VIBRATION CONTROL OF RECTANGULAR LIQUID STORAGE TANK

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Abstract—**Vibration control of liquid storage tanks for chemicals, water etc. is of great importance during earthquake seismic response considering safety factor. During earthquake, seismic excitations are generated, which can cause damage to the tank as well as loss of life and property. In chemical storage tanks, release of toxic chemicals or liquefied gases from the damaged tanks can lead to disastrous effects. Thus estimation of sloshing frequency of liquid in tank, hydrodynamic pressure on wall and proper analysis of fluid-tank interaction under seismic excitations is required for efficient design of storage tanks. In this present study, the behaviour of 3-D rectangular tank is investigated using ANSYS (Version 12.0) software, subjected to various seismic excitation frequencies, different fill levels in tanks.**

Index Terms— **fluid-tank interaction; vibration; sloshing; Seismic response; ANSYS.**

I. INTRODUCTION

Liquid storage tanks (LST) are important role in human societies. The main component of LST services in human life through the fire-fighting systems and cooling systems in many industries like nuclear power plants, chemical plants. They are used in many industrial facilities for storage of water, oil, chemicals, and liquefied natural gas. The failure of many LST during an earthquake has implications far beyond the mere economic value of the tanks and their contents. Unlike other structures liquid storage tank structures are in contact with liquid and their response under seismic load is quite different. Apart from the hydrostatic pressure the seismic force imparts hydrodynamic pressure. This liquid structure interaction is of interest for the design of rectangular tanks and due consideration should be given during design of the structure.

The dynamic behaviour of a free liquid surface depends on the excitation type and its frequency, container shape, liquid motion. The excitation to the tank can be periodic, impulsive, sinusoidal and random. It can create lateral, planar, non-planar, rotational irregular beating, parametric, symmetric, asymmetric, pitching yaw or combinational effects. The aim of this study is to develop a finite element model that includes the effect of the liquid inside the tanks and large deformation of shell using existing finite element software and to study the dynamic buckling behavior of the tanks.

II. SLOSHING OF LIQUID STORAGE TANK

Sloshing can be defined as any movement of the free liquid surface inside other object. This motion can be caused by disturbance to partially filled liquid containers. For sloshing, the liquid must have a free surface to constitute a slosh dynamic problem, where the dynamics of liquid can interact with container to alter the system dynamic significantly. Sloshing behaviour of liquids within containers represents thus one of the most fundamental fluid-structure interactions.

Liquid sloshing and free surface motion is a common problem affecting not only the dynamics of flow inside the container, but also the container itself. The containers carrying the liquids, tanks used to store liquids have to withstand the complex dynamics of the transportation system, different ground motions which they are serving. This unavoidable motion of the container and the forces associated on the liquid inside it results in mostly violent and disordered movement of the liquid/gas (mostly air or vapour) interface or free surface. Containers having liquid with a free surface should be moved with proper attention to avoid spilling and other damages.

III. FLUID STRUCTURE INTERACTION

Fluid-Structure Interaction refers to the coupling of unsteady fluid flow and structural deformation. It is a two-way coupling of pressure and deflection. Its application includes airbag modeling, fuel tank sloshing, heart valve modeling, helicopter crash landings, etc. Purpose of studying FSI is that fluid mechanics may affect and be affected by the structural mechanics and vice-versa. Hence in this case the coupling of the fluid's pressure and the motion of the structure is...

IV. NUMERICAL ANALYSIS OF LIQUID STORAGE TANK USING LUMPED MASS MODEL

When tank is excited by gravity force, a part of liquid moves independent of the tank, called the convective mass or sloshing mass (m_c). This mass lies towards the upper part of the tank. The second mass which also does not move in coordination with tank called as impulsive mass (m_i). This mass comes into picture when the flexibility of the tank wall is considered. This mass lies around the central portion of the tank. The third mass which moves in coordination with the tank called as rigid mass (m_r). This mass lies just below the central portion of the tank. The corresponding stiffness constants have been worked out according

Studies on Properties of Sisal Fiber Reinforced Self Compacting Concrete

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Abstract— Self-compacting concrete (SCC) is becoming a popular choice in concrete industry due to ease of placement in congested reinforcements, reduced labor and equipment, no segregation character and smooth surface. Fly ash has been used in producing SCC which increases filling and passing ability of the concrete. In this study the sisal fibers were used to reinforce self-compacting concrete. This study investigates how the inclusion of sisal fiber of varying quantities, in SCC affects the flowability and performance in hardened state. The flow characteristics were assessed by considering slump flow, V-funnel and J-ring test and the mechanical properties were found using compression, flexural and Impact test.

Key words: Self-Compacting Concrete, Sisal Fibre, Slump Flow, Compressive Strength, Impact Strength, Flexural Strength

I. Introduction

A. General

The term fiber reinforced concrete (FRC) is characterized as a solid containing scattered arbitrarily arranged filaments. Intrinsically concrete is fragile under malleable stacking and mechanical properties of cement might be enhanced by arbitrarily arranged short discrete filaments which avoid or control start and engenderıng of splits. The discrete fibers, dispersed throughout the matrix improve the mechanical properties of concrete through stress redistribution. However the use of fibers reduces the workability of the matrix.

On the other hand, use of self-compacting concrete (SCC) in the construction industry has grown significantly due to its technical advantages. SCC is a new type of concrete that can be cast into a framed work and fill it completely under its own weight without the need of any type of compaction or external vibration. SCC also has a great resistance to segregation and a high ability to flow around obstacles such as reinforcements or narrow sections.

By incorporating fibre in SCC a homogeneous composite material namely fibre reinforced self-compacting concrete (FRSCC) is achieved. Due to the high flowable nature of SCC uniform dispersion of fibre takes place and a higher degree of stress redistribution is ensured.

B. History and Development of SCC

SCC was first created in Japan in 1988 so as to accomplish more strong solid structures by enhancing the quality accomplished in the development procedure and the set material. The evacuation of the requirement for compaction of cement diminished the potential for sturdiness surrenders because of lacking compaction. The use of SCC was also found to offer economic, social and environmental benefits over vibrated concrete construction. These benefits include faster construction and the elimination of noise due to vibration. One of the main drivers for the development of the technology was reduction in the number of skilled site operatives that the Japanese construction industry was experiencing in 1980's. The use of SCC meant that less skilled labour was required for placing and finishing of the concrete. SCC was developed from the existing technology used for high workability and under water concretes, where additional cohesiveness is required. The first required publications that looked into the principles required for SCC were from Japan around 1989 to 1991. These studies concentrated upon high performance and super workable concretes and their fresh properties such as filling capacity, flow ability and resistance to segregation.

The first significant publication in which modern SCC was identified is thought to be a paper from the University of Tokyo by Ozawa et al. in 1992.The term self-compacting cement is not utilized inside the paper, albeit elite solid which had all the basic properties of self-compacting solid blend. In the accompanying couple of years many research papers were distributed on cements, for example, super workable, self-uniting, profoundly workable and exceedingly fluidised cements, all of which had comparative properties to what we now know as SCC. These were mainly papers on work into the mix design of what would become SCC and its associated fresh properties. In 1993 research papers were beginning to be published of case studies on the use of these early forms of SCC in actual applications.

One of the first published references utilising the term self-compacting was in Japan in 1995. After the development of this prototype SCC, intensive research began in many places in Japan, especially within the research institutes of construction companies, and as a result, SCC has now been used in many practical applications.

C. Origin and Development of Fibers Reinforcement in Concrete

The technology of fibre reinforced building material can be traced back to antiquity, when straw was used to make bricks and other examples being the use of asbestos reinforced posts around 2500 B.C. And then Ziggurat at Agar Quf near Bhagdad, built in 1400 B.C. every 6th course of brick work was reinforced with reeds to facilitate drying out and to reduce and evenly distribute drying shrinkage.

The idea that concrete can be strengthened by the inclusion of fibers was first put forward by Porter in 1910, but little progress was made in the development of this material till 1963 when Ramualdi and Bastan published this classical work on the subject. Since then there has been a reviewed interest in the science and applications of fibre reinforced concrete and cement, using a variety of fibers and more basic knowledge has been gained on the behaviour of such cement system.

Research and development works of FRC composites started in India during the early 1970 and investigations were confined only to steel fibers and investigations in other types of fibre arouse later. Even

Behaviour of the Fiber Reinforced Concrete with Partial Replacement of Cement by using Rice Husk ASH

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Abstract— This paper introduces an exploratory examination on the properties of Polypropylene fiber fortified cement with Rice Husk Ash (RHA) as Pozzolanic filler. Concrete made with Portland bond has certain attributes: it is generally solid in pressure yet feeble in strain and has a tendency to be weak. These two shortcomings have restricted its utilization. Another central shortcoming of cement is that breaks begin to shape when cement is put and before it has legitimately solidified. These breaks are real reason for shortcoming in cement especially in extensive on location applications prompting resulting crack and disappointment and general absence of sturdiness. The shortcoming in strain can be overcome by the utilization of customary pole fortification and to some degree by the consideration of an adequate volume of specific filaments. In the present examination, a possibility study is made to utilize Rice Husk Ash as an admixture to as of now somewhat supplanted bond with Rice Husk Ash (Portland Pozzolana Cement) in Concrete, and an endeavor has been made to research the quality parameters of cement. For control cement, IS strategy for blend configuration is received and looking at this as a premise, blend outline for halfway substitution technique has been made. Three distinctive substitution levels specifically 10%, 20% and 30% are decided for the review worry to incomplete substitution technique. Substantial scope of curing periods beginning from 3days, 28days are considered in the present review. The RHA was obtained from a rice paddy processing industry in Nagapattinam. Compressive quality, flexural quality and split elasticity tests were Performed and the outcomes demonstrated that expansion of RHA and additionally fiber had incredible impact on solid properties.

Key words: Fiber Reinforced solid, Rice Husk Ash (RHA), Compressive quality, split elasticity, Flexural quality

I. Introduction

A. Enhanced Properties of RHA Cement

Portland concrete creates an abundance of lime. Including a pozzolan, for example, RHA this joins with lime within the sight of water, results in a steady and more undefined hydrate (calcium silicate). This is more grounded, not so much penetrable but rather more impervious to concoction assault. A wide assortment of natural conditions, for example, responsive total, high sulfate soils, solidify defrost conditions, and presentation to salt water, de-icing chemicals, and acids are injurious to concrete. Lab research and field encounter has demonstrated that watchful utilization of pozzolans is valuable in countering these issues. The pozzolan is not only a "filler", but rather a quality and execution upgrading added substance. Pounded fly fiery remains and ground granulated impact heater slag are the most widely recognized pozzolan materials for cement. Many reviews have been done to decide the adequacy of RHA as a pozzolan. They have focused on the amount of fiery remains in the blend and the enhanced qualities coming about because of its utilization.

