This article discusses the use of cold-formed steel in industrial buildings.

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ABSTRACT

Growing global population and scarcity of natural resources need ever more robust structural frameworks for a long-term sustainable economy and society. Cold-formed steel (CFS) structural systems are increasingly being used in modern building construction as primary or secondary structural components since they are light, quick, recyclable, and long-lasting. As a bonus, they may be recycled. With their low tensile strength and flexibility, thin sections are not able to withstand huge loads because of their weak buckling resistance. The purpose of the project is to use cold formed steel in an industrial construction.

An industrial building's cost may be analysed using terms such as "cold formed steel" and "pressure."

INTRODUCTION

Most of these steel buildings are one-story and built for industrial usage. In between the major building frames, metal building systems' subsidiary structural components may be found. These structural components also hold the roof and wall coverings in place. Some minor structural parts, such flange braces, may be part of the building's lateral load-resist system, which incorporates the main structure. Secondary roof diaphragm components, such as purlins and girts, are typically used in wall bracing systems. The bulk of steel buildings have a single level of construction. There are

several low-rise industrial structures used by steel mills, automobile manufacturers and other light, utility and process industries as well as thermal power plants, warehouses, assembly plants and garages. There must be

no columns in these spaces. Because of this, there will be fewer internal columns, walls, and obstacles. In order for these structures to function properly, they may demand the use of an overhead moving crane. The roof

A Study on Self Compacting Concrete

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Abstract : *Self-compacting concrete (SCC) may be manufactured using a variety of mineral additives and fibres, as detailed in this study. Demand for massive and complicated buildings in the construction industry has resulted in challenging concreting circumstances. To guarantee that a reinforced concrete (RC) element is completely compacted without any voids or honeycombs, a substantial amount of strong reinforcement must be inserted in the concrete. The use of manual or mechanical vibrators to compact material is next to impossible in this condition. That led to the development of self-compacting concrete, a new form of concrete (SCC). This kind of concrete is easy to deal with since it flows readily over the reinforcing steel and into the formwork. As the name suggests, a self-compacting concrete is a kind of concrete that can be compacted without the need of vibration. High performance self-compacting concrete is another name for this kind of material, which is often referred to as self-consolidating concrete. There are no imprisoned air or rock pockets, and it can easily flow around obstructions and fill all of the crevices and crannies of a structure without separating out the mortar or other concrete elements. Compaction is unnecessary with this concrete mix, which saves both labour and resources. Fibers and other mineral admixtures are discussed in this review study, which describes the features of Self-Compacting Concrete. Mineral Admixtures, Fibers, Longevity, Workability, Self-Compacting Concrete, Mix Design*

1. Introduction:

SCC's Background: SCC was introduced in Japan in the late 1980s as a response to a lack of uniform and thorough compaction in concrete structures, which had been recognised as the fundamental cause of poor performance in concrete buildings. Full compaction of concrete on a site could never be ensured by any practical means, thus the emphasis shifted to eliminating the need to compress, whether by vibration or any other method. As a result, researchers Okamura and Ouchi [1] at the University of Tokyo created the first practical SCC. Full compaction of the SCC is possible without vibrating it, as its name implies. Additionally, there is a decrease in on-site repairs and a reduction in construction time as a result, as well as a reduction in total expenditures. SCC mixes include large amounts of fine-grained inorganic materials, which may be used to dispose of "dusts," which are presently waste items that have no practical use and are expensive to dispose of. Large and complicated buildings are being built at an increasing rate in India, which sometimes results in severe concreting circumstances. Vibrating concrete in busy areas may provide a danger to workers, as well as a source of noise pollution. There is always scepticism regarding the long-term viability of structures constructed in these kind of places. As a result, if at all feasible, vibration should be eliminated in the workplace. SCC expertise has progressed from research to implementation in nations like Japan, Sweden, Thailand, the UK, and so on. The awareness of this in India, on the other hand, is expected to be widely diffused.

2. Literature Review:

Plain self compacting concrete has been examined extensively, but fibre reinforced self compacting concrete has not been till now, according to the work of Professors S.A. Bhalchandra et. al.

[8]. Research by Prof. Aijaz Ahmad Zende et. al [2] compared SCC to conventional concrete (NC). Every country on Earth is experiencing an acute shortage of trained construction workers, and Special Concretes are becoming more important in a world where the usage of concrete is so close to water. Special Concrete refers to concrete that is capable of meeting certain performance and performance standards that may not be attainable with ordinary materials and typical concreting procedures. Special concrete, such as Self Compacting Concrete, flows and solidifies under its own weight, making it easier to place concrete in challenging situations and faster to place big sections. It also has higher strengths and longer lifespans than regular concrete. Among the topics covered in this article are the materials and mix design, several testing techniques such as the V-funnel test, the L-Box test, and the performance characteristics and qualities of fresh and hardened SCC. An experimental approach for designing self-compacting concrete mixtures was devised by Paratibha Aggarwal et al [9]. Slump flow, J-ring, V-funnel, and L-

A Review paper on 3D-Printing Aspects and Various Processes Used in the 3D-Printing

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Abstarct:

3D printing, as well as the numerous materials utilised in 3D printing, the qualities of them, usage procedure have become a prominent issue now in deciding the technical aspects, and this study paper is trying to explore these topics further. First and foremost, defining What exactly is 3D printing, what is the significance of 3D printing; then looking to the history of 3D printing and its applications as well as about 3D printing methods and the materials that are utilised in the manufacturing procedure of 3D printed products and showing that the selection of finest(best) materials for specific process(s) are utmost important.This paper also consider the benefits of different 3D printing processes as compared to additive manufacturing.

Keywords— 3d-Printing; additive Manufacturing, materials usage,, equipment.

Introduction:

3D printing, colloquially termed as additive manufacturing (AM), is a technique that allows us to create a three-dimensional object of any shape or size from a three-dimensional model or other electronic data sources by combining additive processes with other processes.Multiple layers of material are laid down in a controlled environment, monitored by a computer.The controls are in the hands of Hideo Kodama, who works for the Nayoga Municipal Industrial Corporation.According to common opinion, the Research Institute was responsible for publishing the first edition ofThe first physical object to be produced from a computer-generated design. The credit, on the other hand, is a little more complicated.In the 1960s, Charles Hull is widely recognised with producing the world's first three-dimensional printer.In 1984, while working for the company he founded, he came up with the idea for it.3D Devices Firm is a worldwide corporation that develops, produces, and distributes 3D printing systems. 3D Systems Corporation was founded in 1984. Charles A. Hull was a pioneer in the area of solid state physics, and he passed away recently.Stereolithography (also known as STL) is a kind of imaging process that is used in the manufacturing industry.The (stereolithographic) file format is still the most widely used file format in today's world.3D printing is a technology that is becoming more popular. In addition, he is regarded as havingBoth companies introduced commercial fast prototyping at the same time.as a result of his study and advancements in 3D printing. He was the first to make use ofphotopolymers that have been heated by ultraviolet light in order to get their desired propertiesWhen melting and solidification occur, the result is [2] Since the first one was launched in 1984, the series has grown in popularity.The first 3D printer was designed and produced by Charles W. Hull, a professor at the University of California, Berkeley.Three-dimensional systems corporation (3D Systems Corp.) has advanced technology, and these are the consequences.Despite the fact that machines have become increasingly

A State-of-the-Art Technical Review of Advanced Retrofitting Techniques for Reinforced Concrete Structures

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Abstract:

Any technology or material has its limitations and new technologies have been invented and utilized over the ages to meet the new requirements. A large number of seismically prone reinforced concrete structures are not able to withstand earthquakes in accordance with the current provisions for coal. Moreover, the seismic Due to a design deficiency, construction deficiency, additional loads, and behavior of existing buildings is affected Additional demand for performance, etc. Recent earthquakes have clearly shown an urgent need for improvement and strengthen those structures that are seismically deficient. The upgrade is one of the best options for making an existing one inadequate construction safe from future likely earthquakes or other environmental forces.

