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Assessment Of Ground Water Quality By Using Water Quality Index Around Ajithsingh Nagar Dump Yard In Vijayawada, Andhra Pradesh, India

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Abstract—Water is an essential natural resource for sustaining life and environment but over the last few decades the water quality is deteriorating due to its over exploitation. Water quality is essential parameter to be studied when the overall focus is sustainable development keeping mankind at focal point. Groundwater is the major source of drinking water in rural as well as in urban areas and over 94% of the drinking water demand is met by groundwater. The study was carried out to assess the ground water quality and its suitability for drinking purpose around the Ajithsingh nagar dump yard of Vijayawada, Krishna district, Andhra Pradesh, India. For this purpose, water samples were collected in Ajithsingh nagar, Nunna, Payakapuram, Kandrika, Rajivnagar areas around dump yard. And we analyzed the samples for different physio-chemical parameters such as pH, turbidity, total hardness, chloride, total dissolved solids, total alkalinity, fluoride, sulphates, nitrate, and iron. We assessed ground water quality in terms of WQI of those areas by using weighted arithmetic water quality index formula. It shows that WQI of ajithsingh nagar, nunna, payakapuram, kandrika, rajivnagar areas have poor ground water quality and undesirable for drinking purpose

Keywords- *Groundwater quality, Physio-chemical parameters, Statistical Parameters, WQI*

I. INTRODUCTION

Water is one of the abundantly available substances in nature. Water plays a vital role in the wealth of a nation, particularly like India, Which is predominantly an agriculture default economy. The importance of water for the existence of life need not be over emphasized [6]. Ground water is the major source for drinking & domestic purposes in both rural & urban areas. The above situation is changing very rapidly & at a very alarming rate due to pollutants from various sources. Although water can be polluted naturally, due to high degree of minerals present in the soils rocks, the quality of ground water may vary from place to place. In addition to above, rapid population growth, increasing living standards, untreated municipal and industrial waste –waters, fertilizers, application of pesticides, sewers and landfill areas are the potential sources of ground water pollution [8].

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Student Learning Centric Methodology: An aid to Innovative Teaching and Learning Process

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Abstract: Teaching is a noble profession that contributes to the Nation Prosperity and with rapid advancing technology, it is necessary for a professional teacher to understand, inculcate, evaluate, examine and enhance the standards of teaching and learning using the available state-of-art technology yet keeping in view the abilities and limitations of both teachers and learners. While teaching and learning seemingly look dichotomous, they are really intertwined. Collaborative aspects of a complex process of learning are to be shaped by both teacher and student. This paper describes a Student Learning Centric (SLC) and an Analogous Learning methodology to create vibrant and active learning process. In this paper the OSI layers of a Communication Network are interpreted with a Bike Race example so that the functionality of each layer is more effectively understood by the students. This methodology emphasises the need for introducing the new concepts with appropriate real time scenario for effective and active learning.

Keywords: Active Teaching and Learning, Inquisitive Learning, Analogous Learning, Learning Assessment

1. Introduction

Teaching and learning are intertwined with each other. Domain Knowledge with insights into the learning process can help the teachers to create active classrooms. Today, the digital world is fast penetrating the education and skills domain. Teachers need to acquire contemporary knowledge and also new innovative tools of teaching that are appropriate for the student generation Z. The teachers need to shift the teacher centric class rooms to student learning centric classrooms added with appropriate learning assessment which is essence of outcome-based education.

The words of A.P.J Abdul Kalam, **"Learning gives creativity, creativity leads to thinking, thinking provides knowledge and knowledge makes you great"**, bring realization among the learner community that learning must be an enthusiastic element in all areas to gain knowledge. **Learning byheart should be changed to Learning by heart** especially in the student and teachers' point of view. **"Teaching without learning is just talking"** sums up the inactive learning element in conventional teaching. The professional efficacy in all professions in the society depends on effective learning and applying the knowledge and this onus rests on the teachers.