B. Role of RHA in Reducing GHG Emissions

The bond business is lessening its CO_2 outflows by enhancing fabricating forms, packing more creation in the most effective plants and utilizing squanders gainfully as option powers in the concrete furnace. In spite of this, for each ton of bond delivered, around 0.75 tons of CO_2 (ozone depleting substance) is discharged by the copying fuel, and an extra 0.5 tons of CO_2 is discharged in the compound response that progressions crude material to clinker (calcinations). The possibility to win CERs comes basically from substituting Portland bond with RHA. There are other ecological advantages of substituting Portland concrete with RHA. The requirement for quarrying of essential crude materials is diminished, and general decreases in discharges of tidy, CO_2 and corrosive gasses are achieved.

C. Fiber Reinforced Concrete

Concrete is by nature a brittle material that performs well in compression, but is considerably less effective when in tension. Reinforcement is used to absorb these tensile forces so that the cracking which is inevitable in all high-strength concretes does not weaken the structure. For many years, steel in the form of bars or mesh (also known as "re-bar") has been used as reinforcement for concrete structures that are designed to experience some form of loading, whether that loading would be carrying traffic, spanning a void or bearing another structure such as a wall. In many structures, steel mesh has been used a crude (and often ineffective) method of crack control. Latest developments in concrete technology now include reinforcement in the form of fibers, notably polymeric fibers, as well as steel or glass fibers. Fiber-reinforcement is predominantly used for crack control and not structural strengthening. Although the concept of reinforcing brittle materials with fibers is quite old, the recent interest in reinforcing cement-based materials with randomly distributed fibers is quite old; the recent interest in reinforcing cement based materials with randomly distributed fibers is based on research starting in the 1960's. Since then, there have been substantial research and development activities throughout the world. It has been established that the addition of randomly distributed polypropylene fibers to brittle cement based materials can increase their fracture toughness, ductility and impact resistance. Since fibers can be produced in a conventional manner, the concept of polypropylene fiber concrete has added an extra dimension to concrete construction.

Potential Application of Orange Peel as an Adsorbent for the Polluted Pond Water

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Abstract— Organic filtration is a practice to eliminate the colour, chemical oxygen demand (COD) and some heavy metals. In this thesis, orange peel was taken as natural adsorbent for the reduction of COD is river water, nearest to the soap factory. An orange peel, carbon powder, fine and coarse aggregate were taken as a filter media. An influent was allowed to pass through the filter media with a contact period of 45 days. Aggregate were used to remove the suspended particles and carbon powder was used to remove contaminates and impurities using chemical adsorption. An orange peel could be removed the colour and COD in the waste water. The physical and chemical characterisation were analysed for influent effluent. An effluent has achieved in the reduction of COD and other parameter like pH, total solids, turbidity etc. It could be compared with IS standards for waste water. Finally concluded, the effluent can be used for non- portable domestically uses, and also for cooling and washing purposes in industries.

Key words: Effluent- Orange Peel, COD Removed, Non-Domestically Usage, Industrial Usage

I. Introduction

Water is an indispensable natural resource essential for all living matter. Without water no living matter such as human beings, animals, and plants can survive. Water occupies about 71% of the earth's surface and the amount of water is about 1400 million cubic meters. But 97% of this water is in the oceans and saline lakes which is useless for any purpose. Only 3% of the total water, is fresh water, of this fresh water nearly 80% exists as snow in the polar region and only 20% of this is available for human consumption either for the domestic use or for agricultural purposes. The fresh water is available in rivers lakes, ponds and other sources. It exists as a liquid between 0°C and 100°C. It has very high specific heat and so warms up and cools down slowly. It is a solvent for many nutrients, which are essential for life. Because of high surface tension water is easily absorbed by plants and reaches the top of the trees from the roots. Water freezes into ice, which is lighter than liquid water and so it floats on the surface. The water under the ice remains a liquid enabling millions of aquatic organisms to survive. These are some of the qualities of water which helps all living organisms to survive and grow. Animals and plants have about 60% of water in their bodies. So water is rightly called the "elixir of life". Water pollution has become a serious problem around the world.

A. *Effects of Polluted River Water*

Water pollution is very harmful to humans, animals and water life. The effects can be catastrophic, depending on the kind of chemicals, concentrations of the pollutants and where they are polluted. The effects of water pollution are varied and depend on what chemicals are dumped and in which location. Many water bodies near urban areas (cities and towns).Are highly polluted. This is the result of both garbage dumped by individuals and dangerous chemicals legally or illegally dumped by manufacturing industries, health centres, schools and market places.

B. *Objectives of the Work*

1) To examine the COD reduction in a selected textile wastewater by using natural adsorbents, to minimize the treatment cost.
2) To removes the TSS present in the waste water.
3) To check that it removes the colour of eutrophication in the trial and error method.

II. Methods and Materials

A. *General*

Adsorption is the process of accumulating substances that are in solution on a suitable interface. Adsorption, as noted, is a mass transfer operation in that a constituent in the liquid phase is transferred to the solid phase. The adsorbate is the substance that is being removed from the liquid phase at the interface. The adsorbent is the solid, liquid, or gas phase onto which the adsorbate accumulates. Although adsorption is used at the air-liquid interface in the flotation process, only the case of adsorption at the liquid-solid interface will be considered in this discussion. The adsorption process has not been used extensively in wastewater treatment, but demands for a better quality of treated wastewater effluent, including toxicity reduction, have led to an intensive examination and use of the process of adsorption. An attempt is made in this study to reduce COD concentration of the waste water using natural adsorbents. The materials and the methodology adopted to carry out this study are presented.

Four types of absorbents are used for reduction of COD present in the waste water are coarse aggregate, fine sand, carbon and orange peel. The waste water is allowed to pass through the tank. The basic characteristics of an influent and effluent were carried out in the experiment.

Sl. No	MATERIAL	SIZE (mm)	DEPTH (mm)	USES
1	Coarse Aggregate	20mm	200mm	Filter the course suspended particles from waste water
2	Fine Aggregate	4.75mm	200mm	Filter the fine suspended particles from waste water
3	Carbon	2.75mm	200mm	Remove contaminants and impurities, using chemical adsorption (chlorine

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Studies on Properties of Coir Fibre Reinforced Self Compacting Concrete

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Abstract

Self-compacting concrete additionally alluded to as self uniting concrete, can stream and solidify under its own particular weight. It is sufficiently firm to fill the spaces of all most any size and shape without isolation or dying. This makes SCC especially utilize full wherever putting is troublesome, for example. in vigorously fortified solid individuals or in confused work forms. Incorporating strands in cement can postpone and control the ductile splitting .However consideration of filaments is relied upon to influence the stream qualities of the solid. Hence SCC, which has an increased flow, can be the ideal matrix for the good workability and uniform dispersion of the fibres. This study investigates how the inclusion of coir fibre of varying quantities, in SCC affects the flowability and performance in hardened state. The flow characteristics were assessed by considering slump flow test and mechanical properties were found using compression, flexural and split tensile test. It was found that it is possible to achieve self compaction properties while using fibre reinforcement where in the mix proportion, fibre length and fibre content can greatly influence concrete flowability. Hence there exist a fibre content that could be used to produce fibre reinforced self-compacting concrete, without effecting properties of self-compacting concrete.

Keywords: Self-Compacting Concrete, Coir Fibre, Slump Flow, Compressive Strength, Split Tensile Strength, Flexure Strength

I. INTRODUCTION

The term fiber strengthened cement (FRC) is characterized as a solid containing scattered haphazardly arranged filaments. Inalienably concrete is fragile under pliable stacking and mechanical properties of cement might be enhanced by haphazardly arranged short discrete strands which avert or control start and proliferation of splits. The discrete filaments, scattered all through the framework enhance the mechanical properties of cement through anxiety redistribution. However the utilization of strands lessens the workability of the grid.

Then again, utilization of self-compacting concrete (SCC) in the development business has become essentially because of its specialized points of interest. SCC is another kind of solid that can be thrown into a confined work and fill it totally under its own particular weight without the need of a compaction or outer vibration. SCC likewise has an extraordinary protection from isolation and a high capacity to stream around snags, for example, fortifications or limited areas. By fusing fiber in SCC a homogeneous composite material to be specific fiber fortified self-compacting concrete (FRSCC) is accomplished. Because of the high flowable nature of SCC uniform scattering of fiber happens and a higher level of stress redistribution is guaranteed.

In India, broad investigations have been completed on steel strands. However the utilization of steel filaments is confined due the high cost of steel. To dispense with this issue, modest and plentifully accessible characteristic filaments were believed to be placed being used and thus ponders on these strands are being done nowadays. Notwithstanding their ease, these filaments have been accounted for to postpone and control tractable splitting in the solid and further they were found to diminish disfigurements at all feelings of anxiety and were found to grant an all around characterized post breaking and post yield conduct. Additionally, they were likewise found to enhance break sturdiness, pliability and vitality retention limit of the composites.

II. EXPERIMENTAL WORK

After a thorough literature review and understanding of Fibre reinforced self-compacting concrete was made, the following work methodology is formulated. First the physical properties of the material such as aggregate, cement, fly ash and Coir fibre are characterized for its use in concrete. Flow characteristics of CFRSCC were studied through slump flow test. Test specimens were casted to study the hardened properties of CFRSCC, namely Compressive, split tensile and flexural strength respectively for 7 days and 28 days were found.

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Design and Analysis of Renewable Energy Based Interleaved Flyback Inverter

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Abstract

Photovoltaic (PV) is a method of generating electrical power by converting solar radiation into direct current electricity using semiconductors that exhibit the photovoltaic effect. Photovoltaic (PV) power generation has become one of the main ways to use solar energy. And the renewable energy source based distributed generation (DG) system are normally interfaced to the grid through power electronic converters or inverters. An interleaved flyback inverter based photovoltaic system with an improved control strategy with MATLAB Simulink is used result is discussed in this paper.

Keywords: Photo Voltaic (PV), Pulse-Width Modulation (PWM), Distributed Generation DG, Interleaved Flyback Inverter (ILFI)

INTRODUCTION

Generally Photovoltaic (PV) energy has plays the major role in the renewable energy. The PV technique also grown faster even though the initial cost is high but the solar energy is available at free of cost by naturally and its efficiency also high. To obtain the sufficient power the PV system use the PV modules are connected in series or parallel. By means of mismatch between the modules, shadows from trees or tree branches, buildings and other things partially cover the PV module so the conventional PV system having power losses. To overcome this problem photovoltaic AC module is considered, For the photovoltaic AC module flyback inverter is the best for the grid connection because it having advantages of less components, simple in construction and provide the isolation between the PV modules and grid line.

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Research Paper

Neural network controller based sequential switch cascaded H-bridge multilevel inverter

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Abstract

This paper presents a novel cascaded multilevel inverter structure with reduced devices. This structure is termed as sequential switch cascaded multilevel inverter. The basic asymmetrical hybrid circuit is described and is capable of generating 17 voltage levels. The various modes of deriving 17 levels are explained and the proposed topology is compared with existing topologies in various aspects. Neural network controller can be used to generate the gating pulses. The algorithm can be trained online by using back propagation algorithm and also an algorithm to determine the number of levels, maximum voltage ratings and power loss is explained. The simulation can be done by MATLAB Simulink.

