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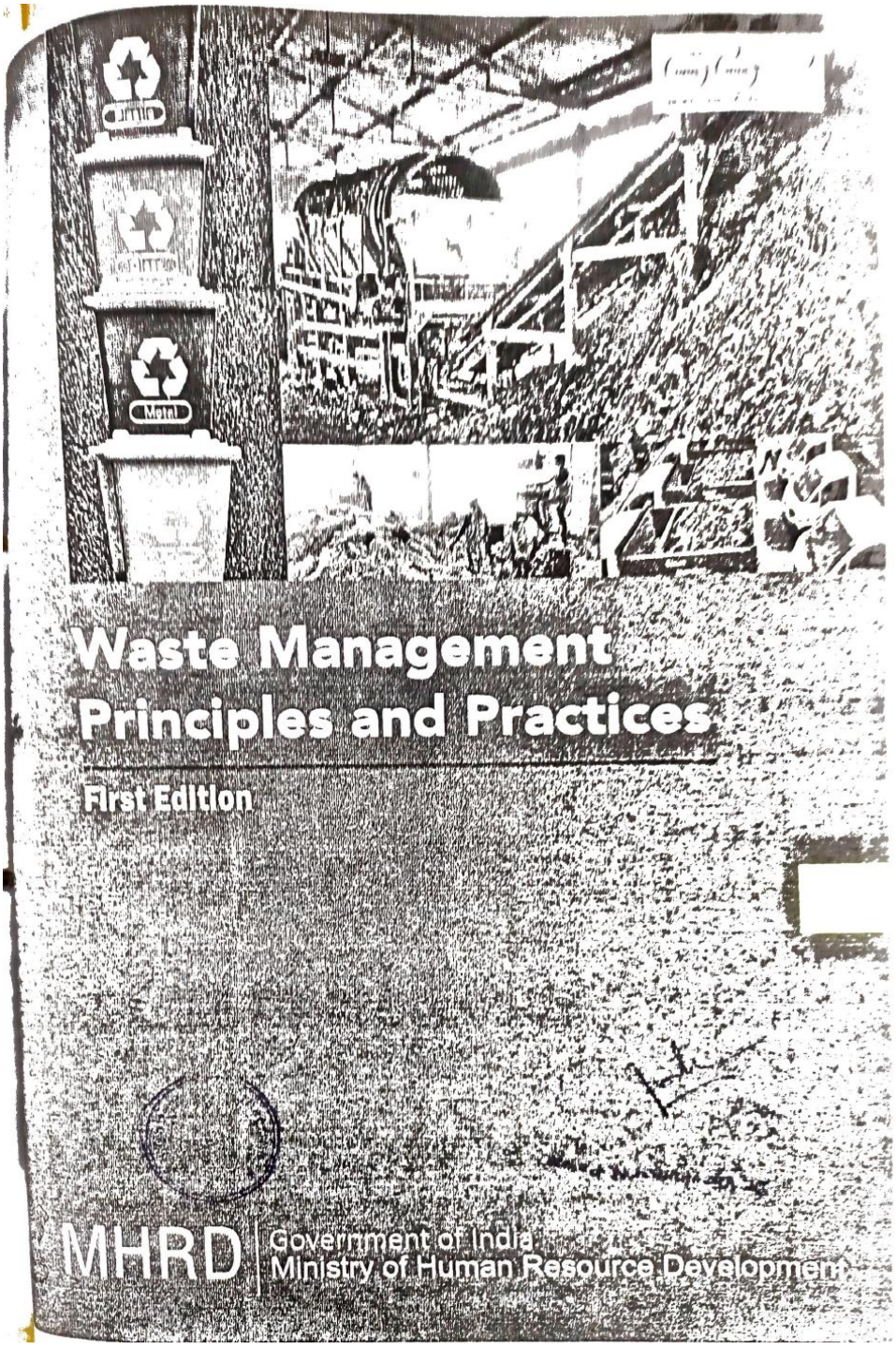

