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# A Frame Work for Detecting Melanoma Using Deep Learning

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**ABSTRACT**: Melanoma is a kind of cancer which occur in our skin due to the deficiency of melanin present in skin. Melanoma is easily curable when it is detected in initial state. But detecting melanoma in initial stage is critical due to lack of experience of physician. In order to get experience one has to go through studying the troublesome picture characteristics includes changing shapes and their irritated sizes, feathery sore limitations, particular dermis covering sorts and closeness of hair.To defeat these constraints, new programmed melanoma location technique for dermoscopy pictures through multi-scale injury one-sided portrayal and joint opposite arrangement. All this study is done by using dermoscopic images which are designed specifically relating to detect the skin lesion which are unseen by human naked eye. MLR used with JRC for melanoma discovery. JRC model permits us to use a great deal of solidly related histograms to determine additional information. Study done on an open dataset of dermoscopy images and exhibit preferable portrayal execution pondered over the present top tier strategies.

**KEYWORDS**: MLR, JRC, Dermoscopic image.

## I. INTRODUCTION

Melanoma is the most frequent type of skin cancer and its incidence has been rapidly increasing over the last few decades. Never the less, it is also the most treatable kind of skin cancer, if diagnosed at an early stage. The clinical diagnosis of melanoma is commonly based on the ABCD rule, or the 7-points depending on color, shape, and texture. The hair which is present on skin can be segmented as lesion because of dark pixels being classified as lesion against lighter pixels which will be categorized as skin. Dermatoscope is provided with ruler markings for measurement of diameter of lesion. These markings will be there in acquired image. The air bubbles and black frame affects the accuracy of segmentation process and further diagnosis of skin cancer. So these artifacts must be removed from image. In some of the cases, contrast between skin and lesion can be very poor. Improved contrast between the lesion and skin improves the accuracy of further diagnosis steps. Melanoma is the most frequent type of skin cancer and its incidence has been rapidly increasing over the last few decades. Never the less, it is also the most treatable kind of skin cancer, if diagnosed at an early stage. The clinical diagnosis of melanoma is commonly based on the ABCD rule, or the 7-points depending on color, shape, and texture. Figure 1 shows the picture of melanoma, while uploading for the detection test. The hair which is present on skin can be segmented as lesion because of dark pixels being classified as lesion against lighter pixels which will be categorized as skin. Dermatoscope is provided with ruler markings for measurement of diameter of lesion. These markings will be there in acquired image. The air bubbles and black frame affects the accuracy of segmentation process and further diagnosis of skin cancer. So these artifacts must be removed from image. In some of the cases, contrast between skin and lesion can be very poor. Improved contrast between the lesion and skin improves the accuracy of further diagnosis steps.Melanoma is a condition or a disorder that affects the melanocyte cells thereby impeding the synthesis of melanin. A skin that has inadequate melanin is exposed to the risk of sunburns as well as harmful ultra-violet rays from the sun. skin disorder has been proven to be unpredictable, as it is characterized by development of lesions in the skin that vary in shape, size, color and texture. Researchers have suggested that the use of non-invasive methods in diagnosing melanoma requires extensive training unlike the use of naked eye. For a clinician to be able to analyze and interpret features and patterns derived from dermoscopic images, they must undergo through extensive training.

Clinicians are often discouraged to use the naked eye as it has previously led to wrong diagnoses of melanoma. Scholars encourage clinicians to embrace routinely the use of portable automated real time systems since they are deemed to be very effective in prevention and early detection of melanoma.