1. Introduction

The scope of multilevel inverters has received more attention because of their high power handling capacity and they can be successfully implemented in medium and high power applications. Recently multilevel inverters are popular in most of power electronic applications due to its high power handling ability, modularity, and superior harmonic characteristics. An array of power semiconductor devices and dc voltage sources are used to generate stepped voltages. Also they are capable of producing output with high quality, reduced harmonics and switching losses. Among three basic types of multilevel inverter namely diode clamped, flying capacitor (FC), cascaded H-Bridge (CHB), the CHB topology uses reduced number of power switches. And to produce high voltage levels two switching configuration are used. They are termed as symmetrical and asymmetrical configuration. In asymmetrical switching by properly introducing the dc voltage proportions successfully the number of components can be reduced with increase in output voltage level.Asymmetrical cascaded MLI with trinary dc sources produce high number of levels than binary switching. Currently researchers concentrating on developing new structures of cascaded multilevel inverter to reduce number of power components [1]-[3]. The basic symmetrical topology presented in [4] requires (2X+1) output levels for X number of H-Bridges.

The major drawback of this symmetrical structure is its increased number of components for higher levels as it uses same dc voltages for all H-Bridges. A new symmetrical multilevel inverter has been presented in [5] that use single and double source sub multilevel units. The series and parallel combinations of switches reduce the total conducting switches in each level.

An asymmetrical configuration with series/parallel conversion of sources presented in [6].This topology is implemented with multi output boost converter. The drawback is when number of level increases the variety of dc sources increases. In article [7] asymmetrical cascaded H-Bridge with different switching frequency for different H-Bridges has been presented. The capacitor voltage balancing technique is also discussed but increases the voltage stress on each conducting switch. Modular Multilevel Converter (MMC) configuration presented in [8],[9] can be easily extended to higher levels but it requires large number of switches. And also neutral point clamped (NPC) technique introduced in1981 uses series connected capacitors at the input side. The main problem is capacitor voltage balancing [10],[11].

Various algorithms in determining values of sources have been presented in [12]. A trinary based algorithm is presented in [13] that needs minimum components and also many structures were developed to reduce number of switches , driver units, dc sources , maximum voltage rating. In [14]-[16] fundamental structure have been developed but number of switches and voltage rating of switches are high. A new topology is presented in [17] and three algorithms have been explained that reduces the number of components used. But here the variety of dc sources increases. A fundamental topology based on developed H- Bridges presented in literature [18] use unidirectional switches and also an algorithm to determine voltage rating, number of sources to analyze cost of the inverter is presented. An asymmetric topology with less number of main switches has been presented with concentration on THD reduction [19],[20]. In asymmetric switching with binary hybrid multilevel inverter produces higher number of levels than symmetric type [21].

In this paper a fundamental topology of multilevel inverter structure which uses reduced number of switches, dc sources. The basic unit is capable of generating seventeen voltage levels and this structure can be extended to higher number of levels.

The Insulated Gate Bipolar junction Transistor (IGBT) with antiparallel diode combination is used as switch. The circuit consists of combination of unidirectional and bidirectional switches. This sequential switch cascaded multilevel topology is compared with existing topologies presented in literature [10]-[18] in various aspects such as maximum blocking voltage, number of

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Implementation of Novel Spray and Weeding Robot Using Mobile for Agriculture Field

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Abstract-A robot is an apparently human automation, intelligent and obedient but impersonal machine. It is relatively, that robots have started to employ a degree of Artificial Intelligence (AI) in their work and many robots required human operators, or precise guidance throughout their missions. Slowly, robots are becoming more and more autonomous. In our project a spray pump and Small Tank are combined with robotic mechanism. We can fill the compound of Chemical to the tank. The robotic mechanism will move forward or reverse depend upon Mobile key tone (DTMF) operation. Pump will pull the Chemical Compound from tank when we press the spay key. We are using matrix type keypad Mobile and each key operate different movement. LCD displayed for corresponding function or operation. This project is very useful for agriculture applications. Our aim of the project is to reduce the man power for agriculture field. How is to be possible means we give three or four level in program for the controller. Unwanted leaf removes with help of weeding mechanism. In this project, the robot is controlled by a mobile phone that makes a call to the mobile phone attached to the robot. In the course of a call, if any button is pressed, a tone corresponding to the button pressed is heard at the other end of the call. This tone is called 'dual-tone multiple-frequency' (DTMF) tone. The robot perceives this DTMF tone with the help of the phone stacked in the robot.

Index Terms- Spraying, Weeding, DTMF, Artificial Intelligence

I. INTRODUCTION

The Robotics is the branch of mechanical engineering, electrical engineering and computer science that deals with the design, construction, operation, and application of robots, as well as computer systems for their control, sensory feedback, and information processing. These technologies deal with automated machines that can take the place of humans in dangerous environments or manufacturing processes, or resemble humans in appearance, behavior and or cognition. Many of today's robots are inspired by nature contributing to the field of bio-inspired robotics. The concept of creating machines that can operate autonomously dates back to classical times, but research into the functionality and potential uses of robots did not grow substantially until the 20th century. Throughout history, it has been frequently assumed that robots will one day be able to mimic human behaviour and manage tasks in a human-like fashion. Today, robotics is a rapidly growing field, as technological advances continue; researching, designing, and building new robots serve various practical purposes, whether domestically, commercially, or militarily. Many robots are built to do jobs that are hazardous to people such as defusing bombs, finding survivors in unstable ruins, and exploring mines and shipwrecks.

II. PROPOSED SYSTEM

The proposed system based on PIC microcontroller is found to be more compact, user friendly and less complex, which can readily be used in order to perform several tedious and repetitive tasks. Though it is designed keeping in mind about the need for industry, it can extended for other purposes such as commercial & research applications. Due to the probability of high technology (PIC microcontroller) used in this system is fully software controlled with less hardware circuit. The feature makes this system is the base for future systems. The principle of the development of science is that "nothing is impossible". So we shall look forward to a bright & sophisticated world.

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AUTONOMOUS NAVIGATION ROBOT

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Abstract - ***The project is design to build an obstacle avoidance robotic vehicle by using a ultrasonic sensors for its movement. A micro-controller (AT mega 328P) is used to achieve the desired operation. A robot is a machine that can perform task automatically or with guidance. It is a combination of computational intelligence and physical machines (motors). Computational intelligence follows the programmed instructions.***

The project proposes robotic vehicle that has an intelligence built in it such that it directs itself whenever an obstacle comes in its path. This robotic vehicle is built, using a micro-controller of AT mega 328P family. An ultrasonic sensor is used to detect any obstacle in front of it and sends a command to the micro- controller. Depending on the input signal received, the micro-controller redirects the robot to move in an alternate direction by actuating the motors which are interfaced to it through a motor driver.

Key Words: **Robot, AT mega-328P microcontroller, Ultrasonic sensors, obstacle avoiding robot, servomotor**

I. INTRODUCTION

Obstacle avoidance is a primary requirement of any autonomous navigation robot. Obstacle avoidance robot is designed to allow the robot to navigate the unknown environment by avoiding collisions[1]. It senses if there is any obstacles in the path to avoid it and resumes its running.

There are some very famous methods for robot navigation like wall-following, edge detection, bomb disposal, line following. One of the commercial systems uses wall-following method on a floor cleaning robot for long hallways. [1] A more general and commonly employed method for obstacle avoidance is based on edge detection. The drawback of obstacle avoidance based on edge detecting is the need of the robot to stop in front of an obstacle in order to provide a more accurate measurement. It detect an obstacle and stop the robot in order to avoid a collision, using some sophisticated algorithms that enable the robot to detour obstacles. In future algorithms are more complex, since they involve detection of an obstacle as well as some kind of quantitative measurements concerning the obstacle's dimensions.

In this paper the steering algorithm ensures that the robot does not have to stop in front of an obstacle during its navigation [2] Hence the robots may overcome some of the problems during navigation, which are discussed above and it can navigate smoothly during its operation avoiding the collisions. We have presented a basic algorithm and design which can be further improved depending upon the required applications.

II. EXISTING SYSTEM:

In simple robot, steering algorithm is used for robotic actions in which driver or a human being is controlling the robot by using r e m o t e . Here driver is present, who can see the obstacle and navigate robot accordingly.

III. PROPOSED SYSTEM:

The project proposes an autonomous robotic vehicle. In which no remote is used for controlling the robotic actions. It intelligently detects obstacles present on its path through the sensors and take decision on the basis of internal code that we set for it. Here we are using servomotor to rotate the sensor up to180 degree or 360 degree.

The detail information is given in the following subtopics which will help you to understand the whole system and its design.

BASIC DESIGN OF ROBOT

This robot was built with an Arduino development board on which microcontroller is placed. Arduino board is connected with DC Motor through Motor driver board which provide power to the actuators. Actuators are used to move robot in Forward, Reverse, Left and Right directions.

The brief description of inputs pins for movement of robot is given in below in table.

Movement	Pin 10	Pin 11	Pin 12	Pin 13
Forward	1	0	0	1
Backward	0	1	1	0
Left	1	0	1	0
Right	0	1	0	1

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INTELLIGENT SOLAR OPERATED PESTICIDE SPRAY PUMP WITH CELL CHARGER

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***Abstract* - Energy is the important need for human beings. Human revealed the new path in sciences by using conventional energy sources and non-conventional energy sources. But most of the innovation depends upon conventional energy sources get affected on environment and human health in every day. So we are interested to turn science into green science by using non-conventional energy sources. Basically sun is clean source of non-conventional energy which is inexhaustible. Sun emits solar radiation regularly in day time. By using solar panel we can easily convert the light energy into electrical energy and do any mechanical work by using that electrical energy. Farmer is the heart of Indian Economy and our new invention gives support by making farmer friendly solar operated spray pump. Use of other pesticide pumps causes fatigues, pollution which is harmful for green society. Considering all energy crisis, solar energy would be one of the best solutions. Here we prepared low cost farmer friendly solar operated pesticide pump with devices such as emergency LED and dc mobile charger. This pesticide pump is remotely use at various places such as farm, garden also in municipality to kill mosquitoes. We hope our new invention make the farmers modern and smarter.**

Key Words: Solar energy, green energy, solar panel, multipurpose machine, pesticide solar sprayer.

1. INTRODUCTION

"Energy - demand" is one of the major threads for our country. Finding solutions, to meet the "Energy demand" is the great challenge for Social Scientist, Engineers, Entrepreneurs and Industrialist of our Country. According to them, Applications of Non conventional energy is the only alternate solution for conventional energy demand. Now a day energy becomes very popular for all kinds of development activities [1-4]. One of the major area, which finds number of applications are in Agriculture Sectors [5].