Contents

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npact of Wind Power Integration on Transient Stability of Power System

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bstract – In view of the fact that conventional sources of gy are depleting, non conventional sources are being duced in the power system. Their contribution to the load ng is still not much in comparison to the conventional es. This is because few challenges are faced by system gners while integrating these sources to the grid. nventional sources of energy such as thermal hydro and lear have the advantages over economy, controllability and ability of output. Non conventional sources lack in the above advantages, but are infinitely available and environment ndly. As a result many countries are making government icies insisting to enhance more in renewable generation pacity. As renewable sources lack in controllability and ability, it gives rise to many grid interconnection challenges. troduction to renewable sources and its integration to grid is ided based on its impact on system stability. In this paper, the inimum capacity of synchronous generation needed to maintain nsient stability of the system even after integration of wind is lculated. Study is proposed for a standard IEEE 14 bus test stem under a particular loading and fault condition, the inimum synchronous generation needed to maintain system ability is found. Also the optimum location at which wind ergy should be integrated for better system performance is scussed. All the results are discussed in detail. MATLAB mulations are performed and results are interpreted.

Keywords/Index Terms - Power system stability, Renewable ergy sources, Synchronous generation, Wind power generation.

I. INTRODUCTION

We know the load on power system is continually varying, rder to feed the load and losses, generation of system is to varied as per requirement. This needs generation scheduling d hence controlled generating sources. As non conventional urces are now inevitable part of power system. Their tegration in to the system its challenges and impact on the stem behavior is to be interpreted. Increasing the share of newable resources affects the stability of the system due to eir dynamics. This paper concentrates on wind as a source of newable energy. Integration of wind with the existing power stem, its challenges and impact is the subject of study here. hen wind is integrated to the system, its effect on point of upling is called the Local impact of integration. When the fect of integration on overall system is studied it is called as obal or System impact of wind integration. Lot of research lready been done on Local impact of wind integration while tegrating wind generation initially. Now as the quantum of ind energy is to be increased in the system, its system impact must be studied in detail. The level of integration is decided based on the system impact analysis. System impact talks about dynamics and stability, voltage control possibilities and system balancing. Integration of wind has impact on overall stability of the system due to characteristics of wind turbine. Response of these systems to disturbances is different as compared to that of conventional systems. As a result renewable resources have less voltage control capability than conventional resources. This particular characteristic makes it uncontrolled source of energy. This gives rise to maintaining some quantum of synchronous generation, being the controllable source of energy. Synchronous generation helps to maintain the stability of the system by maintaining the bus voltages. In other words this Synchronous generator bus acts as a Swing bus and maintains the system voltage and ultimately frequency profile. In this paper, two issues related to stability of the system are discussed. Firstly, What is the ratio in which wind energy and synchronous energy can share the load, considering the maximum possible share of wind generation. And secondly, What is the impact of this integration on transient stability of the system.

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II. LITERATURE REVIEW

Effect of integrating wind turbine generators with different transmission line configuration and at different buses is show that wind farms should be connected through additional transmission line to bus bars near synchronous generation and further away from the loads and higher side fault area.[1] When large scale wind farms integrated with weak grid, it changes the power flow further affecting the voltage profile of the system. [2] Stability of synchronous generators tightly linked with wind turbine has biggest impact on the stability. The optimum level of DG integration for today's grid is 30% while higher level of integration requires mitigation measure to arising DG impact [3] The short term fluctuations by wind power connections may lead to over shedding or under shedding of generation & the suitable real time decision making models can be chosen. [4] Power quality is also affected when a high penetration level of wind energy is reached in a weak or isolated system. Design of wind farm plays an important role in handling such issues. [5] In order to improve the transient stability, central area controller is used/implemented/chosen. [6]