It signifies the teacher's responsibility to make learning in classroom active, fruitful and help in progressive learning. This can happen while exploring the requisite strategic teaching learning process especially in Engineering Education, as most of the Engineering students are not willing to listen until and unless the classroom is active and the session is active. The technological advents made especially in the 21st century aid the teachers in bringing creative outcomes in the learning strategies which in turn promotes effective learning. In order to instil better learning a teacher must be specific about formulating the course objectives that meet the course outcomes. Imagination, Innovation and Introspection are the three quintessential elements that the teacher can strategise to match his/her mission with students' vision. These three elements are the essential qualities/abilities for the industrial growth in the country and play a major role in attaining the new start-up/enterprises by the young budding entrepreneurs.

In conventional teaching often the learning objectives overshadow and overlook the actual expected learning outcomes especially in curriculum where the teachers' degree of freedom is limited. The learning objectives play a key role in the teaching domain because these objectives interpret the basis of what to be taught in a classroom. However, if the teacher were to visualize and design learning objectives in a wider perspective which may ignite students' creativity, then the learning outcomes would also have far reaching implications which in turn will benefit the society.

Of course, the teacher has to visualize the learning objectives with empathy for each individual student's vision and grasping abilities. This is not as simple as discussed in the theory the teacher practically needs to bring the creative minds of the classroom in taking these learning objectives and evaluate the outcomes.

This paper illustrates an Analogous Learning technique that enables a student in hands-on learning that aids in new explorations for application. Section 2 discusses the processes that can provide more insights to the teachers on learner-centred teaching and its advantages over conventional teaching. In Section 3, a student learning centric methodology that embodies analogous and inquisitive and learning assessment. In Section 4 the overall

Student Learning Centric Methodology: An aid to Innovative Teaching and Learning Process

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EVALUATING A MULTIPLE DECISIONS OF POTENTIAL AND COMPLEX ENVIRONMENT USING DEEP REINFORCEMENT LEARNING AND RECURRENT NEURAL NETWORK FOR ALLOWING ERROR FREE COMMUNICATION IN MODISH (SMART) GRIDS

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Abstract:
A smart grid is a network allowing devices to communicate between suppliers to consumers, allowing them to manage demand, protect the distribution network, save energy and reduce costs. Smart grids are the developmental trend of power systems and they have attracted much attention all over the world. Due to their complexities, and the uncertainty of the smart grid and high volume of information being collected, artificial intelligence techniques represent some of the enabling technologies for its future development and success. A smart grid is an electrical grid which includes a variety of operation and energy measures including smart meters, smart appliances, renewable energy resources, and energy efficient resources. Decreasing cost of computing power, the profusion of data, and better algorithms, AI has entered into its new developmental stage and AI is developing rapidly. Deep learning (DL), reinforcement learning (RL) and their combination deep reinforcement learning (DRL) are representative methods and relatively mature methods in the family of AI.
This paper introduces the concept and status of the above three methods, summarizes their potential for application in smart grids, and provides a sequence of decisions can be achieve potential and complex environment can be developed in smart grids an overview of the research work on their application in smart grids.
Keywords: Deep Learning, deep reinforcement learning (DRL), Recurrent Neural Networks (RNN),Convolutional Neural Networks (CNN).

I. Introduction

Artificial intelligence is a comprehensive science and technology, including a huge domain in breadth and width. After decades of development, much progress has been made across the fields of artificial intelligence (AI). In recent years, driven by the increasing amounts of data, there has been a significant emergence in the advancement of AI algorithms and powerful computer hardware, allowing AI to enter into a new evolutionary stage related technologies are currently in the process of development, and many algorithms are emerging. In their present states, deep learning (DL) and reinforcement learning (RL) are relatively mature; and their combination deep

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A SMART WAREHOUSE INVENTORY MANAGEMENT AND MONITORING SYSTEM USING INTERNET OF THINGS AND OPEN SOURCE TECHNOLOGY

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Abstract: In the present era, managing the inventory is crucial part in the industries. More man work and time is taken for managing products in the inventory. So this paper deals with a smart inventory management system that diminishes the man work and makes the process done in a smarter way. The IoT technology integrated with open source technology enhances the performance, security of the system. In this system with the help of RFID technology, the products are annexed with RFID tags and scanned by the RFID reader. The Arduino mega with ESP8266-01 gathers the data from the products and updates the data into the web server. This system automatically checks the count of products in the inventory, if the count is less the system automatically orders the products. Some sensors such as DHT11, MQ2 and fire sensors are used for monitoring the environmental parameters in the inventory and takes necessary actions if needed. The GSM module notifies the users with the updated messages regarding the products. The gathered data in the web server is monitored with real time scenarios in the Android app by Internet of things.