Science and Engineering is making use of knowledge to meet human needs by creating machine, systems, process and technologies that have not previously existed. Design and manufacturing are the synthetic part of engineering practice. Manufacturer has received a lot of attention recently for very good economic reasons [5-12]. In Indian farms generally two types of spray pumps are used for spraying, hand operated spray pump and fuel operated spray pump. Of which hand operated spray pump is most popular. The main drawback of hand operated spray pump is that the user can't use it for more than 5-6 hours continuously as he gets tired after some hours where as fuel operated spray pump requires fuel which is expensive and availability of fuel is not easy at rural places. At the same time it exhausts carbon dioxide as pollutant which is harmful to our environment. Also use of other pesticide pumps causes fatigues. In such situation we should think to move towards some non-conventional energy. Considering it, solar energy would be one of the solutions. Solar energy plays an important role in drying agriculture products and for irrigation purpose for pumping the well water in remote villages without electricity. This technology on solar energy can be extended for spraying pesticides, Fungicides and Fertilizers etc., using Solar Sprayers.We know 70% of population of our country lives in villages and their main occupation is agriculture. Our prominent aim of this project is to fulfil the tasks like hand spraying, IC engine spraying, and leg pump spraying etc. using non-conventional energy sources. Here we prepared a low cost solar operated pesticide pump with devices such as emergency LED, dc mobile charger, which can work without any fuel. This pesticide pump can be use at various places such as farm, garden also in

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Synthesis and Biological Evaluation of Thiazolidinone Derivatives as Antimicrobial Agents

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Abstract - New series of 5-fluoro-2-(2-(4-substitutedphenyl)-4-oxothiazolidin-3-yl)benzonitrile, 3(a-e) have been synthesized from Schiff bases 2(a-e). Schiff bases were synthesized by condensation of 2-amino-5-fluorobenzonitrile with substituted aromatic aldehyde by conventional as well as sonication method thus providing unique chemical processes with special attributes such as enhanced reaction rates and higher yields. All the synthesized compounds were screened for their antibacterial and antifungal activities against some gram positive and gram negative stains. The structure of the synthesized compounds was confirmed by chemical and spectral analysis like IR, ^{1}H NMR and ^{13}C NMR.

Keywords: 2-amino-5-fluorobenzonitrile, Thiazolidinone, Conventional, Antimicrobial and antifungal.

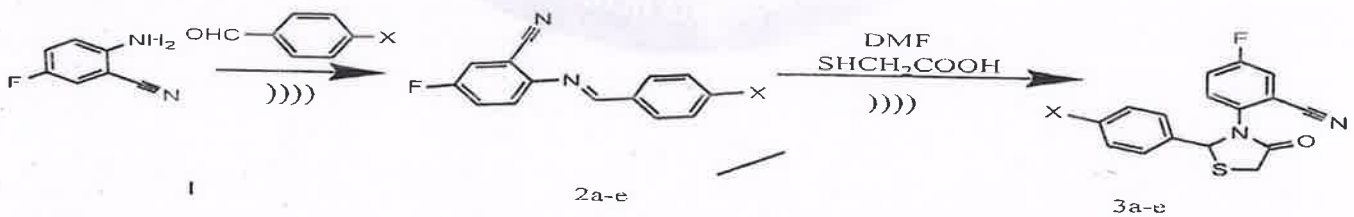
I. INTRODUCTION

4-thiazolidinone nucleus has occupied a unique place in the field of potential pharmaceutical applications. The reactions begin by formation of an imine (the nitrogen of amine attacks the carbonyl of aldehyde or ketone), which undergoes attack by generated sulfur nucleophile, followed by intramolecular cyclization on elimination of water.[1],[2],[3], As of late, this system containing compounds were successful against antimicrobial. Thiazoles are heterocyclic compound containing nitrogen and sulfur particles in their structure and are turned out to be clinically valuable specialists against various types of diseases. Thiazole derivatives have been employed in the preparation of different important drugs required for treatment of Antibacterial [4], Antifungal [5], Antitubercular [6], Anticancer [7], Antiinflammtory [8], Analgesic [9], Anticonvulsant [10], Antidepressant [11], Antiviral [12], Anti-HIV [13], Antidiabetic [14] and Antiarrhythmic [15].

II. MATERIALS AND METHODS

2.1 Experimental

Melting points were taken in open capillaries are uncorrected. Progress of reaction was monitored by silica gel-G coated TLC plates using MeOH: $CHCl_3$ system (2:8). The spot was visualized by exposing dry plate at iodine vapours chamber. IR spectra were recorded in KBr disc on Schimadzu 8201 PC, FTIR spectrophotometer (Vmax in cm-1) and ^{1}H NMR and ^{13}C NMR spectra were measured on a Brucker DRX-300 spectrometer in $CDCl_3$ at 300 and 75 MHz using TMS as an internal standard respectively. All chemical shifts were reported on δ scales. The analytical data of all the compounds were highly satisfactory. For column chromatographic purification of the products Merck silica Gel 60 (230-400 Mesh) was used. The analar grade chemicals were purchased from the commercial sources and further purified before use.



I 2a-e 3a-e

Scheme 1

(X= H, Cl, F, -CH_3, -OCH_3)

2.2. General Sonication method for synthesis of compound 2(a-e) and 3(a–e)

2.2.1 General procedure for the synthesis of Schiff bases 2(a-e)

2-amino-5-fluorobenzonitrile (I) (1mmol), Substituted aromatic aldehydes (1mmol) and 95% ethanol (20 ml) were taken into a 100 ml conical flask. Sample was exposed to intense ultrasonic irradiation the amplitude of the ultrasonic device UP400 S (400W, 24 kHz) was set to 50 % sonication was applied for 90 min at room temperature. The sonotrode of the ultrasonic liquid processors UP4000 S was immersed directly into the reaction solution. The completion of the reaction was monitored by silica gel-G coated TLC plates. After the completion of the reaction the product was filtered with suction on a Buchner funnel. The

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Synthesis and biological evaluation of azetidinone derivatives of 2-(3-chloro-2-(4-substituted phenyl)-4-oxoazetidin-1-yl)-5-fluorobenzonitrile

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Abstract - A series of 2-(3-chloro-2-(4-substituted phenyl)-4-oxoazetidin-1-yl)-5-fluorobenzonitrile compounds (3a-e) have been synthesized from Schiff bases (2a-e). Schiff bases were synthesized by condensation reaction of 2-amino-5-fluorobenzonitrile with substituted aromatic aldehyde and characterized by chemical and spectral analyses such as IR, ^{1}H NMR, ^{13}C NMR. All the synthesized compounds 3a-e were screened for their antibacterial and antifungal activities against some selected bacteria, fungi with their zone of inhibition values and antitubercular activity screened against *M. tuberculosis*. Some compounds of the series showed good activities.

Keywords: 2-amino-5-fluorobenzonitrile, azetidinone, antimicrobial and antitubercular.

I. INTRODUCTION

2-Azetidinone or β-lactums are outstanding class of heterocyclic compounds among natural and therapeutic chemistry[1,2]. They are most endorsed anti-microbial in prescription. The β-lactums nucleus is the structural feature and the core of the biological activity of one of the most successful classes of therapeutic agents to date characterized by a broad spectrum of activity and low toxicity. Unfortunately, long-term use related to the overuse and misuse of β-lactam antibiotics have resulted in the proliferation of resistant organisms among a variety of clinically noteworthy species of bacteria becoming an important worldwide problem. Their effectiveness has been seriously compromised by the bacterial ability to develop different competitive mechanisms in order to survive Besides their antibiotic activity azetidinones are also known to exhibit some other types of biological activities, for example, antibacterial [3-5] ,antimicrobial[6], Antitubercular[7],anti-inflammatory,[8,9] enzyme inhibitors[10], central nervous system[11-12] and anticonvulsant,[13,14] Antitumor activity,[15,16,17].

Bacterial and fungal infection is most common problem of the world. Some serious and life treating diseases also caused by bacteria or fungal infection. In case of accident and limb transplantation or surgery microbial infection is also common problem. From the last decade, researchers made a continuous effort to fight these diseases. Several new classes of chemotherapeutic agents have been introduced in the last decade. As part of interest in heterocyclic that have been explored for developing pharmaceutically important molecules. Biocidal activities of azetidinone have been well established. These have been attributed to the toxophoric C=N linkage in them. All synthesized compounds were screened against selected bacteria and fungi for their antimicrobial activity and antitubercular activity[18] screened against *M. Tuberculosis*. Structures of all the newly synthesized compounds were confirmed by elemental analysis such as IR, ^{1}H NMR and ^{13}C NMR.

II. EXPERIMENTAL

Melting points were taken in open capillaries are uncorrected. Progress of reaction was monitored by silica gel-G coated TLC plates using MeOH: $CHCl_3$ system (2:8). The spot was visualized by exposing dry plate at iodine vapours chamber. IR spectra were recorded in KBr disc on Schimadzu 8201 PC, FTIR spectrophotometer (Vmax in cm-1) and ^{1}H NMR and ^{13}C NMR spectra were measured on a Brucker DRX-300 spectrometer in $CDCl_3$ at 300 and 75 MHz using TMS as an internal standard respectively. All chemical shifts were reported on δ scales. The analytical data of all the compounds were highly satisfactory. For column chromatographic purification of the products Merck silica Gel 60 (230-400 Mesh) was used. The analar grade chemicals were purchased from the commercial sources and further purified before use.

General procedure for the synthesis of Schiff bases (2a-e)

2-amino-5-fluorobenzonitrile (1) (1 mmol), Substituted aromatic aldehydes (1 mmol) and 95% ethanol (20 ml) were taken into a 100 ml conical flask. The mixture was irradiated in a microwave generator in a water-bath for 10 min. The completion of the reaction was monitored by silica gel-G coated TLC plates. After the completion of the reaction the product was filtered with suction on a Buchner funnel. The purified product was dried under vacuum and recrystallized from ethanol at room temperature to yield compound 2a-e.

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Evaluation of water quality suitability for drinking using drinking water quality index in Nagapattinam district, Tamil Nadu in Southern India

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Show more

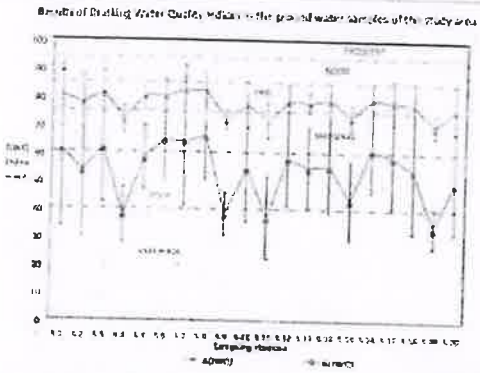
https://doi.org/10.1016/j.gsd.2017.10.005

Abstract

The overall water quality condition is explained using multiple water quality variables by developing a water quality index as a single number. The index consists of water quality variables: pH, EC, total alkalinity, total hardness, calcium, magnesium, chloride, sulphate, fluoride, nitrate, sodium, chromium, copper, iron, manganese, zinc and lead. The present study aims to assess the drinking water quality of the study area in and around Mayiladuthurai taluk using drinking water quality index system. Seventeen water quality parameters are selected for evaluation of water quality. A data set of 20 ground water samples collected from the study area in and around Mayiladuthurai taluk, Tamil Nadu is used to evaluate the quality of water samples through arithmetic and geometric index system.

