Books / Conference Papers

VISION

F.Y. Diploma Semester I *(Common to all Branches)*
Engineering & Technology

A Text Book of

Basic Science Chemistry

BSC 22102

Arti Jha
Pranjali D. Chaple
Shivaji Nirmal
...nhavi D. Omase

MSBTE 'I' Scheme

2017 Edition

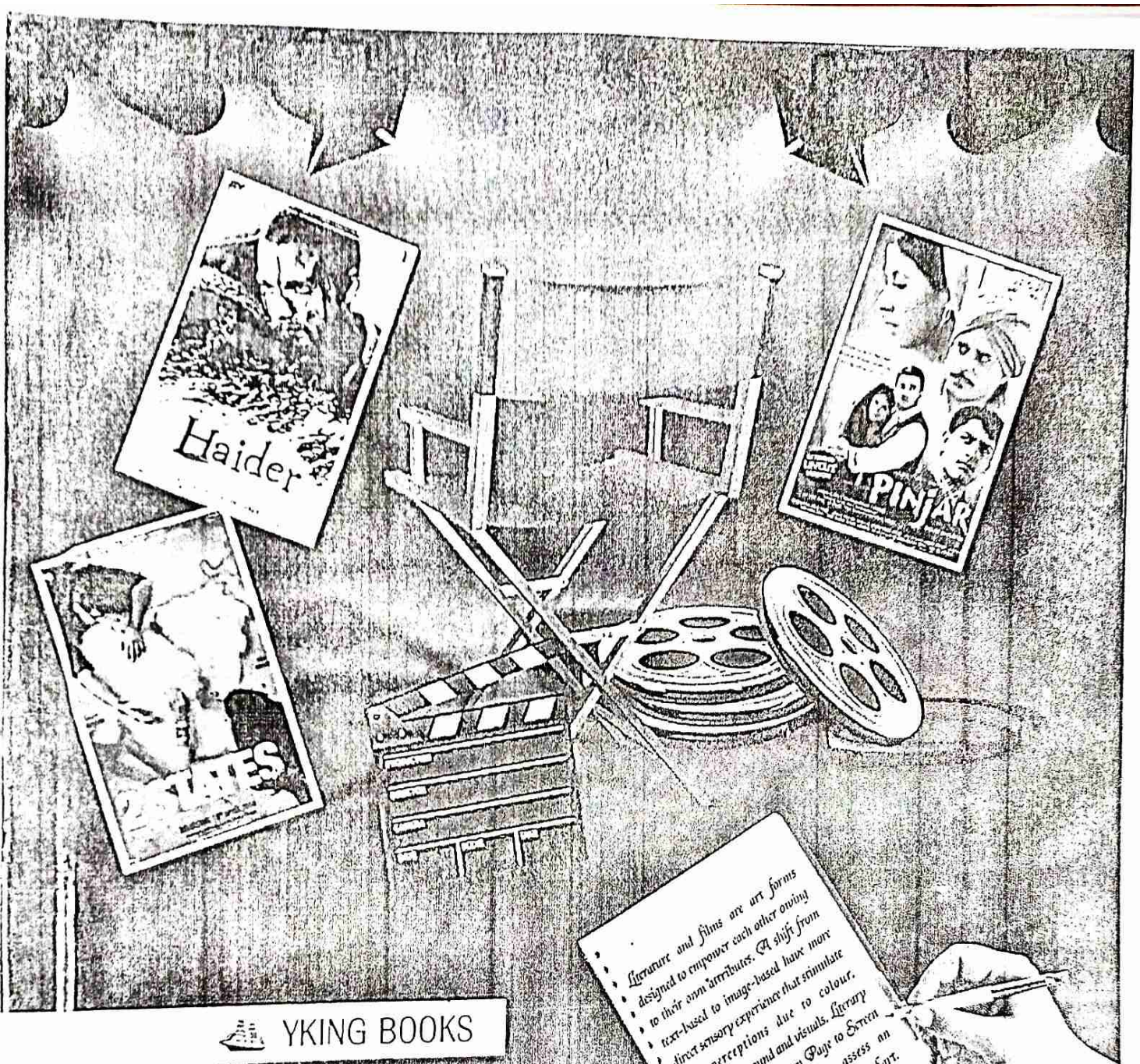
Lots of MCQ's

BTE questions in front of topics for reference

Meanings of difficult words in marathi/hindi

2 way book

Strictly as per new revised 'I' scheme syllabus w.e.f. academic year 2017-18.



YKING BOOKS

Literature and films are art forms designed to empower each other owing to their own attributes. A shift from text-based to image-based have more direct sensory experience that stimulate our perceptions due to colour, movement, sound and visuals. Literary Adaptations: From Page to Screen offers new insight to assess an adaptation like an interpretation of art.

LITERARY ADAPTATIONS

From Page to Screen

(A STUDY IN FILMS)

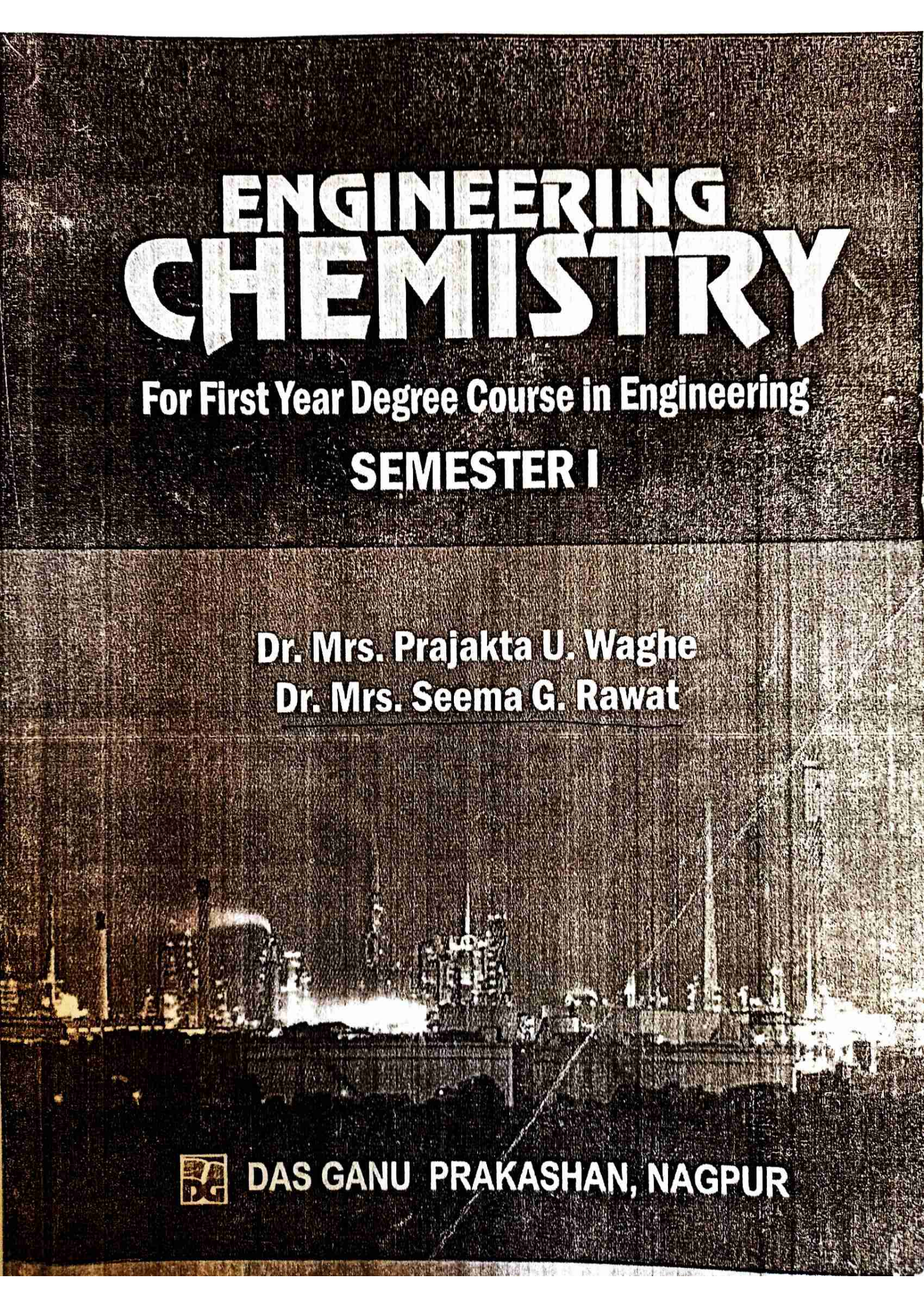
DR FARZANA S ALI

ENGINEERING CHEMISTRY

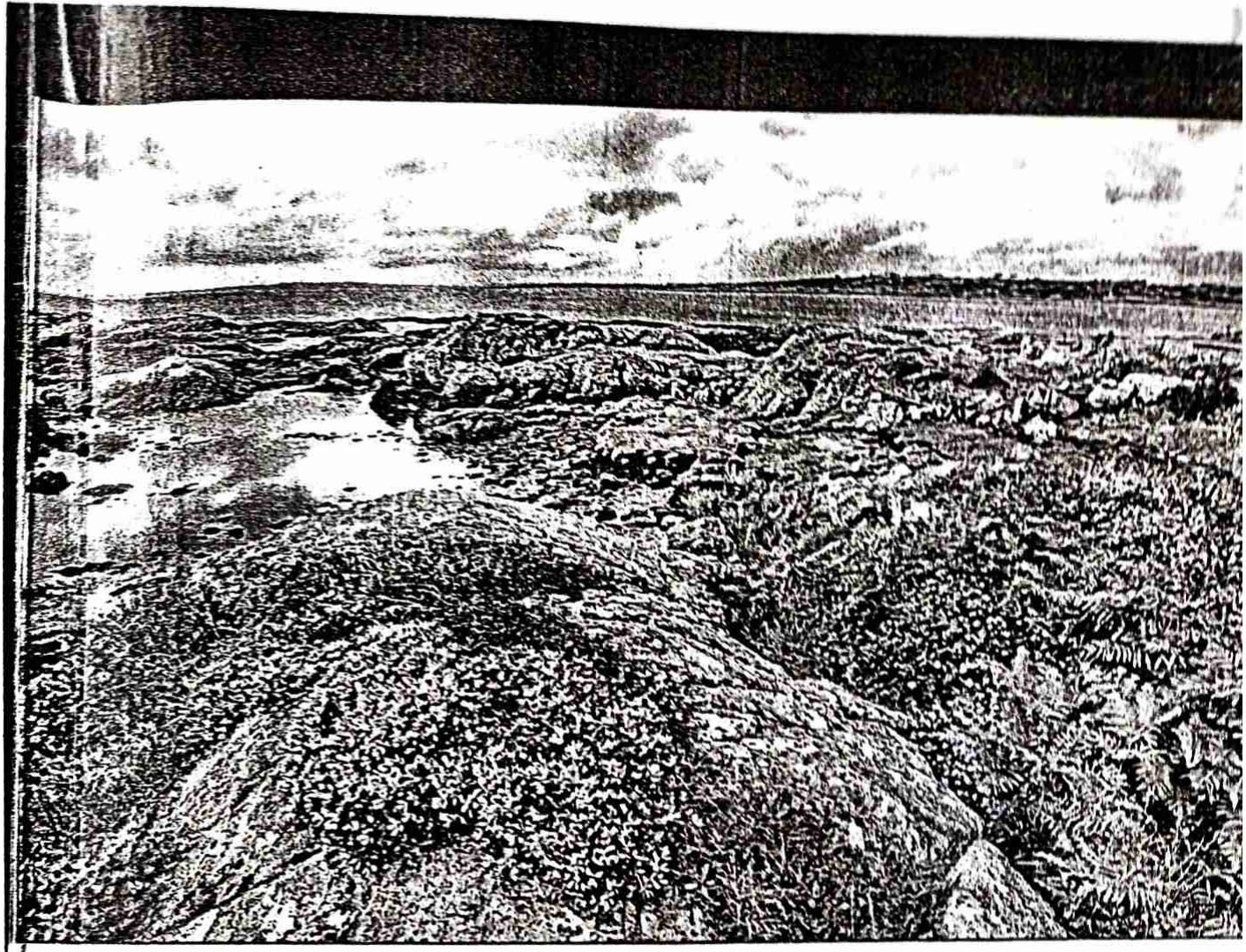
For First Year Degree Course in Engineering

SEMESTER I

Dr. Mrs. Prajakta U. Waghe
Dr. Mrs. Seema G. Rawat



DAS GANU PRAKASHAN, NAGPUR

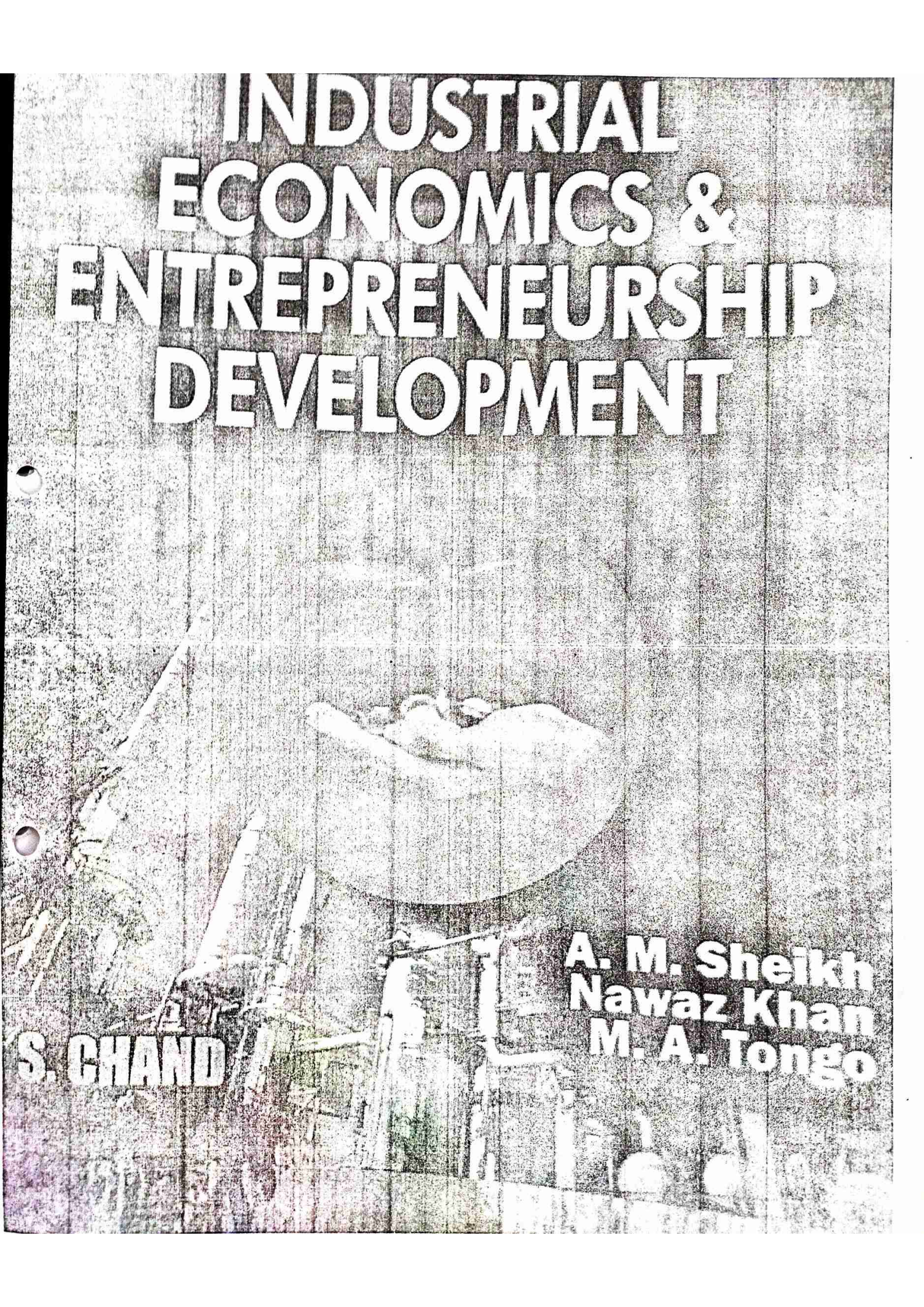


Namdeo Khobragade
Ashwini Kulkarni

Study Of Some Homogeneous And Non Homogeneous Thermoelastic Problems

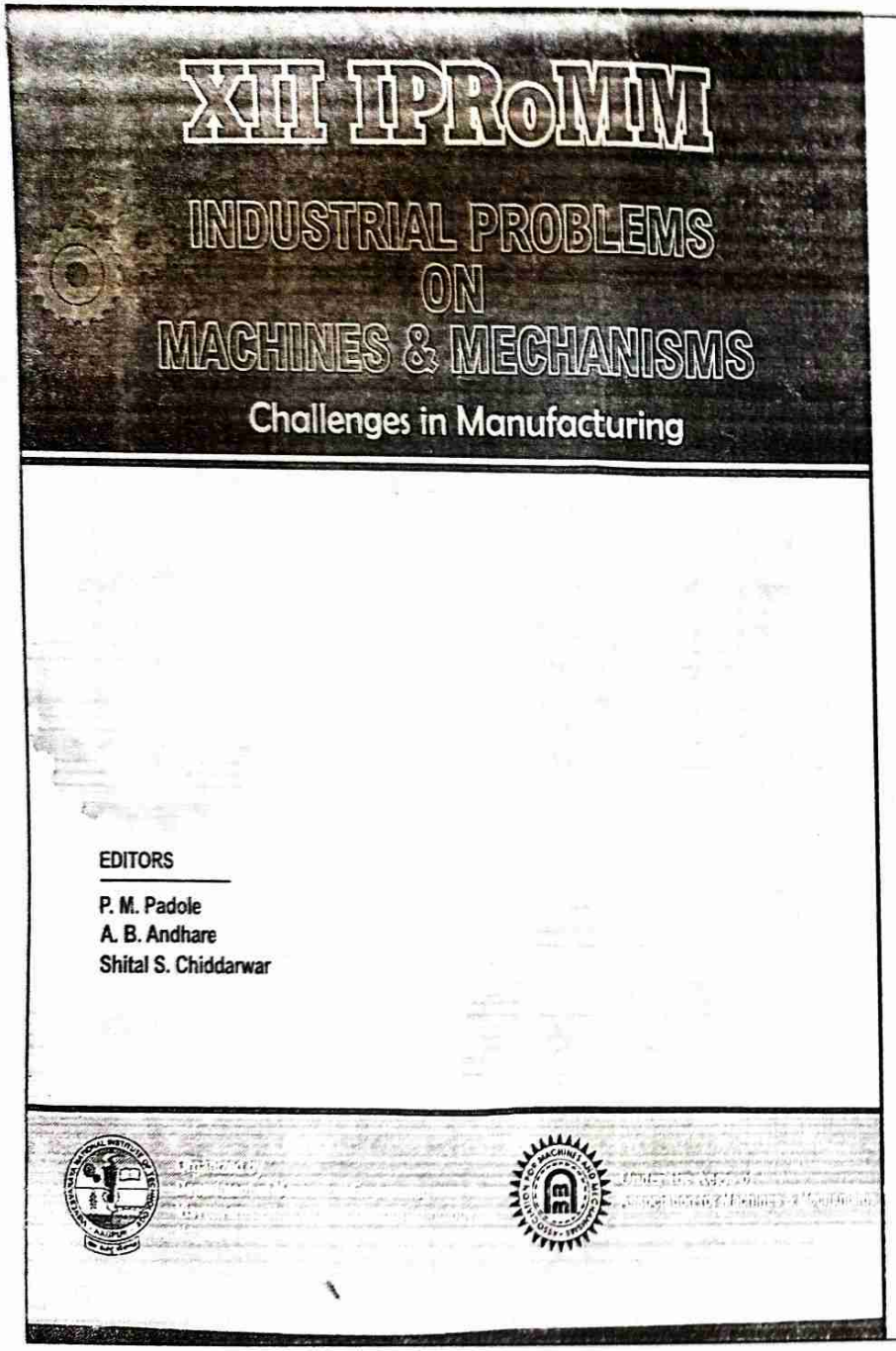
LAP LAMBERT Academic Publishing

INDUSTRIAL ECONOMICS & ENTREPRENEURSHIP DEVELOPMENT



A. M. Sheikh
Nawaz Khan
M. A. Tongo

S. CHAND



AUTOMATIC SYSTEM FOR IMPROVEMENT OF FUNCTIONAL RELIABILITY OF HPFM ENERGISED PROCESS MACHINE

P U Chati[1], J P Modak[2], Mahesh Bundele[3]

[1]Assistant Professor, E&TC Department,
PCE, Hingna Road, Nagpur, MH, India

[2] Dean (R&D), PCE,
CRPF Campus, Hingna Road,Nagpur , MH, India

[3]Dean (R&D), Poornima University
Jaipur, Rajasthan, India

[1]punammumesh.chati@gmail.com,[2]jpmodak@gmail.com, [3]maheshbundele@poornima.org

ABSTRACT

In spite of considerable mechanization / automation introduced in any industry for enhancing / improving production quality, a totally manless factory is rarely to be seen. Still, one has to depend on a Man Machine system.

It is intuitively felt that using appropriately available cotemporary analytical/synthetic tools, it should be possible to improve the performance of any man-machine system / production process. Use of AI techniques is proposed to most effectively realize this goal.

***Keywords**: HPFM, Automation , AI Techniques*

1. Background of the Present Research

1.1 WORK STATION, MAN MACHINE SYSTEM, AUTOMATION

In any industrial unit, there are usually four sections namely (i) Stores (ii) Raw material processing (iii) Assembly (iv) Packaging. Inspection activity takes place in every section.

In every section there are various spots where a facility is created by design for partial processing of raw material. At these spots a physical system and human resource work together for performing intended processing. Such spots are known as WORK STATIONS [1]* (1) Semi finished raw material is shifted from one work station to the next in the sequence either manually or using robots (2). [# Numbers in the square brackets denote references listed at the end of the lecture.] (2) If robots are used for handling, locating & switching on next process m/c, then one can say that the activity being performed is completely mechanized/automated. Otherwise the activity remains in the domain of a MAN MACHINE system.