Keywords: **IoT, RFID, Smart Inventory, Sensors.**

I. INTRODUCTION

The location identification system is employed with many applications where the location of object or personnel is significant. Smart systems play a key role in industries, households, colleges and other native environments. The concept of localization is growing linearly in smart systems, because location plays a crucial role in contemporary life. Placing any particular object accurately is truly challenging. IoT is a vision that allows for the association of individuals and things in a perfect world using any path or any service.

The portion that stores items or products are called the Warehouse. Warehousing cites the activities involved in storing goods on an enormous scale in a precise manner and ensuring their availability whenever possible [1]. The need for a warehouse to store different kinds of products or commodities in order to sustain seasonal production, seasonal demand, fast supply, continuous production, price stabilization. For every warehouse the warehouse inventory management program is a necessary approach. There may be several zones in Warehouse, and those zones are often called Stockrooms. The desire to automate warehouses stems from the fact that manual handling systems can lead to human errors which can affect the operation of t he warehouse.

Identification process is based on AIDC (Automatic Identification and Data Capturing). The AIDC technology has its own relevance among the numerous available technologies. The typical AIDC technology is Barcode technology which is used for reading labels by optical scanners. Barcodes Is an immense advance over normal text labels because it is no longer essential for the staff to enter data manually into the system [2]. The RFID technology replaces Barcode scanning as barcode scanners are cost intensive and protection is lower. When the label does harm the data cannot be read by the scanner. The RFID tags have more data storage capability than the Barcode.

With the help of electromagnetic spectrum the radio waves in the RFID are engage in the application automatic identification which enables the system to recognize or identify the objects that are adhered with the tags. In the indoor environment RFID technology has its own impact in identifying people or assets [3]. Whenever administrators want to find the location of an object in big companies within a precise amount of time this technology suits to be the best. The implementation of location identification system is very reliable, simple, and low cost. In the RFID system the tags are robust and are flexible that is they can be easily attached to any object.

Many standards are used by the identification mechanism but the international standardization is doing some sort of research in the field of tracking goods in the inventory management. The EPC electronic product code technology

Sound Source Localization Using 3D Microphone Array

Dr.D.Bhavana, Dr.K.Kishore Kumar, Y.Vijay Kumar, N.Naga Bhanu Maitreyee, R. Naga Jyothirmayi, D.RaviTej

Abstract: Source localization and tracking with the microphone arrays had become a major interest in room acoustics, teleconference systems and tracking of sound producing objects. The current methods to estimate the source localization depend on conventional time-delay estimation techniques between microphone pairs, however, ignoring the ambient noise, reflections from surrounding and reverberation in the closed space. There are three basic and important methods for finding the direction of arrival (DOA) in a far field environment for sound sources. The first two approaches are based on Beamforming techniques: Delay and Sum Beamformer and Minimum Variance Distortion-less Response Beam former (MVDR). The third approach is a subspace method that uses the well-known algorithm, Multiple Signal Classification (MUSIC). The main goal is to prices-lylocate the direction of a sound source (azimuth, elevation) using recordings from an microphone array. This task is quite-demanding because of a high volume of acoustic noise produced by the UAV, causing negative signal-to-noise ratios (SNR). The resulted or obtained noise consists of harmonics components which are related to the speed of propellers and structural noise and also sometimes atmospheric noise due to the UAV's movements and propellers rotations. Another problem comes from the reality that a UAV is moving constantly, sometimes with quickshiftsindirections, resulting in very complex and comparable source trajectories in the microphone array's which is used as a frame for reference.

1. INTRODUCTION

RECENT advancements in acoustics source localization and tracking, using microphone arrays, have numerousapplications in room acoustics measurements, teleconference systems, automotive industry and tracking of sound producing objects for surveillance systems. The main aim of any localizer is to preciselylocate or estimate the direction of arrival (DOA) of a single or more active sound sources simultaneously, in order to point out the listening stream of sound field. A sound localizer is a core part of any capture system that uses microphone arrays of different configurations and beam-steering. The accuracy of sound source localization critically depends on the ambience and reverberation of indoor environments, such as small rooms, offices and auditorium. Traditionally, the localization methods are based on two ways to estimate the sound arrival direction.