The refurbishment reduces Vulnerability of structural damage in the near future of seismic activity. It aims to consolidate a structure Comply with the requirements of current seismic design codes. A considerable amount of research has been carried out develop various enhancement and rehabilitation techniques to improve seismic performance in recent years of structures. Of structures. This article aims to provide an overview of various innovative and cost-effective techniques Retrofit for reinforcement of damaged structures. Seismic construction protection is a concept based on requirements aimed at improving the performance of any structure Future earthquakes. Future earthquakes. Earthquakes of various magnitudes have taken place in India recently, causing extensive Life and property damage. Some materials and techniques recently developed can play an important role in the structural repairs. Seismic reinforcement, whether damaged or undamaged, of existing buildings.

The main concern of a structural engineer must restore the structures as fast as possible successfully. Choice of the right materials, the techniques and procedures for the repair of a certain structure were a major challenge. Innovative Structural repair techniques have numerous advantages over conventional techniques. Some guidelines for the present paper discussed the selection of materials for repair work, e.g. steel, reinforced fiber polymers. The choice of materials and techniques to use depends on many aspects from various perspectives prospectivei.e. Requirement and available financial resources, applicability and appropriateness of materials Repair of structures damaged. Use of standard and innovative repair materials, suitable technology, manufacturing, Conservation and preservation according to project objectives and Building renovation can include a range of different technical considerations such as fire safety, geotechnical safety Weathering and water infiltration, hazards and remedies, structural performance in earthquakes and wind loads.

I. Introduction

The process of applying measures to maintain the existing form, integrity and materials of a historic building is defined as the preservation. Rehabilitation refers to the process of creating a new property application through repair, Changes and additions to preserve the historical, cultural or architectural values that transmit them.Restauration is the process of restoring a property accurately as it existed at a certain time. The rebuilding is described as an act in which a property is replicated at a certain time. The provisions on rehabilitation need to select the rehabilitation goals and acquire current building information beforehand Design for rehabilitation. The current status of the existing retrofitting method is selectedthe structure and its performance are known and the structure performance after refurbishment is required. The factors in selecting the method, the effectiveness of the various retrofitting methods with respect should be considered for the necessary improvements in performance, viability of retrofitting work performance, impact of Refurbishment work on the environment, maintenance ease after refurbishment, economy and other factors. Structural refurbishment is done to improve survival functionality. There are different types of applications Bridges, buildings and industrial structures, urban transport structures, land-keeping structures and maritime structures.

IJARST

Advanced Retrofitting Techniques for Reinforced Concrete Structures: A State of an Art Technical Review

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Abstract:

Any technology or material has its limitations and new technologies have been invented and utilized over the ages to meet the new requirements. A large number of seismically prone reinforced concrete structures are not able to withstand earthquakes in accordance with the current provisions for coal. Moreover, the seismic Due to a design deficiency, construction deficiency, additional loads, and behavior of existing buildings is affected Additional demand for performance, etc. Recent earthquakes have clearly shown an urgent need for improvement and strengthen those structures that are seismically deficient. The upgrade is one of the best options for making an existing one inadequate construction safe from future likely earthquakes or other environmental forces. The refurbishment reduces Vulnerability of structural damage in the near future of seismic activity. It aims to consolidate a structure Comply with the requirements of current seismic design codes. A considerable amount of research has been carried out develop various enhancement and rehabilitation techniques to improve seismic performance in recent years of structures. Of structures. This article aims to provide an overview of various innovative and cost-effective techniques Retrofit for reinforcement of damaged structures. Seismic construction protection is a concept based on requirements aimed at improving the performance of any structure Future earthquakes. Future earthquakes. Earthquakes of various magnitudes have taken place in India recently, causing extensive Life and property damage. Some materials and techniques recently developed can play an important role in the structural repairs. Seismic reinforcement, whether damaged or undamaged, of existing buildings. The main concern of a structural engineer must restore the structures as fast as possible successfully. Choice of the right materials, the techniques and procedures for the repair of a certain structure were a major challenge. Innovative Structural repair techniques have numerous advantages over conventional techniques. Some guidelines for the present paper discussed the selection of materials for repair work, e.g. steel, reinforced fiber polymers. The choice of materials and techniques to use depends on many aspects from various perspectives prospectivei.e. Requirement and available financial resources, applicability and appropriateness of materials Repair of structures damaged. Use of standard and innovative repair materials, suitable technology, manufacturing, Conservation and preservation according to project objectives and Building renovation can include a range of different technical considerations such as fire safety, geotechnical safety Weathering and water infiltration, hazards and remedies, structural performance in earthquakes and wind loads.

KEYWORDS: *retrofitting, treatments, rehabilitation, cracks, corrosion, preventive measures, epoxy, rehabilitation. Grouts, reinforced polymer fiber jackets, steel jackets, beam jackets.*

Introduction

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An Earthquake Analysis of a Multi-Story Residential Building

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ABSTRACT:

In Zone-III and Zone-V, the top storey is more displaced based on the two evaluations. Compared to Zone-III, Zone-V has a greater value in terms of storey displacement.
The fifth-level EQX load case's time history approach exhibits the largest degree of storey drift. When exposed to RSZ, Zone-6th III's and 7th floors show the most storey drift. The RSX building's fourth through ninth levels include it. In the 4th to 11th and 3rd to 12th levels for Zone-X and RSX, respectively, the maximum storey drift can be seen.
The ground receives the most shear whether employing the response spectrum or time history methods. When looking at this As a clear evidence, Zone-V outperforms Zone-III. Structural seismic analysis employs response spectrum analysis. Seismic research was performed on the G+15-story residential building situated in zone II. With the help of STAAD.PRO software, the whole structure was evaluated. we saw a decrease in the reaction time of instances of ordinary moment resistant frames and special moment resisting frames in both static and dynamic analyses. Seismic loads are well-resisted by the particular moment of the resisting frame construction.
Equivalent static analysis, response spectrum analysis, ordinary moment resisting frame, special moment resisting frame, STAAD.PRO V8i.

INTRODUCTION

People are now confronted with issues related to land shortage and rising land prices. It was unavoidable that multi-story structures would have to be built for both residential and commercial uses because of population growth and the industrial revolution. The lateral force resistance of the high elevated buildings is inadequate due to their faulty design. A structure's collapse might occur as a result of this. A number of considerations go into the construction of earthquake-resistant buildings. These include the structure's The structure should be able to resist earthquakes equal to DBE without significant structural damage though some non-structural damage may occur.
The structure should withstand an earthquake equal to MCE without collapse.

inherent frequency, damping factor, kind of base, significance of the building, and the structure's ductility and flexure. Because of their improved moment distribution, ductile structures need less lateral load design. Response reduction factor R is used to address this issue for various types of structures. The building is built as an SMRF for maximum efficiency. It simply has to be built for forces smaller than those for which an OMRF would be required.