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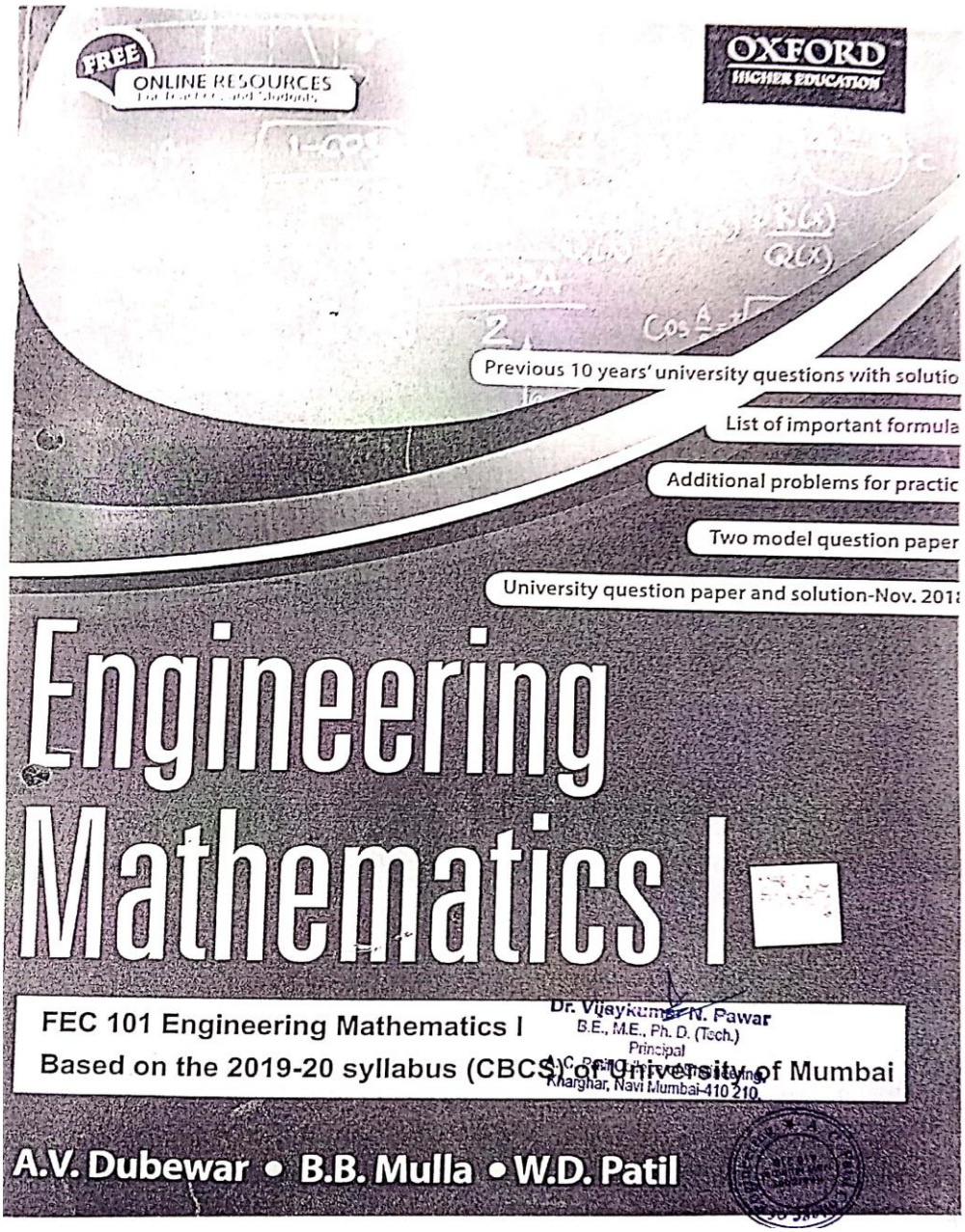

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Network Forensic Investigation Protocol to Identify True Origin of Cyber Crime