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# A Study on Melanoma Detection Using Deep Learning Algorithms

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**ABSTRACT**: Dermoscopy picture has non-obtrusive conclusion procedure assumes a significant job early examination of risky melanoma. The troublesome picture characteristics includes changing shapes and their irritated sizes, feathery sore limitations, particular dermis covering sorts and closeness of hair. To defeat these constraints, new programmed melanoma location technique for dermoscopy pictures through multi-scale injury one-sided portrayal and joint opposite arrangement. MLR used with JRC for melanoma discovery. JRC model permits us to use a great deal of solidly related histograms to determine additional information. Study done on an open dataset of dermoscopy images and exhibit preferable portrayal execution pondered over the present top tier strategies

**KEYWORDS**: Melanoma, MLR, JRC

## I. INTRODUCTION

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Clinicians are often discouraged to use the naked eye as it has previously led to wrong diagnoses of melanoma. Scholars encourage clinicians to embrace routinely the use of portable automated real time systems since they are deemed to be very effective in prevention and early detection of melanoma.

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# Impact of Particle Size Distribution for Variable Mixing Time on Mechanical Properties and Microstructural Evaluation of Al-Cu/$B_4C$ Composite

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## Abstract

In the present work the combined effects of particle size and distribution on the mechanical properties of the 20vol.% $B_4C$ particle reinforced Al–Cu alloy composites by powder metallurgy is investigated. The aim of this work was to evaluate the effect of mixing time (5h, 15h and 25h) and particle size (23μm and 67μm) of $B_4C$ particles on the metallurgical and mechanical properties. It has been found that small ratio between matrix/reinforcement particles sizes resulted in more uniform distribution in the matrix. The particles distributed more uniformly in the matrix with increasing in mixing time. The results also showed that homogenous distribution of the $B_4C$ particles resulted in higher hardness, ultimate tensile strength, yield strength and elongation. Fracture surface observations showed that the dominant fracture mechanism of the composites with small $B_4C$ particle size (23μm) is ductile fracture of the matrix, accompanied by the "pull-out" of the particles from the matrix, which is attributed to positive effect of reinforcement particles in resistance to the movement of dislocations while the

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# Energy Optimization Mechanism to Improve Energy Efficiency of Mobile Device Interface for Mobile System

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**Abstract**

Wireless communication and networking technologies use higher speed network interface devices. These wireless network devices are the power hungry component of the cellular device. The results of power consumption leads to high operating cost and a greater failure rate of the device. This has become a major cause of concern which has imposed challenges towards the development of greater performance system. The key concept to decrease power consumption is to disable all the sub-antennas and their RF chains. The technology employed by wireless communication devices to improve the capacity, is to use Multiple-Input
Multiple-Output (MIMO) scheme. This paper, initially discusses the basic mechanism of power management. Then, we introduce a novel scheme that effectively resolves the issue of reducing energy per bit. We utilize Matlab tool to assess the energy efficiency of receiving antennae. The outcome shows that antenna management can successfully diminish energy per bit to equate with a static MOBILE DEVICE design that keeps all antenna apparatus active.

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***Keywords***; *Energy dissipation, Wireless Local Area Network (WLAN), mathematical model, Fourth Generation (4G) network*

## I. INTRODUCTION

The easy availability of inexpensive mobile devices with features to process multimedia signal, accomplished with ubiquitous higher-speed networking technologies to process multimedia contents has increased the demand to stream multimedia signals in mobile. In the coming times Mobile equipment's can be considered as the main cause for evolution of wireless broadband, because of to their ability to enhance the channel capacity [1] [2]. The increment in the quantity of mobile users has prompted an increment in data traffic; thus, the quantity of base stations (BSs) has expanded to address the issues of mobile users. Reference [3] defines the development in the number of BSs in developing districts somewhere around 2007 and 2012, and predicated that the aggregate number of BSs would increment by more than 2 million inside of this period. The majority of the past studies on this subject have concentrated on enhancing both system channel capacity as well as data rates, while ignoring the growing demand of mobile network systems for energy. This expanding energy demand has encouraged significant investigation on the subject of "green communication".