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The first approach is based on time difference of arrival estimation (TDOA) using paired combinations of microphone pairs, whereas, the second approach maximizes the source steered power response (SPR) at thedelay output and sum beamformer. Both approaches use single frame of captured sound for estimation, producing poor results in precision and also require additional post-processing algorithms to track multiple sources in real time applications. Recent developments in simultaneous multiple source localization, such as, MUSIC and ESPRIT resolve this problem up to satisfactory extent, however, these techniques are only applicable for narrowband sources In past few decades, microphone array based processing has been investigated for sound localization and tracking in order to emulate the existing techniques for multi-channel processing. Different microphone array configurations have been studied and proposed for estimation process, such as, direction of arrival (DOA) estimation and localizing the sources, using correlation among the two pairs of microphones. In our study, we investigated both methods, i.e. TDOA and SPR. In time delay estimation techniques, we have employed generalized cross correlation (GCC) method in frequency domain using several combinations of microphone pairs of the array with weighting functions. The array used for this purpose consists of six microphones with spherical geometric configurations in evenly distributed manners at its imaginary surface. Some of the weighting functions like, 'phase transform (PHAT)', 'smoother coherence transform (SCOT)' and the 'maximum-likelihood (ML)' for GCC algorithm are evaluated in reverberant and noisy environment. A comparative study and evaluation of these weighting functions is performed and presented; therefore, 'PHAT' weighting function is purposed for optimum detection of source in the presence of reverberant environment, especially for multiple sources. For SPR, minimum variance distortion less response weighting is evaluated and purposed for accurate source tracking application at getting high SNR of the steered signal in reverberation conditions. In addition, a practical ASLT

ANTENNAS AND CIRCUITS FOR 5G MOBILE COMMUNICATIONS

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Abstract

The rapidly increasing number of mobile devices, voluminous data, and higher data rate is pushing the development of the fifth-generation (5G) wireless communications. The 5G networks are broadly characterized by three unique features: ubiquitous connectivity, extremely low latency, and very high-speed data transfer via adoption of new technology to equip future millimeter band wireless communication systems at nanoscale and massive multi-input multi-output (MIMO) with extreme base station and device densities, as well as unprecedented numbers of nanoantennas. In this article, these new technologies of 5G are presented so as to figure out the advanced requirements proposed for the nanomaterials applied to antennas in particular. Because of massive MIMO and ultra-densification technology, conventional antennas are unable to serve the new frequency for smaller sizes, and the nanoantennas are used in 5G. The nanomaterials for nanoantennas applied in wideband millimeter waves are introduced. Four types of nanomaterials including graphene, carbon nanotubes, metallic nanomaterials, and metamaterials are illustrated with a focus on their morphology and electromagnetic properties. The challenges for the commercialization of 5G and nanomaterials are also discussed. An atomistic modeling approach is proposed for the development of novel nanomaterials applied in 5G and beyond.

Keywords: 5G wireless communications, nanoantennas, nanomaterials, electromagnetic properties

Introduction

The scientific and technological development of wireless communications benefits to the community and people in their daily life [1–3]. Progress and demand in society, in turn, propel the innovation and development of wireless communications systems. In the next decade, a mobile traffic may increase thousands of times, and billions of connections for communicating devices are expected compared to what we are experiencing today [3,4]. Moreover, the rapid development of essential services including electronic banking, electronic educa- tion, electronic health, and electronic commerce causes a large growth in data volume and requires low latency and high reliability to support applications [2,5,6]. On-demand information and entertainment using reality and virtual reality are progressively delivered and spread via wireless communication systems [7,8]. A wide range of data rates has to be supported up to multiple gigabits per second, and tens of megabits per second need to be guaranteed with high

Anovel approach to mitigate problems in E-Commerce Recommendation systems

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Abstract— **In the recent years, people are adopting towards E-Commerce purchases for their day to day needs on other hand Ecommerce market space also increased drastically because of this situation consumers suffering with a problem called information overhead. To address this problem many E- Commerce owners adopting recommendation systems, which can able to help consumer with the items nearer to their taste by understanding their behavior?. Recommender systems are used to change the way of communication between the user and the item. The recommender system sorts the huge amount of data to identify the interest of the user and makes the information easier. For these the collaborative filtering is used to easier predictions about the interest of the user by collecting the knowledge from the customer.**

The collaborative filtering (CF) is used to the cooperation of the consumer and the product. However, existing CF-based methods can use single type of relation, such as user–user or item–item relation. Another one is, matrix factorization explicitly captures the interaction between them. In the initial stage, corresponding low dimensional vectors of users and items are learned separately. During the prediction stage, a feed- forward neural network is employed to simulate the interaction between user and item, where the corresponding pre-trained representational vectors are taken as inputs of the neural networks.