MOMENT RESISTING FRAME:

The frame whose member and joints resist the forces primarily caused by flexure is Moment resisting frame.

Ordinary Moment Resisting Frame: The moment resisting frame which are designed without any special attention towards ductile nature of the frame are called ordinary moment resisting frames.

Special Moment Resisting Frame: The moment resisting frame which are designed to have ductile nature are called as special moment resisting frames. The design is done according to the requirements specified in IS-13920.
The earthquake resistant designs of structures are considering the following magnitudes of a earthquake.

Design Basis Earthquake (DBE): The earthquake whose probability of occurrence is at least one during the structure design life is called design basis earthquake.

Maximum Considered Earthquake (MCE): The earthquake whose expected intensity is maximum that can occur in a particular area or region is called maximum considered earthquake. The maximum values are considered as per code.

The design approach recommended by IS: 1893-2002 is based on the following principles (clause 6.1).

METHODS OF ANALYSIS

Equivalent Static Analysis:
This method is only one of several that may be used to compute seismic loads. There are no high-rise structures included in the basic static design approach.

Analysis of NCDOT 'S Funding in Highway Construction Projects

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Abstract—This study examines a difficulty with highway building project scheduling under a hypothetical scenario of increased financing. It is common for large-scale highway building projects to depend heavily on state and federal financing sources. Transportation-related taxes and fees are the primary source of income. DOTs must be able to adjust to financing fluctuations in order to avoid going into overdraft or accruing unmanageable cash balances as a result of the economy's inherent unpredictability. In the event that future revenue is projected to fluctuate, a decision support system is offered for deciding how to adapt the let schedule. How the suggested technique may be used to massive, more than $10 million construction projects is shown via an analysis of NCDOT's (North Carolina Department of Transportation) case study. Constrained logistic models are used to predict the building costs of specific projects, and a method to analyze the effect of altering let dates is offered. Among the methods to use the proposed model are the rolling-horizon let scheduling, the study of funding changes, and the evaluation of financing project hazards.

"*Index Terms*—Decisions under risk and uncertainty, optimiza-tion,portfoliostrategies,projectplanning,projectscheduling.

1.INTRODUCTION

A financial scenario analysis for altering the release timetable of significant highway construction projects is discussed in this study. To let a project out for bidding is to open the project up to a wider range of potential suppliers. Even though this article focuses on North Carolina's Department of Transportation (NCDOT), the concept may simply be extended to other states. In the city's master plan, the Transportation Improvement Program (TIP) includes a broad variety of costly construction projects. Prior to awarding a construction contract, governments used the obligation basis, which required a certain sum of money to be available to obligate against the expected spending. From its inception in 2001, the NCDOT has used cash basis accounting to manage its total cash balance rather than project-specific expenditures [1], and this is the new norm for the management of total cash balances.

Almost all of the money in the state highway trust fund and the state highway fund comes from fees collected at the pump [3]. This ambiguity regarding financing is one of the primary risk factors that might lead to poor funding allocation and delays for TIP construction projects, even though these revenues can drastically diverge from predicted quantities due of the current economic concerns.Thus, although cash-based management allows for maximum spending on TIP development projects, this strategy has raised the danger of overdraft owing to a very little cash reserve kept. In an attempt to enhance financial management in North Carolina, a goal cash balance of 12 percent of the expected annual revenue was established [4]. Specifically, this implies that the NC-monthly DOT's cash balance must be at least 5% larger than the total outstanding obligation for all transportation project contracts.

The North Carolina Department of Transportation (NCDOT) must take appropriate action when predicted financial flows indicate a probable overdraft or exhaustion of available funds, respectively. The NCDOT, for example, might postpone the letting of certain building projects for many months in order to meet the requisite cash level. On the other side, certain projects' progress might be hastened in order to reduce an unmanageable cash flow. A group made up of representatives from several departments within the NCDOT has debated and ultimately decided on such measures. A key objective of this research is to provide quantitative guidance for the committee's decision-making process by giving an ideal release timetable under a new financing scenario. You may use an optimization model to establish the best timetable for leasing that minimizes the overall performance impact while maintaining a reasonable cash balance. As an added bonus, we will illustrate Due to the unique nature of this study's topic, it is difficult to locate other research that have dealt with it. For highway construction planning concerns, we present a short literature analysis in Section II of this study. A mathematical programming model is presented in Section III to discover the best possible let schedule for a certain funding circumstance. In order to put this strategy into action, it requires a forecasting model that can accurately anticipate the expenses of certain projects.NCDOT case study in Section IV shows how to construct payment forecasting models and how optimization models for rolling-horizon-based let scheduling are used, assessing the impact of funding shifts and identifying high-risk projects under funding changes. Section V concludes and

ANALYTICAL STUDY ON FLANGED SHEARWALL UNDER LATERAL LOADING

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ABSTRACT:

The frequent occurrence of the major earthquakes in the Indian subcontinent, and construction of tall buildings, especially over the last two decades demands for the construction of earthquake resistant buildings. Shear wall is one of the best lateral loading systems and it should be adequately designed and detailed. An analytical study has been made of the behavior of laterally loaded flanged shear wall in building with cross-shear wall. Particular attention is paid to the modeling of reinforced concrete rectangular shear wall with boundary elements. The objective of this work is to discuss the possibilities of modeling reinforcement detailing of reinforced concrete models in practical use. It reports the results of some analyses performed using the reinforced concrete model of the general-purpose finite element code ANSYS Version 10. The reinforced concrete model in ANSYS consists of a material model to predict the failure of brittle materials, applied to a three dimensional solid element in which reinforcing bars may be included. The material is capable of cracking in tension and crushing in compression. This paper presents the results of the three dimensional nonlinear finite element analysis of the reinforced concrete wall modeled with smeared reinforcement as well as discrete reinforcement detailing subjected to lateral static loading.

INTRODUCTION

Shear walls are specially designed structural walls incorporated in buildings to resist lateral forces that are produced in the plane of the wall due to wind, earthquake and other forces. The term "shear wall" is rather misleading as such wall behave more like flexural member. They act as a vertical cantilever in the form of separate planner walls, and as non planner assemblies of connected walls around elevator, stair and service shafts. The most important property of shear walls for seismic design is that it should have good ductility under reversible and repeated over loads. In planning shear walls, we should try as much gravity forces as it can safely take. They should be also laid symmetrically to avoid torsion stresses.Depending on the height - to - width ratio, a shear wall may behave as a slender wall, a squat wall, or a combination of the two. Slender shear walls usually have a height-to-width ratio greater than two. They behave like a vertical slender cantilever beam. Squat shear wall shows significant amount of shear deformation as compared to bending

deformation. The forces are distributed to the shear wall of the building by the diaphragms and the shear wall transmits the loads down to the next lower storey or foundation.