Graphical abstract

Results of Drinking Water Quality Indices in the ground water samples of the study area



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Introduction

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SOLVING FUZZY TRANSPORTATION PROBLEM USING SUBINTERVAL AVERAGE METHOD OF RANKING

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ABSTRACT

In this paper a new ranking method called Subinterval Average Method is proposed to solve a fuzzy transportation problem. The basic feasible solution has been determined and Modified Distribution method have been utilized to check the optimality of the solution without converting the fuzzy transportation problem into crisp one using the new ranking method. A relevant numerical example is given to clarify the method.

Keywords: *Defuzzification, Fuzzy Number, Ranking of Fuzzy Numbers, Fuzzy Transportation Problem.*

1. INTRODUCTION

The process of production management involves increase of profit by reducing the cost with the values imprecise, the fuzzy set theory could be applied appropriately. Linear programming problems play a vital role as a pioneering tool. Fuzzy sets were introduced by Zadeh and Dieter Klaua in 1965 to represent, manipulate data and information possessing nonstatistical uncertainties [13]. Since the parameters engaged in this process uncertainly, we can use fuzzy linear programming problems. Bellman and Zadeh proposed the concepts of decision making in fuzzy environments [1]. The idea of fuzzy linear programming was first initiated by H.O'heigeartaigh [5].

The process of production management involves maximizing of profit by minimizing the cost with the values imprecise; the fuzzy set theory could be suitably fit. A fuzzy transportation problem is a transportation problem formulated with fuzzy quantities of transportation costs, supply and demand. Many of the existing techniques provide only crisp solutions for the fuzzy transportation problem. Chanas and Kutcha [2] proposed a method to find the optimal solution to the transportation problem with fuzzy coefficients in 1996. Saad and Abbas [7] discussed an algorithm to solve a transportation problem in fuzzy environment in 2003. Gani and Razak [3] discussed a two stage cost minimizing fuzzy transportation in which the demand and supply quantities are trapezoidal fuzzy numbers in 2006. Dinagar and Palanivel [4] studied FTP with trapezoidal fuzzy numbers and they developed a method to find optimal solution in terms of fuzzy numbers in 2009. Pandian and Natarajan [6] proposed a new algorithm namely fuzzy zero point method to find optimal solution of a FTP with trapezoidal fuzzy numbers in 2010.

Since fuzzy numbers are denoted by possibility distribution, it is tough to order clearly the ascending or descending order. A right method for ordering the fuzzy numbers is by the use of a ranking function. The ranking function maps each fuzzy number into the real line. A ranking function is a function $R:(R) \rightarrow R$ which maps each fuzzy number into the real line, where a natural order exists. There are so many ranking methods available, nowadays. Among them, the notable procedures are Lexicographic screening procedure discovered by Wang, M. L., Wang, H. F., Lung, L. C. (2005) [11], Area between centroid and its original point method [12] by Wang, Y. J., Lee, H. S. (2008); SD of PILOT procedure [8]; and Area method [9] and A Revised approach of PILOT ranking procedure [10] by Stephen Dinagar, D., and Kamalanathan, S.

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Self-Weak Complementary Fuzzy Soft Graph

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Abstract: In this paper, we discussed the notion of fuzzy soft graph and concepts of homomorphism, isomorphism, weak isomorphism, self-weak isomorphism of fuzzy soft graphs. Also some properties of isomorphism on fuzzy soft graphs, self-complementary and self-weak complementary fuzzy soft graphs are discussed.

Keywords: Weak isomorphism, self-complementary fuzzy soft graphs, self-weak complementary fuzzy soft graphs.

I. INTRODUCTION

The concept of fuzzy set theory was introduced by zadeh. A [1]. This concept have potential application in various fields such as the smoothness of functions, medical and life sciences, social sciences, Engineering graph theory, artificial intelligence, robotics, computer, networks, decision making and automata theory. The concept of fuzzy soft sets with is a new mathematical tool was irstly introduced by Maji et al [2]. They presented the definition of fuzzy soft sets and investigated some properties at this notion. Therefore many researchers have applied this concept on different branches. In 1975, Rosenfeld [8] introduced the concept of fuzzy graphs. Therefore many researchers have generalized the different notions of graph theory using the notions of fuzzy sets. P. Bhattacharya in [3] showed that a fuzzy graph can be associated with a fuzzy group in a natural way as an automorphism group. K.R. Bhutani in [4] introduced the concept of weak isomorphism and isomorphism between fuzzy graphs. In this paper we define the concept of homomorphism, isomorphism, weak isomorphism, self weak isomorphism of fuzzy soft graph. We also study some of their important properties.

II. PRELIMINARIES

In this section ,We recall some basic notion of graph ,fuzzy graph, soft graph and fuzzy soft graphs

A. Definition:2.1

A *graph* G = (V, E) consists of a non-empty set of objects V called vertices and a set E of two element subset of V called edges.

B. Definition:2.2[5]

Let V be a non-empty finite set μ: V → [0, 1] and v =VxV → [0, 1].If v(x, y) ≤ μ (x) Λ μ(y) for all x, y ∈ V. Then the pair G =(μ,v) is called a *fuzzy graph* over the set V. Here μ and v are called *fuzzy vertex* and *fuzzy edge* of the fuzzy graph (μ, v).

C. Definition:2.3[6]

Let (F, A) be a soft set over V. Then (F, A) is said to be a *soft graph* of G if the subgraph induced by F(x) in G. F(x) is a connected subgraph of G for all x ∈ A.

D. Definition:2.4

A *fuzzy soft graph* $\tilde{G} = (G^*, \tilde{F}, \tilde{K}, A)$ is a 4 tuple such that

(i) G* = (V, E) is a simple graph

(ii) A is a nonempty set of parameters

(iii) $(\tilde{F}, A)$ is a fuzzy soft set over V.

(iv) $(\tilde{K}, A)$ is a fuzzy soft set over E.

(v) $(\tilde{F}(a), \tilde{K}(a))$ is a fuzzy (sub) graph of G*, for all a ∈A.

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Solving Fuzzy Linear Programming Problem Using New Ranking Procedures of Fuzzy Numbers

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Abstract

In this paper the new ranking methods of Subinterval Addition and of Subinterval Average are developed to solve the fuzzy linear programming problem. The fuzzy quantities are defuzzified using the proposed ranking methods and then the simplex method is employed to find the optimal solution. Some numerical examples are given to illustrate our results.

Keywords: *Defuzzification, Fuzzy Numbers, Ranking of Fuzzy Numbers, Linear Programming Problem.*

Received: September 28, 2017

1. Introduction

Since the process of production management involves increase of profit by reducing the cost with imprecise values, the fuzzy set theory could be applied appropriately. Linear programming problems play a vital role as a pioneering tool. Fuzzy sets were introduced by Zadeh in 1965 to represent non statistical uncertainties, manipulate data and information possessing [12]. Since the parameters are engaged in this process uncertainly, we can use fuzzy linear programming (FLP) problems. Bellman and Zadeh proposed the concept of

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Sub interval addition method for ranking of fuzzy numbers

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Abstract

In this paper, a new method using the addition of sub intervals formed by discrete points of real line covered in the fuzzy numbers is presented. A generalized indexed formula has been set. Using this formula any linear type of normalized fuzzy number could be ranked. This method is simple in estimating the ranking of fuzzy numbers. The concept is illuminated with suitable examples and some properties related to the method is discussed.

Key Words and Phrases: polygon fuzzy numbers; ranking; ranking of fuzzy numbers; sub intervals.

1 Introduction

Zadeh introduced fuzzy sets in 1965 [15]. It helps in representing and possessing information of data in nonstatistical uncertainties. "Fuzzy numbers" refer to a connected set of possible values, of which each value has a different weight in between 0 and 1, unlike a single valued number. It is a special case of normalized fuzzy set in the real line, which is also convex. It influences in solving the problems practically arising in realistic world. Ranking the fuzzy

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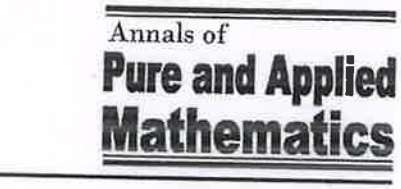

A Comparison of Two New Ranking Methods on Solving Fuzzy Assignment Problem

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Abstract. In this paper two different new ranking methods namely "Ranking of Fuzzy Numbers with New Area Method" and "revised SD of Point of Intersection of Legs of Trapezium (PILOT) ranking procedure" are proposed to defuzzify the generalized trapezoidal fuzzy numbers. A comparative study based on the solution of fuzzy assignment problems with generalized trapezoidal fuzzy numbers has been made using the proposed ranking methods and the results are discussed along with appropriate numerical examples

Keywords: Defuzzification; Fuzzy Number; Generalized Trapezoidal Fuzzy Numbers; Ranking of Fuzzy Numbers; Fuzzy Assignment Problem

AMS Mathematics Subject Classification (2010): 03E72, 90C05

1. Introduction

The process of production management involves increase of profit by reducing the cost with the values vague atmosphere, the fuzzy set theory could be applied appropriately. Linear programming problems play an important task as a revolutionary tool. Fuzzy sets were introduced by Zadeh and Dieter Klaua in 1965 to represent, control data and information possessing nonstatistical uncertainties [15]. Since the parameters engaged in this process uncertainly, we can use fuzzy linear programming problems. Bellman and Zadeh proposed the concepts of decision making in fuzzy environments [1]. The idea of fuzzy linear programming was first initiated by H.O'heigeartaigh [6].

Assignment problem is a special type of linear programming problem. It is basically allocation of different resources to different activities on one-to-one basis. It helps to use the resources such a way that cost or time may be minimized so as to increase the profit. The process of production management involves maximizing of profit by minimizing the cost with the values imprecise; the fuzzy set theory could be used appropriately. A fuzzy assignment problem is a transportation problem formulated with fuzzy quantities of transportation costs, supply and demand. Many of the existing techniques provide solutions for the fuzzy assignment problem. Chen [3] presented a fuzzy assignment model that considers all persons to have same skills. Long Sheng

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Finding Fuzzy Critical Path using Revised PILOT Method of Ranking

Research Article

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Abstract: In this paper a new ranking method called "Revised Point of Intersection of Legs of Trapezium (PILOT)" have been proposed used to find the fuzzy critical path, fuzzy earliest, fuzzy latest times and fuzzy floats in a project management problem. It is quiet interest to study in calculating critical path using generalized trapezoidal fuzzy number. A numerical example is given for justifying the proposed method.