1.2 CAUSES AND EFFECTS OF AN ACTIVITY

Attempt continuously takes place towards improving performance of the work station with a view to (i) Reduce duration of activity in other wards to increase production turnover / day (ii) Improve product quality (iii) Reduce wastage and reworking (iv) Reduce amount of supplies necessary for executing the activity. (v) Reduce human exertion and fatigue. These aspects are to be treated as responses of the activity at every work

Proc. XII IPRoMM-2016 (Challenges in Manufacturing)
VNIT Nagpur, 22-23 December 2016

XII IPRoMM

INDUSTRIAL PROBLEMS ON MACHINES & MECHANISMS

Challenges in Manufacturing

EDITORS

P. M. Padole
A. B. Andhare
Shital S. Chiddarwar

Formulation and Analysis of No of bends for Stirrup making operation using human powered flywheel motor

Dr.S.N.Waghmare[1], Dr.C.N.Sakhale[2], Dr.J.P.Modak[3]

[1] Department of Mechanical Engineering, RTM Nagpur University , Priyadarshini college of Engineering, Nagpur, INDIA.

[2 3] Department Mechanical Engineering ,RTM Nagpur University , Priyadarshini college of Engineering, Nagpur, INDIA.

[1]subhashwaghmare1981@gmail.com, [2]chsakhale@gmail.com ,[3]jpmodak@gmail.com

ABSTRACT

The present research work explain the design of experimental work to be executed for formulation of model for processing time, number of bends and resistive torque for the stirrup making operation using human energized flywheel motor(HPFM) on the basis of experimentation data chosen, using methodology of engineering experimentation and design of experimentation . Out which process for formulation of mathematical model and its analysis for number of bends for stirrup making operation is explain .Stirrup is one of the essential elements of reinforced cement concrete in civil construction. These stirrups are used for strengthening column and beams for avoiding buckling of long slender column and also avoiding sagging of horizontal beam. Previously these stirrup are made from hand by using wooden block but in this paper formulated the mathematical model for number of bends for stirrup making operation by using human powered flywheel motor and is explain in details.

Key words: ***Stirrup, bar bending, Human power, Sensitivity analysis.***

1. INTRODUCTION

Stirrups are the lateral ties which are used to bind the steel framework together. It is an essential element of reinforced cement concrete in civil construction. In small construction sites workers bend stirrup using traditional method. There is no other way to make stirrup with less human effort and the same time the detailed study of present manual stirrup making activity indicates that the process suffers from various draw back like. In this paper stirrup are made from HPFM method. The stirrup making machine driven by human powered flywheel motor (HPFM) consists of bicycle unit i.e Energy Unit and stirrup making unit i.e. Process Unit. Energy unit consists of bicycle-drive mechanism with speed increasing gearing, appropriate clutch transmission and a flywheel. Process unit is the stirrup bending unit which is coupled to the energy unit. The process unit is stirrup making unit which comprises of two spur gear, its having 3/4 and ¼ teeth the gear drive is used to transmit the motion from energy unit to process unit shaft. The rectangular helical spring ,circular disk it having fixed pin and rotating pin over it and it used for bend the rod ,foot lever with coupling is used for rotate the disk in 90 degree position .

The setup of stirrup making machine driven by HPFM is shown in figure 1. The operator pumps energy to the flywheel at a convenient input power level. After enough energy is stored, pedalling is stopped and the energy in the flywheel is made available to the process unit by engaging the clutch. The stirrups are made by five bending operation. The stirrup rod is first cut in definite length and marking by chock then the five bending operation are performed as fallows. i) First the small length of rod is bend by inserting the rod in the guiding slot and put it on centre position of disc then by press and left the lever with help of foot and first bend is made which is called as anchorage

XII IPRoMM

INDUSTRIAL PROBLEMS ON MACHINES & MECHANISMS

Challenges in Manufacturing

EDITORS

P. M. Padole
A. B. Andhare
Shital S. Chiddarwar

Prediction of Performance of Human Powered Flywheel through Artificial Neural Network

Arati R. Lende[1], P. A. Chandak[2], J. P. Modak[3]

[1]Research Scholar, Mechanical Engineering, RTMNU, Nagpur, MH, India

[2]Mechanical Engineering, DMIETR, Sawangi (Meghe), Wardha, MH, India

[3]Dean (R&D), PCE, CRPF Campus, Hingna Road,Nagpur , MH, India

[1]tanuja.chandak04@gmail.com, [2]pukhraj@rediff.com, [3]jpmodak@gmail.com

ABSTRACT

As per geographical survey of India about 60% of human population is living in rural areas where urban resources like electricity, employment accessibility, etc are very deprived. The country is still combating with fundamental needs of every individual. The country with immense population living in villages ought to have research in the areas which focuses and utilizes the available human power.

Some Authors of this paper had already developed a pedal operated human powered flywheel motor (HPFM) as an energy source for process units. The various process units tried so far are mostly rural based such as brick making machine (both rectangular and keyed cross sectioned), Low head water lifting, Wood turning, Wood strips cutting, electricity generation etc. This machine system comprises three sub systems namely (i) HPFM (ii) Torsionally Flexible Clutch (TFC) (iii) A Process Unit.

Because of utilization of human power as a source of energy, the process units have to face energy fluctuation during its supply. To evaporate this rise and fall effect of the energy, the concept of use of HPFM was introduced. During its operation it had been observed that the productivity has great affection toward the rider and producing enormous effect on quality and quantity of the product.

ANN modeling has been use to model the experimental findings. We observed the effect of alteration of parametric values for ANN parameters like neuron size, transfer functions, performance function, training function and learning algorithm over functionability of ANN model. It has been observed that neuron size, transfer function, training function plays important role in performance of the network. The optimal selection of parametric values of each ANN parameter is carried through observation of performance, regression plots. This is a unique method of selecting optimal ANN network for fitting function approximation problem.

Key words: Human Powered Flywheel Motor, Artificial Neural Network (ANN), ANN Parameters, Modeling.

1. Overeview

Dr J. P. Modak and his associates have developed Human Powered Process Machines for several rural based production activities such as low level water lifting (J P Modak et al, 1994; J P Modak, 1998) bricks making (rectangular as well as keyed cross section) for various combinations of raw materials,

XII IPRoMM

INDUSTRIAL PROBLEMS ON MACHINES & MECHANISMS

Challenges in Manufacturing

EDITORS

P. M. Padole
A. B. Andhare
Shital S. Chiddarwar

Optimization of Mathematical Model for Wood Chipper Cutter Using HPFM Concept

Vivek M. Sonde[1], Dr. P. N. Belkhode[2], Dr. J. P. Modak[3]

[1]Research Scholar & Assistant Prof., Dept. of Mechanical Engineering, Priyadarshini College of Engineering, Nagpur, India
[2]Assistant Professor, Laxminarayan Institute of Technology, Nagpur, India
[3]Professor, Dept. of Mechanical Engineering, Priyadarshini College of Engineering, Nagpur, India
[1]mailtovivekms6@gmail.com, [2]pramodbe@rediffmail.com, [3]jpmodak@gmail.com

ABSTRACT

Until this century wood was the single greatest material aid and comfort in every century of our ancestors lives.the art and technique of working wood into countless forms of tools, heat, shelter, furniture, transportation, decoration, kitchen utensils, any and every other thing imaginable; and some not. The first submarine and airplane were made of wood. Wood is one of the most important building materials. The machine consists of (HPFM) human powered flywheel motor as an energy source. The hpfm comprises of subsystems like human powered process unit, appropriate clutch and transmission and a process unit. Energy unit consists of bicycle-drive mechanism with speed increasing gearing, appropriate clutch transmission and a flywheel. The operator drives the bicycle by pedaling the mechanism while clutch is in disengage position. The hpfm is energy source. This energy source energizes the process unit through clutch and transmission. The flywheel is accelerate and energies which stores some energy inside it. When the pedaling is stopped, clutch is engaged and stores energy in the flywheel is transferred to the process unit input shaft by means of clutch. The process unit is wood chipper unit which comprises of upper & lower in feed & feed out rollers, counter knife, adjusting knobs, helical spur gear train, foundation frame and knuckle and pipe joint. The aim of the paper is to do the optimization of formulated model [1] of wood chipper cutter.

Keywords: - Wood,Mathematical Model, Optimization, Flywheel, HPFM

1. INTRODUCTION

This research work is selected with following objectives and reasons: Cutting of trees is major responsible factor for global warming, the increasing issues of farmer suicide in ruler areas, unemployment & non profitable production. The major objectives are possibility of optimization of mathematical model [1] for assessment of wood chipping properties and development of such model and possibility of formulation of Artificial Neural Network model for assessment of wood chipping properties and development of such model.

This machine is very useful in rural areas because wood articles have very high demand in rural market. So, they can start their own business of making wood chips by purchasing this machine. As it is operated by human powered flywheel, it does not require electric power. The unit operating by means of electricity has limited applications in the rural area. In remote and interior places where there is no facility of electricity as well as in urban areas, while in the duration of load shading or during electrical power-off timings, this type of human power operated unit will have very extensive utility.

2. CONSTRUCTION AND WORKING OF THE MACHINE

This human energized wood chipper cutter mainly comprises of three important unit are as follows.

1. Energy unit.
2. Power transmission unit.
3. Processing unit i.e. Wood chipper cutter.

3. WORKING OF THE MACHINE

XII IPRoMM

INDUSTRIAL PROBLEMS ON MACHINES & MECHANISMS

Challenges in Manufacturing

EDITORS

P. M. Padole
A. B. Andhare
Shital S. Chiddarwar

Formulation of Experimental Data Based Model for Number of Slivers in Bamboo Sliver Cutting Operation Driven by HPFM

Dr. S. K. Undirwade[1], Dr. M. P. Singh[2], Dr. C. N. Sakhale[3] Dr. J. P. Modak[4]

[1]Department of Mech. Engg., Priyadarshini College of Engineering, Nagpur, INDIA

[2,3,4]Priyadarshini College of Engineering, Nagpur, INDIA

[1]siddharthundirwade@gmail.com, [2]mpsing3712@gmail.com, [3]chsakhale@gmail.com, [4]jpmodak@gmail.com

ABSTRACT

This paper presents the experimental approach towards formulation of an approximate generalized experimental data based model for cutting the slivers from bamboo energized by human powered flywheel motor (HPFM) for the number of slivers to be produced. The mathematical model is formulated for number of slivers as a one of the response variable in the bamboo sliver cutting phenomenon by HPFM by using dimensional analysis approach along with test points and test envelopes for the concerned response variable i.e. number of slivers. Further apart from formulation of mathematical model for number of slivers, it also includes sensitivity analysis, reliability, optimization and ANN simulation.

Key words: ***HPFM, Slivers, Bamboo, Processing Machine, Reliability.***

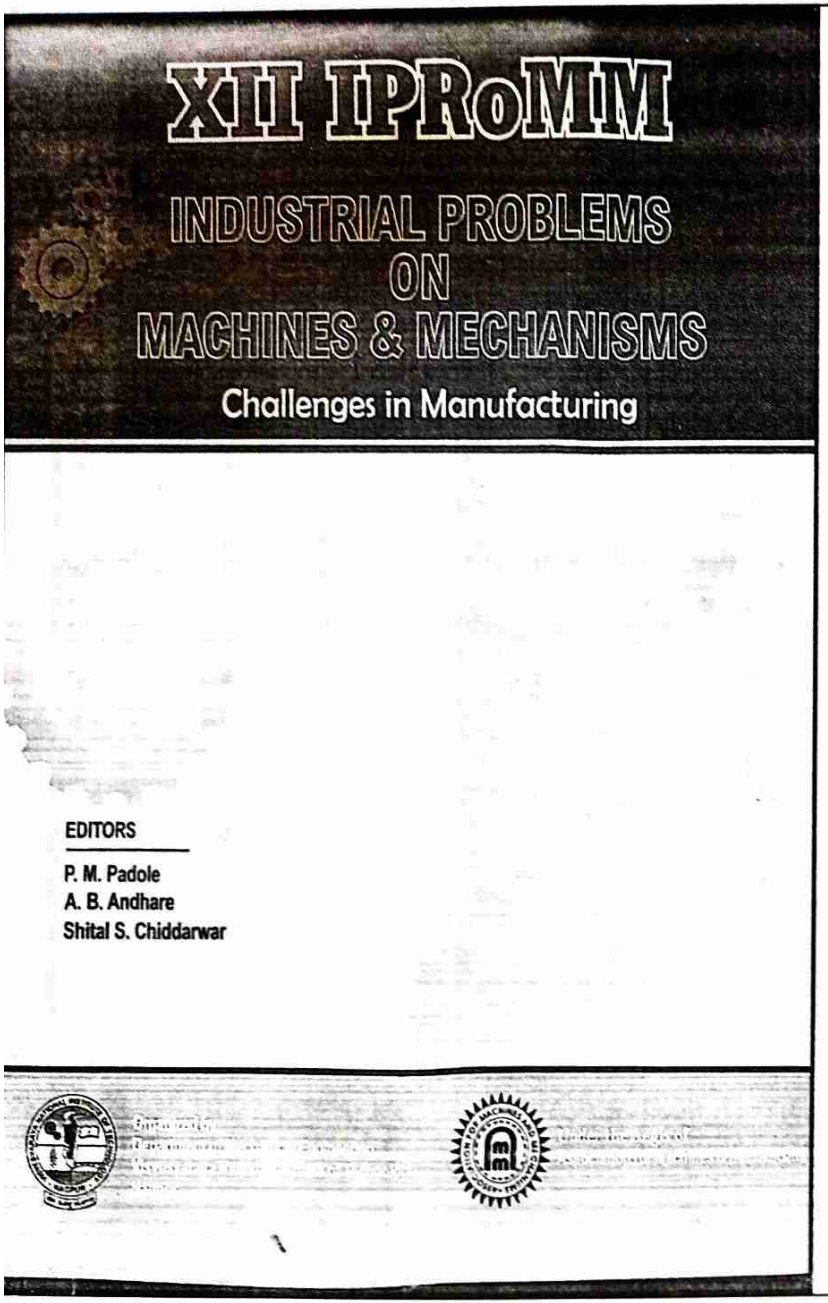
1. INTRODUCTION

The human power was neglected during the periods when there was the rapid use of fossil fuels. But due to very high prices of fossil fuels and hazardous environmental pollution from them, the human power again came in the light as renewable energy source. Muscle power was prime importance source of energy in the ancient times. Over the past many centuries, it was used in different kind. Ancient history shows that the human powered machines were powered by arm muscles, back muscles and leg muscles. We need to come with alternate source of energy, i.e. non conventional energy. Human power credits its importance in search of an alternative source of energy as it fulfils the requirement of renewable source of energy.

The operator drives the bicycle by pedalling the mechanism while clutch is in disengage position. The human power operated flywheel motor is energy source. This energy source energizes the process unit i.e. bamboo sliver cutting unit through clutch and transmission. The flywheel is accelerated and energized which stores some energy inside it. When the pedalling is stopped, clutch is engaged and stored energy in the flywheel is transferred to the process unit input shaft by means of clutch. The process unit is sliver cutting unit which comprises of feeder, two pairs of spring loaded rollers, sliver cutter, adjusting knobs etc. When the energy from flywheel is transferred to the sliver cutting unit by engaging the clutch, the split bamboo is fed through feeder. It enters the first pair of push-in rollers, then comes out of push-out roller pair and strikes the sliver cutter which is kept fixed and the sliver is cut. The sliver cutting immediately commences upon the clutch engagement it continues for 5 to 20 seconds until the flywheel comes to rest.

There is a provision of operating the system at the speeds by properly choosing the gear ratio of a torque amplification provided on the sliver cutting unit shaft.

2. APPLICATION OF THEORY OF EXPERIMENTATION



Establishment of empirical relationship simulating phenomena of Human powered Nursery Fertilizer Mixer

H S Bhatkulkar[1], Dr J P Modak[2]

[1]Department of Mechanical Engineering, S B Jain Institute of Technology Management and Research,
Katol Road, Fetri, Nagpur, INDIA

[2]Department of Mechanical Engineering, Priyadarshini College of Engineering,
Hingna Road, Nagpur, INDIA

hsb41036@gmail.com

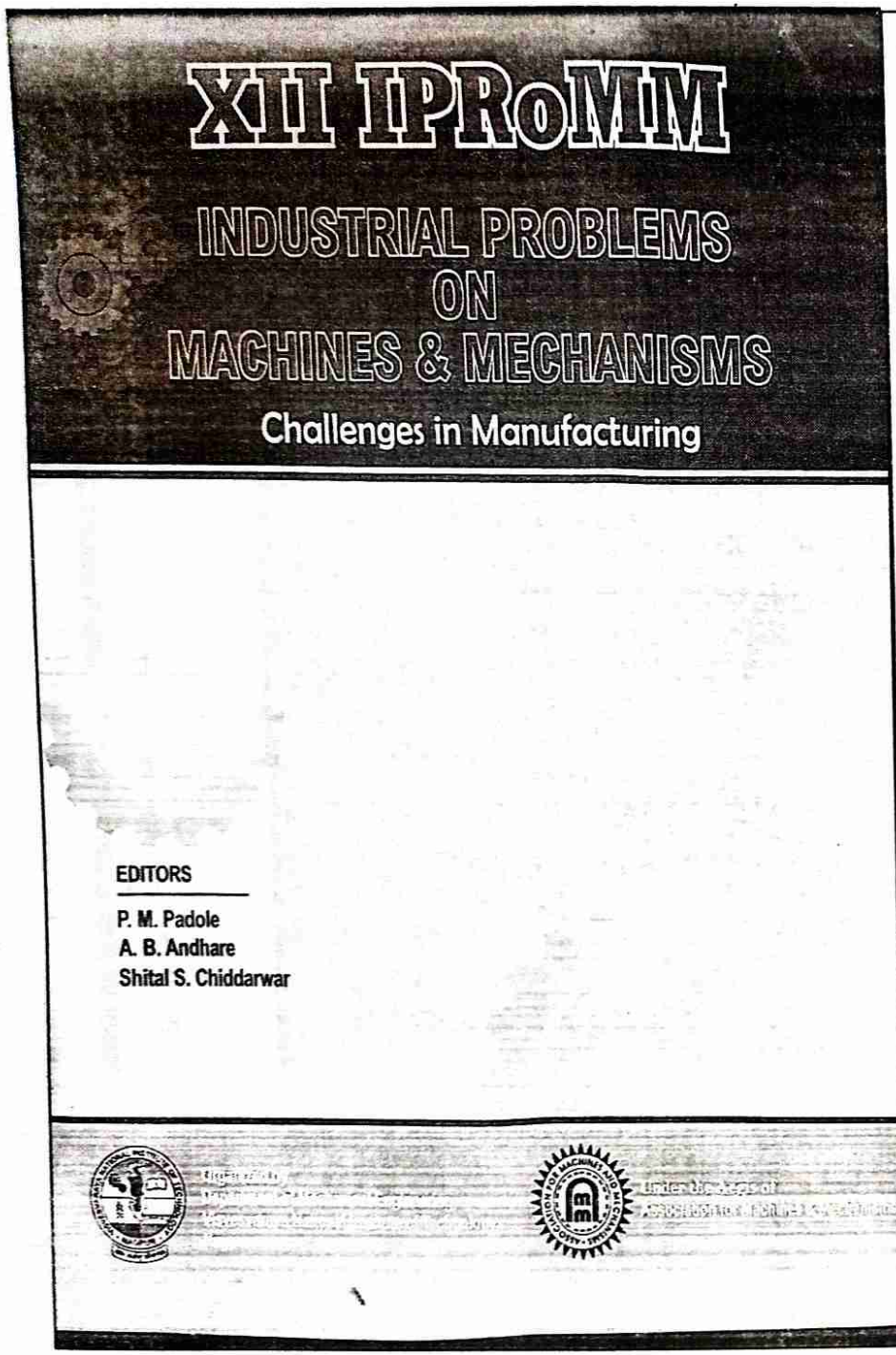
ABSTRACT

The present work reports the development of experimental work to be executed for establishing approximate generalized experimental data base model for nursery fertilizer mixer energized by human powered flywheel motor . In this paper an attempt is made to develop and experimentally validate a human powered mixing machine to mix nursery fertilizer in proper proportion. The evolved machine system comprises of three sub systems namely (1) Energy Unit : Comprising of a suitable peddling mechanism, speed rise gear pair and Flywheel conceptualized as Human Powered Flywheel Motor (HPFM) (2) Suitable clutch and torque amplification gear pair and (3) a process unit (Nursery fertilizer mixer). As a result of the continuous variation of speed of the process unit input shaft, understanding of the phenomenon of execution of the process cannot be logic based. Hence it is necessary to adopt application of Methodology of Experimentation to such a process for formulating experimental data based model. Hence Theory of Experimentation, provided by H. Schenck Jr. was applied. In this paper, an Experimental data based model for such a human powered Nursery Fertilizer mixer is developed by varying independent parameters during the experimentation The functional feasibility and economic viability of Human Powered nursery fertilizer mixer to mix nursery fertilizer is established in this paper The machine so developed is economically viable, can be used by unskilled workers and it save time.