LITERATURE REVIEW

Can Balkaya et al. (1993) studied about the shear wall dominant structures. Shear-wall dominant buildings are the prevailing multistory RC buildings type particularly in the regions prone to high seismic risk. To identify their most essential design parameters, dynamic and inelastic static pushover analyses were conducted on the backbone of performance based design methodology. Antonio F Barbosa et al. (2000) presented a paper considering the practical application of nonlinear models in the analysis of reinforced concrete structures. The results of some analyses performed using the reinforced concrete model of the general-purpose finite element code ANSYS are presented and discussed. The differences observed in the response of the same reinforced concrete beam as some variations are made in a material model that is always basically the same are emphasized. The consequences of small changes in modeling are discussed and it is shown that satisfactory results may be obtained from relatively simple and limited models. He took a simply supportedreinforced concrete beam subjected to uniformly distributed loading has been analyzed. Fanning (2001) did research on non-linear models of reinforced concrete beams. The requirement to include the nonlinear response of reinforced concrete in capturing the ultimate response of ordinarily reinforced beams demands the use of the dedicated Solid 65 element in ANSYS. The internal reinforcements were modeled using three dimensional spar elements with plasticity, Link 8, embedded within the solid mesh. Anthony J Wolanski (2004) did research on the flexural behavior of reinforced and prestressed concrete beams using finite element analysis. The two beams that were selected for modeling were simply

Anticipating the Unpredictability of Interstate Development Cost File Utilizing Long Momentary Memory

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Abstract: For the highway construction business, the highway construction cost index (HCCI) is a composite statistic that shows the overall pricing trend in the industry. The wide range of available indices makes it difficult for governmental agencies to provide precise budget estimates. The index has been predicted several times using quantitative models, however there are still two fundamental issues. Firstly, there are few models that operate well with data that is very variable. Using only stable data to assess a model's predicting capabilities is a waste of time. Having the ability to foresee at diverse periods in time is also critical for a reliable prediction model In the past, Many studies predicted just one index point ahead of time, limiting its applicability in real-world circumstances. LSTM units are used in the encoder and decoder architectures in this work to model and predict the variability of the HCCI. Comparisons were made between the results of a seasonal autoregressive integrated moving average model and data from the Texas Health Care Cost Index. Short-term, medium-term, and long-term forecasts all showed time series models to be useless in predicting the future. Cost engineering and forecasting experts now have the following new insights thanks to this study: Time series models are outperformed in this research by a cost index forecasting approach based on artificial intelligence, especially for volatile cost indexes. It is possible that future researchers might profit from this paper's findings and utilise them as an example. This is the first work in construction management to illustrate how forecasting models function when there is a shape-change in the index.

Authorkeywords: Constructioncostindex;Costprediction;Timeseriesforecasting;Artificialintelligence.

As demonstrated in Fig.2, the proportion of lunar materials in these constructions will undoubtedly rise with time.

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Abstract

Engineers in the field-of-civil engineering are preparing for future activities in outer space. This new era's main point will most likely be the Moon. Engineers and scientists working together on the Moon are now in the planning phase of lunar operations. The Earth's four millennia of experience are about to be put to use in a new context. Civil engineering has new obstacles in the face of this new nature, and this study aims to highlight the required factors for overcoming the issues. Some of the issues, such as how to build buildings, how to manage a project, and how to employ both native and imported resources on the Moon are also explored in this paper.

INTRODUCTION

Written rules and regulations have been in place in civil engineering for a long time. In Hammurabi's Code, which dates back to about 1700 BC, there were rules governing the labour of persons who may be regarded as civil engineers of our day. Using this code, we can plainly see that civil engineers existed 4000 years ago, and a profession known as civil engineering was in existence at the time. About four millennia ago, this occupation served mankind with apparent interplay between other professions and the sciences. If you're looking for a brief definition of it, you'll have a hard time finding one here. It is Thomas Tredgold's 1828 definition that best fits the content of this paper, which states that "... the art and science of directing great sources of power in Nature for the use and convenience of man." This definition is the one that best fits the content of this paper. "The art and science of directing great sources of power in Nature for the use and convenience of man." Many components of civil engineering are missing from this description, but its focus on "... directing huge sources of Nature" is crucial.

Earth's natural environment exists for the sole purpose of serving humankind's needs and wants. As a result, civil engineers have amassed a wealth of knowledge and expertise in a wide range of areas related to their profession.

Humanity on Earth and elsewhere now seems to have the opportunity to benefit from the vast resources of nature on Earth, the Moon, Mars, and beyond in space. An experienced civil engineer need only hear this single sentence to be terrified and exhilarated about the possibilities that lie ahead. Anyone who has tried to tame Nature understands how difficult it is to do so. This new nature is distinct from the one that has prevailed on Earth since our inception, and it's one that we haven't been able to fully comprehend or control. Sections 2 and 3 begin by providing an overview of the new Nature. Finally, a civil engineer's job in this new setting has been listed and discussed. For obvious reasons, civil engineers must now cooperate closely with other scientists and researchers due to the nature of this task suddenly becoming a truly multidisciplinary endeavour. As a result, the vast majority of issues will be addressed via interdisciplinary collaboration.

LUNAR NATURE IS

[Johnson et al., 1991; Criswell, Sadeh, 1991; Lajpat, 1993] describe the circumstances on the Moon. The following characteristics should be noticed from a civil engineering perspective:

The gravitational pull of the moon is just one-sixth as strong as that of Earth.

On the Moon, there is no atmosphere and no global magnetic field.

On the lunar equator, the same side is constantly facing Earth, making one lunar day equal to 27.3 terrestrial days.

- Temperature fluctuations on the moon's surface are projected to be three times larger than those on Earth, with a low temperature of around -2500C at the poles. Additionally, it has been shown that temperatures 30cm below the ground surface remain very stable at −56C, with a modest change of

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ABSTRACT

In this article, the authors discuss the findings of a terminological study they did on a Computer Science-related Digital Archives Net maintained by the Italian National Research Council (CNR). In particular, the study examines the prevalence of key phrases in Computer Science to confirm their evolution through time, with the ultimate goal of mining the web for the substance of documentation. Its primary data set is a reference corpus of 13,000 papers that aggregates the scholarly output of three CNR research Institutes. The IIT (Institute of Informatics and Telemetric) and the ILC (Information and Library Computing) are the three organizations involved. (Institute of Computational Linguistics), all of which originated in the "Centro Study sullen Calcolatrici Elettroniche" (Electronics Research Center), and are now affiliated to CNR's Division of ICT and Cultural Identity.

The following are the study's three parts:

One is an introductory piece that focuses on the data culled from the scientific literature; these data share a vocabulary that includes certain phrases. appropriate to the Computer Science vocabulary, even if the terms themselves come from other fields (Linguistics, Informatics, and Telemetric) 2) The PUMA (Publication Management System) system's content description takes up the bulk of the second portion Part Three is a Statistical Representation of Archive-Extracted Terms and consists of a Few Comparison Tables graphs showing percentages of the most Frequently used phrases in the scientific documents generated by the three Institutes will be made.

Introduction

We are already in an era when retrieving vast quantities of digital it's becoming more crucial to be familiar with what's out there on the web. A great deal of this information is disseminated via the written records of scientific documentaries storage facilities and online archival databases. This nonfictional phrase to keep safe the plethora of exotic words that words from the past that have mostly gone out of usage, together with a more new words coined

A Study of Self-Plagiarism in Computer Science

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Abstract

For this purpose, we introduce a web spider that automatically downloads research articles from the websites of the top fifty Computer Science departments in the country. academics in the field of Computer Science have a habit of plagiarizing their own work. There are instances of self-plagiarism for each author, and they are re reported in so that they may be looked at so that verify whether these documents are really fake.