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ABSTRACT

An increase in digitization is giving rise to cybercrimes. The existing network protocols are insufficient for collecting the required digital evidence of cybercrime, which eventually makes the process of forensic investigation difficult. In the current scenario of network forensics, the investigator with current capabilities can reach only up to the ISP. This is not primary evidence. Currently, available tools work only at the network layer. In this work, we propose a protocol that ensures tracking up to the true source by collecting beforehand forensically sound evidence. The proposed protocol can collect target data from the device in the form of a device fingerprint with the help of an agent process. The proposed methodology will help in proving non-repudiation, which is a well-known challenge in forensic cases. The fingerprint evidence generated by the proposed method has the capability of not getting obsolete even if the criminal tries to destroy evidence. The fingerprinting technique deployed uses a hash tree and generates evidence in such a way that this fingerprint can act as legal evidence. The security validation of the proposed system is done using the BAN logic. Formal verification is performed using the AVISPA tool. The system has been implemented as a prototype and hosted on AWS.

1. Introduction

The rapid increase in digitization is giving rise to cybercrimes. Cyber security Ventures predicts that there will be 6 billion Internet users by 2022, and 7.5 Billion internet users by 2030 (Morgan, 2017). According to the National Crime Records Bureau (NCRB), the number of cybercrime cases registered so far outnumbers the arrests made (Crimes in India, 2018). The main reason for this is the lack of legal evidence against criminals. The collected evidence does not satisfy the characteristics stipulated by the court of law where most of the digital forensic investigations halt at the edge routers or the ISP of the attackers. Many of the techniques track attackers using the public IP of the attacker, while in the real scenario there is a huge network behind the ISP and the attacker is hiding behind it (Patil and Devane, 2017). It becomes a critical task for the investigator to identify the exact source of the attack. Identifying the exact source also requires significant cooperation from the ISP but being competitors amongst themselves the ISP's are reluctant to cooperate in the investigation process (Yao et al., 2015). Besides, there is a concern about the security of the log information maintained by the ISP. There is no such mechanism available to verify the integrity of ISP data.

Forensic evidence is a key component of the forensic investigation. Paying attention to the authentic collection and preservation of evidence is required for increasing the acceptability of them in the court of law. To gather forensically sound evidence from the network, we need to collect more detailed information about the network devices which will enable the development of accurate techniques supportive to forensic investigation.

Currently, most of the existing network protocols carry information required for routing purposes and security of the contents. This information such as IP address or port numbers can only help in identifying the edge router or the ISP of the attacker and not the exact device used for attempting cybercrime (Patil and Devane, 2017). This information cannot be used as evidence in the court of law. This is not adequate for forensic analysis and investigation. The proposed evidence collection protocol addresses this challenge by specifically carrying detailed information required for investigation without disturbing the original functioning of existing protocols.

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Employing Community Detection into Recommender System: A Review

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Abstract - *The recommendation system aims to predict user's preferences for new items based on the preferences for old items. As no of internet users has increased exponentially, the corporate sectors, especially the E-commerce industry is incorporating 'evolved' recommendation system to retain customers. Recommendation system has evolved from traditional Collaborative-based Filtering or Content-based Filtering to hybrid models which combines two or more strategies to gain accurate results. Both these traditional methods has its strengths and weakness, thus there is a need to make use of different strategies from different domains to build more advance recommender system. One of the strategies is Community Detection in social network analysis which is being used to make hybrid models. Community detection aims to find a highly connected group of nodes (users) in social networks. A social network may contain many hidden information that can be used to know 'preferences' or 'interests' of users. This paper provides a review on recommender systems which incorporates community detection, metrics used for evaluation purpose, its performance against old traditional methods.*

Key Words: Recommender sytem, Collaborative filtering, Content filtering, Community detection, Hybrid, Social network.