MSC: 03E72, 90C05.

Keywords: Defuzzification, Fuzzy Number, Ranking of Fuzzy Numbers, Fuzzy Critical Path.

1. Introduction

The process of production management involves increase of profit by reducing the cost with the values imprecise, the fuzzy set theory could be applied appropriately. The Critical Path Method (CPM) is a technique of project modelling introduced by Morgan R. Walker and James E. Kelley in the year 1950. Critical path method plays a crucial role in project management. Many business firm are applying the concept of project management in order to maximizing the resource utilization and in reducing the overall cost properly. Fuzzy sets were introduced by Zadeh and Dieter Klaua in 1965 to denote, influence data and information holding nonstatistical uncertainties [15]. Since the parameters engaged in this process uncertainty, we can use fuzzy environment. Bellman and Zadeh proposed the concepts of decision making in fuzzy environments [1].

The process of production management involves maximizing of profit by minimizing the cost with the values imprecise; the fuzzy set theory could be applied appropriately. A fuzzy critical path problem is formulated with fuzzy quantities of activities and duration. Many of the existing methods are available to find fuzzy critical path. Yao and Lin [14] studied fuzzy critical path method based on signed distance ranking of fuzzy numbers in 2000. Chanas and Zelinski [2] proposed a method Critical path analysis in the network with fuzzy activity times in 2001. Liu [5] studied Fuzzy activity times in critical path and project crashing problems in 2003. Chen [3] discussed analysis of critical paths in a project network with fuzzy activity times in 2007. Chen and Hsueh [4] discussed A simple approach to fuzzy critical path analysis in project

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OPTIMIZED PSEUDO-DERIVATIVE FEEDBACK WITH FEED-FORWARD CONTROLLER USING FLOWER POLLINATION ALGORITHM FOR AUTOMATIC GENERATION CONTROL IN A RESTRUCTURED POWER SYSTEM

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Abstract: *This paper presents Pseudo-Derivative Feedback with Feed-forward controller (PDFF) controller based Automatic Generation Control (AGC) of a two area interconnected power system. The control parameter of PDFF controller are optimized employing Flower Pollination Algorithm (FPA) in order to achieve the optimal transient response of the test system under for different types of possible transactions in restructured environment. The proposed PDFF controller are used in AGC application which locates the zero at an optimal place that shortens the step response rise time without overshoot and gives better dynamic performance of the system over PI controller. Integral Square Error (ISE) criterion of the test system was considered as an objective function to be minimized for tuning the gains of PDFF controller using FPA. In this study two type of test system is considered such as two area Hydro-Thermal and Thermal-Diesel power system. The simulation results show that the proposed FPA tuned PDFF controller improves the dynamic response of the restructured power system. The convergence speed performance of the proposed FPA algorithm is significantly better compared to those achieved by the existing algorithms. Moreover the Power System Restoration Indices (PSRI) is computed based on system dynamic performances and the remedial measures to be taken can be adjudged. These PSRI indicates that the ancillary service requirement to improve the efficiency of the physical operation of the power system with the increased transmission capacity in the network.*

Key words: *Automatic Generation Control, Flower Pollination Algorithm, Diesel power plant, PDFF Controller, Power System Restoration Indices.*

1. INTRODUCTION

Automatic generation control (AGC) has greater currency in power system operation and control to supply sufficient, efficient, reliable and quality electrical power to the consumers. A critical up-to-date literature review explaining all aspects of AGC is reported in [1–3]. A power system can be considered as being divided into control areas interconnected by the tie-lines. For satisfactory operation of a power system the frequency should

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Investigation in Autonomous Line Follower Robot

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The line follower robot is a mobile machine that can detect and follow a line drawn on the floor. In this paper, a predefined path is provided and the path is made up of a black line on a white surface with high contrast color. The mobile robot senses the path with two of its infrared sensors that installed under the robot and a third infrared sensor is used for obstacle avoidance. The left sensor controls the right wheel and the right sensor control the left wheel. The sensors detect the path and provide the information to the microprocessor. The microprocessor activates the motors depending on the path which may be straight or curved. The robot is allowed to follow a line of 4m length with varying wheel diameter and Castor position. The times taken for the travel under different arrangement were tabulated. Design of Experiments is used for finding optimal design parameters of the robot for time taken to complete the travel along the predefined path. The parameters considered are Wheel Diameter 'D' for three levels (70 mm, 80 mm, 90 mm), Centre to Centre (C-C Distance) between the Caster wheel centre and the Rear wheel centre for three levels (90 mm, 100 mm, 112 mm). Finally empirical model have been formulated by the application of Regression Modeling after evaluation of Test of hypothesis for above mentioned levels and factors for significant effects. The results obtained from the design of experiments are given fed in to the fuzzy logic controller. The results of the two methods were compared and obtained satisfactory results.

Keywords: Autonomous Line Follower Robot, Response Surface Modeling, Regression Modeling, Fuzzy Logic Control

Introduction

Mobile Robots are mechanical devices cable of moving in an environment with a degree of autonomy. Autonomous navigation is associated to the availability of external sensors that capture information of the environment through visual images or distance or proximity measurements[1]. A mobile robot is programmed to follow a dark line on the white background[2,8] and detect turns (or) deviations and modify the motors appropriately. The path was sensed by the IR (Infra-Red) sensors. Differential steering is used to turn the robot. Each back wheel has a dedicated motor while the front wheel is free to rotate. An Autonomous mobile robot for speed and position control on variable trajectory depending on trajectory curvature was designed. Road data image was captured by CCD camera[3,4] mounted on the vehicle and transferred to host computer and RF data link unit. Image processing was applied on trajectory. Reference speed was applied to fuzzy controller unit and output was send to vehicle by wireless transmitter unit. The robot has the capability to follow the line on the floor using visual feedback and maintaining its balance on two wheels. The visual servoing technique allowed the robot to follow the line on the floor captured by a camera as the desired trajectory[4]. A RCX LEGO robot is a robot for training undergraduate student which incorporates an on-board Hitachi H8 microprocessor. Two light sensors were used under the robot to sense a white line drawn on a black surface[5,7]. A fuzzy logic algorithm was used to move the robot to follow the line[5,8]. An educational mobile robot called Rug-Warrior Pro for robotics course was developed. It was the use of fuzzy logic[6,8] for controlling and could avoid obstacles. The robot was based on the Motorola MC68HC811E2 microcontroller with extended memory and real-time operating system.A line follower is made from a tankbot using twin line sensors. It follows white line drawn on the black surface[7]. A low cost educational microcontroller based robot called Robo-PICA and was equipped with a pair of infrared reflectors mounted at the bottom and at both corners of the robot. The fuzzy logic controller implemented inside PIC16F887 microcontroller using mikroC development environment kept the robot on track. The robots developed followed a black line follow on

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Worm Gear Drive optimization Considering Industry Constraints Based on Nature Inspired Algorithms

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ABSTRACT

This paper presents a novel method to obtain optimum design for a worm gear drive used in sugar industries taking into account certain constraints of industrial relevance. The objective of this research is to minimize volume of worm gear drive. Gear ratio, face width and pitch circle diameters of worm and worm wheel are considered as design variables. Industry relevant constraints viz. gear strength capacity, wear capacity, thermal capacity, dynamic load, self locking, and face width are considered. Besides this other constraints such as maximum power transmission capacity, centre distances, deflection of worm and beam strength of worm are also considered. Nature inspired optimization algorithms, namely, Simulated Annealing (SA), Firefly (FA), Cuckoo Search (CS) and MATLAB solvers fmincon and GA are used for solving this problem in MATLAB environment. Results of simulation are analysed and presented.

Keywords: Gear optimization, Worm gear drive, Industry relevant constraints, Nature inspired algorithms SA, FA, CS, MATLAB solvers GA, fmincon

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Advanced helical gear reducer design optimization through nature inspired algorithms

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ABSTRACT

In this paper a high power helical gear pair design optimization problem is solved. It is a multi variable, complex non linear problem with derived objective function and constraints. The objective is to minimize the volume of the gear. The design parameters considered are module, face width, number of teeth on drive and driven and helix angle. The various factors for sizing and strength of gear geometry parameters are based on German Institute for Standardization (DIN) Standards. Nature inspired algorithms, namely, Simulated Annealing (SA), Fire fly (FA) and Cuckoo Search (CS) and MATLAB solvers fmincon, GA are used. Simulation results are analysed and compared with literature.

Key words: Helical gear reducer design, DIN Standards, optimization, metaheuristics, Nature inspired Algorithms SA, FA, CS, MATLAB solvers fmincon, GA

Deep Learning in Artificial Intelligence

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I. INTRODUCTION

Artificial Intelligence is the field of computer technology and which is used to apply varies theories, models, methods, techniques and algorithms to simulate and develop intelligent systems. AI enables to solve real time problems by using computer and make intelligent decision. An algorithm is the main part for developing or solving real time problems and it is the step by step procedure at each stage. AI algorithms are set of procedure and used to perform intelligent behaviour and make successful decision using involvement of learning and perception. The main purpose of AI is to apply technology to real time situation and reduce the human efforts. The high level goal is to the user to exhibit perception behaviour to intelligent machine. Learning is the most important part for applying AI based solutions or automated environment. Learning can be done by perception of input behaviours at different environment. Deep learning is the most responsible part to recognize or percept following capabilities of intelligent system like problem solving, decision making, planning and reasoning, interaction and knowledge representation. Deep learning process is used to build, represent and analysis input behaviours and involves symbolic and neural forms to achieve knowledge representation. Knowledge representation is the important part in AI and which leads the role to make intelligent machine with decision making capabilities.

Machine learning and Natural Language processing is need to apply deep learning process. Machine learning techniques are used to analyse the behaviours be set of input characteristics. A successful intelligent AI system gives the ability to read, write, process and generate human and native user inputs. Nowadays Internet are playing important role in day-to-day life and includes information processing and analysing various inputs such as text, audio, video, etc. Handling internet request AI researchers are developed highly effective algorithms as well as computer vision techniques.

This paper mainly focuses on general techniques of AI with deep learning characteristics and gives historical view of current state of intelligent systems. Based on various survey we focused the AI can verifies different paradigms such as machine learning, agent interaction systems, natural language processing, etc. The core application of AI the above is need and most significant contribution in AI technology and deep learning.

II. THE FIRST ERA OF AI

The expert systems are started in engineering domain in 1970s and it devised computer programs based on pseudo code transition. Teach Pendent type of AI system involved in Expert application processing in telecommunication and commercial environments. In this case the capability of learning and converting new situation is difficult process. So the decision making process was not up to the level and solve the complex problem is tedious process. The expert systems developed in 1980s with the if-else statement t make decision with inference rule forms. Due to this stage the first AI system cannot handle real time data processing, language processing and chat based applications.