1 Introduction

Self-plagiarism occurs when an author reuses his or her own previously published works in a new publication without giving proper citation. as a point of departure Self-plagiarism opens the door to excessive amounts of academic papers are expected to be written. without putting in extra time and effort to produce brand new documents. Consequently, essentially equivalent articles might be developed and sent to periodicals for no other reason than The goal is to raise the profile of the institution. from the researcher's point of view. But such methods never in that they help the scientific community as a whole in the sense that Paperwork increases, while fewer cutting-edge studies are published. material to spark fresh thoughts. As an alternative, we may use the pool when a stack of articles on the same topic yet they're called something else here. This study aims to determine whether or not The Question of Whether or Not Top Computer Science colleges and institutions that condone such behavior. Essentials, at their most notion is to use a web spider to go through the upper 50 CS programs to determine the commonalities the ultimate pages. To get the full list of downloads for each professor, a lecturer's scholarly writings. When you've got them in text form,

you may system for analyzing texts for instances of self-plagiarism and to report any professors or articles that violate academic integrity. This means that each reported case would need manual verification. Verify if the resemblances are indeed a result of scholarly dishonesty. Look at the example in Figure 1.

Certificateless Algorithm for Body Sensor Network and Remote Medical Server Units Authentication over Public Wireless Channels

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Important patient health data is processed and sent using wireless sensor networks. Any loss of the detected data may obviously have dire effects that might put people's lives in peril. patients. Therefore, there should be rigorous safeguards for personal information and security. data both when it is being sent and while it is being stored. In recent years, Numerous digital security systems have been created by academic cryptography, elliptic curve cryptography, digital signatures, digital certificates. and advanced encryption standards methods include curve cryptography and others. On the other hand, there have been investigations in the that numerous security and privacy holes exist and be used by adversaries to wreak damage in these systems. In Digital certificates, for example, have a very high storage certificates, public keys, and the associated computational difficulties problems with management. This article presents a certificateless algorithm. to verify the legitimacy of the internal monitoring devices and the far-flung medical server computers. Analyses of its security have shown that it protects user data and provides secure session keys. accord, invisibility, and privacy. It is also resistant to the elements and may be used in In wireless sensor networks, threats including impersonation, packet replay, and man-in-the-middle. Alternatively, it is shown to have the lowest The necessary time for execution and the available bandwidth.

Introduction

The components of a wireless body area network (WBAN) are:

distributed networks of nano-sensors capable of collecting medical history and physical examination results. This was followed by a perceived information is sent to off-site medical data centers for analysis evaluation and corrective action [1]. Some of the information gathered may include measurements of core body temp, BP, and glucose dimensions [2]. Following the account provided by Farooq, S. [3] agree that WBAN is a Under the guise of a Wireless Sensor Network (WSN). Indicators in A little amount of WBAN may be applied to the skin around the body of a patient or implanted there [4]. Prior to, during, and after hospital-bound communications from the patient's end We use public wifi channels [5] for medical server purposes. Such two-way interaction enables distant surveillance. healthcare monitoring for the elderly and younger patients alike group of people who are unable to work. Through this process. technology improves improvement in productivity and security while lessening the risks Medical expenditures. A touch of automation is also present. healthcare cost management, key parameter

Computer science research: the top 100 institutions in India and in the world

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Abstract:

The focus of this research is to examine the top 100 Indian and worldwide institutions producing computer science researchers. The analytical characterization is based on data from the last quarter-century of Scopus-indexed research output (1989-2013). Our In the context of computational analysis, the usual scientometric methods are used in a two-dimensional framework. Include reading closely at literature. We want to compare the quality of CS research in India to that of other nations using scientometric indicators. Emphasize the similarities and differences among the world's top from a global viewpoint. We conducted a complete probe along traditional scientometric indicators of achievement like as output, citation impact, and number of co-authored works fluctuations, levels of international collaboration, etc. The written description is meant to help pick out the most crucial research. Similarities and developments throughout time in the two categories of institutions. This study breaks new

territory, and it's possible this is the first comprehensive look at how different areas of computer science share and diverge in their approaches to a problem. Examining Indian Organizations Next to International Models Insightful analytical results and practical recommendations from the research inferences.

Introduction

These days, IT plays a crucial part in every country's development. A lot of the research and development that goes into ICT (Information and Communication Technologies) is done so that we may have reliable and secure methods of exchanging information. Technological progress in the field of computing (CS). Knowledge-based economies have been more prominent this century and governments everywhere are spending more money to advance scientific research and technological innovation, especially in

Development of Recovery and Redundancy Model for Real Time Wireless Networks

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ABSTRACT

It is becoming clearer that dependable communication via wireless networks is a need as the number of uses for wireless technology grows. The challenges of ensuring punctual transmission through a wireless mean a major difficulty because of its erratic delivery. Here, we provide a Sequential time division multiple redundancy and recovery wireless communication, space-time division multiple-access (S-TDMA) is created. Those in the press Station selection is handled by the S-TDMA medium access control (MAC) layer. Should broadcast within a certain window of time determined by the channel's current status. MATLAB was used to run simulations of the modeled systems. The SIMULINK application. Signal processing and control blocks in SIMULINK the telecommunications infrastructure was modeled using communication block sets. Total link reliability, system throughput, and error rate are used to assess S-performance. TDMA's production rate, typical percentage of on-time deliveries, and the delay caused by the system. Analyses, when contrasted through graphs, reveal recovery times with immediate retry and loss of frame were determined to be respectable dropped data signals.

Introduction

Verifying uninterrupted real-time delivery in a wire-free communication channel is difficult. When compared to wired networks, its dependability in delivering data is low [1]. Real-time applications in

Wireless broadcasting place severe a limited window for transmission, which makes packet loss quite frustrating. harder to cover [2] When two people are able to talk to one other in use case that must have guaranteed service levels (Quos) pertaining to the communication network, such as the longest possible latency, maximum allowable loss at its interface to ensure level of service that was desired [3] The continuous monitoring of a network's capacity to transmit data over a certain amount of time limit. What this means is that data in real time must be re to the intended recipient before a specified time limit [4]. Some highlights of the real-time applications

Microstrip Patch Antenna Performance Enhancement by Double Layer Metamaterial Superstrate

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Abstract.

In this paper, a metamaterial antenna running at a frequency of five. Eight GHz is supplied. Metamaterial superstrate cover acts as a lens which focuses the EM radiations because of the unusual homes of the metamaterial.This results in improvement performance of patch antenna along side its bodily protection. The proposed metamaterial lens consists of a double layer of nine-through-nine matrix of cut up-Ring Resonators (SRRs), and is positioned above a probe-fed rectangular patch resonating at five. eight GHz. The shape improve the gain and directivity of a easy patch antenna up to 7 dB.Simulation effects of the proposed antenna are presented and discussed in this letter.

Keywords: Metamaterial (MTM),Split Ring Resonator (SRR).

1 Introduction

An widespread boom inside the subject of telecommunication has generated significant desires and has ended in a primary technological trade at the antenna degree, depending at the transmission frequency, statistics charge or transmission range.