Key words : ***Nursery Fertilizer Mixer, Experimental data base model , Human powered Flywheel Motor***

1. INTRODUCTION

The increased power demand, depleting fossil fuel resources and growing environmental pollution have led the world to think seriously for other alternative sources of energy. Human power is one such form of renewable energy that has been used historically to varying degrees. In the recent years, many of the researchers and scientists find importance in carrying out vast research in the field of human energized or human powered machines. Dr J.P. Modak had already developed pedal operated human powered flywheel motor (HPFM) as an energy source for various process units .Human powered brick making machine was first of its kind developed for the manufacturing of bricks [4], and since then various processes are energized by the human power such as chaff cutter, wood turning, cloth washing, potter's wheel, flour mill etc [5]. In an attempt this paper presents the development and performance of a Human Powered Flywheel Motor (HPFM) operated Nursery Fertilizer Mixer to mix nursery fertilizers like cow dung , sand , soil and water in proper proportion which is then used for plantation in small size farming. The methodology of experimentation suggested by Hilbert Schenk Jr. is used to formulate the experimental data based models for such complex phenomenon of mixing Firstly categorization of the various variables involved in the mixing phenomena are made in terms of pi terms viz.Π1, Π2 ,Π3 and Π4 as independent variables whereas Π_{01} and Π_{02} as dependent variables. Then the



Formulation of approximate generalized experimental data base model of output mesh size for human powered flywheel motor energized food grain crushing process

M. S. Giripunje[1], J. P. Modak[2], M. P. Singh[3]

[1] Research Scholar & Assistant Professor, Dept. of Mech. Engg., PCE, Nagpur, Mah., INDIA
[2] Dean R & D, LTJSS, Nagpur, Mah., INDIA
[3] Principal, PCE, Nagpur, Mah., INDIA

[1]manishgiripunje@gmail.com, [2]jpmodak@gmail.com, [3]mpsingh3712@rediffmail.com

ABSTRACT

Powdered food grains are a base of almost all foods in India. In ancient times, food grains are ground with the help of hand grain crushers. Now a days the electric motor driven grain crushers are used. But today there is a huge scarcity of electricity almost everywhere in India which results in six to twelve hours of load shedding. In rural areas the load shedding is done daily from ten to twelve hours which badly affects their daily needs requiring electricity such as food grain crushing, water supply etc. To overcome this, we can replace the electric motor driven process units by manually driven process units such as food grain crusher driven by human powered flywheel motor [1] i.e. manually driven food grain crusher. Also we all are aware about the strength of leg muscles over hand muscles [24] i.e. we can operate the food grain crusher for a longer period if we replace hand operated food grain crusher by pedal operated food grain crusher.*

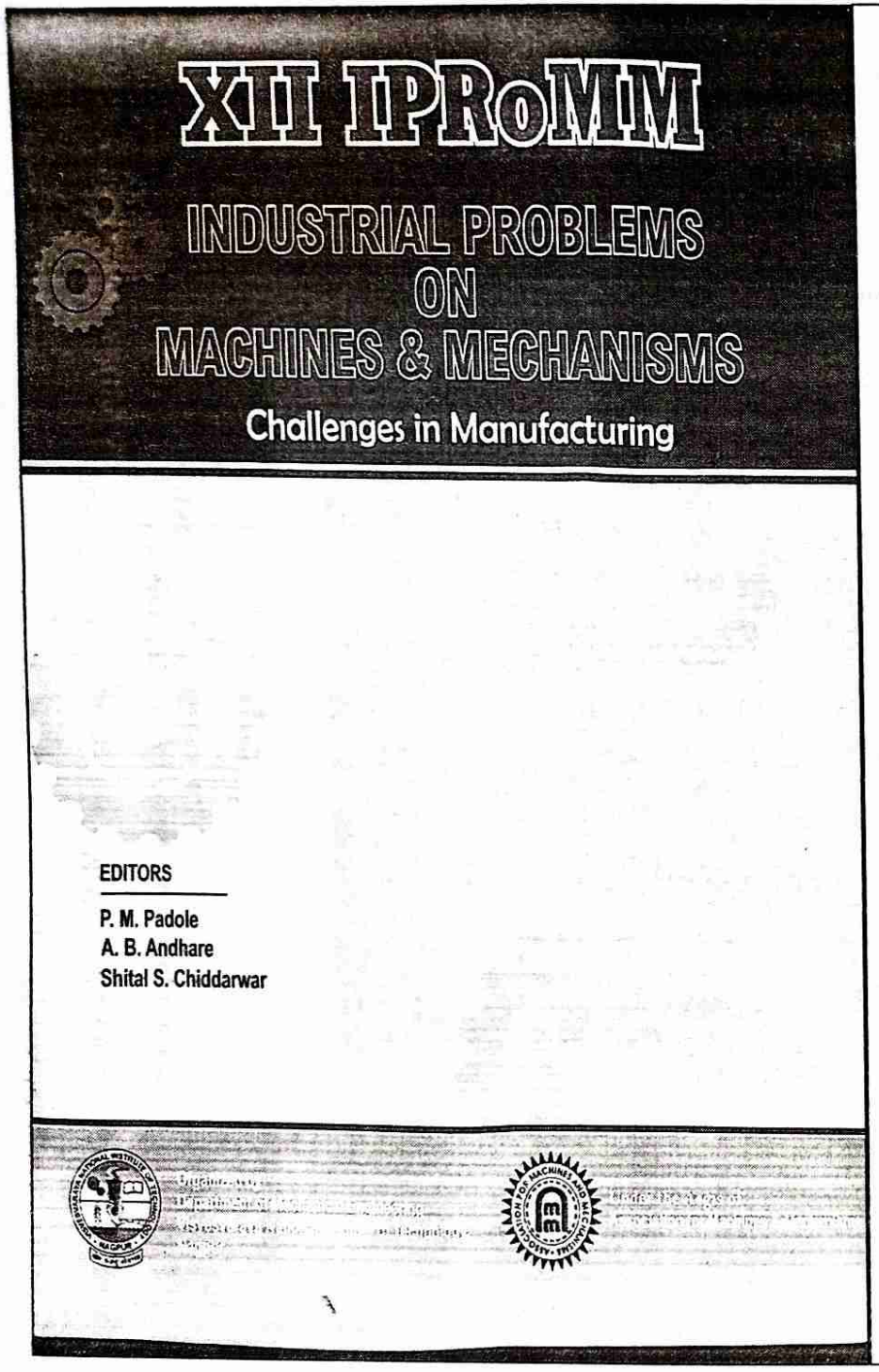
Key words: ***Process unit, food grain crusher, pedal driven, human powered flywheel motor, ANN***

1. INTRODUCTION

The Human powered Flywheel motor comprises of three sub systems namely (i) Energy supply unit (peddling mechanism to supply power or to store energy in flywheel) (ii) Appropriate clutch and transmission and (iii) a process unit.

The complete unit consists of a bicycle mechanism, an appropriate clutch and transmission system and a process unit which could be any process device needing power up to 7 hp. Here it is food grain crusher.

Referring Figure 1 the rider sits on the seat and paddles the bicycle mechanism while the clutch is in dis-engaged position. Thus the load on the legs of the rider is only the inertia load of the flywheel. The Flywheel is accelerated to the speed of 800 rpm in minutes time by a young rider of the age group of 20 to 25 physically fit of height about 165 cm. The Flywheel size is 1m rim diameter, 10cm rim width and 2cm rim thickness. Such a Flywheel when energized to the speed of 800 rpm, it stores energy to the extent of 3200 kgf-m. At the end of 1 minute, speed of 800 rpm is reached and so much of energy is stored in a Flywheel. Afterwards the peddling is stopped, clutch is engaged and such a stored energy in the flywheel is communicated to the process unit through the clutch. Obviously the clutch is subjected to sever shock on account of instantaneous momentum transfer. This is so because as the clutches engaged, the Flywheel is subjected to the process load and the process unit consumes shaft energy of the Flywheel. After the clutch engagement, the energy stored in a Flywheel gets exhausted in 5 to 15 seconds for application tried so far (ref [1] to [7], [10], [21]). The capacity of such a system is in the range of 2.5 to 8.5 Hp. The functional feasibility and economic viability of this system has also been confirmed ([1] to [7], [10], [21])



DESIGN AND DEVELOPMENT OF A PELLET MILL ENERGIZED BY HUMAN POWERED FLYWHEEL MOTOR (HPFM)

Y. M. Sonkhaskar[1], Dr. V. S. Deshpande[2], Dr. J. P. Modak[3]

[1]Research Scholar & Assistant Professor, Department of Mechanical Engineering,
Shri Ramdeobaba College of Engineering and Management, Nagpur-440013 Maharashtra, India

[2]Professor, Department of Industrial Engineering,
Shri Ramdeobaba College of Engineering and Management, Nagpur-440013 Maharashtra, India

[3]Professor Emeritus of Mechanical Engineering, Dean (R&D), LTJSS, Priyadarshini College of Engineering,
Hingna road, Nagpur, Maharashtra, India

[1]sonkhaskarym@rknec.edu, [2]deshpandevs@rknec.edu, [3]jpmodak@gmail.com

ABSTRACT

Wood pellets are the most common type of pellet fuel and are made from compacted sawdust. Pellets are gaining popularity due to the cost effectiveness in many parts of India. It is also due to the increase in the cost of primary fuels and concerns about global climate change.

The existing pellet mills are driven by using electrical energy. But today there is severe power shortage in country like India, particularly in rural and remote area. Thus the concept of human powered flywheel motor (HPFM) is used to develop the pedal operated pellet mill. The objective of the present investigation is to develop a mathematical model to predict the production rate of a pellet mill. Density of pellet is very significant as it affects the combustion efficiency. Thus the research also aims to identify the factors which may affect the pellet density. The mathematical model for mean resisting torque and instantaneous resisting torque is also developed.

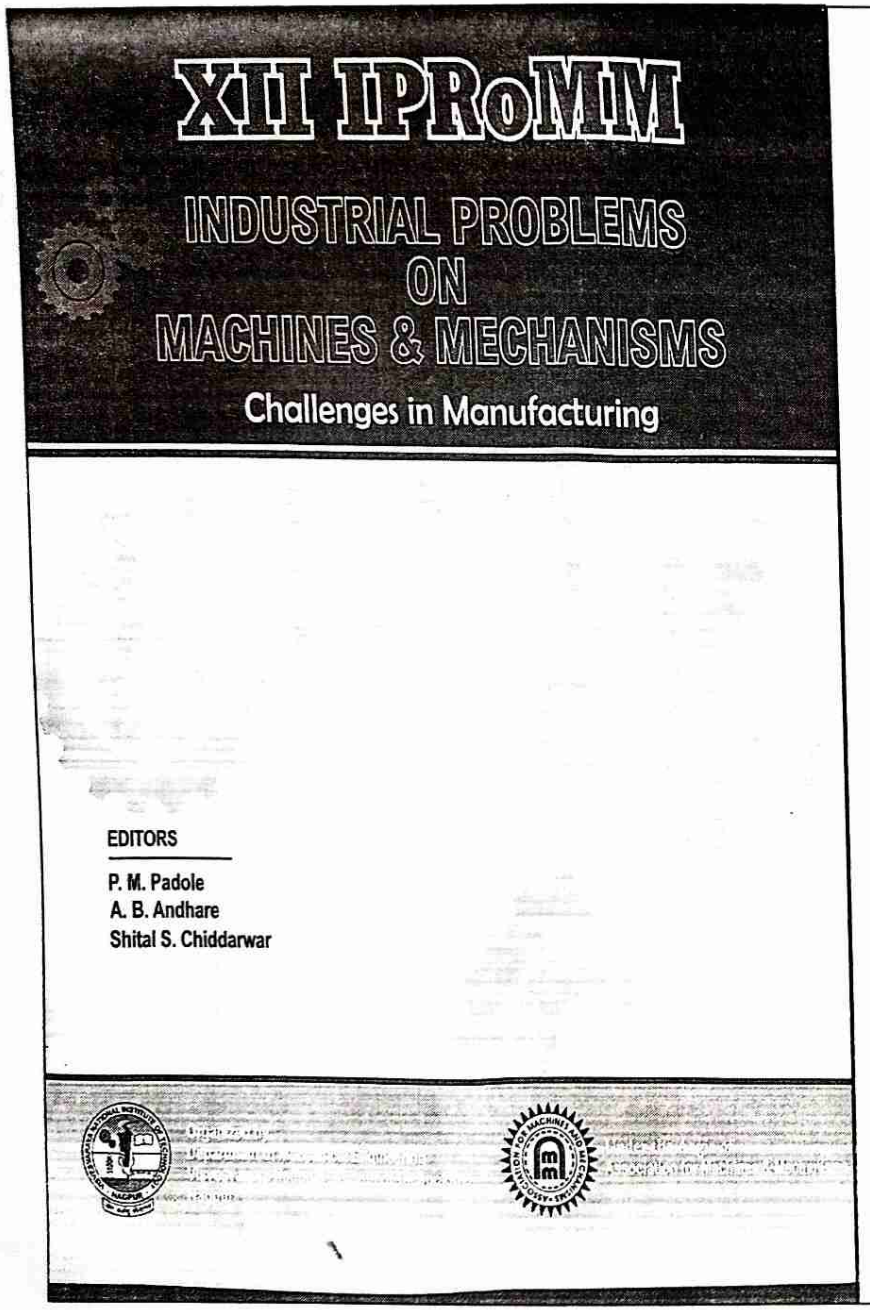
The design and fabrication of pellet mill is carried out by using conventional method. The major components are die, flywheel, bicycle- drive mechanism etc. The operator stores the energy into flywheel by paddling bicycle- drive mechanism with a speed rising gear pair. After attaining the required speed pedaling is stopped, and then flywheel shaft is connected to pellet mill. The stored energy is enough to operate the pellet mill. The experimentation of pelletizing process with the set objectives is carried out to develop a mathematical model using dimensional analysis. The correlation coefficient of mathematical model developed is 91 % for Production rate, 99% for pellet density and 92 % for Instantaneous resisting torque with experimental results.

Keywords: ***Human Powered Flywheel Motor (HPFM), pellet mill, production rate, pellet density, resisting torque, manually driven***

INTRODUCTION

Wood pellets gained popularity as a heating fuel in recent years with household and commercial plants. Pellets are used in stoves or boilers over traditional wood-fired equipments due to their relative ease of use.

Proc. XII IPRoMM-2016 (Challenges in Manufacturing)
VNIT Nagpur, 22-23 December 2016



Formulation of experimental data based model for oil press using HPFM as energy source

A D Dhale[1], J P Modak[2]
[1]Department of Mechanical Engineering, S S J College of Engineering, Dombivli
Mumbai University, Mumbai, India
[2]Department of Mechanical Engineering, Priydarshni College of Engineering, Nagpur,
RTM Nagpur University, Nagpur, India

atuldhale32000@yahoo.com

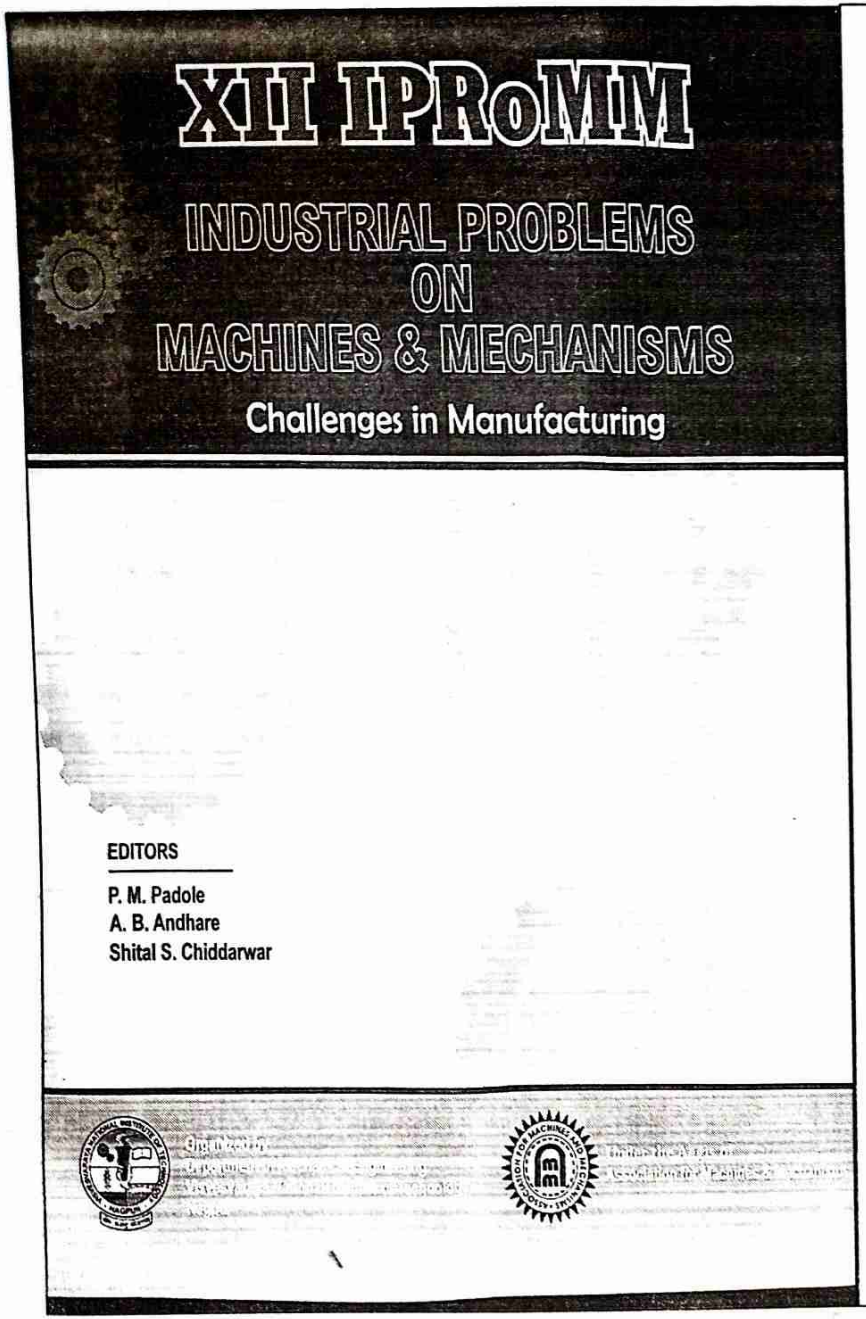
ABSTRACT

In the cursory survey conducted in Vidarbh region of Maharashtra, it is observed that there is 10 to 12 hours load shading of electricity, the geometric dimensions of the oil seed presser used by the small-scale entrepreneurs are lacking uniformity and no standard specifications are in existence for oil seed presser energized by Human Powered Flywheel Motor (HPFM). However, in normal circumstances, oil seed press is motorized wherein input speed is almost constant, whereas in HPFM energized Oil Seed Press the input speed is maximum once the clutch is engaged and it becomes zero within 15 to 20 seconds, so there is continuous variation in input speed. Hence, this system cannot be compared with design of existing oil seed press. The evolution of oil press using human power is a complex phenomenon. There are many factors affecting the performance of oil press. Because of the continuous variation of speed of the process unit input shaft, understanding of the phenomenon of execution of the process cannot be logic based. Therefore it is necessary to adopt application of Methodology of Experimentation to such a process for formulating experimental data based model. Thus, Theory of Experimentation provided by H. Schenck Jr. is applied. In this research work, we develop the mathematical model for two dependent variables that are Instantaneous Load Torque and Quantity of Oil Extracted. For particular range of instantaneous load torque, we can decide the independent π terms that pi terms are related to geometric variables (π_1), crushing strength of material to be processed and material of screw (π_2), average size of oil seed (π_3), initial energy given to the processer (π_4), instantaneous time (π_5), and Gear ratio (π_6). This data is used for design of human powered flywheel motor energized oil press. Similarly for productivity (Quantity of Oil Extracted) of Oil Press, we can decide the pi terms from the mathematical model, through which we can determine the geometric parameter for the HPFM energized oil seed press for particular response variable which was not available before this work. Thus end results of this experimental research will be useful to farmers or low profile entrepreneurs in the rural area. This technology will not only bring about upliftment of the socioeconomic condition of the rural population, but also reduce the gap between supply and demand of edible oils.

Keywords: Human powered flywheel motor, energy, oilseed, oil press, dependent variables, and independent variables

1. INTRODUCTION

Modak and some other engineers developed human powered process machines which energized process units needing 3 to 7 kW and which have intermittent operation. This machine system comprised of three subsystems; energy unit, mechanical power transmission system and process unit. Energy unit comprised of an arrangement similar to a bicycle, a speed raising gear pair and a flywheel. The flywheel size is 1m diameter, 0.10 m width and 0.02 m thickness. The flywheel is with 6 armed constructions and each arm is with elliptical cross section. Mechanical transmission comprises of spiral jaw clutch and torque amplification gear pair. The process units used are for brick making, wood turning, Algae formation machine, wood strips cutter and Smiths hammer and electricity generation. A young operator with a slim stature and 165 cm height sped up crusher flywheel to 700 to 800 rpm in 3 minute. Then pedaling was stopped and clutch was engaged connecting this human



Formulation of Field Data Based Models to Correlate the Performance of Manual Stirrup Manufacturing Activity by Using MATLAB

Himanshu M. Shukla[1], Dr. S. R. Ikhar[2], Dr. A. V. Vanalkar[3], Dr. J. P. Modak[4]

[1]Department of Industrial Engineering, Shri Ramdeobaba College of Engineering, Nagpur INDIA

[2]Department of Mechanical Engineering, KDK College of Engineering, Nagpur INDIA

[3]Department of Mechanical Engineering, KDK College of Engineering, Nagpur INDIA

[4]Department of Mechanical Engineering, Priyadarshini College of Engineering, Nagpur INDIA

[1]profhmshukla@gmail.com, [2]sanjay_ikhar@rediffmail.com, [3]avanalkar@yahoo.co.in

ABSTRACT

Traditionally in construction work stirrups are used to reinforce the columns. Stirrups are square shaped rods manufactured on a wooden platform provided with pins with respect to which the rod is bent with the help of lever. The force is applied in the form of torque and the pin works as a fulcrum point for the torque. So a study is being carried out to improve the production rate, accuracy and reduce human energy expenditure of the activity. And finally a mathematical model is made on the basis of actual field data. In order to remove above draw backs authors have determined an appropriate sample size for the activity and formulated various field data based mathematical models (FDBM) using matrix method in MATLAB and reliability of model is checked. The formulated model can be used to optimize the human energy of worker, production rates and inaccuracy of stirrups.