Antenna diversity apparatus is utilized as a part of wireless communication frameworks to battle the impacts of fading. In the event that various autonomous duplicates of the same signals are available, we can add them to an aggregate signal



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# A Survey on Security and Authentication Issues and Future Trends in Next Generation Networks

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**Abstract:**
With an increasing number of mobile devices, large amounts of data and higher data rates, the current generation of the mobile network is being reconsidered. The next generation networks (NGN) are expected to fulfill high-end requirements, with three features: pervasive connectivity, extreme low latency, and high-speed data transmission across broad areas. This article presents an extensive analysis of current 4 G and next generation network authentication and security systems. We first offer an overview of existing 4 G and next-generation network surveys. We then describe multiple threats in 4 G networks and next-generation networks, including privacy attacks, integrity attacks, availability attacks and authentication attacks. We also provide security services, including authentication (authentication entity, message authentication), confidentiality and integrity. We are also providing authentication and security solutions for networks of next generation. By knowing the drawbacks to IKEV1, as well as the future direction, we identify challenges in new generation networks by supportingIKEV2 re-authentication and re-using new hash signature algorithms.

***Keywords:*** *NGN, Security, Authentication, Availability, Confidentiality, Key Management, Privacy, IPsec, IKEV1, IKEV2.*

## I. INTRODUCTION

With the increasing threats from the Internet and computer networks and the relative rate of safety needed, addressing security issues and creating an application security model for next-generation networks is important. Based on these three features, the next-generation network services are 1. Awareness of Service 2. Richness Product 3. Flexibility of service. Application potential for these services is high through the convergence of such services into a broadband infrastructure [1].

The vision of the next 5 G wireless communication networks consists in providing extremely high data rates, low latency, increased base station capacity, and significant enhancement in service quality (QoS) recognized by users compared to current 4 G LTE networks[2].

High-end requirements are to be met for the next or 5th generation (5 G) mobile networks. Three unique features characterize the 5 G networks: ubiquitous connectivity, extremely low latency and high-speed transfer of information. In addition to state-of - the-art infrastructure, the5 G networks will provide new architectures and technologies [3].

Figure1 demonstrates the common architecture of 5 G wireless networks. 5 G Wireless systems not only offer traditional voice and data communication, but also support new applications in the industry and many other devices .Wireless systems are also available. [4].

The combination of different wireless technologies



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# MAPSDN-EESC: A MODELING OF AUTHENTICATION PROCESS FOR THE SOFTWARE DEFINED NETWORK USING ENCRYPTED ENTITY SCHEME CRYPTOGRAPHY

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**Abstract - The distinguishing characteristics of the SDN provide flexibility to build a robust ubiquitous application but also suffer various security challenges. The effective authentication process provides solutions towards mitigating the adverse effect on network performance and data protection. The typical limitations of the existing systems of authentication are not so scalable due to the higher complexity of flow rule monitoring. The proposed model of the authentication for the SDN uses the mechanism suggested by Trusted Computing Group Specification Architecture and encrypted entity cryptography as an evolution of attributed based encryption. The proposed method MAPSDN-EESC provides lightweight authentication mechanism along with the cross-platform validation of the legitimate user. The proposed method EES reduces the latency by 12.89%, 9.2%, and 4.9% as compared to the existing method of SEND, CGA, and IDS, respectively. The CPU usage reduces by 14.44%, 9.60%, and 4.91% as compared to the existing method of SEND, CGA, and IDS, respectively. The fast authentication delays are lower by 17.44%, 10.44%, and 5.12 % as compared to the existing method of SEND, CGA, and IDS, respectively.**

***Keywords*:** Authentication., Attribute-based Encryption., Network security., Software Define Network., Trusted Computing Group Introduction.