1.INTRODUCTION

The Recommendation has been part of human practice from a very early date. The most simple and used, but yet the most effective recommendation method is 'Word of mouth'. This informal way of passing information orally from person to person is the most practiced way of recommendation. With the rapid growth in internet users, the method of advertisements of products has changed dramatically. Now companies are experimenting with new methods to recommend their products to users. This experimentation has made the 'Recommendation system' a new standalone research area. According to the article published in the journal Mckinsey & Company, 35% of the purchases on Amazon are due to their recommendation system and about 75% of what people are watching on Netflix is the result of their recommender system [2]. This data shows the prominence of recommender systems in the online-based services. The traditional methods of recommender systems have been studied extensively by researchers from past decades. It can be divided into many categories depending on the information they are using. Collaborative filtering (CF), Content-based filtering (CBF), Knowledge-based filtering (KF), Demographic filtering (DF), and hybrid methods are major categories of recommender systems.

1.1 Collaborative-based filtering (CF)

CF relies on the past interactions of users and items to predict preferences. This data, stored in the 'user-item' matrix, is used to find similarity between users or items to make predictions. CF is again divided into two subcategories - Model-based approach and Memory-based approach. The model-based approach uses Machine learning techniques like PCA, SVD, Matrix factorization, Neural networks, etc. to find the user's rating of unrated items. The memory-based approach uses Pearson correlation or Cosine similarity functions to find similarities in users or items and then computes weighted average ratings of unrated items. It has two subcategories - User-item filtering and Item-item filtering. The user-item filtering approach aims to find similarities between users while the item-item filtering approach relies on similarities between items. The major problem that Memory-based approach suffers is Data sparsity, Non-scalability, and Cold start. As Model-based approaches don't solely depend on the user's rating data, it doesn't suffer from data sparsity and non-scalability problems. Overall, CF is preferred for diverse recommendations as it considers the data and preferences of other users. It also provides flexibility in the user's perspective and preferences due to its ability to capture the change in user's interest over time.

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1.2 Content-based filtering (CBF)

CBF examines the description of each item and constructs a personalized user profile. The description of each item is defined by tags (eg. In the movie dataset, *director name, actor name, genre,* etc. will be the tags.). The user profile is built up with the same tags by analysing the description of each item preferred by the user in the past. CBF doesn't need any data from other users and their preferences for other items making it a highly personalized recommendation method. This makes it scalable to large no. of users even in the sparse dataset. However, it fails to deliver diverse recommendations as it is specific to the existing interests of the user.

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Searching for an Exoplanets Using AI

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ABSTRACT

Various scientists have used NASA's Kepler Space Telescope for several years to discover thousands of new stars and exoplanets. During the Extended K2 mission, they detected various types of stars and exoplanets in various regions of the sky and, as a result, in various galaxy environments. Astronauts are interested in learning more about the population of various Exoplanets in different systems. Whatever they need is an automated and unconditional method of detecting an exoplanet in the vicinity and producing a false positive signal that transmits the planet signal. We have a method for identifying an exoplanet that uses deep learning, a type of machine learning algorithm that has become well-known in the field of linguistics. We previously used neural networks to classify an exoplanet in the K2 region, and we will continue to use neural networks, as well as other algorithms such as data augmentation and artificial neural networks, to improve accuracy. That means better precision and recall values for exoplanet discovery. K2 excels at this mission, achieving a 98 percent accuracy rate. As a result, although it is effective at detecting False Positives, it still requires human supervision to generate a full star sample. We previously used a variety of algorithms and Kepler data, but now we will use a cutting-edge technology algorithm called a Neural Network to classify new stars and exoplanets, as well as their population dependence.

Keyword — Deep Learning, Exoplanets, prediction, Star Brightness, Feature Engineering, Data augmentation, Neural Network, 1D Convolutional, ANN, RNN.