Key words: Stirrup, Dimensional Analysis, field data based mathematical models (FDBM), MATLAB, Sensitivity Analysis, Human Energy Expenditure

1. INTRODUCTION

Stirrup or lateral-tie is one of the necessary elements of reinforced cement concrete which is used for strengthening columns and beams [1]. Stirrups are used in the pillars and beams to increase its strength. The framework is made up by the mild steel rods and then the concrete mortar material is filled in it which provides the strength to the construction. The basic functions of the stirrups are

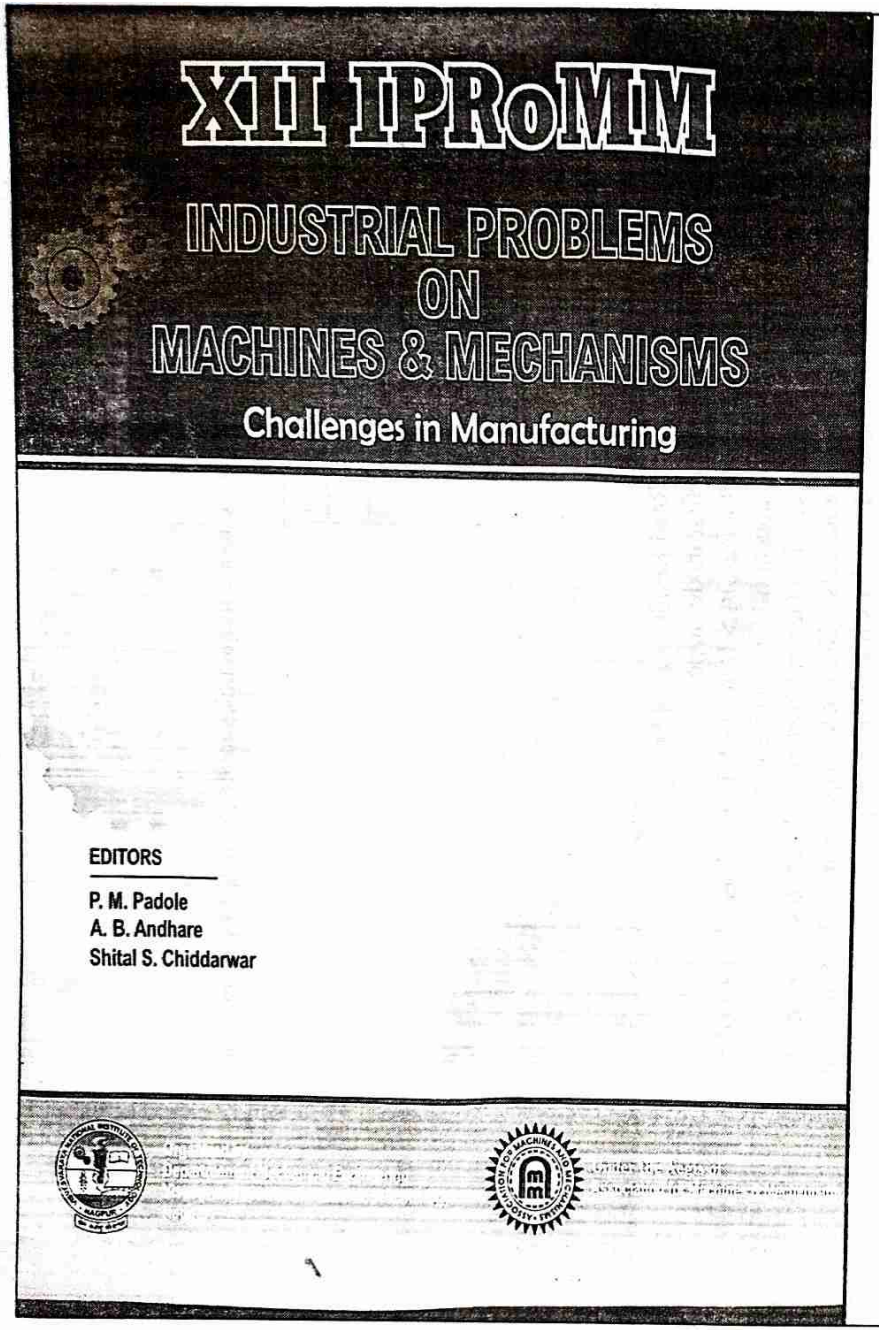
(1) To hold and support horizontal and vertical plain mild steel or torr-steel bar.

(2)To provide reinforcement and rigidity to columns and beams.

(3)To take shear force in horizontal beams structures as well as vertical columns.

(4)To avoid buckling of long slender column or to avoid sagging of horizontal beam.

The hooked ends of the stirrup also provide proper anchorage which in turn safeguards the structure against horizontal forces occurring due to wind, earthquake etc. The stirrups are made out of 6 mm, 8 mm, 10 mm in plain M.S. or torr-steel bar in various shapes such as rectangular, square. These stirrups are presently made manually. Fig.1 shows schematic of stirrup.



Formulation of Experimental Data Based Model for Oil Expeller Powered By Human Powered Flywheel Motor.

S.M.Sheikh[1], Dr.K.S.Zakiudddin[2], Dr.J.P.Modak[3]

[1]Ph.D Scholar,
Priyadarshini College of Engineering,
Nagpur, Maharashtra, INDIA

[2] Professor & Head, Mechanical Engineering Department,
Priyadarshni College of Engineering, Nagpur, Maharashtra, INDIA

[3] Emeritus Professor & Dean (R&D), Mechanical Engineering Department,
Priyadarshni College of Engineering, Nagpur, Maharashtra, INDIA

[1]*sirajsheikh27@gmail.com*, [2]*qszaki1@rediffmail.com*

ABSTRACT

There are many factors touching the performance of Oil Expeller Powered by Human Powered Flywheel Motor. The fruition of oil expeller using human power is a complex phenomenon. In this paper, the various steps of design of experimentation like dimensional analysis, identification of variables in human powered oil expeller phenomenon, reduction of variables and the formation of mathematical models equations are presented in detail.

The pedal powered flywheel motor has been adopted for many designs of rural applications in the last two decades. In the recent past a pedal powered process machine has been developed for brick making, chaff cutter, water pump, blender, wood turning, clothes washing and drying and earthen pot making etc (7). Human power credit is more because of health benefit as a source of energy and more effective use of human power could be achieved through properly designed mechanisms.

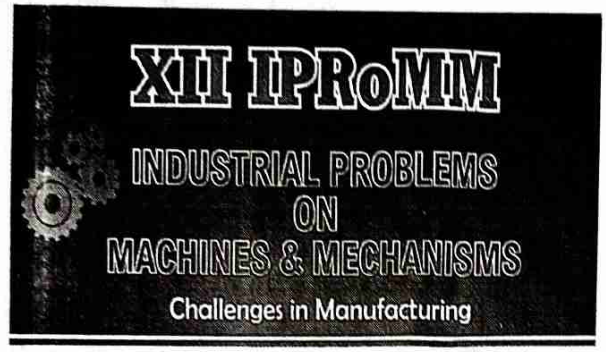
The machine consist of human powered flywheel motor using a bicycle drive mechanism with speed increasing gearing and a flywheel, which drive the process unit through a spiral jaw clutch and torque increasing gearing (3). The operator puts energy into the flywheel at a convenient power level for about one minute. After enough energy is stored, pedaling is stopped and the energy in the flywheel is made available to the process unit (Oil Expeller).

In this paper the attempt is made to present to generate design data in the form of evolving experimental data based models for various dependant/ response variables of human powered oil expeller.

Key words: ***Dependent Variable, Independent Variable, Dimensional Analysis Oil Expeller Buckingham pi theorem***

1. INTRODUCTION

India is one of the largest producers of oil seeds in the world and Maharashtra is one of the major oil seed producing and edible oil producing state in India [6]. The oil Expeller can produce oils extracted from a number of fruits, nuts and seeds for use in cooking and soap making or as an ingredient in other foods such as baked or fried goods. Extraction of oil from oil-bearing products could be done in two major ways a) Traditional Method b) Improved Methods. The traditional method is usually a manual process and involves preliminary processing and hand pressing. The improved method consists of chemical extraction and mechanical extrusion. Traditional oil expellers are simple mechanical devices that are hand/animal operated. Chemical extraction requires more capital expenditure, and refining



EDITORS
P. M. Padole
A. B. Andhare
Shital S. Chiddarwar

Optimization of Mathematical Model for Wood Chipper Cutter Using HPFM Concept

Vivek M. Sonde[1], Dr. P. N. Belkhode[2], Dr. J. P. Modak[3]
[1]Research Scholar & Assistant Prof. Dept. of Mechanical Engineering, Priyadarshini College of Engineering, Nagpur, India
[2]Assistant Professor, Laxminarayan Institute of Technology, Nagpur, India
[3]Professor, Dept. of Mechanical Engineering, Priyadarshini College of Engineering, Nagpur, India
[1]mailtovivekmse2@gmail.com, [2]pramodbe@rediffmail.com, [3]jpmodak@gmail.com

ABSTRACT

Until this century wood was the single greatest material aid and comfort in every century of our ancestors lives the art and technique of working wood into countless forms of tools, heat, shelter, furniture, transportation, decoration, kitchen utensils, any and every other thing imaginable, and some not. The first submarine and airplane were made of wood. Wood is one of the most important building materials. The machine consists of (HPFM) human powered flywheel motor as an energy source. The hpfm comprises of subsystems like human powered process unit, appropriate clutch and transmission and a process unit. Energy unit consists of bicycle-drive mechanism with speed increasing gearing, appropriate clutch transmission and a flywheel. The operator drives the bicycle by pedaling the mechanism while clutch is in disengage position. The hpfm is energy source. This energy source energizes the process unit through clutch and transmission. The flywheel is accelerate and energies which stores some energy inside it. When the pedaling is stopped, clutch is engaged and stores energy in the flywheel is transferred to the process unit input shaft by means of clutch. The process unit is wood chipper unit which comprises of upper & lower in feed & feed out rollers, counter knife, adjusting knobs, helical spur gear train, foundation frame and knuckle and pipe joint. The aim of the paper is to do the optimization of formulated model [1] of wood chipper cutter.

Keywords: - Wood,Mathematical Model, Optimization, Flywheel, HPFM

1. INTRODUCTION

This research work is selected with following objectives and reasons: Cutting of trees is major responsible factor for global warming, the increasing issues of farmer suicide in ruler areas, unemployment & non profitable production. The major objectives are possibility of optimization of mathematical model [1] for assessment of wood chipping properties and development of such model and possibility of formulation of Artificial Neural Network model for assessment of wood chipping properties and development of such model.

This machine is very useful in rural areas because wood articles have very high demand in rural market. So, they can start their own business of making wood chips by purchasing this machine. As it is operated by human powered flywheel it does not require electric power. The unit operating by means of electricity has limited applications in the rural area as remote and interior places where there is no facility of electricity as well as in urban areas, while in the duration of load shading or during electrical power-off timings, this type of human power operated unit will have very extensive utility.

2. CONSTRUCTION AND WORKING OF THE MACHINE

This human energized wood chipper cutter mainly comprises of three important unit are as follows.

1. Energy unit.
2. Power transmission unit.
3. Processing unit i.e. Wood chipper cutter

3. WORKING OF THE MACHINE

Proc. XII IPRoMM-2016 (Challenges in Manufacturing)
VNIT Nagpur, 22-23 December 2016

EDITORS

P. M. Padole
A. B. Andhare
Shital S. Chiddarwar

Formulation and Analysis of No of bends for Stirrup making operation using human powered flywheel motor

Dr.S.N.Waghmare[1], Dr.C.N.Sakhale[2], Dr.J.P.Modak[3]

[1] Department of Mechanical Engineering, RTM Nagpur University , Priyadarshini college of Engineering, Nagpur, INDIA.

[2,3] Department Mechanical Engineering ,RTM Nagpur University , Priyadarshini college of Engineering, Nagpur, INDIA.

[1]subhashwaghmare1981@gmail.com, [2]chsakhale@gmail.com ,[3]jpmodak@gmail.com

ABSTRACT

The present research work explain the design of experimental work to be executed for formulation of model for processing time, number of bends and resistive torque for the stirrup making operation using human energized flywheel motor(HPFM) on the basis of experimentation data chosen, using methodology of engineering experimentation and design of experimentation . Out which process for formulation of mathematical model and its analysis for number of bends for stirrup making operation is explain .Stirrup is one of the essential elements of reinforced cement concrete in civil construction. These stirrups are used for strengthening column and beams for avoiding buckling of long slender column and also avoiding sagging of horizontal beam. Previously these stirrup are made from hand by using wooden block but in this paper formulated the mathematical model for number of bends for stirrup making operation by using human powered flywheel motor and is explain in details

Key words: *Stirrup, bar bending, Human power, Sensitivity analysis.*

1. INTRODUCTION

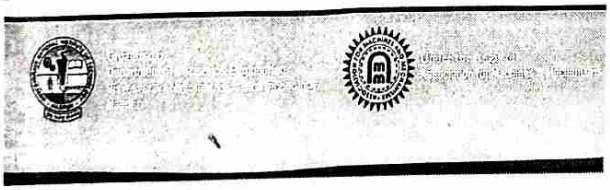
Stirrups are the lateral ties which are used to bind the steel framework together. It is an essential element of reinforced cement concrete in civil construction. In small construction sites workers bend stirrup using traditional method. There is no other way to make stirrup with less human effort and the same time the detailed study of present manual stirrup making activity indicates that the process suffers from various draw back like In this paper stirrup are made from HPFM method. The stirrup making machine driven by human powered flywheel motor (HPFM) consists of bicycle unit i.e Energy Unit and stirrup making unit i.e. Process Unit. Energy unit consists of bicycle-drive mechanism with speed increasing gearing, appropriate clutch transmission and a flywheel. Process unit is the stirrup bending unit which is coupled to the energy unit. The process unit is stirrup making unit which comprises of two spur gear, its having 3/4 and ¼ teeth the gear drive is used to transmit the motion from energy unit to process unit shaft. The rectangular helical spring ,circular disk it having fixed pin and rotating pin over it and it used for bend the rod ,foot lever with coupling is used for rotate the disk in 90 degree position .

The setup of stirrup making machine driven by HPFM is shown in figure 1. The operator pumps energy to theflywheel at a convenient input power level. After enough energy is stored, pedalling is stopped and the energy in the flywheel is made available to the process unit by engaging the clutch. The stirrups are made by five bending operation. The stirrup rod is first cut in definite length and marking by chock then the five bending operation are performed as fallows .i) First the small length of rod is bend by inserting the rod in the guiding slot and put it on centre position of disc then by press and left the lever with help of foot and first bend is made which is called as anchorage

Proc. XII IPRoMM-2016 (Challenges in Manufacturing)
VNIT Nagpur, 22-23 December 2016

EDITORS

P. M. Padole
A. B. Andhare
Shital S. Chiddarwar



Formulation of Experimental Data Based Model for Number of Slivers in Bamboo Sliver Cutting Operation Driven by HPFM

Dr. S. K. Undirwade[1], Dr. M. P. Singh[2], Dr. C. N. Sakhale[3] Dr. J. P. Modak[4]

[1]Department of Mech. Engg., Priyadarshini College of Engineering, Nagpur, INDIA

[2,3,4]Priyadarshini College of Engineering, Nagpur, INDIA

[1]siddharthundirwade30@gmail.com, [2]mpsing3712@gmail.com, [3]csakhale@gmail.com, [4]jpmodak@gmail.com

ABSTRACT

This paper presents the experimental approach towards formulation of an approximate generalized experimental data based model for cutting the slivers from bamboo energized by human powered flywheel motor (HPFM) for the number of slivers to be produced. The mathematical model is formulated for number of slivers as a one of the response variable in the bamboo sliver cutting phenomenon by HPFM by using dimensional analysis approach along with test points and test envelopes for the concerned response variable i.e. number of slivers. Further apart from formulation of mathematical model for number of slivers, it also includes sensitivity analysis, reliability, optimization and ANN simulation.

Key words: ***HPFM, Slivers, Bamboo, Processing Machine, Reliability.***

1. INTRODUCTION

The human power was neglected during the periods when there was the rapid use of fossil fuels. But due to very high prices of fossil fuels and hazardous environmental pollution from them, the human power again came in the light as renewable energy source. Muscle power was prime importance source of energy in the ancient times. Over the past many centuries, it was used in different kind. Ancient history shows that the human powered machines were powered by arm muscles, back muscles and leg muscles. We need to come with alternate source of energy, i.e. non conventional energy. Human power credits its importance in search of an alternative source of energy as it fulfils the requirement of renewable source of energy.

The operator drives the bicycle by pedalling the mechanism while clutch is in disengage position. The human power operated flywheel motor is energy source. This energy source energizes the process unit i.e. bamboo sliver cutting unit through clutch and transmission. The flywheel is accelerated and energized which stores some energy inside it. When the pedalling is stopped, clutch is engaged and stored energy in the flywheel is transferred to the process unit input shaft by means of clutch. The process unit is sliver cutting unit which comprises of feeder, two pairs of spring loaded rollers, sliver cutter, adjusting knobs etc. When the energy from flywheel is transferred to the sliver cutting unit by engaging the clutch, the split bamboo is fed through feeder. It enters the first pair of push-in rollers, then comes out of push-out roller pair and strikes the sliver cutter which is kept fixed and the sliver is cut. The sliver cutting immediately commences upon the clutch engagement it continues for 5 to 20 seconds until the flywheel comes to rest.

There is a provision of operating the system at the speeds by properly choosing the gear ratio of a torque amplification provided on the sliver cutting unit shaft.

2. APPLICATION OF THEORY OF EXPERIMENTATION

Proc. XII IPRoMM-2016 (Challenges in Manufacturing)
VNIT Nagpur, 22-23 December 2016

EDITORS

P. M. Padole
A. B. Andhare
Shital S. Chiddarwar

Formulation and Analysis of No of bends for Stirrup making operation using human powered flywheel motor

Dr.S.N.Waghmare[1], Dr.C.N.Sakhale[2], Dr.J.P.Modak[3]

[1] Department of Mechanical Engineering, RTM Nagpur University , Priyadarshini college of Engineering, Nagpur, INDIA.

[2,3] Department Mechanical Engineering ,RTM Nagpur University , Priyadarshini college of Engineering, Nagpur, INDIA

[1]subhashwaghmare1981@gmail.com, [2]chsakhale@gmail.com ,[3]jpmodak@gmail.com

ABSTRACT

The present research work explain the design of experimental work to be executed for formulation of model for processing time, number of bends and resistive torque for the stirrup making operation using human energized flywheel motor(HPFM) on the basis of experimentation data chosen, using methodology of engineering experimentation and design of experimentation . Out which process for formulation of mathematical model and its analysis for number of bends for stirrup making operation is explain .Stirrup is one of the essential elements of reinforced cement concrete in civil construction. These stirrups are used for strengthening column and beams for avoiding buckling of long slender column and also avoiding sagging of horizontal beam. Previously these stirrup are made from hand by using wooden block but in this paper formulated the mathematical model for number of bends for stirrup making operation by using human powered flywheel motor and is explain in details.

Key words: Stirrup, bar bending, Human power, Sensitivity analysis.

1. INTRODUCTION

Stirrups are the lateral ties which are used to bind the steel framework together. It is an essential element of reinforced cement concrete in civil construction. In small construction sites workers bend stirrup using traditional method. There is no other way to make stirrup with less human effort and the same time the detailed study of present manual stirrup making activity indicates that the process suffers from various draw back like In this paper stirrup are made from HPFM method. The stirrup making machine driven by human powered flywheel motor (HPFM) consists of bicycle unit i.e Energy Unit and stirrup making unit i.e. Process Unit. Energy unit consists of bicycle-drive mechanism with speed increasing gearing, appropriate clutch transmission and a flywheel. Process unit is the stirrup bending unit which is coupled to the energy unit. The process unit is stirrup making unit which comprises of two spur gear, its having 3/4 and ¾ teeth the gear drive is used to transmit the motion from energy unit to process unit shaft. The rectangular helical spring ,circular disk ,it having fixed pin and rotating pin over it and it used for bend the rod ,foot lever with coupling is used for rotate the disk in 90 degree position .

The setup of stirrup making machine driven by HPFM is shown in figure 1. The operator pumps energy to the flywheel at a convenient input power level. After enough energy is stored, pedalling is stopped and the energy in the flywheel is made available to the process unit by engaging the clutch. The stirrups are made by five bending operation. The stirrup rod is first cut to definite length and marking by chock then the five bending operation are performed as follows :i) First the small length of rod is bend by inserting the rod in the guiding slot and put it on centre position of disc then by press and left the lever with help of foot and first bend is made which is called as anchorage

Proc. XII IPRoMM-2016 (Challenges in Manufacturing)
VNIT Nagpur, 22-23 December 2016

XII IPRoMM

INDUSTRIAL PROBLEMS ON MACHINES & MECHANISMS

Challenges in Manufacturing

EDITORS

P. M. Padole
A. B. Andhare
Shital S. Chiddarwar

Design of experimentation for establishing empirical relationship of rice milling phenomenon using human powered flywheel motor

M Sohail Pervez[1], Dr.K.S.Zakiuddin[2], Dr. J.P.Modak[3]

[1]Ph.D Research Scholar, Priyadarshini College of Engg. Nagpur, Maharashtra, India
[2] Prof. & Head, Mechanical Engineering Deptt. Dean (PG), Associate Dean (R&D), Priyadarshini College of Engineering, Nagpur
[3] Professor& Dean (R&D), Department of Mechanical Engineering Priyadarshini College of Engineering,

[1]sohailmailbox@rediffmail.com, [2] qszaki1@rediffmail.com

ABSTRACT

These Rice is the staple food for 65% of the population in India. India is the second largest producer and exporter of rice next to China in the world market. The process of rice milling helps in removal of husk and bran layer from paddy grains to produce edible rice. About 75-80% of the world's rice which is consumed locally is produced by small-scale farmers in rural areas [1]. The rice in paddy forms can be stored for a longer period as compared to dehusked rice. The available rice mills are electrically operated whereas the availability power is not reliable in the rural areas. Hence a human powered rice milling machine developed without any design data .The set-up consists of three main systems namely, (i) Human powered driven flywheel motor, (ii) Transmission between flywheel and process unit shaft.

This paper presents detailed design of experimentation to be performed for establishing empirical relationship of rice milling phenomena using human powered flywheel motor. It includes identification of variables, dimensional analysis, test envelope, test point, test sequence, measurements and instrumentation, data checking and rejection and method of data analysis.
(iii) Process unit i.e. rice mill.