Keywords— Recommended System, collaborative filtering, Hybrid Filtering, content based filtering.

I. INTRODUCTION

Recommendation systems (RS) play an increasingly important role in modern online services. Recommendations that are personalized help the users in getting the list of items that are of their interest in e-commerce sites. The recommender systems use Collaborative Filtering techniques to generate recommendations to their users. The recommender system use an information filtering technique called as Collaborative Filtering for generating personalized recommendations in movies for user.

Collaborative filtering is of two types, namely, collaborative filtering based on users and collaborative filtering based on items. Collaborative Filtering based on users is more expensive computationally but it produces better results. Collaborative Filtering based on users is not preferred because it encounters the problems of Scalability when the number of users increases.

Therefore, we use item-based Collaborative Filtering which is an alternative method. Collaborative Filtering, which is based on items, uses two techniques- Pearson correlation technique and cosine similarity technique for calculating the similarity between items and to generate recommendations to users.

Recommendation systems can be categorized as contents-based filtering, collaborative filtering, and hybrid approach. They are different types of recommended systems (RS) are following,

1. Content Based
2. CollaborativeFiltering
3. HybridFiltering

Content Based Recommended System

The content based recommended systems are based on the description of an item and a profile of theuser'spreferredchoices.Inacontent-basedrecommendationsystem,keywordsareusedtodescribethe items; besides, a user profile is built to state the type of item this user likes.

The recommendations are basedontheinformationonthecontentofitemsratherthan theothersuser'sopinions.Basically, these methods use an item profile characterizing the item within the system.The system creates a content based profile of users based on a weighted vector of item features. The weights denote the importance of each feature to the user and can be computed from individually rated content vectors using a variety oftechniques.

Collaborative Filtering Recommendation System

Collaborative Filtering method finds a subset of users who have similar tastes and preferences to the target user.Collaborative filtering is the process of filtering information or patterns using techniques which involves collaboration among various agents, viewpoints, data sources, etc. The collaborative filtering is based on collecting and analyzing information on user's behaviors, their activities or preferences and predicting what they will like based on the similarity with other users. The keywords are

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Original Article

NUMERICAL SIMULATION OF A NEW OPTIMIZED CABINET DRYER FOR APPLE DRYING

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ABSTRACT

Drying cabinets are the most common fruit drying equipment. Experimental assessment of the heat and the mass transfer phenomenon during the drying process is a complex task, which also involves more operating costs and time. This drawback is neutralized by the use of computational software. A new dryer was designed to analyze its performance using ANSYS FLUENT. Four dissimilar geometries of cabinet dryers were designed to execute heat transfer analysis. From the heat transfer analysis for a given boundary conditions, the optimized design based on temperature and velocity behaviors within the dryer was selected. Design 4 displays the maximum temperature and better turbulence at the trays among all other designs. It is therefore chosen as the optimum design for mass transfer analysis. The multiphase model was selected in the ANSYS software. Rectangular apple slices are used as a drying product. The results of the mass transfer analysis show that the vapor content decreased from 100 to 11 percent in 500 sec using the optimized heat transfer analysis design.