I. INTRODUCTION

Conveyancing Exoplanets do provide a remarkable Oppor-tunity to ascertain planetary atmosphere through the various spectroscopic features. During Various primary transit, when a planet goes nearby or passes nearby it's host star, the light which transmits the planet's atmosphere that reveals absorption from the atomic and molecular species. So for that, with the recent activity in technology, we can also use the famous technology which is powerful telescope, i.e NASA's Kepler Space Telescope, for observing the stars and planets which is visible through universe for the extrasolar stars and extrasolar planets which are also called as Exoplanets.

II. SCOPE

While doing this work, we address many of the task which creates an automatic system which identifies

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Transmission Line Fault Detection Using Wavelet & Artificial Neural Network

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***Abstract*—The transmission line has different techniques related to the protection of the relay as the development is carried out by the different researchers in this field. The artificial neural network system was adopted for the case of the first order single phase system in the case of the transmission line. The transmission line if present in the parallel system, then the back propagation case of the neural network in the case of the schemes of the relay was adopted. The combined method related to the back propagation as well as the neural network system in the case of the diagnosis of the presence of the faults in the case of single circuit line can be possible. The present work is related to the detection process of the faults for the case of transmission line with the help of the wavelet as well as the process of the artificial neural network.**

Keywords*— *fault detection, wavelet, artificial neural network and transmission line

I. INTRODUCTION

The transmission line if it is overhead in that case it would be exposed the condition of the environment and faults could be on the higher side for this transmission line. The deduction procedure is very important in the fault persist in the transmission line also to find out the zone so that the repair procedure can start as well as the power restored will also be at the earliest. Protect the system of transmission line in the relaying is to be at the certain distance. The protection should be very fast for such cases as well as the there should be not any delay. The backup protection it's possible if the corresponding relay get fails.

There could be difficulties for the carrying out distinguish in the case of fault if they are closed to the the remote bus and 80% covering is possible for the length of line. There could be delay Hindi protecting of zone 2 with the help of coordination system for the interval of time. To protect in the case of LINE which is primary for the second number zone in that case the protection which is backed up can be provided for 50% case for the line which is adjacent and having delay of 0.25 second to 0.4 sec. To cover adjacent line as well as primary line in that case zone 3 can have set and also the delay can be the additional part for the case of LINE which is remotely placed with 25%.

That can be different conditions for the case of resistance weight the part which is faulty capacitance with shunt and infield currents remotely placed and that can be degradation in the case of Relay which are distantly placed and its performance. The setting of the relay is not easy for the decision as that can be the current switch r line charging and Saturn currents could have the variation as there can be the faults which are highly resistant. The voltage which is composite in nature as well as the measurement for the current mostly used so that the sensitivity of the relay can be improved very effectively. As the fault clearance should be faster in that case there can be the improvement in the stability of the system as well as the skiing relying which are dependent upon the wave which is travelling in nature.

It is found that the transient current as well as the features of it can be used so that the demonstration for the case of event which can be switching or faulty take place. Protection of the relay the response comparatively fast and the time consumption is more if the proper operation is not covered. In such cases the relations team if it is sensitive in that case it is very beneficial while the tendency of the sensitivities so that the operation can be not desire the fault is not present in such cases the people faces the issues like blackout.

II. LITERATURE SURVEY

The line which is faulty in that case the detachment procedure is possible but before the head there should be precisely differentiation for the zone which is faulty and need the indication related to the type of the fault which is present (1). If the current was which are transient in nature and generated with the faults which contains the frequency band which are distinct and need to be captured the different bands related to the frequencies among the current signal which is transient in nature as well as having the transform called discrete wavelet considering the mother wavelet to be used (2). The determination of the faulty zone with the help of two bands with the frequency is possible. The use of the mother wavelet for the case of selecting the phase which is faulty should be carried out (3). The phase which is faulty can be classified with the help of computation of the value which is average in consideration related to the coefficient value in the case of every wave of the current (4).

Distribution of the power in the different location is to be carried out effectively in that case the detection of the fault as well as classification of the fault is very important procedure (5). In the circuit breaker is to be tripped actively in that case it will be fit to for the protecting the line of transmission very precisely and they in the action of the tripping for the circuit breaker please completely e governed by the current as well as wavelet related to the voltage in the case of fault (6).