Key words: ***Human power, Dependent variable, Independent Variable, , rice milling, Dimensional analysis,***

1. INTRODUCTION

Modak and his associates have developed a system similar to bicycle is used to spin a flywheel by human power and the energy is stored in the flywheel as rotational kinetic energy. Such an energy source is conceptualized as Human Powered Flywheel Motor (HPFM) . It can be substituted for electrical motor for transient processes. As the energy is drained continuously from the flywheel the output speed of Flywheel Motor decreases continuously which in turn runs a process unit. Pedal power may be the most efficient way of harnessing human energy for countless applications which would otherwise require electricity [4-7].

As the present setup is a man-machine system, it is rather difficult and unreliable to adopt total theoretical approach for this system, instead an experimental approach is adopted (H. Schenk Jr., 1961). Thus it is necessary to establish the empirical relationship by applying the methodology of experimentation for rice mill using human powered flywheel motor by varying all possible physical variables involved in the process. The paper addresses detailed design of experimentation which includes dimensional analysis of the system, deciding test envelop, test points, test sequence for the

Proc. XII IPRoMM-2016 (Challenges in Manufacturing)
VNIT Nagpur, 22-23 December 2016

JAIPUR NATIONAL UNIVERSITY

(Established by the Government of Rajasthan, Approved by UGC Under Section 2(f) and Accredited by NAAC)

CERTIFICATE

This is to certify that Prof./Dr./Mr./Ms. C. N. Sakhale of Priyadarshini College of Engg., Nagpur delivered a plenary talk/chaired a session/ participated/ presented a technical paper/ poster in the *"International Conference on Recent Trends in Engineering and Material Sciences (ICEMS-2016)"* organized by Jaipur National [illegible] during March 17-19, 2016 held at Jaipur.

Chancellor | Vice -Chancellor | Convener

Available online at www.sciencedirect.com

ScienceDirect

Materials Today: Proceedings 4 (2017) 10174–10178

materialstoday: PROCEEDINGS

www.materialstoday.com/proceedings

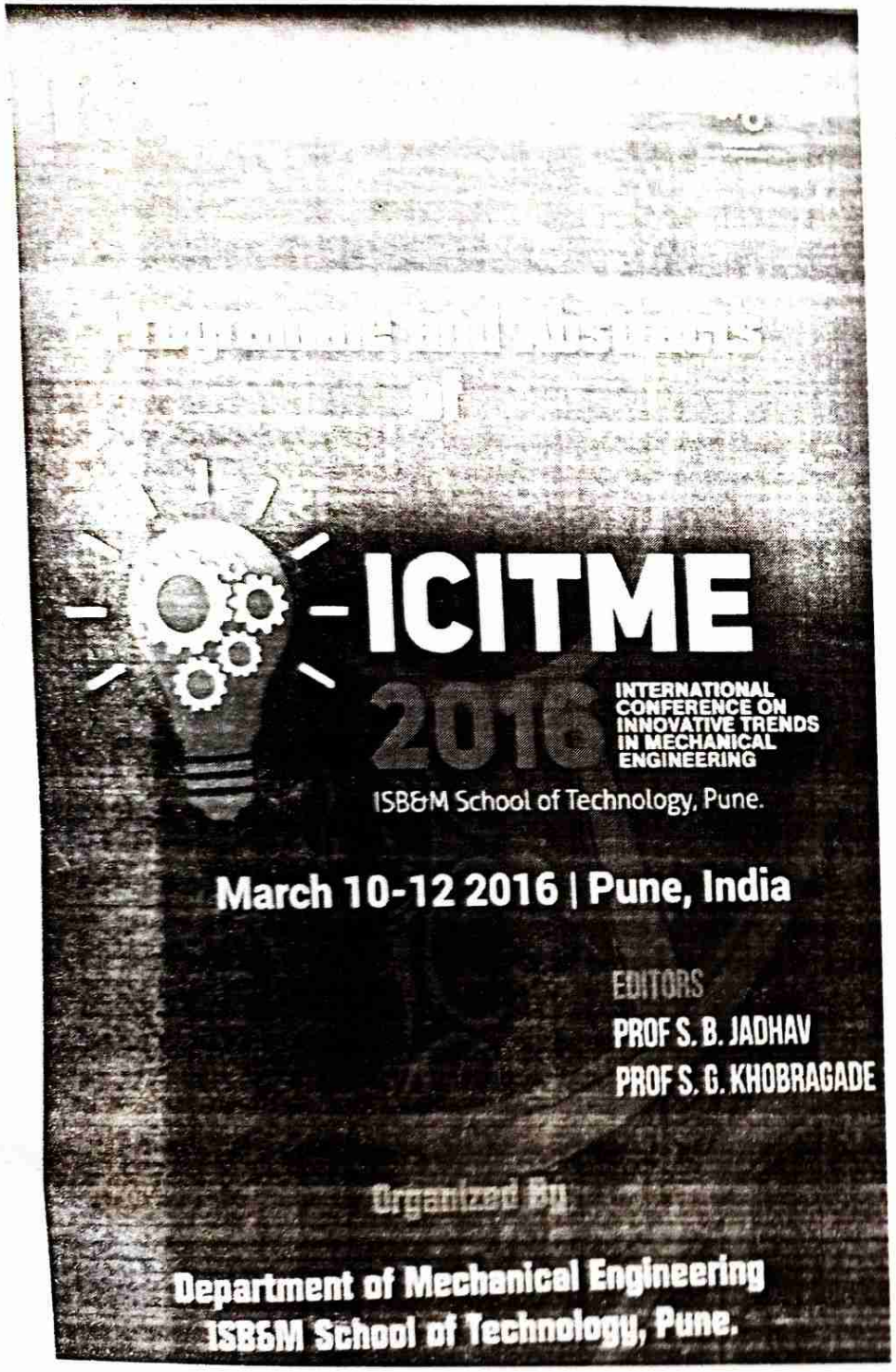
ICEMS 2016

Formulation of Mathematical Model for Processing Time Required for Bamboo Sliver Cutting Using HPFM

Siddharth K. Undirwade*, M.P. Singh[1], C.N. Sakhale[2]

Mechanical Engg., Priyadarshini College of Engineering, Nagpur:440019

Abstract



This paper proposes a novel approach for the Optimization of mechanism synthesis for function generation problem with twenty accuracy points using a hybrid search algorithm. A hybrid optimization method is based on the fusion of the Simulated annealing (SA) and Rosenbrock Search (RS), derivative-free type method of optimization, called SA/ RS, in which the SA is embedded the RS to enhance its search capability. The algorithm combines the advantages of the global optimization technique and a classical nonlinear programming technique. An overview of SA/ RS is presented and applied to dimensional synthesis of a planer four bar mechanism. The optimization is carried out to minimize the objective function formulated from the structural error at the accuracy points. A novel SA/ RS is employed to determine the optimal values for the design variables that best satisfy the desired objectives of the problem. Simulation results demonstrate the remarkable advantages of our approach in achieving the diverse optimal solutions and improved converge speed. The experimental results manifest that the proposed hybrid approaches are effective and efficient in finding near optimal solutions.

➢ ICITME 2016_T1/08

A General Paper Review on Effect of Misalignment on Vibration Response of Coupling

A.A.Pachpor, G.D.Mehta, M.K.Sonpimple, S.N.Awatade

This paper presents the view of different author regarding vibration response of coupling due to misalignment in machinery. The effect of misalignment had been explained by performing controlled experiment on experimental setup fabricated by the respective author. The results and conclusion obtained from these experimentations shows the need for continuing the study on effect of misalignment on coupling performance. Hence, an attempt is being made to study the dynamics of coupling and the effect of load variation on coupling performance.

➢ ICITME 2016_T1/09

Modal Analysis of Composite Sandwich Panel

Mr. Deshmukh P.V., Mr. Shrigandhi G.D.

Use of Sandwich construction for an aircraft structural component is very common to the present day. One of the primary requirements of aerospace structural materials is that they should have low density, very stiff and strong. Sandwich panels are thin-walled structures fabricated from two flat sheets separated by a low density core. The core investigated here is of aluminum honeycomb structure because of excellent crush strength and fatigue resistance. Sandwich panels have a very high stiffness to weight ratio with respect equivalent solid plate because of low density core. Modeling is developed in FEA by consideration of rotary inertia. The free vibration analysis of sandwich panels is studied. Four nodded isoperimetric shell element is used for FEA. The effects of sandwich design parameters, such as face thickness, core thickness and pitch, on the global bending and vibration responses are determined. Convergence study is also included for high accuracy of the results. Analytical results are based on classical bending theory. Mode shapes and corresponding natural frequencies are studied for simply supported sandwich panel and cantilever condition.

ZEISS

MESA

Programme and Abstracts of

ICITME 2016

INTERNATIONAL CONFERENCE ON INNOVATIVE TRENDS IN MECHANICAL ENGINEERING

ISB&M School of Technology, Pune.

March 10-12 2016 | Pune, India

EDITORS

PROF S. B. JADHAV

PROF S. G. KHOBRAGADE

Organized By

Department of Mechanical Engineering ISB&M School of Technology, Pune.

➤ ICITME 2016_T1/04

A Review: Design & FEM Analysis of Twisted Blade Micro Wind Turbine

Mr. Pavankumar S. Nikure, Dr. Chandrashekhar N. Sakhale, Dr. Nitin K. Mandavgade

This paper presents Design & FEM Analysis of Twisted Blade Micro Wind Turbine. Rapid depletion of fossil fuel resources necessitated research on alternative energy sources. A wind system is a reliable alternative energy source because it uses wind energy to create a stand-alone energy source that is both dependable and consistent. The main objective of this project is to investigate the design and development of micro wind turbines for integration into residential, commercial and industrial complexes. This project mainly focuses on Design of Twisted Blade Micro-Wind Turbine system using computer aided design and FEM analysis technology.

➤ ICITME 2016_T1/05

Design, Analysis and Modeling of XY Flexure Mechanism with Compliant Mechanical Amplifier-A Short Review

M. A.Bhosale, Prof. U. N. Gujar, Prof. S. S. Mulik

In precision engineering flexural mechanism are widely used because of their advantages such as friction free and wear free motion, high precision, high reliability. The flexure mechanism is a mechanism which gives motion due to elastic deformation of the beam used to build it. Piezoelectric actuators are used to apply input force/displacement in flexural mechanism. They have limitations such as low range of motion. Hence there is need of amplifying the input force/displacement. When we combine piezoelectric actuator with mechanical displacement amplifier we can achieve high range of motion. This paper deals with design and analysis of XY flexural mechanism with compliant mechanical amplifier.

➤ ICITME 2016_T1/06

Natural Frequency & Mode Shape Analysis of Rotordisc with Diametral Slots

Miss. Varsha Waikar, Prof.Y B Ghogare

Rotordiscs with different diametral slots are extensively used in the construction of aircraft, ships, automobiles, flywheels, clutch plates, circular saw plates, pressure vessel, missiles, liquid containers, and ship structures & other vehicles. The turbine is a well-known example for the industrial application of the rotor disc. The knowledge of natural frequencies of components is of great interest in the study of response of structures to various excitations. Hence one of the application of rotor disc i.e. tile cutter with central hole, fixed at inner edge and free at outer edge is chosen and its dynamic response is investigated

➤ ICITME 2016_T1/07

A Coupled Simulated Annealing-Hill Approach for Mechanism Synthesis with Twenty Accuracy Points

Dr. M. K. Sonpimple, M. S. Motey

Approximate Mechanism Synthesis Using Global Search for Twenty Accuracy Points

M.K. Sonpimple, S.D. Shelare
Associate Professor, Department of Mechanical Engineering, PCE, Nagpur
Assistant Professor, Department of Mechanical Engineering, PCE, Nagpur
Corresponding Author M.K. Sonpimple sagmech24@gmail.com

Abstract: *The paper presents the results of newly developed global search approach for the Optimization of a planer four bar mechanism for the task of mechanism synthesis problem with twenty accuracy points. In the past, a number of different techniques have been employed for the synthesis of mechanisms. The solution method is based on the graphical, and/or analytical design methods. Later with the proliferation of high speed computers and their integration into mechanism analysis and synthesis, a wide variety of numerical optimization methods have been developed for the synthesis of mechanisms. The major drawback in using the graphical and analytical methods is that there could be significant error in the overall output between the precision points and valid for three to five precision points. The global search approach is developed to minimize the objective function formulated from the structural error at the accuracy points. A novel global search is employed to determine the optimal values for the design variables that best satisfy the desired objectives of the problem. Simulation results demonstrate the remarkable advantages of our approach in achieving the diverse optimal solutions and near optimal solutions.*

Keywords: *Function generation problem, simulated annealing, Accuracy points.*

CFD analysis of Helical baffle Shell and Tube Heat Exchanger

Amol D. Jibhkate, Prof. Sagar A. Giri
Department of Mechanical Engg., Shri Ramdeobaba College of Engg. and Management, Nagpur
amol.jibhkate@gmail.com, sagar_giri@rediffmail.com

Abstract: *Shell and tube heat exchangers are most commonly used for high pressure applications viz. power plants, refrigeration and air conditioning systems & automotive industries. The objective of the current work is to design shell and tube heat exchanger with helical baffle and study the temperature & pressure fields on the shell side by using ANSYS Fluent. The heat exchanger consists of 5 tubes of 500 mm length with shell diameter 150mm. The helix angle of helical baffle is varied from 0° to 30° by the step size of 10. The flow pattern on shell side was forced to be rotational and helical due to geometry of continuous helical baffles which results in a significant increase in the heat transfer coefficient per unit pressure drop. The required model is prepared in CREO 2.0 & further it is imported to ANSYS Fluent for mesh generation & solution. The pressure-velocity based coupling & k-ε SST turbulence model is used for the analysis. The simulation result shows that pressure drop is reducing in the range of 10 to 15% whereas heat transfer rate increases with increase in baffle angle inclination.*

Keywords: *Shell and tube heat exchanger, Ansys Fluent, helical baffle, heat transfer coefficient, pressure drop.*

Conference World

ISBN: 978-81-932074-6-8

4th International Conference on Recent Innovations in Science, Engineering and Management

Certificate

This certificate acknowledges and honours

Prof. S Shelare

for presenting his/her paper on

A Case Study on Pump of Hydro Pneumatic Booster System

in

4th International Conference on Recent Innovations in Science, Engineering and Management

ICRISEM-16

held on 20th March 2016 at
India International Centre, New Delhi

Conference World Team Wishes all the Best for your Bright Future

Conference Coordinator
www.conferenceworld.in

Associated Journal

A Novel Approach for the Identification of Writing Traits on Email Database

Mrs. Pranjal S. Bogawar
Assistant Professor, Department of Information Technology,
Priyadarshini College of Engineering,
Nagpur, Maharashtra, India
pbogawar@gmail.com

Dr. Kishor K. Bhoyar
Professor, Department of Information Technology,
YashvantraoChavhan College of Engineering,
Nagpur, Maharashtra, India
kkbhoyar@yahoo.com

Abstract: **Trait is a particular characteristic that can produce a particular type of behavior. The email which is written communication medium among the people is the source, to identify the writing traits of the person. This paper proposes a novel approach to identify the writing traits of person from their email communication. The proposed technique is combination of an unsupervised k-means clustering algorithm and rule based system to classify the traits of email writer. We classified the email writers into three categories as perfect writer, average writer and casual writer. The experiment was carried out on Enron's email data set. This experiment is helpful to predict the writing behavior of a person which will be helpful in identifying an email writer or improve his/her writing style.**

Keywords: **Email Mining, K-means Clustering, Personality traits, rule based system, writing traits, traits**

I. INTRODUCTION

Email is most widely used way of written communication. It is used in official and unofficial purpose. As it is used in official purpose, the style and writing way of email writer should be perfect. Many companies are taking the email writing test while recruiting the people because they are in need of perfect email writer. Emails are also used in unofficial communications. It may be used for ill-legitimate activities such as spamming, email bombing, phishing, threatening, cyber bullying, sexual harassment etc. [15, 20]. Every email writer has his/her own writing style. According to the researchers, writing psychology helps to give all the details of the person which is helpful to show the differences among them [1, 3, 16, 18, 19, 21, 22]. Hence forensic people are using emails as one of the source of evidence. This experiment will help to company trainers to check writing style of trainees, forensic team to reduce the search space while generating evidences and individual to work on their own writing style.

The goal of this paper is to find the writing traits of email writers. Traits are the patterns which always exist with the person. We classified the email writer into three categories as perfect writer, average writer and casual writer using a novel approach explained in the next sections. Section 2 gives the overview of available literature on email mining and psychological aspects. Section 3 describes the problem statement. Section 4 describes the implementation of novel approach to classify the email into said categories. Observations of experimentation are presented and discussed in section 5. Section 6 concludes the paper.

II. LITERATURE SURVEY

Every person has his own writing style. Writing trait refers to lasting writing characters in the writing behavior of person in the variety of situations. Some researchers suggested that the writing style is important to identify the personality of a person [1, 2, 3, 4, 5, 6]. Saxena *et al* used a machine learning approach to classify the personality from the blog data. They classified the personality traits into highly extrovert, highly introvert, low introvert, low extrovert and ambivert [1]. Mishne used support vector machine algorithm to classify the blog messages into different types of moods. He discussed about 39 types of mood and the accuracy of their experiment [2]. The

Soft Computing Approaches to Classification of Emails for Sentiment Analysis

Mrs. Pranjal S. Bogawar
Assistant Professor, Department of Information Technology, Priyadarshini College of Engineering, R.T.M. Nagpur University,
(+91)9922964262
pbogawar@gmail.com

K.K. Bhoyar
Department of Information Technology, Yeshwantrao Chavhan College of Engineering, R.T.M. Nagpur University,
(+91)9764996487
kkbhoyar@yahoo.com

ABSTRACT

Email is a fast and well-liked communication medium on the internet. Email users are rapidly increased due to easy availability of internet. Email is used for personal as well as official communications. It is also used for illegitimate activities such as phishing, spamming, abusing, and threatening. Email mining gives the better solution to this problem. The clustering and classification methods of data mining are used to classify the emails into different categories. The paper tries to extract effective features for investigating an email to identify the sentiment which is helpful for forensic people. Data mining approaches such as k-means clustering, fuzzy c-means clustering and neural network backpropagation algorithm were applied on extracted features for classification of emails as per the sentiments hidden inside them. Evidence can be generated from the Negative sentiments. The paper does the comparative analysis of various algorithms. For this problem, neural network backpropagation algorithm gives the best recognition rate.

Keywords

email, email mining, k-means clustering, fuzzy c-means clustering, neural network, sentiment analysis, email sentiment analysis, forensic, email forensic

1. INTRODUCTION

Ray Tomlinson sent the first electronic mail called 'email' across the network which now become the fastest communication medium [33]. Emails are used for official as well as personal communications. E-mail transactions are tremendously increased due to its speed and low cost. According to the survey of Radicatti group, at the end of 2015 there will be 4.1 billion email users [29]. E-mail is used in many legitimate activities such as document exchange and message transfer. Unfortunately, it can be misused, for example, in the distribution of unsolicited junk email, unauthorized conveyance of sensitive information, mailing of offensive or threatening material. Hence, investigation of email is a need.

Email can be considered as an important data as an evidence in forensic application as it contains information hidden in message header and message body.

Message header contains details such as sender, date, message-id, recipient, bcc, cc, subject, references etc. These things along with the body of email play vital role in email management and its investigations.

Email contains structured & unstructured information. E-mail header has structured information. E-mail subject and body contain unstructured information [28]. Previous studies classified the emails as suspicious emails [12], Chinese emails [6], English and other language emails [2], Arabic and English language [4], phishing and normal emails [14], activities [34], spam emails and normal [9,15,17,18,19].

Unstructured information of an email can be a source of emotions and polarity. Sentiment analysis is used to detect the polarity and emotions. Existing sentiment analysis approaches were classified as keyword spotting, statistical methods, lexical affinity and concept based techniques. Keyword spotting technique classified the document on the basis of

ICIA-16, August 25-26, 2016, Pondicherry, India
 ISBN 978-1-4503-4756-3/16/08...$15.00
DOI: http://dx.doi.org/10.1145/2980258.2980304

IC-QUEST 2016

International Conference on Quality Up-gradation in Engineering Science & Technology

In association with

Institution of Engineers (India) | International Journal of Computer Application | Computer Society of India | International Journal of Engineering Research & Technology | The Institution of Electronics & Telecommunication Engineers

IC-QUEST2016/ ETRX58

(19)

Manuscript Title :

DESIGN OF ON CHIP AREA-EFFICIENT BANDGAP VOLTAGE REFERENCE IN 0.18μm CMOS TECHNOLOGY

Author's Name :

Ms. Vrushali G. Nasre

This is to certify that the aforesaid author with above mentioned title has presented / participated her paper at 5th International Conference on Quality Up-gradation in Engineering, Science & Technology (IC-QUEST 2016) organized by Bapurao Deshmukh College of Engineering, Sevagram on 12th April 2016.

12th April 2016

Prof. Manoj R. Sayankar	Prof. Mangesh N. Thakare	Dr. Nitiket N. Mhala	Dr. Mahendra A. Gaikwad
Org. Secretary	Co-ordinator	Convener	General Chair & Principal

Certificate

Bapurao Deshmukh College of Engineering, Sevagram
Wardha, Maharashtra, INDIA Tel. 07152-284378, URL : www.bdce.edu.in

Published in:

Volume 5 Issue 5
May-2018
eISSN: 2349-5162

Unique Identifier

JETIR18IC018

Page Number

80-83

Title

Design of Vision based Lane Departure Warning System

ISSN

2349-5162

Cite This Article

"Design of Vision based Lane Departure Warning System", International Journal of Emerging Technologies and Innovative Research (www.jetir.org), ISSN:2349-5162, Vol.5, Issue 5, page no.80-83, May-2018, Available :http://www.jetir.org/papers/JETIR18IC018.pdf

Authors

Kalyani U. Chafle
Manoj K. Demde

Abstract

Road traffic accident is one of the problems that are risking lives of people. Most traffic accidents were caused by the negligence of the drivers. In order to reduce the number of traffic accidents and to improve the safety and efficiency of the traffic, Intelligent Transportation System (ITS) have been conducted worldwide .One of the component of ITS is Advanced driver assistance system has shown tremendous potential to address the on road measures taken for mitigating the fatalities due to distracted driving. The domain of Advanced Driver Assistance System covers Lane Departure Warning System (LDWS). In Every year, many car accidents mainly occurred around the world due to the lane Departure. Lane Departure Warning systems (LDWS) is one of the main approaches for Lane Detection and Lane Tracking and accident prevention. The Lane detection and Lane Tracking is a complicated problem in LDWS. Lane detection and Lane Tracking is a challenging task. But detection of Lane is not only used to solve the problem of avoiding accidents .To avoid the accidents Lane tracking is also important. In this propose system, Vision Based Intelligent system for Lane detection and Lane Tracking are useful in avoiding these accidents, and safety is the main purpose of these systems. Such intelligent systems have the goal to detect and track the lane marks and to warn the driver in case the vehicle has a tendency to depart from the lane. A lane detection and Lane Tracking system is an important element of many intelligent transport systems. The objective of the paper is to reduce the number of traffic accidents and to improve the safety and efficiency of the traffic by using computer vision based intelligent system for driver assistance.