## 1. Introduction

Many of the advances are witnessed in the recent past in the ubiquitous and context-oriented application in various domains of smart and intelligent transport, factory, city, healthcare, etc., systems [1]. These advancements have become possible due to modern technologies of embedded systems, sensors, networks (WSN, IoT, MANET, CRN), and communication standards (4G-LTE, 5G)[2]. The core backbone of the network on which these applications rely on a core network component at the Layer-2(L2) and layer-3(L3) routers and switches capabilities. The inclusion of the software-defined network (SDN) is an advantageous against the traditional components at the L2/L3 because of the distinguishing characteristic of operating in a centralized manner with the partition or isolation of the different planes (such as data plane and the control plane). Due to this separation of the plane, it provides a higher capacity to manage the network traffic more effectively. Another advantage of the inclusion of SDN is the flexible reprogramming, and these characteristics make the SDN based system more flexible and robust [3]. The new layer and architecture of the SDN based application introduce associated vulnerabilities that provide an opportunity to the adversaries to plan attacks to gain the benefit by means of compromising the network operation as well as access to the data, many of such attacks are being reported in the literature[4][5][6].

Unlike the core characteristics of the security protocol designs for any network, even SDN also require to handles issues like authentication, integrity, access control, authorization, and non-repudiation along with proactive and reactive approaches to handle a defined attack pattern [7]. The effective authentication scheme mitigates many of the security challenges as well as complements another security requirement. The strong and effective authentication scheme controls the adversary or the intruder to gain access to the data as well also helps to protect malfunctions on the network operations from the manipulation by the attackers. The biggest vulnerability in SDN is the lack of a strong, consistent, and more effective authentication mechanism so that it can authenticate the stakeholder from the different layers of the network as well as application units. In lack of

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# Security and Authentication Scheme for Software Defined Network

**Ravindra, S.Shankaraiah**

***Abstract*: Software-Defined Network (SDN) is regarded as one of the most significant areas for future networking. SDN architecture is a revolutionary new concept that offers more mobility, a high degree of automation and shorter delivery time by pushing the conventional network to be software-based. SDN architecture dynamically separates the control plane from the network data (forwarding) plane, providing a centralized view of the network as a whole and making it easier to manage and monitor the resources of the network. Furthermore, the SDN's initial design, with its centralized control point, does not accurately perceive the security requirements, which poses additional challenges to security issues. Security and authentication scheme in SDN is being surveyed in this paper providing advances in this field to both the research community and the industry. Then start with a list of identified threats to security and SDN breaches. The article analyzes previously outlined security and authentication solutions for SDN. The challenges in securing the network from the attacker are discussed and the holistic security approach required for SDN is described. It will identify future directions for research that will be key to providing network security in SDN.***

***Keywords:* Software-Defined Network, Security, Authentication, Authorization, Network Functions Virtualization.**

## I. INTRODUCTION

In contrast to network functionality, recent developments in wireless communication address users ' needs in data rate, accessibility support, bandwidth expansion, delays, and much more. The fifth-generation (5 G) network would, in the future or the near future, be promising to meet these user requirements. Security has recently become a public good to integrate into each network, including mobile, digital, 5G and Long Term Evolution (LTE) networks. Security is also a must for all networks.

SDN / NFV is incorporated into 5G infrastructure to serve as a cross-backhaul while cloud computing is integrated to enable the storage of data. Since each model has suffered from some security issues, implementing these three different technologies into the 5G network brings with it a giant threat to security.

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Distributed Denial of Service (DDoS) attack, hijacking attack, IP spoofing attack, flow table overload attack, aircraft command saturation attack, are some attacks that are carried on 5 G networks. Here, as it is involved in all three systems, DDoS attack is considered more disruptive.

Any of these technologies or any combination of these technologies will also be impacted by other attacks. The modern era in human history is identified by the ubiquity of information, often called the Information Age. Since it emerged in the 1960s, the prevalence of the Internet has brought a revolution in economy, social development, communication, and entertainment by almost 40 percent of the population worldwide.