The antenna is one of the maximum important components within the wireless communication systems, since the overall performance of the antenna alone can severely affect the overall overall performance of the entire system. The layout aim of an antenna is regularly governed with the aid of the specifications provided through the patron. Many applications specify that the antenna have to be conformal, and that it ought to have a excessive directivity along a course when transmitting. These requirements, namely high directivity is the main growing trends amongst antennas and usually provides a wonderful assignment to engineers running in this subject. The traditional antenna technology to gain the high directivity needs multiple radiating elements to manufacture the antenna array [1]. but, such array layout requires a complicated feed network, and the demands that the a couple of antenna factors be maintained nicely. this is due to the fact the malfunction of 1 or extra antenna factors may also occasionally seriously affect the overall overall performance of the antenna device, different thrilling answers to beautify the directivity of the patch antenna have been counseled: the primary one become to utilize a DGS method to modify the parameter of antenna and the second one proposed these days changed into to sandwich the antenna with the aid of dielectric layers of the equal permittivity [2] [3].

Introduction to Minitrack on AI, Machine Learning, IOT & Analytics: Exploring The Implications For Knowledge Management And Innovation

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Abstract

Welcome to the HICSS-52 Minitrack on AI, machine getting to know, IOT & Analytics wherein we set out to explore those emerging technologies and tendencies from the lense of know-how control and innovation. it's far from this angle we seek to understand the consequences of the deployment and application of those technologies on knowledge management and introduction. This minitrack includes 3 papers. papers discover conceptual problems in the artificial intelligence area with one searching mainly at know-how gadget language in the context of artificial intelligence laying a foundation for discussion and an operationalization of phrases. the second one paper then uses AI and visualization as a methodology to discover studies questions, mainly the effect of managerial reaction on patron evaluations. The third and final paper of the minitrack shifts gears to explore the effectiveness of an IOT answer in 10 Finnish small-to-medium sized firms (SME). together the three papers combine to offer insight into the results of gadget learning, artificial intelligence, and IoT in the expertise management and innovation area.

1.Introduction

The exponential growth of information-in depth technologies which include IoT, IoMT, augmented truth, gadget getting to know programs, and synthetic intelligence is creating a rich landscape for the gathering, employer, storage, and dissemination of expertise. the results of the effect these technologies have on the knowledge control surroundings encompass procedure integration problems, information garage and information control challenges, behavioral problems along with accept as true with in output from those technologies, and even challenges within the analytics manner. additionally, information the ability impact of those systems enables inform the way to build and use the infrastructures and methods to gain advanced choice making and organizational performance. This minitrack seeks a focal point on research that contribute to the information of the traits of these artifacts and the challenges they gift within the context of knowledge control and expertise introduction.

2. Machine Learning in Artificial Intelligence: Towards a Common Understanding (Kühl, Goutier, Hirt & Satzger)

on this paper, okühl, Goutier, Hirt, and Satzger discover the function machine studying performs inside artificial intelligence. The authors discuss the growing occurrence of machine mastering and artificial intelligence. The authors first differentiate among machine gaining knowledge of and synthetic intelligence earlier than dissecting the contribution of gadget getting to know to artificial intelligence.

Utilizing Pulse-Shrinking Fine Stage With Built-In Coarse Gain Calibration Of A 16-piece 2.0-ps Resolution Two-Step TDC in 0.18-μm CMOS

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Abstract

This paper proposes an opportunity to-computerized converter (TDC) that accomplishes wide information range and fine time goals simultaneously. The proposed TDC uses beat contracting (PS) plot in the second stage for a fine goals and two-advance (TS) engineering for a wide range. The proposed PS TDC forestalls an unwanted non uniform contracting rate issue in the traditional PS TDCs by using an implicit counterbalance beat and a balance beat width recognition plans. With a few strategies, incorporating an implicit coarse increase adjustment system, the proposed TS design conquers a nonlinearity because of the sign spread and addition befuddle among coarse and fine stages. The reproduction consequences of the TDC actualized in a 0.18-μm standard CMOS innovation show 2.0-ps goals and 16-piece go that compares to 130-ns input time interim with 0.08-mm2 region. It works at 3.3 MS/s with 18.0 mW from 1.8-V supply and accomplishes 1.44-ps single-shot accuracy.

*index Terms—Built-in alignment, beat contracting (PS), time-to-advanced transformation, two stage (TS).*1.

INTRODUCTION

BASED on the recent progress in CMOS process scaling. time resolution is becoming more and more superior to voltage resolution due to the high-speed transistors and the reduced supply voltage [1], [2]. Recently, a time-to-digital converter (TDC) has been used for various applications, e.g., ADPLLs, space science instruments. jitter measurements, and so on. In particular, with the recent improvement in TDC performance, it is often used in high-precision time-of-flight
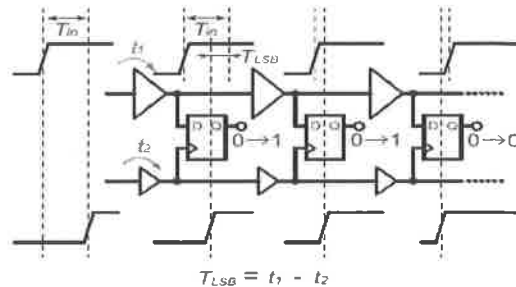

$$T_{LSB} = t_1 - t_2$$

Fig. 1. Simplified schematic of a typical Vernier TDC.

Measurement applications, such as laser range finder [3] and mass spectrometry [4]. It is also used in fluorescence lifetime imaging applications [5]. In these applications, which are the main target applications of this paper, fine time resolution and wide dynamic range are demanded at the same time [6]. Since the TDC determines the overall performance of the measurement. a few ps time resolution with low jitter at a sampling rate of several MS/s is often requested. In terms of fine resolution, several time conversion techniques that realize sub-gate-delay resolution have been proposed. A Vernier TDC is widely adopted, thanks to the simplicity of its design concept [6]–[9]. As illustrated in Fig. 1, a typical Vernier TDC needs two independent delay lines that are often implemented as ring delay lines to save area. Two lines have different delay steps, e.g., $t1$ and $t2$ ($t2 < t1$), and thus, the initial time interval Tin between two rising transitions gradually shrinks until the moment when the transition in lower delay line catches up with that in the upper one. By tuning the delay difference $TLSB = t1-t2$, we can realize fine time resolution. However, this architecture requires two independent delay lines, where mismatch between them is inevitable. On the other hand, a pulse-shrinking (PS) TDC shown in Fig. 2, which is also a type of Vernier TDCs, utilizes the delay difference between rising and falling transitions of a buffer instead of the two independent delay lines [10], [11].

The buffer is intentionally designed to have different rise and fall delays, e.g., tr and tf ($tf < tr$), and thus,

A Big Data-Informed Math Classroom Space Built on the Wisdom Cloud for Postsecondary Vocational Education

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ABSTRACT

Math has been getting a lot of attention from higher education policymakers since it has been recognised as a public core curriculum subject in the system of vocational universities. However, difficulties persist in higher education due to the dispersed nature of mathematics teaching materials and the difficulty of integrating data. The proliferation of intelligent technology, spurred driven by big data (DT) and smart clouds, has assisted academic institutions in implementing programmes that teach informatization and data integration arithmetic teachers in higher vocational education have challenges including more material to cover in less contact hours. difficult, advanced occupational training because to rising student numbers and deteriorating math instruction, to create a data-driven, mathematically-savvy cloud platform via the use of big data's rich mathematical resources instructing.