KEYWORDS: Ansys Fluent, Cabinet dryer, Heat transfer analysis& Multiphase model

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NOMECULATURE

a	-	Divergence angle
U_{xy}	-	Ordained templates
V_{xy}	-	mass transfer coefficient
q	-	Solidity of fluid
k	-	Turbulent dynamic energy
Ɛ	-	Rate of scattering
μ	-	dynamic viscosity
E	-	Total energy
υ_i	-	velocity vector
υ_{mag}	-	velocity magnitude
$(\tau_{ij})_{eff}$	-	deviatoric stress tensor

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A Novel Empirical Model For Drying Of Root Vegetables In Thin-Layers

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Abstract: In the present work, a new empirical thin layer model for modeling the hot-air drying of root vegetables was developed. Drying characteristics of root vegetables viz., red beetroot and radish are determined at various temperatures. A novel approach is compared with two well-known thin-layer drying models. The proposed model has given the highest determination coefficient (R^2). Statistical estimation of the moisture ratio (MR) from experiments and calculated shown that the proposed equation reliably gave the lowest root mean square error (RMSE) and sum of squares due to error (SSE). The results indicate that the proposed model has the best curve fitting ability for root vegetables.

Index Terms: Beetroot, Effective moisture diffusivity, Forced convective tray dryer, New empirical relation, Radish, Thin-layer modeling.

1. INTRODUCTION

DRYING is not just merely a food preserving technique, but it involves mathematical interpretation of heat and mass transport phenomena undergoing by material during drying [1-2]. Simple empirical models can be used to design and analyze the drying kinetics of any material [3-4]. But these models can be effectively utilized only with the aid of experimental data of material being dried in thin layers. Numerous experiments and several mathematical modellings were carried out to elucidate the drying kinetics in thin layers [5-13]. In the present work, a novel thin layer drying model is proposed and statistical methods were employed to compare the proposed model with best suitable thin layer models for red beetroot and radish available in literature [14-18]. The experimental setup used for drying of red beetroot and radish was a forced draft convective tray dryer. Beetroot and radish were collected from nearby market. Before drying, beetroots and radish were washed and cut into rectangular shaped dices. Drying experiments were conducted at various temperatures and at velocity 2 m/s. The range of process parameters were set to values based on the dryer capacity and drying material. The RH of the drying air at both ends of drying chamber is determined by measuring its DBT and WBT. The sample weight is recorded during drying at each 10 min interval using electronic weighing balance with accuracy of ± 0.05 g. Drying was operated till the final moisture content of the material reached nearly 0.03 kgw/kgds. The moisture content of dried materials was determined at a standard research facility. Time dependent moisture content of the samples was determined from the material weight and dry basis weight.

2 PROPOSED MODEL

As samples are drying in single layers, the temperature distribution is assumed as uniform in the material and lumped parameter models are more suitable [19]. Mass transfer with in the product will be obtained from Eq. (1) [20-21], whose solution is presented in Eq. (2) [22].

$$\frac{\partial M}{\partial t} = D_{eff}\frac{\partial^2 M}{\partial x^2} \tag{1}$$

$$MR = \frac{8}{\pi^2}\sum_{i=1}^{\infty}\frac{1}{(2i-1)^2}\exp\left[-\frac{(2i-1)^2\pi^2 D_{eff}t}{4L^2}\right] \tag{2}$$

Thin layer drying models can be derived by analogues with Newton's law of cooling or Fick's II law of diffusion or can be MR developed with the experimental results. In the present work a model was developed with the experimental results of drying of red beetroot in the temperature range of 70-90 °C and radish in the temperature range of 40-60 °C. In the literature, most of the thin layer models predicts moisture ratio in terms of time exponentially. Wang and Singh model [10] was the first to develop a drying model in a simple polynomial equation form. Hence, the proposed model in this work was modelled in the rational equation form. Thus, the proposed model takes the form as in Eq. (3).

$$MR(a,b,c,d,e,f) = \frac{at^3+bt^2+ct+d}{t^2+et+f} \tag{3}$$

For applicability of proposed model to thin layer drying following two cases are considered:

1. If material is dried in a oscillating RH of drying air then MR may be taken as

$$MR = \frac{M_t}{M_o} \quad \text{instead of} \quad MR = \frac{(M_t - M_e)}{(M_o - M_e)}$$

2. If material is dried in constant RH of drying air, then MR is

$$MR = \frac{(M_t - M_e)}{(M_o - M_e)}$$

The proposed model is evaluated by comparing with models presented in Table 1. Relationship between different variables in Eq. (3) is obtained from nonlinear regression analysis. The validation of proposed model was checked with different statistical methods. MATLAB – 18 computer program was used for statistical analysis. The correctness of fit was determined using correlation of determination (R^2), reduced root mean square error (RMSE) and sum of squares due to error (SSE) [23-25].

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