The analysis of the discrete wavelet in the case of identifying as well as classic find the faults on the line of transmission network can be carried out effectively (7). Analysis procedure for the case of current having a waveform then if there is a fault in that case the method of discrete wavelet transform is very beneficial (8).

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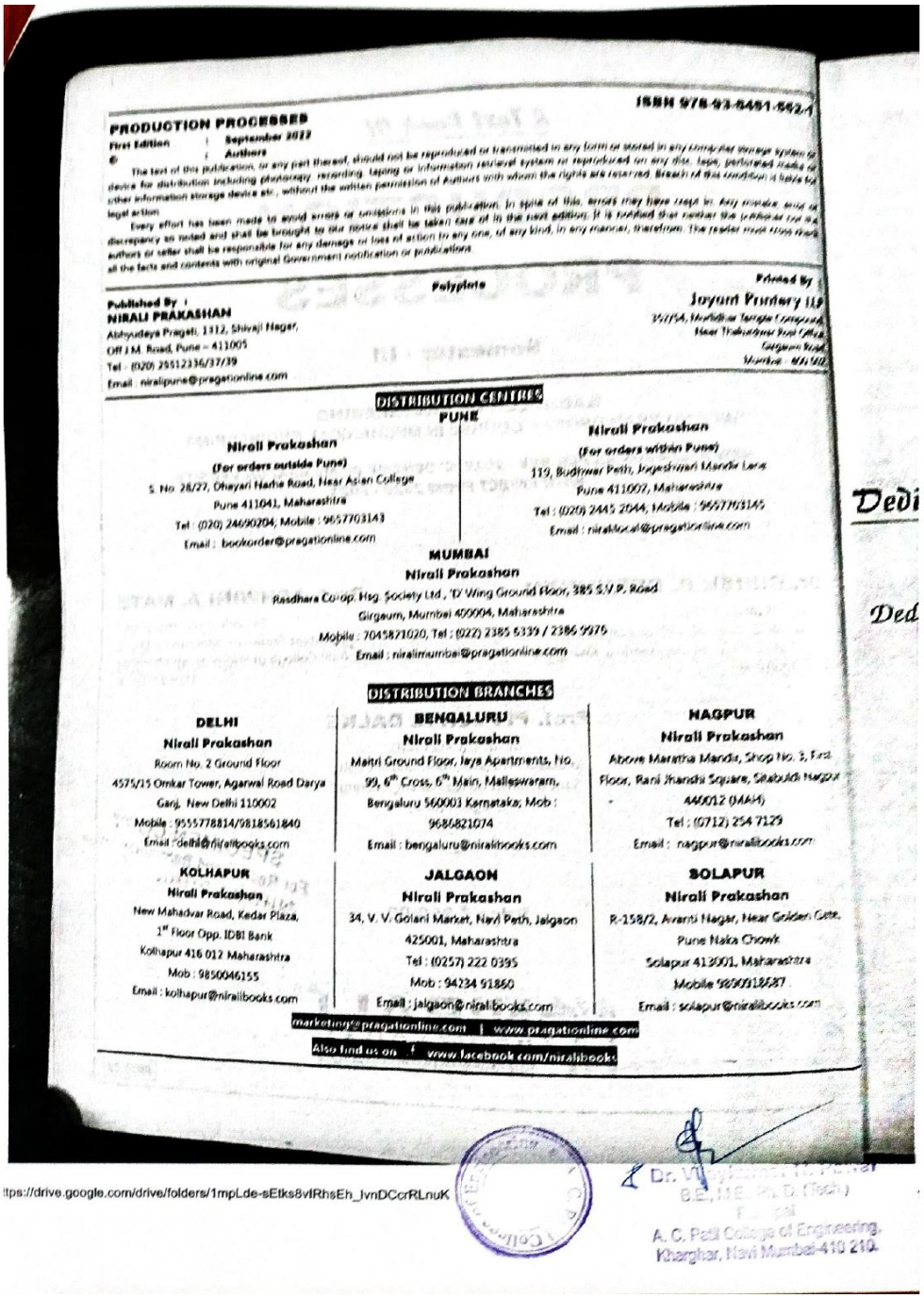

