that have been frequently changed due to developer and user actions to be collected for a specific category in top charts. The attributes include version, last updated date, features of an app and keywords will undergo an independent process that produces the following levels: 1. Version change level, 2. Keyword matching level and 3. Feature matching level. Each value of a level has to be consolidated and aggregated to produce the final ranking of apps in a specified category. The actual ranking has been compared with the obtained ranking to find the deviation value and the false ranked app in the app store.

**Keywords:** Evidence aggregation, Version change level, Keyword matching level, Feature matching level

### 1. Introduction

In the app universe, ranking plays an important role to survive and sustain among a large number of applications. Many review platforms give a final picture of the user's expectation and the flow of user choice of apps with ranking and rating. As the Rating and Ranking decide the fate of the app's survivability, Google and Bing have their protective algorithms to rank the apps in top charts based on catchphrases and graphs. Users are incredulous of advanced showcasing, and companion proposals as application store evaluations and audits remain solitary as the single most prominent driver of revelation and transformation. Unmistakably application evaluations and surveys aren't simply vanity measurements; they have genuine results on change rates and brand notoriety. Most of the companies have a separate marketing section and put more effort both in terms of time and money for paid apps installations. The app developer has to pay a minimal amount to the marketing section or representatives for every installation and they boost the app's rating and ranking with increased visibility.

App Store and Play store have millions of apps in top trends, top grossing, and top paid with different categories and genres. But the app that exists in both the stores will not have the same rating or ranking. Of these applications, almost 66% have not gotten a solitary rating and 99% are viewed as unbeneficial. These examinations, in this manner, single out the uncommon exemptions for the standard—the best-ranked applications in each store.

Even though a large number of apps available in the market, the user's choice to download is still a difficult task. For that, App Store Optimization has been used where the managers obtain the no of downloads and the number of active users to increase the app's ranking and earn more money. A budget based on paid installation strategy has been formulated that boosts up the ranking lead to make the place in top trends or charts.

The rest of this paper is organized as follows. In Section 2, the evolution of app store optimization techniques has been discussed. Section 3 presents the architecture of the evidence aggregation system with different levels and its collection methods. Experiment results and analysis are shown in Section 4. The conclusions and further enhanced are given in Section 5.

### 2. Related work

Multihoming, a technique where a designer is distributing items for various platforms. Information assortment is in two stages. In the first stage, the scripts gather the novel identifiers of the applications which are generally well known in every category of the application store. In the second stage, the scripts gather the varied properties from the application's open sites at the application store. The assessment of multihoming application types was finished by breaking down their classifications in the application store. The level of accessible applications in every classification was determined and afterward contrasted with other application stores to spot the favored category alongside the mindful mobile app.

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