Review on Realization of AES Encryption and Decryption with Power and Area Optimization

Mohini Mohurle[1] and Prof. Vishal V. Panchbhai[2]
[1]M.Tech, Electronics and Communication Engineering, Priyadarshini College of Engineering, Nagpur, India
[2]Dept.of Electronics and Telecommunication Engineering, Priyadarshini College of Engineering, Nagpur, India
E-mail: [1]mohinimohurle@gmail.com, [2]vishal_panchbhai@rediffmail.com

***Abstract*—In this project, a hardware implementation of the AES-256 encryption and decryption algorithm is proposed. The AES cryptography algorithm can be used to encryption and decryption blocks of 128 bits and is capable of using cipher keys of 256 bits. Feature of the proposed pipeline design is depending on the round keys, which are consumed different round of encryption, are generated in parallel way with the encryption process. This lowers delay of the each round of encryption and reduces the encryption delay of a plaintext block. Xilinx ISE.14.7 (64-bit) is used for simulation by using VHDL and hardware implementation on FPGA (Xilinx Spartan 6 or Altera Cyclone 2 FPGA device).**

Keywords: Cryptography, Cipher, FPGA, Advanced Encryption Standard (AES), VHDL

I. INTRODUCTION

An encryption is the conversion of data into a secret code. It is the most effective way to achieve the data security. To read an encrypted file, one must have an access to a secret key or password that enables us to decrypt the information. The unprocessed data is called the plain text, the encrypted data is referred to as the cipher text.To break the password,

there are different types of attacks that include Brute force attack, Known plaintext attack, Chosencipher text attack, Cipher textattack. The Brute force attack on AES-128 bit up to 5throundand the further analysis get stop.There are various algorithms available in cryptography like MARS, RSA, TWOFISH, SERPENT and RIJNDAEL. Advanced Encryption Standard is called as a Rijndael Cryptography. AES is better than Data Encryption Standard (DES). The DES algorithm broken because of short keys.AES can be implemented both on hardware and software. Main aim of AES hardware implementation to minimize hardware and lower the power consumption and also maintain high throughput at highest operating frequency [1].

AES is a symmetric encryption algorithm process data in block of 128 bits. A 128-bit block is encrypted bytransforming it in a same way into a new block of the same size. The only secret necessary to keep for security is the key. AES algorithm with encryption and decryption was desgin in Verilog Hardware Description Language. The128-bit plaintext, 128-bit key expansion and 128-bit output data all divided into four 32-bit consecutive units respectively controlled by the clock. The pipelining technology was utilized in the 13 round transformations so that the new algorithm formed a balance between speed and chip area.AES use different key-lengths, the standard defines three lengths and the resulting algorithms are named AES-128, AES-192 and AES-256 respectively with different length in bits of the key. In AES-256 encryption and decryption with 256-bit key is considered.AES provides combination of security, performance and efficiency. For any security, here key size is important because of this it determines the strength of security, area optimization and power consumption [5].

II. LITERATURE REVIEW

Pritam Kumar Khose *et al.*, implementing AES hardware to achieve less area and low power consumption which maintain throughput of data, to achieve high speed data processing and reduce time for key generating. The implementation of AES algorithm uses pipeline structure for repeated computation by lower down speed and data rate is capable to support USB protocol[1]. Hrushikesh Deshpande *et al.*, proposed AES architecture is based on optimizing area in terms of reducing number of slices required for design of AES algorithm in VHDL. The AES algorithm optimized throughput per number of slices. Efficiency parameter being the reliable one for purposes of comparison with other platform like ASIC, ALTERA designs[5]. Yuwen Zhu, Hongqi Zhang and Yibao Bao *et al.*, proposed AES realization method on the reconfigurable hardware ideas, the design uses a state machine to control encryption round module according to the different lengths. The design using HDL Verilog to support serial key length 128/192/256 bits AES encryption and decryption circuit[7]. R.V. Kshirsagar, M.V. Vyawahare *et al.*, proposed high data throughput AES hardware architecture by partitioning 10 rounds into sub blocks of repeated AES modules. The key feature is having high throughput by partitioning the AES into 10 sub-blocks with intermediate buffer between them, thus creating a deep pipelining structure for complete 10 AES blocks. [9].

III. PROPOSED WORK

The AES block diagram, the encryption part of this algorithm, the data to be secured or encrypted is called a plain text (M). The length of plain text will be of 128 bits, with a cipher key/ shared key (K) of 256 bits. The plain text (M) and shared key (K) will be converted into cipher text (C) using Encryption part of Rijndael algorithm. In the decryption part, the cipher text (C) will be considered

978-1-4673-8586-2/16/$31.00 ©2016 IEEE

TECH-CHRONICLE
AN INTERNATIONAL E-JOURNAL ON
EMERGING TRENDS IN SCIENCE, TECHNOLOGY AND MANAGEMENT

Low Power Single Phase Clock Multiband Flexible Divider Using Low Power Techniques

Mr. Devendra O. Rapelli(Author1)
Electronics Engineering Department,
PCE College Nagpur, Maharashtra, India
devend.rapelli@gmail.com

Mrs. Divya Meshram (Author2)
Electronics Engineering Department,
PCE College Nagpur, Maharashtra, India
divyameshram@gmail.com

Abstract- : In this paper, a low-power single-phase clock multiband flexible divider for Bluetooth, Zigbee, and IEEE 802.15.4 and 802.11 a/b/g WLAN frequency synthesizers is proposed based on pulse-swallow topology and is implemented using a 0.18µm CMOS technology. The multiband divider consists of a proposed wideband multimodulus 32/33/47/48 prescaler and an improved bit-cell for swallow(S) counter and operates in 2.4 to 5 GHz resolution selectable from 1 to 25 MHz. In this paper, we propose a new method to reduce static power in the CMOS VLSI circuit using Low power Techniques like Sleep Transistor Approach.

Keywords- DFF, E-TSPC, true single-phase clock (TSPC), wireless LAN (WLAN).

I. INTRODUCTION

For mobile wireless communications, low-power operations are of crucial importance for the mobile units as the battery lifetime is limited by the power consumption and the low power consumption also helps to reduce the operating temperature resulting in more gstable performance. For the modern transceiver architecture, a fully integrated frequency synthesizer with low power voltage-controlled oscillators (VCO) for quadrature signal generation and low power frequency dividers with multi-channel selection is always a topic of interest in research.

Phase-locked loops (PLLs) are widely used in radio frequency synthesis. The PLL based frequency synthesizer is one of the key building blocks of an RF front-end transceiver. The PLL frequency synthesizer system is mainly designed to ensure the accuracy of its output frequency under operating conditions The IEEE 802.15.4 standard has been specifically designed to cater for the needs of low cost, low power, low data rate and short range wireless networks. Few frequency synthesizers based on this standard have been reported in literature and the frequency synthesizer reported in [5] has the power consumption of 2.4 mW at 1.2-V power supply. In the previous design [1], a dynamic logic multiband flexible integer-N divider based on pulse-swallow topology is proposed which uses a low-power wideband 2/3 prescaler [4] and a wideband multimodulus32/33/47/48.

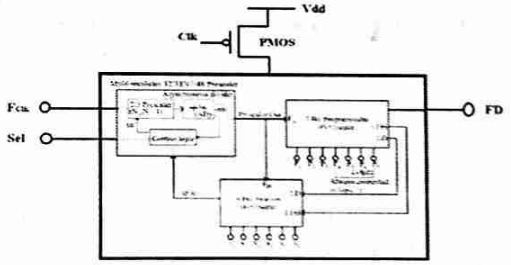


Figure.1.Proposed dynamic logic multiband flexible divider using SleepyP transistor

In this paper a new method for designing a dynamic logic multiband flexible integer-N-divider has been proposed which was developed using a sleep transistor based and wideband multimodulus 32/33/47/48 prescaler with low-power wideband 2/3 prescaler and an integrated S counter as shown in Fig. 1. A sleep transistor is referred to either a PMOS or NMOS high Vth transistor that connects permanent power supply to circuit power supply which is commonly called "virtual power supply". The sleep transistor is controlled by a power management unit to switch on and off power supply to the circuit.

II. DESIGN CONSIDERATIONS

In the case of high-speed digital circuits propagation delay and power consumption are the important

198

375

Proceedings of the National Conference on Luminescence and its Applications, R.T.M. Nagpur University, Nagpur. 18-20 February, 2016. pp.123-123.

Glow Curve Analysis of Gamma - Particles Irradiated $KMgSO_4Cl:Cu^+$ Phosphor

Nita Shinde[1], N.S. Dhoble[2], S.C. Gedam[3] and S.J. Dhoble[1]

[1]Department of Physics R.T.M. Nagpur University, Nagpur.
[2]Department of Chemistry, Sevadal Mahila Mahavidyalaya, Nagpur.
[3]K. Z. S. Science College, Kalmeshwar, Nagpur.
Email: [3]gedam_sc@rediffmail.com

ts— $KMgSO_4Cl$: Cu Phosphor; Ethanol wet chemical method; TL; trapping parameters

Cl:Cu phosphors were prepared by Ethanol centrifuge technique method. This work evalutes the dosimetric s of $KMgSO_4Cl$ doped with Cu.Prepared phosphors are characterized by XRD,SEM, thermoluminescence

action analyses showed that samples of $KMgSO_4Cl$:Cu exhibit only single phase corresponding to crystal f anhydrite and well match with that of standard file (JCPDS no. 74-0383).SEM analysis reveals particle size l μm range.

nescence (TL) characteristics of developed high sensitive chlorosulphate phosphors, $KMgSO_4Cl$: Cu were mparison with $CaSO_4$: Dy in order to assess the possibility of their use in personal monitoring and TLD very low dose of 5Gy. The preparation of an inexpensive and high sensitive $KMgSO_4Cl$: Cu with TL glow ferent concentrations are observed at 210°C, exposed to gamma-rays of ^{60}Co for their thermoluminescence s. The glow curves have been recorded on samples at a heating rate of 5^0Cs^{-1} and irradiated at a dose rate $^{-1}$ for 5 Gy. In present study, the trapping parameters such as order of kinetics (b), activation energy (E) factors (s) have been calculated for the 210°C glow peaks of $KMgSO_4Cl$: Cu by using Chen's peak shape nd initial rise method(IR) is employed. Activation energy (E) and frequency factors (s) have been he 210°C glow peaks of $KMgSO_4Cl$: Cu is 0.76 eV and 9.10 $X10^8$ s^{-1} respectively by Chen's peak shape The activation energy calculated by Intial rise method is o.89eV The glow peak of $KMgSO_4Cl$ phosphor order kinetics (b = 2), which suggest that there is probability of retrapping of charges. The compound e a good host for TL dosimetry.

S

ar C.Gedam, SanjayJ.Dhoble, Journal of Luminescence 132 (2012) 2670–2677.
P. Kore , N.S. Dhoble , R.M. Kadam , S.P. Lochab , S.J. Dhoble, Materials Chemistry and Physics xxx 11

54

Proceedings of the National Conference on Luminescence and ...
R.T.M. Nagpur University, Nagpur. 18-20 February, ...

Synthesis and Photoluminescence Characteristics of $KMgSO_4Cl$ ... for near-UV White LEDs

Nita Shinde[1], N.S. Dhoble[2], S.C. Gedam[3] and S.J. Dhoble[1]

[1]Department of Physics R.T.M. Nagpur University, Nagpur.
[2]Department of Chemistry, Sevadal Mahila Mahavidyalaya, Nagpur.
[3]K. Z. S. Science College, Kalmeshwar, Nagpur.
Email: [3]gedam_sc@rediffmail.com

Highlights— Photoluminescence, XRD, SEM, Ethanol centrifuge technique method.

Series of $KMgSO_4Cl$:Cu phosphor were prepared by novel ethanol centrifuge technique method. Xray diff... (XRD) patterns SEM (Scanning electron microscopy), luminescence spectra including excitation and emission ... been used to characterize the the prepared $KMgSO_4Cl:Cu^+$ phosphors. Powder x ray diffraction analysis show... crystalline nature of prepared phosphors. All the diffraction peaks of $KMgSO_4Cl$ match well with that of standa... (JCPDS no. 74-0383).

The morphological structures of the samples were conducted using scanning electron microscopy. SEM images s... particle size in the range 0.01 - 1 μm.

Under ultraviolet excitation $KMgSO_4Cl$:Cu shows a strong blue emission. $KMgSO_4Cl$:Cu shows characteristics ... emission at 440 nm under 261 nm excitation. The intense emission of the spectrum is assigned due to elec... transitions $3d^94s^1$-$3d^{10}$ in monovalent copper ion. The photoluminescence properties of the phosphors ... systematically investigated. With increasing Cu^+ concentration in $KMgSO_4Cl$: Cu^+ (x) mol % (x=0.02, 0.05,0.1 ... mol%) phosphor the luminescence intensity first increases, reaches the maximum up to 0.1 mol% concentration of ... earth ions and then decreases.The energy transfer mechanism has been confirmed to be exchange interaction .The re... can be validated via the agreement of critical distances obtained from the concentration quenching (33A°). The re... shows that phosphor may possess potential application in ultraviolet based white LEDs.

REFERENCES

[1] Sharadkumar C.Gedam, SanjayJ.Dhoble, Journal of Luminescence 132 (2012) 2670–2677.

Proceedings of the National Conference on Luminescence and its Applications, R.T.M. Nagpur University, Nagpur. 18-20 February, 2016. pp.138-138.

Luminescence Study in C^{5+} ion-Beam Irradiated $MgB_4O_7:Dy^{3+}$ Phosphor

Abha H. Oza[1], N.S. Dhoble[2] and S.J. Dhoble[3]

[1,3]Department of Physics, R. T. M. Nagpur University, Nagpur.
[2]Department of Chemistry, Sevadal Mahila Mahavidhyalaya, Nagpur.
Email: [3]sjdhoble@rediffmail.com

Highlights— TL and PL study of $MgB_4O_7:Dy^{3+}$ phosphor irradiated with C^{5+} ion-beam is performed over a wide range of exposures.

Magnesium borate has good characteristics to be used as a thermoluminescent dosimeter; it is about 10 times more sensitive than LiF and has an effective atomic number for photoelectric absorption equal to 8.4, which is comparable to water and soft biological tissue (7.4) and is important for personal dosimetry application [1]. Magnesium borate phosphors were extensively studied by Prockic [2].

In this study, Dy^{3+} activated MgB_4O_7 phosphors were successfully synthesized by modified solid state reaction technique for different dopant concentrations. Obtained XRD pattern confirms the formation of phase pure MgB_4O_7 compound. PL emission spectra of C^{5+} ion-beam irradiated $MgB_4O_7:Dy^{3+}$ phosphorreveal two prominent peaks of cantered at 484 nm (blue) and 576 nm (yellow), which corresponds to $^4F_{9/2}$-$^6H_{15/2}$ and $^4F_{9/2}$-$^6H_{13/2}$ transitions of Dy^{3+} ion, respectively. PL intensity enhances with increasing ion fluence and shows highest for 15×10^{11} ion/cm^2 ion fluence and then it starts reducing, which is due to the destruction of luminescence center.

The TL Study of phosphors irradiated with 75MeV C^{5+} ion-beam with ion fluence ranging from 1.5×10^{11} to 30×10^{11} ion/cm^2. Negligible variation is observed in TL glow curve of the samples irradiated with different ion fluence this also reflects in calculated trapping parameters which show slight variation for different traps. The linear TL response to the ion fluence shows that phosphor may be used for carbon ion beam dosimetry over a wide range of exposures.

REFERENCES

[1] L.F. Souza, R.M. Vidal, S.O. Souza, D.N. Souza, Rad. Phys. and Chem. 104 (2014) 100-103.
[2] M. Prockic, Nucl. Instrum. Methods (B) 175 (1980) 83.

Proceedings of the National Conference on Luminescence and its Applications, R.T.M. Nagpur University, Nagpur. 18-20 February, 2016. pp.139-139.

Photoluminescence Study in $CaAl_2B_2O_7:Tb^{3+}$ Phosphor

Abha H. Oza[1], N.S. Dhoble[2] and S.J. Dhoble[3]

[1,3]Department of Physics, R. T. M. Nagpur University, Nagpur.
[2]Department of Chemistry, Sevadal Mahila Mahavidhyalaya, Nagpur.
Email: [3]sjdhoble@rediffmail.com

Highlights— (1) The phosphor $CaAl_2B_2O_7:Tb^{3+}$ phosphor was synthesized by combustion method; (2) The photoluminescence characterizations of $CaAl_2B_2O_7:Tb^{3+}$ phosphor is carried out; (3) The near UV excited phosphor show strong green emission.

Rare earth ion activated aluminoborate phosphors have drawn much attention owing to their high UV transparency and non-linear properties [1,2]. Thus in this work, we opt to synthesize and study the photoluminescence properties of $CaAl_2B_2O_7:Tb^{3+}$ phosphors. The said phosphors were synthesized by combustion method with 10% excess of H_3BO_3 for any evaporative loss. The diffraction pattern of as synthesized phosphor is compatible with standard JCPDS data. Several bands were observed at 318 nm, 340 nm, 352 nm, 370 nm and 379 nm in excitation spectra of $CaAl_2B_2O_7:Tb^{3+}$ phosphors attributed to the transitions from ground state $^7F_6$ to respective excited states $^5H_6$, $^5H_7$, $^5L_9$ and $^5G_6$ of Tb^{3+} ion respectively. Amongst all the excitation bands, the peak centered at 379 nm was the most prominent one; therefore all the emission spectra were recorded at 379 nm excitation. The emission profile of Tb^{3+} activated $CaAl_2B_2O_7$ phosphor presents a strong green emission band centered at 545 nm due to magnetic dipole ($^5D_4 \rightarrow {}^7F_5$) transition of Tb^{3+} ion. The intensity of green emission band is found to be highest for 1 mol% concentration of Tb^{3+} ion in host lattice. In addition, several other emission lines in blue as well as in green region at 490 nm, 585 nm and 622 nm also observed which are corresponding to the, $^5D_4 \rightarrow {}^7F_6$, $^5D_4 \rightarrow {}^7F_4$ and $^5D_4 \rightarrow {}^7F_3$ transitions of Tb^{3+} ion respectively. The chromaticity coordinates ($x = 0.295$, $y = 0.491$) of the phosphor excited at 379 nm lies in green region which suggest that this phosphor has potential for application as green component in UV LED.

REFERENCES

[1] V.L. Scha¨fer, H.J. Kuzel, Neues. Jb. Miner. Monat. 131 (1967).
[2] J.F. MacDowell, J. Am. Ceram. Soc.73 (1990) 2287.

ID: 1226

202

International Journal of Novel Research in Engineering, Science & Technology

Volume-1, Issue-1, March, 2016

ISSN NO: 2455-7935

STUDY OF LUMINESCENCE IN CERIUM METAPHOSPHATES

S.U. Bhonsule [1*], Deepali Marghade[2], S.P. Wankhede[3] and S.V. Moharil [4]

S.U. Bhonsule
Department of Applied Physics,
P.C.E, Nagpur, India
e-mail: subhonsule@gmail.com

Deepali Marghade
Department of Applied Chemistry,
P.I.E.T, Nagpur, India
e-mail: deepalichem@gmail.com

S.P. Wankhede,
Department of Appled Physics,
K.D.K.College of Engineering,
Nagpur, India

S.V. Moharil
Department of Physics, Nagpur University,
Nagpur, India

Abstract*—Rare earth element doped tetra-and meta-phosphate compounds have been widely used mainly in miniature solid state lasers and optical amplifiers. Increasing interest in these materials has been observed since binary and ternary phosphates could be used as laser devices not only in the form of single crystals but also in the form of powder and glass. Here syntheses of meta-phosphates of Cerium like $NaCe(PO_3)_4$ and $KCe(PO_3)_4$ by the solid state reaction are described. X-ray diffraction and PL characterization of phosphors is also reported. The $4f^{n-1}5d \rightarrow 4f^n$ broadband luminescence of trivalent Lanthanide ions can be useful for new tunable solid-state lasers in the blue and UV spectral regions. Emission bands are observed at about 310–360 nm (32,260 –27,780 cm^{-1}) for meta-phosphates. It means that the Stokes shift is estimated to be about 5000 cm^{-1} for the meta-phosphates These results imply that both the ion-lattice and type of phosphate anion influence the Stokes shift in these materials.

Keywords* - Cerium metaphosphate; Excitation and emission spectra; solid state synthesis

I. INTRODUCTION

Trivalent lanthanide ions are used extensively for optically-pumped solid-state lasers because they possess suitable absorption bands and numerous fluorescence lines of high quantum efficiency in the visible and near-infrared. Trivalent Ce has only two J manifolds in the $4f^1$ ground configuration, $2F_{5/2}$ and $2F_{7/2}$. Since the energy separation of these states is 2000 cm -l, multiphonon emission is the dominant decay. Lasing would be possible only with special pumping conditions or materials. Intense Stokes-shifted 5d-4f emission from Ce^{3+} is present in the near-ultraviolet and has been considered for laser action .Transitions to levels of $2F_{7/2}$ provide a possible four-level laser scheme. Because of the short radiative lifetime of the lowest 5d state, an intense ultraviolet pump source or electron beam pumping may be required to achieve inversion. In addition, excited state absorption may prevent losing in some materials.