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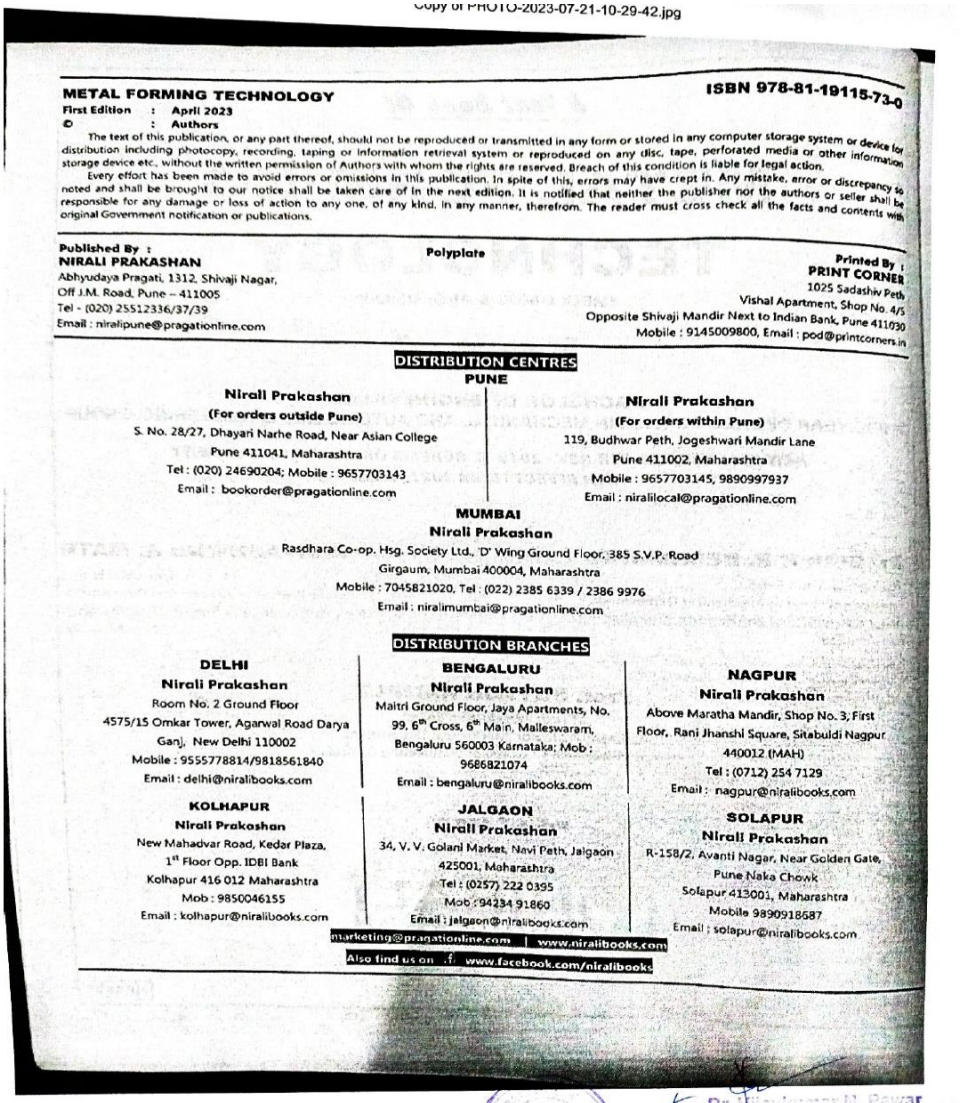

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