The data revolution has led to a recognition of how the conventional IP-based networks are inflexible and difficult to manage, given their prevalence. In short, this is the motivation for Network Functions Virtualization (NFV) and SDN. Although closely related and often coexisting, NFV and SDN are distinct approaches to imposing meanness to the infrastructure which defines the digital age's bedrock. SDN provides the ability to detach data planes from control planes that cannot be conceived in conventional networks.

Data plane and control plane decoupling enables control of forwarding hardware in a network as opened and controlled by both the user. OpenFlow is the standard SDN protocol, with OpenFlow switches, controller and flow entries in the architecture. Software-Defined Networking (SDN) provides a new centralized network control and management structure; an SDN controller monitors and manages all network elements and globally and seamlessly enforces the management and supervision functions. [2]

The rest of the paper is sorted as follows: Section II presents System Architecture of Typical Software-Defined Networks; Section III presents SDN Security Overview; Section IV describes details of SDN Security Analysis; Section V presents SDN Authentication Systems Overview; Section VI explains SDN Authentication Analysis; and finally, Section VII presents the ends and future directions.

## II. SOFTWARE-DEFINED NETWORKS

The Software-Defined Networks (SDN) approach is based on the premise that splitting network function control from the network devices themselves (switches, routers, firewalls, etc.) will overcome many drawbacks associated with the vertically integrated, closed, and proprietary networking infrastructure of today. The implementation of software-based virtualization systems and the convergence of voice, video and information communication to IP networks increased the need for such a change in networking standards.

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# A Framework for Identifying and Mitigating Malicious Flow in Software Defined Network Deployed over an IoT Ecosystem

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**Abstract - With the rising demand for incorporating smartness over a security operation in networking technologies, Software Defined Network (SDN) has been witnessed to be extensively researched. SDN is one of the integral parts of operation in large scale networking operations e.g., Internet-of-Things (IoT), owing to its highly flexible communication protocols and centralized controlling features. Although there has been an extensive review of literature towards the security aspect of SDN, they do not offer full-fledged solutions especially if the adversary is unknown. Therefore, the proposed manuscript presents a novel framework capable of identifying the degree of severity of the attack from the rate of request message originated from a switch of SDN node and offers a decisive operation of resisting such malicious flows using an auxiliary agent. The auxiliary agent resides in the data plane and works alongside a switch to identify and confirm malicious flow. This information is further updated to the SDN controller, which can further take action that leads to isolating the adversary and allowing only flows with validated legitimacy. The study outcome shows, the proposed system excels better both in security and communication performance.**

**Keywords:** Software Defined Network, Internet-of-Things, Security, Attack, Controller, Switch, Routing Request

## 1. Introduction

With the advancement of networking technologies, there is also a parallel rise of the adversaries and threats over large scale networks [1]. In order to make the network operate smarter and more efficiently, (SDN) has played a contributory role [2][3]. Being an emerging architecture, SDN offers adaptable and cost-effective features that separate the forwarding plane from the control plane. An SDN architecture is characterized by agility, centrally manageable, direct programmable, support towards open standard, etc. [4]. However, deployment of SDN architecture also invites various threats of various degrees of severity as very often; the attacks and threats are novel forms targeting the SDN controller system. The attacker usually targets the SDN controller node as it retains all sensitive information about the complete network. Therefore, compromising one SDN controller will mean compromising all the nodes that are connected to this SDN controller. There have been various studies being carried out towards securing SDN architecture [5][6], and it has been seen that there are mainly three different security issues that are required to be controlled effectively, e.g., i) offering availability of services hosted by the network, ii) safeguarding the system integrity, and iii) safeguarding the data confidentiality. It is evident that the SDN controller is an integral part of the security system, and it is required to precisely configured them as they can block the routing request as well as a specific route which are found to be vulnerable. It is also required for an SDN controller to carry out sufficient validation with a trusted platform.