Srivastava et al [1] have studied the luminescence and electronic energy transfer in $K_3La_{1-x-y}Tb_xCe_y(PO_4)_2$. Finke et al [2]have discussed the optical properties of $K_3Ln(PO_4)_2$ and they found that the band gaps determined by reflection and excitation spectra were in the range 7.29–7.9 eV. Parent et al[3] studied various mechanisms involved in green emission of $KCaLa_{1-x-y}Tb_yCe_x(PO_4)_2$ under UV excitation. The various orthophosphates containing trivalent cerium and terbium have been proposed as strong green emitters under UV excitation. $Ba_3Y(PO_4)_3$ orthophosphate doped trivalent neodymium has been described as a possible powder laser material.[4] Barium and calcium orthophosphates are reported by Szczygiel et al.[5] They have studied optical absorption spectra, for Ce–orthophosphates, meta-phosphate and pyrophosphate. Infrared and Raman studies of these phosphates are also reported by them.

II. EXPERIMENTAL METHOD

$NaCe(PO_3)_4$ has been synthesised by sintering the mixture of $Ce(PO_3)_3$ and $NaPO_3$ in the molar ratio 1:1 at 750°C for 20 h. $KCe(PO_3)_4$ has been obtained from KPO_3 and $Ce(PO_3)_3$ by sintering a stoichiometric mixture of these compounds at 800°C for 48 h. Cerium meta phosphate $Ce(PO_3)_3$ was obtained from cerium oxide $CeO_2$and $NH_4H_2PO_4$ by sintering the mixture of these compounds stoichiometrically at 250, 500,and 900°C for 2, 5, and 15 hr respectively. Sodium meta phosphate $NaPO_3$ was obtained by complete dehydration of $NaH_2PO_4 .H_2O$ at 300°C for 0.5hr and then at 500°C for 2 hr. Method given by Szczygiel et al and Rzaigui[5,6] were followed for preparation of these compounds. X-ray diffraction patterns were recorded on Philips PANalytical X'pert Pro diffractometer. Photoluminescence (PL) spectra in the spectral range 220-700 nm were recorded at room temperature on Hitachi F-4000 spectro-fluorimeter with spectral slit widths of 1.5 nm.

III. RESULTS AND DISCUSSION

Fig.1 shows the XRD of prepared $NaCe(PO_3)_4$. X-ray diffraction of prepared $NaCe(PO_3)_4$ is found to match with ICDD file 33-1233 of $NaCe(PO_3)_4$. Fig.2 shows the XRD of prepared $KCe(PO_3)_4$. X-ray diffraction of prepared $KCe(PO_3)_4$ is found to match with ICDD file 35-0277 of $KCe(PO_3)_4$.

3.1 PL Emission and Excitation result of $NaCe(PO_3)_4$:

The emission spectra of the prepared $NaCe(PO_3)_4$ is also recorded using a spectral slit of 5, 1.5 nm and excitation spectra is recorded using a spectral slit of 1.5, 1.5 nm. {Fig.3curves (a)&(b)}.The emission spectra shows intense PL emission with peaks at 346 nm(28901cm^{-1},3.59 eV) and 327.6 nm(30525 cm^{-1},3.79 eV)which are due to transition from the lowest level of 5d configuration to the two $^2F_{5/2}$, $^2F_{7/2}$ multiples of the $4f^1$ configuration in Ce3+ ions and half intensity peaks at 316 nm(31645 cm-1,3.94 eV) and 361 nm(27701 cm-1,3.44

Proceedings of the National Conference on Luminescence and its Applications, R.T.M. Nagpur University, Nagpur. 18-20 February, 2016. pp.66-66.

Synthesis and Study of Photoluminescence in $CeMgAl_{11}O_{19}$:Yb

S.U. Bhonsule[1], S.P. Wankhede[2] and S.V. Moharil[3]

[1]Dept.of Applied Physics ,Priyadarshini College of Engineering, Nagpur
[2] Dept. of Applied Physics, KDK College of Engineering, Nagpur
[3]Ex-HOD of Department of Physics, RTMNU, Nagpur
Email: [1]subhonsule@gmail.com

Highlights— (1) Efficient Energy transfer from Ce^{3+} to Tb^{3+}; (2) Modified Combustion Synthesis

Doped Cerium Aluminates have been used by lamp Industry as green emitting phosphors in manufacturing of energy efficient tri-colour fluorescent lamps. $CeMgAl_{10}O_{19}:Tb^{3+}$ was used as a green emitting phosphor in the first tri-colour fluorescent lamp. The cerium based luminescent materials are self-activating due to the presence of trivalent cerium in the host lattice. The compound, $CeMgAl_{11}O_{19}$, has a peak emission at about 373 nm, when subjected to 254 nm excitation. Efficient energy transfer was first reported in $CeMgAl_{10}O_{19}:Tb^{3+}$. Energy transfer occurs from Ce^{3+} to Tb^{3+}, resulting in a green emission with a quantum efficiency up to 65%.

Here we have studied such type of energy transfer from Ce^{3+} to Yb^{3+} ions in $CeMgAl_{10}O_{19}:Yb^{3+}$. The samples were made using modified combustion technique. The Combustion synthesis technique consists of bringing a saturated aqueous solution of the desired metal salts and a suitable organic fuel to boil, until the mixture ignites and a self sustaining and rather fast combustion reaction takes off, resulting in a dry, usually crystalline, fine particle oxide powder. Stoichiometric composition of the metal nitrate (oxidizers) and urea (fuel) were calculated using the total oxidizing and reducing valencies of the components which serve as the numerical coefficients so that the equivalence ratio is unity and heat liberated during combustion is at a maximum. All constituents in stoichiometric proportions, along with fuel (urea) were mixed together and small quantity of double distilled water was added. The mixture on thoroughly grinding was transferred to a pre-heated furnace at 500 ^{0}C. On rapid heating the mixture evaporates and ignites at 450 ^{0}C to yield a white product. Entire process completes within several minutes. Photoluminescence Characterization of Samples were done. Plotted graph shows efficient energy transfer from Ce^{3+} to Yb^{3+}. Ce^{3+}: 4f $\rightarrow$5d transition was detected by monitoring the Yb^{3+}: $2F_{5/2} \rightarrow 2F_{7/2}$ emission at 977 nm, verifying the existence of Energy Transfer from Ce^{3+} to Yb^{3+}.

ID: 1113

Proceedings of the National Conference on Luminescence and its Applications, R.T.M. Nagpur University, Nagpur. 18-20 February, 2016. pp.246-246.

Synthesis of Quantum Dots for Light Emitting Devices

S.S. Soley[1], S.J. Dhoble[2] and Abhay D. Deshmukh[3]

[1]Department of Physics, Priyadarshini College of Engineering, Nagpur.
[2]Dept. of Physics, Energy Materials and Devices Laboratory, RTM Nagpur University, Nagpur
[3]Dept. of Physics, Nanomaterials Research Laboratory, RTM Nagpur University, Nagpur.
Email: [3]abhay.d07@gmail.com

Quantum dots (QDs), also named as semiconductor nanocrystals, show great potential in different applications such as solid state lighting, bio molecule labeling, medical identification and cell imaging. Semiconductor nanocrystals shows size-dependent properties, which make them interesting candidates for these different applications. With the increasing demand of energy all over the world, it is very important to develop energy-saving lighting devices. In the last few years, many phosphors, including quantum dots (QDs) and quantum wires, have been discovered. QDs show many advantages over traditional lighting sources such as high photoluminescence efficiency, size dependent emission wavelengths, narrow and symmetric emission spectra, broad absorption spectra, and photostability. Nowadays Cd-free QDs are attracting scientists and lighting devices manufacturers because of their low toxicity compared to Cd-basedones such as CdSe, CdTe, and CdS QDs. Recently, significant progress has also been made toward largescalesynthesis of this class of luminescent nanomaterials. It includes doped core/shell QDs, such as ZnSe:Mn/ZnS,core/shell QDs such as InP/ZnS, and alloy core–shell QDs, such as CuInS2/ZnS (CIS/ZnS).By combining CIS/ZnS QDs with various Cu/In ratios with a blue or near-UV LED chip, have been used as wavelength-converters to make QDs-WLEDs. Several procedures have been developed for the preparation of alloys and Core–Shell Structures Based on CIS Nanocrystals. To cover a CIS corewith a ZnS shell various synthesis methods e.g. hot-injection method, heat up, and solvothermal method etc. are used. This paper summarizes the methods developed during the last few years to synthesize of alloys and Core–Shell Structures Based on CIS Nanocrystals and highlights on the current progress on tuning the optical properties of these ternary nanocrystals as well as the primary application in light-emitting devices.

Proceedings of the National Conference on Luminescence and its Applications, R.T.M. Nagpur University, Nagpur. 18-20 February, 2016. pp.247-247.

Synthesis and Optical Properties of Rare Earth Free Phosphor

S.S. Soley[1], S.J. Dhoble[2] and Abhay D. Deshmukh[3]

[1]Department of Physics, Priyadarshini College of Engineering, Nagpur.
[2]Department of Physics, Nanomaterials Research laboratory, RTM Nagpur University, Nagpur.
[3]Department of Physics, Energy Materials and Devices laboratory, RTM Nagpur University, Nagpur.
Email: [3]abhay.d07@gmail.com

Different forms of carbon, especially BCNO phosphors have aroused great interest in recent years. BCNO phosphors with numerous advantages such as simple synthesis process, high quantum efficiency, low cost, wide excitation and emission wavelength and free of toxic rare earth elements as activators have attracted the researchers in the field of material science. A phosphor is a material which emit light of certain wavelength when excited by a light having higher energy such as ultraviolet (UV). The BCNO phosphors can be excited with a wide range of wavelengths, ranging from 254 nm (UV) to 460 nm (blue). The tuneable emission of BCNO phosphors can be obtained by changing the ratios of the precursors especially the carbon source. Carbon atoms have a role as impurity which are able to substitute for boron or nitrogen atoms in the BCNO structure and consequently change the emission colour. Because of the tunable emission characteristic, nowadays, BCNO materials are widely used in various applications such as white LEDs, biological imaging, phosphorous pigments and medical applications. In the present work BCNO phosphors with changing carbon percentage are synthesized at low temperature and their structural and photoluminescence properties are researched. Broad emission bands are observed for each sample. When the phosphors are annealed at 700^{0}C for 10 min, the emission peak shifted to higher wavelength and maximum shift span reached up to 40-45 nm.

ID: 1342

Advance Physics Letter

Nanotechnology: A Review

[1]J.M. Ghushe, [2]S.U. Bhonsule, [3]A.D. Deshpande, [4]S.S. Soley, [5]A.A. Dani

[1,2,3,4,5]Priyadarshini College of Engineering, Nagpur

Email: jtghushe21@gmail.com [1], subhonsule@gmail.com [2], asmitadeshpande202@gmail.com [3] swati17soley@gmail.com [4], aruna0407@gmail.com

Abstract— Nanotechnology deals with the engineering of functional systems at the molecular level and is focused on controlling and exploiting the structure of matter below 100 nanometers. It is involved with everything today from clothes to foods. In this paper, we have discussed the concept of Nanotechnology along with its history and various applications. The purpose of this paper is to look into the present aspects of "Nanotechnology" and its applications in various fields viz. computing, medicine, food technology, Robotics, Solar cells etc. It also deals with the future perspectives and risks in advanced nanotechnology.

Keywords: Nanotechnology, nanomaterial, Top-Down Approaches, Bottom-Up Approaches, NanoFilms, Grey Goo, Nanoelectronics, Nanomedicine.

I. INTRODUCTION

Nanotechnology is a new emerging theoretical and experimental field of applied science and technology with systems at the molecular level. It is focused on controlling and exploiting the structure of matter on a large scale below 100 nanometers [1]. It has significant impact on almost all industries and all areas of society [2]. It deals with the fabrication of materials with novel and improved properties. It has considerable impact on physical and chemical sciences, biological and health sciences. This technology leads to better materials which are longer lasting, cleaner, safer and smarter and cost effective solutions for home, communications, medicine, transportation etc. Nanotechnology provides a new foundation for knowledge, innovation, and integration of technology [3].

Nanoparticles

Particles whose sizes range from 1-100 nm is called a nanoparticle, whether it is dispersed in gaseous, liquid or solid medium. These are number of atoms or molecules bonded together and intermediate in size between individual atoms and bulk material. They can be built by assembling individual atoms or subdividing bulk materials. Size of nanoparticles is less than wavelength of light. Critical characteristics are their very high surface-to-volume ratio, quantum confinement effect etc. Van der Waal forces or magnetic forces play more important role than gravitational forces in case of nanomaterials[4].

II. SYNTHESIS METHODS

A. Top-Down and Bottom-Up Approaches

The methods of synthesis of nanoparticles are classified into „top-down" and „bottom-up" approaches. Top-down approach involves breaking of larger materials into fine particles of nanometer dimensions. The miniaturization of components for the construction of useful devices and machines has been and still is pursued by the top-down approach [5]. In this method the bulk is machined down to the nanometer length scale by lithographic or laser ablation-condensation techniques.

For mass production of metal nanoparticles, the chemical methods are more effective than the physical ones. Fig. 1 shows the Schematic illustration of preparative methods of metal nanoparticles.

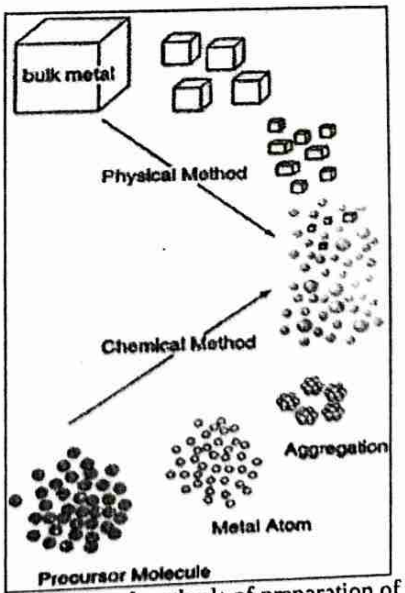


Fig 1: Schematic of methods of preparation of metal nanoparticles

NATIONAL INSTITUTE OF TECHNOLOGY WARANGAL
Department of Metallurgical and Materials Engineering

National Conference on Advances in Materials Processing and Characterization

NCAMPC - 2016

Certificate

69

is to certify that ~~Dr.~~/Mr./~~Ms.~~ Ritesh Laxman Wahane

of MIT, Aurangabad has presented

l/ poster presentation in **NCAMPC-2016** organized by the Department of Metallurgical and Materials Engineering, NIT Warangal from 4th-6th January 2016.

207

N Narasaiah

Prof. M.K. M[illegible]an

Prof. T. Srinivasa Rao

Proceedings of
6th International & 27th All India Manufacturing Technology, Design and Research Conference (AIMTDR-2016)
College of Engineering, Pune, Maharashtra, INDIA
December 16-18, 2016

Effect of the Post Weld Heat Treatments on Mechanical and Corrosion Properties of Friction Stir Welded AA 7075-T6 Aluminium Alloy

R.L. Wahane[1], P.M. Ambad[2], S.S. Patil[3] and C.L. Gogte[4]

[1,2]Department of Mechanical Engineering Maharashtra Institute of Technology, Aurangabad (MS), India
[3,4]Department of Mechanical Engineering Marathwada Institute of Technology, Aurangabad (MS), India
E-mail: [1]riteshaero@gmail.com, [2]prashant.ambad@mit.asia, [3]sandeep.patil@mit.asia, [4]shekhar.gogte@mit.asia

ARTICLE INFO

Keywords:
Friction Stir Welding
AA7075
PWHT
Exfoliation Corrosion
Microhardness
RRA

ABSTRACT

High strength aluminium alloy AA7075 is broadly used in the aerospace, defense, marine and automobile components and structures. Because of their excellent strength-to-weight ratio and reasonably good corrosion resistance heat treated alloys are extensively use in all these sectors. These alloys also exhibit low weldability due to poor solidification cracking, porosity in fusion zone and lose their mechanical properties when they are welded by fusion welding techniques. Friction stir welding (FSW) is a reliable technique to retain the properties of the alloy as the joining takes place in the solid state. The welds are susceptible to corrosion due to the microstructural changes in the weld nugget during FSW. For this investigation, FSW joints of AA 7075-T6 was given a variety of PWAA treatments. The effect of Retrogression & reaging (RRA) and stabilization with double aging (SDA) on the microstructure, electrical conductivity, mechanical properties and exfoliation corrosion has been studied. The microstructural changes of base metal and weld zones of friction stir welds were studied using optical microscopy and scanning electron microscopy. Electrical conductivity, tensile and microhardness test of base metal and welds has been carried out. It was observed that AA 7075-T6 can be friction stir welded and post-weld aged in a manner that produces superior exfoliation resistance and good mechanical properties. The hardness and strength of weld were observed to be comparatively high in RRA condition compared to as welded condition. SDA shows the high resistance to exfoliation corrosion.

1. Introduction

Friction stir welding (FSW) is energy efficient, environment friendly, green solid state welding process. Because of the absence of parent metal melting and related problems such as hot cracking, excessive micro-fissuring due to hot tearing, porosity, distortion and residual stresses there have been widespread benefits in joining high strength aluminium alloys for aerospace, marine and automotive industries. In FSW process the material is welded due to stirring action of a rotating tool and the material is subjected to intense plastic deformation at elevated temperatures [1]. Friction stir welding achieves solid phase joining by locally introducing frictional heat and mechanical deformation by rotation of the welding tool with resulting local microstructure change in aluminum alloys [2]. Due to the dissolution or overaging of strengthening particles which leads to the formation of a softened region with degraded mechanical properties generally in heat affected zones [2], [3].

The post weld heat treatment is the available technique to restore the mechanical properties and corrosion resistance of the joints by modifying the size, shape and distribution of strengthening particles [4]. The effects of the aging treatments on microstructure and mechanical properties of friction stir welded AA7075 aluminium alloy joints shows that the yield and tensile strength of the solution treated and aged (STA) joints were approximately 5% greater than the as welded (AW) joints. The AW joints showed a joint efficiency of 70%, while the STA joints exhibited high joint efficiency [5]. STA treatment increases the yield strength and tensile strength, resulting in increasing joint efficiency by 9% in comparison to AW joint [6]. The solution treatment followed by artificial ageing treatment is formed to be beneficial to increase the ultimate tensile strength, yield strength, and other mechanical properties, also the electrical conductivity (EC) of the friction stir welded AA7075 aluminium alloys joints.

After FSW the high strength aluminium alloys joint can be solution heat treated and followed by stabilization and double aging improves mechanical properties such as tensile strength, hardness [7].

Table 1
chemical composition (WT%) of base metal

Material	Al	Si	Cu	Mg	Cr	Mn	Ti	Fe	Zr	Zn
AA7075	Bal.	0.21	1.32	2.30	0.18	0.10	0.12	0.37	0.01	5.21

One potential method of restoring the corrosion resistance to AA7075 alloys is post-weld artificial aging after joining by FSW. RRA treatment increases the corrosion resistance. The fine precipitates due to RRA treatment would have decreased the corrosion rate. The reason could be the size and the amount of precipitates at the grain boundary and also within the grains. Due to the discontinuous grain boundary precipitates with large spacing, no continuous chain exists for corrosion to take place.

ISBN: 978-93-86256-27-0

Proceedings of
6th International & 27th All India Manufacturing Technology, Design and Research Conference
(AIMTDR-2016)
College of Engineering, Pune, Maharashtra, INDIA
December 16-18, 2016

Effect of the Post Weld Heat Treatments on Mechanical and Corrosion Properties of Friction Stir Welded AA 7075-T6 Aluminium Alloy

R.L. Wahane[1], P.M. Ambad[2], S.S. Patil[3] and C.L. Gogte[4]

[1,2]Department of Mechanical Engineering Maharashtra Institute of Technology, Aurangabad (MS), India
[3,4]Department of Mechanical Engineering Marathwada Institute of Technology, Aurangabad (MS), India
E-mail: [1]riteshaero@gmail.com, [2]prashant.ambad@mit.asia, [3]sandeep.patil@mit.asia, [4]shekhar.gogte@mit.asia

ARTICLE INFO

Keywords:
Friction Stir Welding
AA7075
PWHT
Exfoliation Corrosion
Microhardness
RRA

ABSTRACT

High strength aluminium alloy AA7075 is broadly used in the aerospace, defense, marine and automobile components and structures. Because of their excellent strength-to-weight ratio and reasonably good corrosion resistance heat treated alloys are extensively use in all these sectors. These alloys also exhibit low weldability due to poor solidification cracking, porosity in fusion zone and lose their mechanical properties when they are welded by fusion welding techniques. Friction stir welding (FSW) is a reliable technique to retain the properties of the alloy as the joining takes place in the solid state. The welds are susceptible to corrosion due to the microstructural changes in the weld nugget during FSW. For this investigation, FSW joints of AA 7075-T6 was given a variety of PWAA treatments. The effect of Retrogression & reaging (RRA) and stabilization with double aging (SDA) on the microstructure, electrical conductivity, mechanical properties and exfoliation corrosion has been studied. The microstructural changes of base metal and weld zones of friction stir welds were studied using optical microscopy and scanning electron microscopy. Electrical conductivity, tensile and microhardness test of base metal and welds has been carried out. It was observed that AA 7075-T6 can be friction stir welded and post-weld aged in a manner that produces superior exfoliation resistance and good mechanical properties. The hardness and strength of weld were observed to be comparatively high in RRA condition compared to as welded condition. SDA shows the high resistance to exfoliation corrosion.

1. Introduction

Friction stir welding (FSW) is energy efficient, environment friendly, green solid state welding process. Because of the absence of parent metal melting and related problems such as hot cracking, excessive micro-fissuring due to hot tearing, porosity, distortion and residual stresses there have been widespread benefits in joining high strength aluminium alloys for aerospace, marine and automotive industries. In FSW process the material is welded due to stirring action of a rotating tool and the material is subjected to intense plastic deformation at elevated temperatures [1]. Friction stir welding achieves solid phase joining by locally introducing frictional heat and mechanical deformation by rotation of the welding tool with resulting local microstructure change in aluminum alloys [2]. Due to the dissolution or overaging of strengthening particles which leads to the formation of a softened region with degraded mechanical properties generally in heat affected zones [2], [3].