Introduction

The context. Higher vocational education has grown significantly in recent years as a result of policy shifts on a national level. While this development is encouraging, the increasing school enrolment has led to the dilemma of a reduction in quality of pupils as a whole. And then there are the benefits of modern maths is an essential public fundamental topic, and its texts are conceptually strong. • is makes it dif cult to comprehend. Even with the progress of the national as a result of changes brought about by education reform, higher vocational institutions have adapted their

curricula and enhanced the quality of their teaching. material of many majors for the goal of enhancing the providing lessons at a more advanced mathematical level At the same time, they have also strengthened the qualifications for the quality of instruction and the breadth of instructors' knowledge in better schools for the trades, which boosts the difficulty of teaching mathematics. In Moreover, smart cloud technology has also started to be utilised in every facet of our life, yet technology has also brought the potential for creative new approaches to teaching and learning in the field of education. There is growing support for the use of online and one instruction. number of top managers in the education More specifically, the MOOC platform's online courses include recognised as a serious academic by professors. , thus, mathematics for higher An increasing number of scientific methods are being included into vocational technology to contribute to the growth of the internet as a whole classes.

The purpose of this article is to provide a framework for the development of a knowledge cloud platform for mathematics instruction and education at post

Patients Tracking and Diagnosis of A Wireless Emergency Telemedicine System

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Abstract

Now a days, remote human services frameworks have gotten expanding consideration in the most recent decade, clarifying why canny frameworks with physiology signal checking for e-medicinal services are a rising zone of improvement. Thusly, this examination receives a framework which incorporates consistent assortment and assessment of different imperative signs, long haul medicinal services, and a cell association with a clinical focus in crisis case and it moves all gained crude information by the web in typical case. The proposed framework can persistently obtain four distinctive physiological signs, for instance, ECG, SpO2, temperature, and circulatory strain and further transferred them to a clever information examination plan to analyze anomalous heartbeats for investigating potential interminable sicknesses.

The proposed framework additionally has a benevolent online interface for clinical staff to watch prompt heartbeat signals for remote treatment. When unusual occasion occurred or the solicitation to continuous presentation fundamental signs is affirmed, every single physiological sign will be promptly transmitted to remote clinical server through both cell systems and web. Additionally information can be transmitted to a relative's cell phone or specialist's telephone through GPRS. A model of such framework has been effectively evolved and executed, which will offer exclusive expectation of human services with a significant decrease in cost for our general public.

I. Introduction

A healthcare system in the last decade was made possible due to the recent advances in wireless and network technologies, linked with recent advances in nanotechnologies and ubiquitous computing systems. The term telemedicine refers to the utilization of telecommunication technology for medical diagnosis, treatment, and patient care [1]. The aim of telemedicine is to provide expert-based healthcare to understaffed remote sites through modern telecommunication (wireless communications) and information technologies. One of the benefits of telemedicine is cost savings, because information is less expensive to transport than are people. Advances in medical technologies have led to accelerated growth of the elderly population in many countries, resulting in an increasing requirement for home health monitoring to ensure that elderly patients can lead independent lives [2].

Many physiological signals can be measured from individuals in their living environments during daily activities and are potentially applied to observe the deviations of health status in the early phase or to alert paramedics automatically in emergency cases [3]. Especially for remote monitoring of physiological parameters, all the studies developed and currently used in this area can be categorized by several aspects: type of sensors, type of data communication, monitoring device, and signal processing/medical algorithms [4]. So these aspects along with recent studies will be discussed in this section. As shown in Figure 1 the main telemedicine system components in recent years include bio signal sensors, processing units, data communication networks, and medical service center.

The bio signal sensors are responsible for acquiring the physiological data (patient's vital signs) and transmitting it to the signal processing unit. Several studies are made focusing only on designing these sensors to be tiny in size [5], maintain patient mobility [6], and consume low operating power to reduce battery size which can last for longer durations [7].A collection of wearable medical sensors could communicate using personal area network or body network [8], which can be even integrated into user's clothes [9].At the next stage, sensor layer of every remote monitoring system is typically connected to the processing device for

A Switched-Capacitor Bidirectional DC-DC Converter with Wide Voltage Gain Range for Electric Vehicles with Hybrid Energy Sources

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Abstract— *An exchanged capacitor bidirectional DC-DC converter with a high advance up/step-down voltage gain is proposed for electric vehicles (EVs) with a half breed vitality source framework (HESS). The converter displayed has the benefits of being a basic circuit, a diminished number of parts, a wide voltage-gain extend, a low voltage stress, and a shared opinion. Likewise, the synchronous rectifiers permit zero voltage exchanging (ZVS) turn-on and turn-off without requiring any additional equipment, and the proficiency of the converter is improved. A 300W model has been created which approves the wide voltage-gain scope of this converter utilizing a variable low-voltage side (40V-100V) and to give a consistent high-voltage side (300V). The greatest effectiveness of the converter is 94.45% in step-down mode and 94.39% in step-up mode. The test results additionally approve the possibility and the adequacy of the proposed topology.*

Index Terms—Switched-capacitor, Synchronous rectification, Bidirectional DC-DC converter, EVs, HESS, Wide voltage-gain range

I. INTRODUCTION

To address the challenges of fossil fuels as the primary energy source for transport (including reducing stockpiles and polluting emissions) [1]-[2], electric vehicles (EVs) powered by battery systems with low or zero polluting emissions, are increasing in popularity. Although the developed advancement of batteries can provide higher population performance for EVs, the unlimited charging or discharging current (i.e. inrush current) from batteries will result in shorter battery cycle life, as well as reducing the efficiency [3]. The combination of a battery and super-capacitors as a hybrid energy source system (HESS) for electric vehicles is considered as a good way to improve overall vehicle efficiency and battery life [4]. Super-capacitors have

advantages of high power density, high cycle life, and very good charge/discharge efficiency. They can also provide a large transient power virtually instantaneously and are therefore suitable for meeting sudden EV power changes such as acceleration or meeting an incline.

The HESS can make full use of the performance of batteries and super-capacitors: the super-capacitors supply power for acceleration and regenerative braking with the battery meeting the requirement of high energy storage density for long range operation [5]. A challenge for the HESS is that the terminal voltage of super-capacitors is low, and varies over a wide range as they are charged or discharged. Therefore, a bidirectional DC–DC converter with a wide voltage-gain range is desired for the HESS to connect low-voltage super-capacitors with a high-voltage DC bus. There are two broad classifications for bidirectional DC-DC converters, namely isolated converters and non-isolated converters. Isolated converters, such as half-bridge and full-bridge topologies are implemented using a transformer [6]-[8]. In addition, the half-bridge converter in [6] needs a center-tapped transformer which results in a complex structure, and the full-bridge converters in [7]-[8] require a higher number of semiconductor devices. High-frequency transformers and coupled inductors can be used in isolated converters to obtain high step-up and step-down ratios [9]-[11]. However, in [9], the realization of bidirectional power flow requires ten power semiconductors and two inductors. The converter in [10] requires two inductors in addition to the transformer, and three inductors are used for the converter in [11]. The structure of these converters is complex, the cost is high, and it is difficult to standardize the design. When the turns ratio of the high frequency transformer increases, the number of winding turns increase

Zero-Voltage and Zero-Current-Switching Full-Bridge PWM Converter Using Auxiliary Active Clamp

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Abstract— *Another zero-voltage and zero-current-exchanging (ZVZCS) full-connect (FB) pulsewidth balance (PWM) converter is proposed to improve the presentation of the recently exhibited ZVZCS FB PWM converters. By including an optional dynamic cinch and controlling the brace switch reasonably, ZVS (for driving leg switches) and ZCS (for slacking leg switches) are accomplished without including any lossy parts or the saturable reactor. Numerous preferences including basic circuit topology, high effectiveness, and ease make the new converter alluring for high-voltage and high-power (>10 kW) applications. The rule of activity is clarified and dissected. The highlights and structure contemplations of the new converter are likewise represented and checked on a 1.8-kW 100-kHz protected entryway bipolar transistor (IGBT)-based exploratory circuit.*
Index Terms— conversion of DC–DC power.