There are various forms of attacks and vulnerabilities on the SDN system. From the viewpoint of attacks over data planes, the adversary can illegitimately access the physical medium from the network itself, leading to making the host a victim. Some examples of attacks over data plane in SDN are denial-of-service attack, man-in-middle attack, replay attack, etc. The attacks on the controller system lead to a rogue controller node, which led them to construct forged entries without being tracked by any engineers. There are different layers in SDN, and all of them have a very discrete demand for security. One such security demand is a configuration error. If this problem is not addressed, then it leads to the invitation of different other security threats. Denial-of-Service is one of the frequently reported attacks which use a flooding approach over the switch as well as over the controller, and hence complete layers of SDN will get affected. In the presence of any form of attacks over policy enforcement, the severity of the attack increases multifold over the entire upper three layers of SDN. In the case of authorization-

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# Leveraging Deep Learning to Extract Actionable Insights from High-Dimensional Biomedical Data: Opportunities and Challenges

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**ABSTRACT:** Addressing the challenge of extracting actionable insights from complex, high-dimensional biomedical data is crucial for advancing health care. Modern biomedical research generates a variety of data types, including electronic health records, imaging, -omics, sensor data, and textual information, which are often complex, diverse, poorly annotated, and unstructured. Traditional methods of data mining and statistical learning usually involve feature engineering to create effective and robust features, followed by the development of prediction or clustering models. These processes face significant difficulties due to the complexity of the data and the lack of comprehensive domain knowledge. Recent advancements in deep learning offer promising new approaches for creating end-to-end learning models from such complex data. This article reviews recent literature on the application of deep learning in health care and suggests that these approaches could help translate extensive biomedical data into better health outcomes. However, there are limitations and a need for more refined methods, particularly in terms of making these models more understandable to domain experts and citizen scientists. We discuss these challenges and recommend the development of interpretable architectures that can bridge the gap between deep learning models and human understanding.

**KEYWORDS**: Deep learning, health care, biomedical informatics, translational bioinformatics, genomics, electronic health records

## I. INTRODUCTION

Health care is entering a new era where the growing volume of biomedical data is becoming increasingly significant. For instance, precision medicine aims to deliver tailored treatments to individual patients by integrating various data sources such as molecular traits, environmental factors, electronic health records (EHRs), and lifestyle information.

The vast amount of biomedical data presents both opportunities and challenges for health care research. Understanding the relationships between different data components is essential for developing reliable, data-driven medical tools. Previous efforts have focused on linking multiple data sources to create comprehensive knowledge bases for predictive analysis and discovery. Despite promising results from existing models, the adoption of machine learning tools in medicine remains limited. The high-dimensionality, heterogeneity, temporal variability, sparsity, and irregularity of biomedical data present significant challenges. These issues are further complicated by inconsistencies and conflicts among various medical ontologies, such as SNOMED-CT, UMLS, and ICD-9. Additionally, clinical phenotypes can be represented in multiple ways, complicating efforts to standardize and understand these concepts. Traditionally, domain experts manually define phenotypes, which is labour-intensive and may overlook novel patterns. Representation learning methods offer an alternative by automatically discovering the necessary features for prediction from raw data. Deep learning, a subset of representation learning, employs multiple layers of non-linear transformations to derive increasingly abstract representations from raw input. Deep learning has shown impressive results in fields like computer vision, speech recognition, and natural language processing.

Given its success in various domains and ongoing methodological advancements, deep learning holds significant promise for biomedical informatics. Initiatives are already underway to apply deep learning in health care, such as Google DeepMind's plans and Enlitic's use of deep learning for analyzing X-rays and CT scans.

However, deep learning has not yet been extensively tested across the wide range of medical problems that could benefit from its capabilities. The field must address several challenges related to the unique characteristics of health care data,

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# A Conceptual Framework for Understanding Machine Learning and Artificial Intelligence Roles in Technological Advancements

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Assistant Professors, Department of Computer Science and Engineering, City Engineering College, Bengaluru, Karnataka, India[1,2,3,4,5]

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