The post weld heat treatment is the available technique to restore the mechanical properties and corrosion resistance of the joints by modifying the size, shape and distribution of strengthening particles [4]. The effects of the aging treatments on microstructure and mechanical properties of friction stir welded AA7075 aluminium alloy joints shows that the yield and tensile strength of the solution treated and aged (STA) joints were approximately 5% greater than the as welded (AW) joints. The AW joints showed a joint efficiency of 70%, while the STA joints exhibited high joint efficiency [5]. STA treatment increases the yield strength and tensile strength, resulting in increasing joint efficiency by 9% in comparison to AW joint [6]. The solution treatment followed by artificial ageing treatment is formed to be beneficial to increase the ultimate tensile strength, yield strength, and other mechanical properties, also the electrical conductivity (EC) of the friction stir welded AA7075 aluminium alloys joints.

After FSW the high strength aluminium alloys joint can be solution heat treated and followed by stabilization and double aging improves mechanical properties such as tensile strength, hardness [7].

Table 1
chemical composition (WT%) of base metal

Material	Al	Si	Cu	Mg	Cr	Mn	Ti	Fe	Zr	Zn
AA7075	Bal.	0.21	1.32	2.30	0.18	0.10	0.12	0.37	0.01	5.21

One potential method of restoring the corrosion resistance to AA7075 alloys is post-weld artificial aging after joining by FSW. RRA treatment increases the corrosion resistance. The fine precipitates due to RRA treatment would have decreased the corrosion rate. The reason could be the size and the amount of precipitates at the grain boundary and also within the grains. Due to the discontinuous grain boundary precipitates with large spacing, no continuous chain exists for corrosion to take place.

ISBN: 978-93-86256-27-0

Brushless DC motor drive using sensorless control back EMF zero crossing detection and filter technique

Publisher: IEEE

Cite This PDF

Nehal Kanhare ; B. S. Dani ; U. E. Hiwase All Authors

Abstract: This paper describes the brushless DC motor drive based on sensorless control back Emf zero crossing detection for enable the drive work on wide range of speed. The dynam... **View more**

Metadata

Abstract:
This paper describes the brushless DC motor drive based on sensorless control back Emf zero crossing detection for enable the drive work on wide range of speed. The dynamic equations of the motor are modelled in MATLAB Simulink. In addition to this, by controlling the filter output speed control of BLDC motor is done. Back emf is obtained from the difference between line voltages by applying this new technique of filtering zero crossing detection of back emf can be neglected.

Published in: 2016 International Conference on Electrical, Electronics, and Optimization Techniques (ICEEOT)

Date of Conference: 3-5 March 2016

INSPEC Accession Number: 16487613

Date Added to IEEE *Xplore*: 24 November 2016

DOI: 10.1109/ICEEOT.2016.7755528

211

Analysis of boost converter and interleaved converter for permanent magnet synchronous motor of Hybrid electrical vehicle

Publisher: IEEE

Arpita Moon ; B. S. Dani ; Rahul Argelwar All Authors

Abstract: Different converter topologies have been introduced for high power applications in recent years. This paper shows Permanent Magnet Synchronous Motor in Hybrid electrical ... **View more**

Metadata

Abstract:
Different converter topologies have been introduced for high power applications in recent years. This paper shows Permanent Magnet Synchronous Motor in Hybrid electrical vehicle is proposed by an interface of boost converter, interleaved converter and inverter as an integrated circuit. An inverter/converter circuit is designed in such a way so as to operate or control the HEV during different modes of operation. The integrated circuit in HEV will operate as a boost converter or interleaved converter depending on the load condition. The proposed integrated circuit will reduce the current ripple and voltage ripple hence it will leads to reduction in switching, conduction losses, and thermal stress on the motor. The effectiveness of proposed integrated circuit is simulated in MATLAB/Simulink. The simulation shows that the integrated circuit have a high efficiency and can be used at high power application.

Published in: 2016 International Conference on Electrical, Electronics, and Optimization Techniques (ICEEOT)

Comparison of cuk and buck converter fed electronically commuted motor drive

Amit Dodke ; Rahul Argelwar ; B.S. Dani ; S. P. Muley All Authors

Abstract: In this paper novel technique of Controlling electronically commutated motor drive (PMBLDCMD) using cuk converter explain. A DC-DC converter topology is employed for spee... **View more**

Metadata

Abstract:

In this paper novel technique of Controlling electronically commutated motor drive (PMBLDCMD) using cuk converter explain. A DC-DC converter topology is employed for speed control BLDC MOTOR and operated with voltage follower Approach in discontinuous conduction mode (DCM). This paper give comparative performance of speed controlling of BLDC motor using Buck and cuk converter. The performance of BLDC motor is studied using MATLAB Simulation for wide range of speed control.

Published in: 2016 International Conference on Electrical, Electronics, and Optimization Techniques (ICEEOT)

Date of Conference: 3-5 March 2016

Date Added to IEEE *Xplore*: 24 November 2016

INSPEC Accession Number: 16487259

DOI: 10.1109/ICEEOT.2016.7755529

Solar based series Z-source inverter for induction motor drive with soft starting

Publisher: IEEE

Rahul V. Adle ; Mohan M. Renge ; Shubhada P. Muley All Authors

Abstract: Solar fed induction motor application requires an efficient converter, which can produce higher value of ac output voltage from PV. This paper proposes the series Z-sourc... **View more**

▸ **Metadata**

Abstract:
Solar fed induction motor application requires an efficient converter which can produce higher value of ac output voltage from PV. This paper proposes the series Z-source inverter (SZSI) topology for induction motor along with series and parallel combination of solar photovoltaic unit in drive application. Shoot through duty ratio is used for boosting dc bus voltage in series Z-source inverter. In this paper new modified pulse width modulation control technique for series Z-source inverter fed drive with PV and soft starting is presented. The major benefits of modified PWM control technique are, current reduction with soft start and harmonics reduction in output voltage as compare to traditional PWM control scheme. The simulation results are given for verifying the traditionality and feasibility of the proposed technology.

Published in: 2016 IEEE 1st International Conference on Power Electronics, Intelligent Control and Energy Systems (ICPEICES)

Date of Conference: 4-6 July 2016 **INSPEC Accession Number:**

Improved performance of series Z-source inverter for motor drive

Publisher: IEEE

Rahul V. Adle ; Mohan M. Renge ; Shubhada P. Muley All Authors

Abstract: The Z-source inverter has single state power conversion capability with buck-boost ability. The series Z-source inverter (SZSI) uses shoot through state for boosting dc b... **View more**

Metadata

Abstract:
The Z-source inverter has single state power conversion capability with buck-boost ability. The series Z-source inverter (SZSI) uses shoot through state for boosting dc bus voltage. By controlling shoot through duty cycle, the series Z-source inverter can produce desired line-line output ac voltage. This paper presents new pulse width modulation (PWM) control technique with third harmonic injection, which increases the average shoot through duty ratio for SZSI. The features of proposed PWM control scheme with third harmonic injection are improvement in harmonic profile, reduction in dc bus voltage and stress on capacitor. The proposed PWM control scheme with third harmonic injection is verified by simulation results.

Published in: 2016 IEEE Students' Conference on Electrical, Electronics and Computer Science (SCEECS)

Date of Conference: 5-6 March 2016 **INSPEC Accession Number:** 16154679

ScienceDirect

Procedia Computer Science
Volume 87, 2016, Pages 18-24

Handwritten Marathi Compound Character Segmentation Using Minutiae Detection Algorithm ☆

Snehal S. Golait Mrs. [a], Latesh Malik Dr. [b]

Show more

Outline | Share | Cite

https://doi.org/10.1016/j.procs.2016.05.120

Abstract

Segmentation process is the heart of handwritten Script Identification system. Aside from the large variation of individual's handwriting, many researchersfound difficulty to separate characters from scanned word document Image. The key factor of selection of segmentation algorithm is used to improve efficiency of character segmentation as well as good feature extraction. One of the feature of Marathi script is Compound Character, derived from Devnagari, occur rarely in the script. Segmentation of such type characters is very difficult due to their complex structure. This paper proposed new technique for segmentation of handwritten Marathi compound characters. The Proposed algorithm used the concept of Minutiae extraction for fingerprint for segmenting the compound character. Basically Segmentation is carried out using morphological operations such as erosion and dilation. For segmenting the character from compound character our aim to find termination point and bifurcation points. And for finding the termination and bifurcation point proposed algorithm used the morphological operation hit or miss transform. The experimentalresults shows 90% accuracy in finding termination and bifurcation points.

Previous

Next

Keywords

Design of current starved voltage control oscillator with band gap reference in 0.18µm CMOS process

Publisher: IEEE

Vrushali G. Nasre ; G. M. Asutkar All Authors

Abstract: Presently design of a linear and wide range voltage controlled oscillator for analog and mixed mode signal applications with lesser design cycle time is a challenging wor... **View more**

Metadata

Abstract:
Presently design of a linear and wide range voltage controlled oscillator for analog and mixed mode signal applications with lesser design cycle time is a challenging work for Electronics Engineers. Band Gap reference voltage source is required, since the power supply noise is one of the important factors that affect the PLL noise performance. This paper describes the new design technique of the Band Gap Reference Current Starved Voltage Controlled Oscillator (BG-CSVCO) circuit to reduce power supply noise for PLL application. The BG-CSVCO circuit is designed and simulated using 0.18µm CMOS Technology. The BG-CSVCO has frequency range from 1.59 MHz to 2.87 GHz for the tuning range 0.2V to 1.8V and power consumption is 1.336mW. The supply voltage VDD is 1.8V.

Published in: 2017 International Conference on Recent Innovations in Signal processing and Embedded Systems (RISE)

Date of Conference: 27-29 Oct. 2017 **INSPEC Accession Number:**

Electromagnetic behaviour of ohmic series RF MEMS switch for frequency reconfigurable antenna application

Publisher: IEEE Cite This PDF

Yogita A. Nafde ; Rajesh Pande All Authors

Abstract:RF switching devices are vital elements of all reconfigurable antennas as these are essential for redirecting the signals and current paths. This redirection of current c... **View more**

Metadata

Abstract:

RF switching devices are vital elements of all reconfigurable antennas as these are essential for redirecting the signals and current paths. This redirection of current changes the antenna's electrical length and subsequently changes in resonating frequencies are observed. RF MEMS switches possess an excellent electromagnetic characteristics as compared to other RF switches such as high isolation in off state and very much low insertion loss in on state. In this paper the ohmic series RF MEMS switch is designed and its critical parameters are analyzed. This ohmic RF MEMS switch is suitable for reconfigurable microstrip patch antenna operating at 1-10GHz. The effect of variation of design parameters are analyzed by varying the design parameters such as gap between the electrodes and thickness of cantilever. The pull in analysis is done to predict the operating voltage of the switch. The test prototype of switch is fabricated which is incorporated in reconfigurable antenna design and performance characteristics are presented in this paper.

Lecture Notes in Electrical Engineering

Volume 362

Procedia Computer Science
Volume 78, 2016, Pages 748-755

Transliteration of Secured SMS to Indian Regional Language ☆

Krutika Sapkal [a] ✉, Urmila Shrawankar [b] ✉

Show more

Outline | Share | Cite

https://doi.org/10.1016/j.procs.2016.02.048

Abstract

SMS means conversing with others in minimal words which lead to a new SMS lingo. This reduces efforts for typing complete message. Today's devices lack the regional language keypad. If they exist people are uncomfortable with the keypads. Thus regional language messages are written using English alphabets which causes chaos when SMS lingo is used. This SMS language may vary, which leads to miscommunication. The message security is ensured by conversion of compressed message to its normal and transliterated form that helps decrypting SMS. The focus is on transliterating short form to full form, this work considers only Marathi language.

Keywords

SMS Lingo; Indian Regional Language; Transliteration; Clustering; Internationalization

International Conference on Electronics and Communication System (ICECE'16)

Solving Linear Equation Using Vedic Mathematical Approach on Parallel Platform

Krutika Sapkal
GHRCE
Nagpur, India
krutikasapkal@gmail.com

Urmila Shrawankar
GHRCE
Nagpur, India
urmila@ieee.org

Abstract— **Solving Linear equations with large number of variable contains many computations to be performed either iteratively or recursively. Thus it consumes more time when implemented in a sequential manner. There are many ways to solve the linear equations such as Gaussian elimination, Cholesky factorization, LU factorization, QR factorization. But even these methods when implemented on a sequential platform yield slower results as compared to a parallel platform where the time consumption is reduced considerably due to concurrent execution of instructions.[13][14][15]. The above mentioned linear equation solving methods can be implemented on the parallel platform using the direct approaches such as pipelining [6] or 1D and 2D Partitioning approach [3]. Vedic mathematics is a very ancient approach for solving mathematical problems. These Vedic mathematical approaches are well known for quicker and faster computation of mathematical problems. Vedic Mathematics provides a very different outlook towards the approach of solving linear Equation on parallel platform. It could be considered as a better approach for reducing space consumption and minimizing the number of algebraic operations involved in solving linear equation. In future Vedic Mathematics might serve as a viable solution for solving linear equation on parallel platform.**

Keywords- **Vedic Mathematics, Parallel Programming, Paravartya Yojayet, Multicore Systems, 1D and 2D partitioning**

I. INTRODUCTION

Mathematics is the mother of all sciences as it holds the solution to all the problems that are faced by the human race. But as the technology advances the complexity of the problems also increases and it is desirable that a faster and more accurate solution is obtained. Linear Equations form an integral part of the problem solving techniques provided by mathematics which helps predict the unknown variables. But as the size of the problem accents the time consumed to compute the problems also increases. The uniprocessor system consumes a lot of time for computing the solution to linear equations with a large variable size increasing the energy consumption. Parallel computation of the problem on a multicore system however should faster results, as parallel computing is considered popular way of achieving high energy efficiency. In multi-core systems energy efficiency is a question of both the time and space, sharing of resources, and is highly dependent on the application characteristics such as its level of parallelism. Thus efficiency can be achieved by parallel applications mapping the program on many cores and the clock frequency can be lowered. But this not the case when implemented on actual parallel machine as there are many factors that hamper the efficiency of the system by causing overheads such as-

- Inter-process Interaction
- Idling
- Excess Computation

There are many ways to tackle this problem but main propaganda of this work is to survey and form a comparative analysis of all the existing techniques to solve linear equation on parallel platform.

It can be also noted during the further analysis of the previous works that after certain level the ordinary mathematics laws fail to give the desired faster and accurate results. Hence the need arises for the use of Vedic mathematical principles that satisfy void left by conventional mathematics. Vedic mathematics is acclaimed for yielding accurate results in minimum time. These mathematical principles involve the use of simple arithmetic operations to compute a very large problem in most efficient manner.

This work will cover the following aspects in the consecutive sections-

- Related Previous Work
  - *Survey of methods for solving linear equations*- will enlist all the methods that are available for solving linear equations irrespective of the platform.
  - *Survey of methods for parallel platform*- will mention the methods in which the equations can be solved on parallel platform.
  - *Analysis of performance based on Partitioning*- the effect of matrix dimensions on the

978-1-4673-6680-9/16/$31.00 ©2016 IEEE

A novel approach for the identification of writing traits on email database

Publisher: IEEE

Pranjal S. Bogawar ; Kishor K. Bhoyar All Authors

Abstract: Trait is a particular characteristic that can produce a particular type of behavior. The email which is written communication medium among the people is the source, to id... **View more**

Metadata

Abstract:
Trait is a particular characteristic that can produce a particular type of behavior. The email which is written communication medium among the people is the source, to identif [1] y the writing traits of the person. This paper proposes a novel approach to identify the writing traits of person from their email communication. The proposed technique is combination of an unsupervised k-means clustering algorithm and rule based system to classify the traits of email writer. We classified the email writers into three categories as perfect writer, average writer and casual writer. The experiment was carried out on Enron's email data set. This experiment is helpful to predict the writing behavior of a person which will be helpful in identifying an email writer or improve his/her writing style.

Published in: 2016 1st India International Conference on Information Processing (IICIP)

Date of Conference: 12-14 Aug. 2016 **INSPEC Accession Number:**

Sentiment Analysis

Authors: Pranjal S. Bogawar, K. K. Bhoyar Authors Info & Claims

ICIA-16: Proceedings of the International Conference on Informatics and Analytics • August 2016 • Article No.: 22 • Pages 1–7 • https://doi.org/10.1145/2980258.2980304

Online: 25 August 2016 Publication History

ABSTRACT

Email is a fast and well-liked communication medium on the internet. Email users are rapidly increased due to easy availability of internet. Email is used for personal as well as official communications. It is also used for illegitimate activities such as phishing, spamming, abusing, and threatening. Email mining gives the better solution to this problem. The clustering and classification methods of data mining are used to classify the emails into different categories. The paper tries to extract effective features for investigating an email to

Wavelet Based Image Enhancement Using Adaptive Fusion Methodology

Manisha Turkar
Dept. of E&TC, Priyadarshini College of Engineering
Nagpur, India
Manishaturkar92@gmail.com

Prof. Nitin S. Ambatkar
Dept. of E&TC, Priyadarshini College of Engineering
Nagpur, India
nambatkar@gmail.com

Abstract **— The image fusion is one of the important branch of data fusion. Data fusion techniques have been designed not only to allow integration of different information source images, but also to take advantage of complementary. Though there are various definitions of image fusion, more or less all definitions agree that image fusion is a process to obtain better content image from multiple images. In this project, our goal is to obtain a single image, which presents better performance under several popular evaluation criteria, by fusing Wavelet transform along with Burt and Adaptive fusion algorithm on multi-resolution images. Wavelet Transform represents image variation at different scales. The processing of wavelet transform of image involves recursive filtering and sub-sampling of source images. In this paper, a adaptive threshold fusion method based on wavelet transform is proposed on multi-resolution images. It will adaptively fuse the source images by match degree and have a better performance than other methods like PCA. Further various performance matrices are evaluated for analysis. The experimental results on several images show the efficiency improvement of our method both in quality and noise reduction in comparison with several recent proposed techniques.**

Keywords— Image Fusion, Wavelet Transform,Adaptive fusion, Burt method.

I. INTRODUCTION

The motivation for image fusion research is mainly due to the contemporary developments in the fields of multi-spectral, high resolution, robust and cost effective image sensor design technology. Since last few decades, with the introduction of these multi-sensory imaging techniques, image fusion has been an emerging field of research in remote sensing, medical imaging [5] [9], night vision, military and civilian avionics, autonomous vehicle navigation, remote sensing, concealed weapons detection, various security and surveillance systems applications.

Image fusion is classified into two: Spatial domain and transform domain. Average method, select maximum\minimum method, PCA [15], HIS are the spatial domain methods which produces spatial distortion. While in transform domain images spatial distortion is well handled. So in the present paper wavelet transform method is used which is of the transform domain method. Image is filtered recursively and decomposes in the sub bands. Further Burt's method and adaptive method [2] for fusion algorithm is implemented.

Proposed method can be implemented on multi-focus images also on the multi-resolution images. The objects in front of or behind the focus plane would be blurred. A popular way to solve this problem is image fusion, in which one can acquire a series of pictures with different focus settings and fuse them to produce an image with extended depth of field. This is multi-focus image fusion. Moreover, Multi-resolution image fusion can also be carried out well using proposed method irrespective to the other methods [7] [13] [16].

II. PROPOSED METHOD

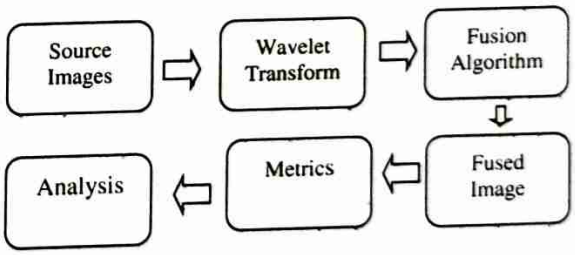


Figure 1: Proposed Model

A. Wavelet Transform

The principle of image fusion using wavelets is to merge the wavelet decompositions of the two original images using fusion methods applied to approximations coefficients and details coefficients. The Wavelet Transform provides a time-frequency representation of the signal. Successive application of this decomposition to the LL sub band gives rise to a pyramid decomposition where the sub images correspond to different resolution levels and orientations. Also Laplacian Method is also accomplished after Wavelet Transform traditionally [6][11]. After one level of decomposition, there will be four frequency bands, namely Low-Low (LL), Low-High (LH), High-Low (HL) and High-High (HH) as shown in figure 2. The

978-1-5090-2476-6/16/$31.00 ©2016 IEEE

Available online at www.sciencedirect.com

ScienceDirect

Procedia Computer Science 87 (2016) 18 – 24

Procedia Computer Science

2016 International Conference on Computational Science

Handwritten Marathi Compound Character Segmentation using Minutiae Detection Algorithm

Mrs. Snehal S. Golait[a], Dr. Latesh Malik [b]

[a]*Research Scholar ,Department of CSE,*

G.H.Raisoni College of Engineering,Nagpur

[b] *Professor &Head ,Department of computer Science & Engineering .*

G.H.Raisoni College of Engineering,Nagpur

Abstract

Segmentation process is the heart of handwritten Script Identification system. Aside from the large variation of individual's handwriting, many researchersfound difficulty to separate characters from scanned word document Image. The key factor of selection of segmentation algorithm is used to improve efficiency of character segmentation as well as good feature extraction. One of the feature of Marathi script is Compound Character, derived from Devnagari, occur rarely in the script. Segmentation of such type characters is very difficult due to their complex structure. This paper proposed new technique for segmentation of handwritten Marathi compound characters. The Proposed algorithm used the concept of Minutiae extraction for fingerprint for segmenting the compound character. Basically Segmentation is carried out using morphological operations such as erosion and dilation. For segmenting the character from compound character our aim to find termination point and bifurcation points. And for finding the termination and bifurcation point proposed algorithm used the morphological operation hit or miss transform. The experimentalresults shows 90% accuracy in finding termination and bifurcation points.

Peer-review under responsibility of the Organizing Committee of ICRTCSE 2016

Keywords: Erosion; Segmentation; bifurcation; Morphology;

E-mail address: snehal.golait@gmail com

Peer-review under responsibility of the Organizing Committee of ICRTCSE 2016
doi:10.1016/j.procs.2016.05.120