The researchers can decide machine learning based expert systems with the involvement of contributors and optimization produce to good software deliverables. According to the survey of Colorado University and Li Deng et al, the speech processing agent systems are in the field of 1990s to perform automated caller based response system. The author can contribute to transmitting from inference rule based mechanism to speech recognition system with the capable of data domain, knowledge and statistical approach.

III. THE SECOND ERA OF AI

The speech processing agents are used in real time application and which gives clear picture of learning and perception. Computer vision was played vital role for handling perception and knowledge request. According to defence based knowledge systems and NASA report the speech based agents are having autonomous behaviour and automated learning capabilities. In this case, the machine learning inputs and natural language processing are combined with deep learning representations. In such cases, AI system more focuses on trained input data and predefined algorithms. The real time input capturing agents are designed in 2000s with the key components such as decision trees, Bayesian networks, support vector machine, neural networks, etc. Generally the AI system performs various real time applications like face recognition, Bio-metrics process, speech processing, machine learning vision applications, etc.

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Motion Detection Algorithm for Agent Interaction Surveillance Systems

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Abstract - Motion detection is the essential process in the extraction of information from moving objects in automatic video surveillance system. In this work, a novel and accurate approach is used to detect moving object from video. It contains two phase background matching techniques such as rapid matching and accurate matching for background modelling. The rapid matching technique is used to quickly find out difference between the current and previous incoming video frames. The accurate matching is used to compare the current incoming frame and current background candidates. The background module is used to produce optimum background pixels for the background model. Next, our proposed AT module eliminates the unnecessary examination of the entire background region allowing the subsequent OE module to only process block containing moving objects. Finally, the OE module forms the binary object detection mask in order to achieve highly complete detection of moving objects. The detection results produced by our proposed method were both qualitatively and quantitatively analyzed through visual inspection and for accuracy, along with comparisons to the results produced by other state of-the-art methods.

Index: Motion Detection, Video Surveillance System, Alarm trigger, Object Extraction Model.

I. INTRODUCTION

Video is the technology of electronically capturing, recording, processing, storing, transmitting, and reconstructing a sequence of still images representing scenes in motion. Video processing uses hardware, software, and combinations of the two for editing the images and sound recorded in video files. Extensive algorithms in the processing software and the peripheral equipment allow the user to perform editing functions using various filters. The desired effects can be produced by editing frame by frame or in larger batches. Most modern personal computers come with software that allows the user to compile images and videos, edit images, and create videos on a limited level. Storyboards allow the addition of audio files and the adjustment of visual images, transitions, and audio files, which, together, determine the overall length of the video. Videographers, electrical engineers, and computer science professionals use programs that are capable of a wider range of functions. Signal processing usually involves applying a combination of prefilters, intrafilters and post filters.

Video files are obtained from the recording device using a universal standard bus (USB) cable or fire wire attachment. The files are then loaded into a computer software program or peripheral device. Before applying the filters used in video processing, certain programs require information for the optimization framework. This information allows the program to calculate the horizontal and vertical image gradients, determine the desired filter gradients, and establish function parameters. Prefilters used in video processing might include contrast changes, deflicking, and noise elimination along with pixel size conversions. Contrast changes allow the processor to highlight particular areas of an image, change the lighting perspective, and darken or lighten images. Deflicking eliminates camera motion or uneven lighting effects that produce flickering on the video. Noise elimination removes artifacts, including lines or other textured effects that reduce image clarity. Using size conversions, users might change a video from 720

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Privacy preserving multi factor authentication using trust management

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Abstract A proper access control mechanism is the need of the hour, as the data stored in the cloud needs to be protected securely. Generally, a multifactor authentication (MFA) is preferred, one that needs the authentication of two or even more aspects based on identity, information and facts, and ownership which needs to check the value and correctness of users while logging into cloud services. Clouds such as Amazon, Google, Microsoft etc. generally have an additional attribute, one that is automatically made inactive. The MFA are intrusive and untrusted cloud servers can access user's sensitive information. The objective of this work is to use a trust model which can identify client device. For instance, if the client device is public then a biometric authentication is provided. Based on the client device, trust is computed and the authentication process will be reduced from multifactor to single factor. Experimental results show that improved performance is attained by the proposed trust based MFA.

Keywords Cloud computing · Authentication in cloud · Multi factor authentication (MFA) · Cloud security · Trust model

1 Introduction

Cloud computing uses network of remote servers on the internet for scalable (here scalable means the storage based on requirement for applications and organizational structures) and effective computation and storage needs. These methods mitigate the complexity of data management by using the concept of data outsourcing for managing data access [1]. Cloud computing has its applications in many private data including banking operations, social networking and so on. These applications collect the data and store them and releases them on-demand by the request of the users. But while handling a large data, there might be breach of security and so a robust security access should be formed so as to keep the data secure and the credibility of the data owner.

The security of cloud computing has an issue due to familiarity. It is susceptible to many issues related to security such as service denial, distributed service denial, spying/eavesdropping, authentication which is not secure or logging etc. To maintain cloud standards and to ensure quality of service, various security concerns needs to be taken care of by the cloud [2]. The advent of final user movement into cloud has led to the increase in the requirement to move different necessities, files, images, and so on into cloud and accessing them if need be through an internet connection.

For every user an identity is created and whenever the user wants to access the cloud, he needs to authenticate his identity which can be confirmed or denied based on its genuineness. Whenever an authentication is performed, the service provider has to trust the identity provided by the user. But this method is critical with respect to security as the control of the service depends on the results of authentication. If the authentication is weak, then it can ruin the security of the service which is dependent on it and also there is a risk of impersonation. One of the most efficacious methods of authentication is a mathematical model which merges many authentication methods which is similar to that used in multifactor authentication, which can build a high-security trust system.

In cloud, mostly biomedical data is actually saved which permit to use shared data much faster for various users. Ohio State University follows the biomedical cloud and they made

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A Detailed Study on Security Services in Cloud Environment

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Abstract – **Cloud computing is a powerful service that allows the cloud users to utilize the resources located in the cloud servers by pay-per-use or charge-per-use mode through the internet. The cloud users are enjoying the on-demand services provided by the cloud computing environment without maintaining the data in a local system. Even though the service is offered to cloud users in an efficient way, there are some serious security issues to be considered very much for maintaining and accessing the data in a secure way from the Cloud Service Provider (CSP). On the data placed in the cloud servers located in any part of the world, various security attacks might be performed by both the internal and external attackers to break the security services like confidentiality on data, user and server authentication, data integrity, and access control of data. This survey provides a detailed study of the recent security issues existing in the cloud environment. This study shows communication architecture of cloud computing and exhibits the security services data confidentiality, data integrity, user privacy, authentication and access control. There are five security services that need to be provided in the cloud network to make it a safe one in real time environment. This paper discusses about various existing works that are used to provide the five security services. For each security service, we have given a short description of the existing works and evaluated the efficiency of each existing works individually. Finally, based on the summary of the existing works, we have also proposed new solutions to mitigate the computation cost and to improve communication efficiency for providing the security services of the data stored in CSP.**

Keywords – Cloud Service Provider; Confidentiality; Integrity; Authentication; User Privacy.

I. INTRODUCTION

Cloud computing allows customers to utilize the resources such as server, storage space, networking components, applications and services. Typically, these resources are hosted by the CSP based on a pay-per-use or charge-per-use basis. The Cloud Service Provider (CSP) provides the owner data, which are stored in redundant storage at multiple physical locations using distributed systems and also facilitate the cloud users to access the storage using BigQuery or AppEngine. The CSP uses a virtualization technique that enables the resources of virtual type and resources of physical type to be shared with relatively great number of cloud users and also it dynamically allocates and releasing resources based upon the request from cloud users. Cloud computing services are accessible through the internet by multifaceted devices such as personal computers and also used by simple hand held equipments like advanced mobile phones. Based on the data owner's perspective, IT enterprises store the data remotely in a cloud in an elastic and service on request manner and carries attractive uses: storage management, global access to data on autonomous terrestrial locations, and to avoid more expenditure of maintenance on hardware and software. Several companies to examine or implement cloud computing services with the main reason being the cost. Minor companies neither afford a large amount of hardware nor expensive software.

Many clouds are generated by commercial cloud service providers or by enterprises in locating at distributed manner. They are interconnected through the internet to achieve scalable and efficient cloud services. Cloud computing is one of the most powerful services that offers users to store data in remote servers and accessing the on-demand high quality cloud applications along with a platform [1]. A few CSPs are EC2 provided by Amazon, Windows Azure of Microsoft, Rackspace, Joyent, Google cloud storage and Amazon Simple Storage Service (S3). These providers offer huge space for storage and customizable resources of computing for storage of data. The cloud is turning into pools of computing services and storage of data and its data owner's

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Bluetooth based Face-to-Face Proximity Estimation on Smart Mobile

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Abstract

The availability of "always-on" communications has tremendous implications for a way individuals move socially. Above all, sociologists have an interest within the question if such pervasive access will increase or decreases face-to-face interactions. In contrast to triangulation that seeks to exactly outline position, the question of face-to-face interaction reduces to at least one of proximity, i.e., square measure the people inside a particular distance? What is more, the matter of proximity estimation is sophisticated by the very fact that the measuring should be quite precise (1-1.5 m) and might cover a large kind of environments. Existing approaches like GPS and Wi-Fi triangulation square measure insufficient to fulfill the wants of accuracy and adaptability. In distinction, Bluetooth, that is often obtainable on most smartphones, provides a compelling different for proximity estimation. During this paper, we have a tendency to demonstrate through experimental studies the effectiveness of Bluetooth for this precise purpose..

Keywords: *Communications, face-to-face, smartphones, bluetooth*

INTRODUCTION

Overview

The traditional laptop computer to completely fledged smartphones has introduced inexpensive, always-on network property to important swaths of society. Network applications designed for communication and property offer the ability for individuals to achieve anyplace at any time within the mobile network cloth. Data communication like texting and social networking, connect people and communities with ever increasing info flows, all the whereas changing into additional more interlinking. There are a unit compelling analysis queries whether or not such digital social interactions area unit modifying the character and frequency of human social interactions. A key metric for sociologists is whether or not these networks facilitate face-to-face interactions, i.e., area unit 2 or a lot of people at intervals an exact distance that would afford such interactions? Interactions aren't restricted to any explicit space and may occur at a large sort of locations, starting from sitting and chatting during a Starbucks eating house whether or not these networks impede face-to-face interactions. Studies have shown that aggregation occurrences of communications supported self-reporting, wherever subjects area unit asked concerning their social interaction proximity, is unreliable since the accuracy depends upon the regency and saliency of the interactions With the increasing convenience of information in logs generated by smartphones, there are a unit tremendous opportunities for aggregation information mechanically.

The crucial technical challenge is the way to live face-to-face interactions, walking and chatting across a school field. As are going to be explored later within the paper, for many face-to-face interactions, the approximate distance between people in

Evolution of Nature-inspired Intelligent Robots – A Review

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Abstract— **Over the last 25 years, evolutionary robotics (ER) with embodied intelligence is viewed as a promising area encouraging the elaboration of several investigations and has drawn the quick attention of several investigators due to their increasing applications in manufacturing industries, biomechanics, health care environments, academies, and in the army. Such robots should be capable of dealing with any dynamic changes prevailing in their workspace. Nature-inspired algorithms (NIA) are employed as evolutionary approaches (EAs) for solving increasingly complex problems in designing a suitable body design and mind for a robot. In this survey, we investigate the field of modern nature (bio)-inspired technology through the contributions of many investigators and designers focused on robot control, the creation of robot body (morphology), co-evolution of morphology and mind of the nature-inspired intelligent robots and transferring the evolved robots to real mechanisms. This topical analysis paper provides a survey of recent research in each of these domains in conjunction with some promising future directions for innovative study. Further, we briefly discuss the practical limitations and issues arising on the road to modern intelligent robots.**

Keywords *— co-evolution; evolutionary robotics; genetic algorithm; morphology; nature-inspired algorithms;*

I. Introduction

Intelligent virtual creatures have been not only employed in structured industries but also progressively inflowing into unpredictable human environments. For the last several decades, human beings have looked at nature to solve their complex problems. There are two main aspects for humans to learn from nature.

1. To bring innovations by morphing the body of creatures. For instance, humans designed the piloted glider aircraft inspired from the hovering principle of birds and designed the radar or sonar system based on the echolocation principle of marine mammals and bats.
2. To develop tools based on different ideologies drawn from nature. For instance, inspired by the process of ant foraging, Ant Colony Algorithm (ACA) was proposed; Genetic Algorithm (GA) was developed based on biological evolution like natural selection, inheritance, mutation, and crossover.

This same trend can be used in the arena of virtual creatures along with embodied computational intelligence and it can be anticipated to initiate new intuitions into how to solve the problem. In this domain, there are several unsolved issues which have been resolved remarkably in nature. The complexity of the specific problem can vary from simple navigation tasks to complex computation such as a human's walking, driving, insect's navigation, addressing real-world uncertainties, obstacles avoidance, object recognition and categorization. Inspired by nature, robotics designers have initiated to establish meaningful algorithms for body morphologies and mind of intelligent robots. However, human-like computation ability has not yet been realized.

The deduction is that if we want to build a human-like service creature (i.e., humanoids), we must devise machines which able to behave and work much like a human being. Humanoids (i.e., a robot endowed with capabilities to chat with us, walk with us and perform computational tasks that can be dangerous to us, or just solve complex problems), has been the dream of engineers for several years, and especially so when computing and information technology started to develop. Since then the manipulation capacity of physical resources has augmented radically and continues to do so, but our efforts for building human-like brain are developing slowly. Constructing humanoids is a notoriously challenging endeavor that entails a combined effort of electrical engineers, mechanical engineers, software engineers, and system architects [1].

With the proliferation of NIAs [2, 3, 4, 5], the attention of several researchers is directed to the effectiveness of the algorithms implemented in the body morphology and intelligence of virtual creatures. In 2001, Taylor and Massey revealed the capability of ER to create multifaceted body designs and intelligence of smart robots [6]. However, previous studies have revealed that the last twenty years of developments in artificial intelligence and evolutionary techniques would create a lot more

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Bluetooth based Face-to-Face Proximity Estimation on Smart Mobile

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Abstract

The availability of "always-on" communications has tremendous implications for a way individuals move socially. Above all, sociologists have an interest within the question if such pervasive access will increase or decreases face-to-face interactions. In contrast to triangulation that seeks to exactly outline position, the question of face-to-face interaction reduces to at least one of proximity, i.e., square measure the people inside a particular distance? What is more, the matter of proximity estimation is sophisticated by the very fact that the measuring should be quite precise (1-1.5 m) and might cover a large kind of environments. Existing approaches like GPS and Wi-Fi triangulation square measure insufficient to fulfill the wants of accuracy and adaptability..In distinction, Bluetooth, that is often obtainable on most smartphones, provides a compelling different for proximity estimation. During this paper, we have a tendency to demonstrate through experimental studies the effectiveness of Bluetooth for this precise purpose..

Keywords: *Communications, face-to-face, smartphones, bluetooth*

INTRODUCTION

Overview

The traditional laptop computer to completely fledged smartphones has introduced inexpensive, always-on network property to important swaths of society. Network applications designed for communication and property offer the ability for individuals to achieve anyplace at any time within the mobile network cloth. Data communication like texting and social networking, connect people and communities with ever increasing info flows, all the whereas changing into additional more interlinking. There are a unit compelling analysis queries whether or not such digital social interactions area unit modifying the character and frequency of human social interactions. A key metric for sociologists is whether or not these networks facilitate face-to-face interactions, i.e., area unit 2 or a lot of people at intervals an exact distance that would afford such interactions? Interactions aren't restricted to any explicit space and may occur at a large sort of locations, starting from sitting and chatting during a Starbucks eating house whether or not these networks impede face-to-face interactions. Studies have shown that aggregation occurrences of communications supported self-reporting, wherever subjects area unit asked concerning their social interaction proximity, is unreliable since the accuracy depends upon the regency and saliency of the interactions With the increasing convenience of information in logs generated by smartphones, there are a unit tremendous opportunities for aggregation information mechanically.

The crucial technical challenge is the way to live face-to-face interactions, walking and chatting across a school field. As are going to be explored later within the paper, for many face-to-face interactions, the approximate distance between people in

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Web Enabled Data Warehouse Answer With Application

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Abstract: This project proposes a method to evaluate data reliability from meta information. Several criteria are used, each one providing a piece of information about data reliability. These pieces are then aggregated into a global assessment that is sent back, after proper post-treatment, to the end user. We propose a generic method to assess data reliability from a set of criteria using the theory of belief functions. Customizable criteria and insightful decisions are provided. The chosen illustrative example comes from real-world data issued from the data warehouse.

Introduction

Estimating data reliability is a major issue for many scientists, as these data are used in further inferences. During collection, data reliability is mostly ensured by measurement device calibration, by adapted experimental design and by statistical repetition. However, full traceability is no longer ensured when data are reused at a later time by other scientists. If a validated physical model exists and data values fall within the range of the model validated domain, then data reliability can be assessed by comparing data to the model predictions. However, such models are not always available and data reliability must then be estimated by other means. This estimation is especially important in areas where data are scarce and difficult to obtain (e.g., for economical or technical reasons), as it is the case, for example, in Life Sciences. The growth of the web and the emergence of dedicated data warehouses offer great opportunities to collect additional data, be it to build models or to make decisions. The reliability of these data depends on many different aspects and meta information: data source, experimental protocol. Developing generic tools to evaluate this reliability represents a true challenge for the proper use of distributed data.

Existing System

In classical statistical procedures, a preprocessing step is generally done to remove outliers. In procedures using web facilities and data warehouses, this step is often omitted, implicit or simplistic. There are also very few works that propose asolution to evaluate data reliability. It is nevertheless close to other notions that have received more attention. In evidence theory, methods to evaluate reliability consist in choosing reliability scores that minimize an error function. In spirit, the approach is similar to the comparison of source assessments with reference values (as done to evaluate experts in probabilistic or possibility methods). Other approaches rely on the analysis of conflict between source information, assuming that a source is more reliable when it agrees with the others.

Disadvantages

Poorly reliable when partitioning is done.
No influence on the reliability.

Proposed System

The method to evaluate data reliability from meta information. Several criteria are used, each one providing a piece of information about data reliability. These pieces are then aggregated into a global assessment that is sent back, after proper post-treatment, to the end user. A model information by the means of evidence theory, for its capacity to model uncertainty and for its richness in fusion operators. Each criterion value is related to a reliability assessment by the means of fuzzy sets later transformed in basic belief assignments, for the use of fuzzy sets facilitates expert elicitation. Finally, interval-valued evaluations based on lower and upper expectation notions are used to numerically summarize the results, for their capacity to reflect the imprecision (through interval width) in the final knowledge.

Advantage

Easier to integrate in a data warehouse.
Reliable expert opinions and fuzzy.

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A Detailed Study on Security Services in Cloud Environment

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***Abstract* – Cloud computing is a powerful service that allows the cloud users to utilize the resources located in the cloud servers by pay-per-use or charge-per-use mode through the internet. The cloud users are enjoying the on-demand services provided by the cloud computing environment without maintaining the data in a local system. Even though the service is offered to cloud users in an efficient way, there are some serious security issues to be considered very much for maintaining and accessing the data in a secure way from the Cloud Service Provider (CSP). On the data placed in the cloud servers located in any part of the world, various security attacks might be performed by both the internal and external attackers to break the security services like confidentiality on data, user and server authentication, data integrity, and access control of data. This survey provides a detailed study of the recent security issues existing in the cloud environment. This study shows communication architecture of cloud computing and exhibits the security services data confidentiality, data integrity, user privacy, authentication and access control. There are five security services that need to be provided in the cloud network to make it a safe one in real time environment. This paper discusses about various existing works that are used to provide the five security services. For each security service, we have given a short description of the existing works and evaluated the efficiency of each existing works individually. Finally, based on the summary of the existing works, we have also proposed new solutions to mitigate the computation cost and to improve communication efficiency for providing the security services of the data stored in CSP.**

Keywords – Cloud Service Provider; Confidentiality; Integrity; Authentication; User Privacy.

I. INTRODUCTION

Cloud computing allows customers to utilize the resources such as server, storage space, networking components, applications and services. Typically, these resources are hosted by the CSP based on a pay-per-use or charge-per-use basis. The Cloud Service Provider (CSP) provides the owner data, which are stored in redundant storage at multiple physical locations using distributed systems and also facilitate the cloud users to access the storage using BigQuery or AppEngine. The CSP uses a virtualization technique that enables the resources of virtual type and resources of physical type to be shared with relatively great number of cloud users and also it dynamically allocates and releasing resources based upon the request from cloud users. Cloud computing services are accessible through the internet by multifaceted devices such as personal computers and also used by simple hand held equipments like advanced mobile phones. Based on the data owner's perspective, IT enterprises store the data remotely in a cloud in an elastic and service on request manner and carries attractive uses: storage management, global access to data on autonomous terrestrial locations, and to avoid more expenditure of maintenance on hardware and software. Several companies to examine or implement cloud computing services with the main reason being the cost. Minor companies neither afford a large amount of hardware nor expensive software.

Many clouds are generated by commercial cloud service providers or by enterprises in locating at distributed manner. They are interconnected through the internet to achieve scalable and efficient cloud services. Cloud computing is one of the most powerful services that offers users to store data in remote servers and accessing the on-demand high quality cloud applications along with a platform [1]. A few CSPs are EC2 provided by Amazon, Windows Azure of Microsoft, Rackspace, Joyent, Google cloud storage and Amazon Simple Storage Service (S3). These providers offer huge space for storage and customizable resources of computing for storage of data. The cloud is turning into pools of computing services and storage of data and its data owner's

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