I.   INTRODUCTION

Insulated gate bipolar transistors (IGBT's) are widely used in switching power conversion applications because of their distinctive advantages such as easiness in drive and highfrequency switching capability. The performance of IGBT's has been continuously improved, and the latest IGBT's can be operated at 10–20 kHz without including any snubber circuit. Moreover, IGBT's are replacing MOSFET's for the several or several tens of kilowatts power range applications since IGBT's can handle higher voltage and power with higher power density and lower cost compared to MOSFET's. The maximum operating frequency of IGBT's, however, is limited to 20–30 kHz [1] because of their tail-current characteristic. To operate IGBT's at high switching frequencies, it is required to reduce the turn-off switching loss.

Zero-voltage switching (ZVS) with a substantial external snubber capacitor or zerocurrent switching (ZCS) can be a solution. The ZCS, however, is deemed more effective since the minority carrier is swept out before turning off [6]. ZVS full-bridge (FB) pulsewidth modulation (PWM) converters have received considerable attention in recent years [2]–[5]. This converter is controlled by a phase-shifted PWM technique which enables the use of all parasitic elements in the bridge to provide ZVS conditions for the switches. Distinctive advantages including ZVS with no additional components, and low-device

voltage/current stresses make it very attractive for high-frequency high-power applications,

where MOSFET's are predominantly used as the power switches. The IGBT's, however, are not suited for the ZVS FB PWM converter because the ZVS range is quite limited unless the leakage inductance is very large. In addition, several demerits such as duty-cycle loss and parasitic ringing in the secondary limit the maximum power rating of the converter. To apply IGBT's for a high-frequency converter, a ZVZCS FB PWM converter was presented [7]. IGBT's with no antiparallel diodes are used for all primary switches. During the freewheeling period, the primary current is reset by using reverse avalanche-breakdown voltage of the leading-leg IGBT's, which provides ZCS condition to lagging-leg IGBT's. However, it has some drawbacks as follows. The stored energy in the leakage inductance is completely dissipated in the leading-leg IGBT's. There is parasitic ringing in the primary during the freewheeling period. The maximum controllable duty cycle is limited since the reverse avalanche-breakdown voltage is low (15–30 V) and fixed. Therefore, the overall efficiency will be deteriorated unless the leakage inductance is very low. Another approach for ZVZCS FB PWM converter was presented [8]. By utilizing a dc blocking capacitor and adding a saturable inductor in the primary, the primary current during the freewheeling period is reset, which provides ZCS condition to the lagging-leg switches. Meanwhile, the leading-leg switches are still operated with ZVS. The stored energy in the leakage inductance is recovered to the dc blocking capacitor and finally transferred to the

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A NEW CONTROL STRATAGY FOR SOLAR PVT- BATTERY AND DIESEL GENERATOR BASED EV CHARGING STATION

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Abstract: The main aim of this project tis solar pv-battery & diesel generator-based EV charging station. This paper employs a PV (photovoltaic), a power storage unit, a DG generator, & a grid-based EV charge station (CS) to continuously load isolated, grid-connected & DG-connect modes. This project involves an energy & electronic energy storage plant. In this project, the PI controller is changed to a Fractional Order PID (FOPID) controller in the DG set, which can regulate the tension & frequency. The charging station is primarily intended to recharge the electric car battery (EV) with a solar PV & BES range. However, the charging station is intellectually electricity coming from the grid or DG in case of an empty storage battery & of the unavailable production of Solar PV array (Diesel Generator). The electricity in the DG collection is however drawn in such a way that it frequently works with an 80 to 80 percent charge in all charging situations to achieve optimal fuel efficiency. In conjunction with the storage battery, the charger also handles the power & frequency of the generator without the mechanical speed control. In addition, the PCC (Common Coupling Point) tension synchronizes for continuous loading with grid/generator voltage. The charging station leads the automobile to the active/reactive transmission of the grid, the vehicle to its domestic & the vehicle to the transference of vehicle power in order to optimize its operating efficiency. With Mat lab/Simulink software the operation of the charging station is validated.

Keywords: PV, Battery, Electric vehicle (EV), Point of common coupling (PCC), FOPID controller

I. INTRODUCTION

One of the most efficient ways of transportation is electric vehicles (EVs), which produce zero exhaust emissions. EVs give car fleets an enormous advantage, as it is estimated that about 3 million vehicles are already on the road, & it is predicted that this number would increase to 100 million by 2030. Although the construction of the required charging infrastructure & a vast amount of electrical energy are essential, that is not enough. To be sustainable, EVs require renewable & sustainable electrical energy to charge. While fossil fuels are still being used for energy generation, their emission is only displaced, not reduced. Because renewable energy is the only option for electricity generation, renewable energy usage eliminates emissions while providing a benefit to the environment. The availability of renewable energy sources, such as solar PV arrays, wind turbines, hydroelectric dams, & fuel cell-based generators, ensures that a solar PV-based energy generation method will be the most practical option for EV charging in both rural & urban areas. With regard to the Indian subcontinent, availability is nearly year-round. Conversely, while solar PV arrays are commonly installed in areas with strong sunlight, wind & hydro energy are region dependent. In the coastal region, wind energy is mainly used, but in the higher regions, hydro energy is useful.

The least favorable alternative is a renewable-energy charging plant, where a further energy conversion stage is introduced & the charge system becomes more complex & less powerful. In addition, a dedicated control unit needs to be integrated with the existing control for each conversion stage. Basically, it is important to construct an integrated system with multifunctional & multimode operating capability to have a unified control & coordination amongst all different sources. Renewable energy based charging stations have received many attempts to be developed. Renewable energy plays a key role in the sustainability of the EV charging station, as highlighted by Ugirumurera et al. [3]. According to Mouli et al. [4], a high power bidirectional EV charger has been used to charge EVs using solar electricity. However, the AC charger has not been specifically built for it. In a study by Monterio et al. [5], three-port converters were developed to integrate PV power with EV chargers. Even though the charger was built to deal with these distortions, No factors are considered in the design for the current grid distortions induced by the charger. An improved converter for a PV array/grid-connected EV loader was proposed by Singh et al. [6]. While the charger has not been created expressly for this particular operating mode, it works in that environment. Therefore, unless the grid is ready, it can not allow

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PSPWM BASED SCMLI TOPOLOGY WITH A REDUCED NUMBER OF SWITCHES FOR AC POWER DISTRIBUTION SYSTEM

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Abstract: The main aim of this project is Phase Shift Pulse Width Modulation (PSPWM) based Switched Capacitor Multi Level Inverter (SCMLI) topology with a reduced number of switches for AC power distribution system. The output voltage and current waveforms from the various PV sources are being produced by the power electronics converters. In recent years, PV applications have concentrated on the delivery of high-frequency AC electricity. With DC/AC SCMLIs, for example, the number of power conversion stages and components is greatly reduced resulting in an increased rate of conversion. A new PSPWM based SCMLI topology with fewer switches and a self-balanced floating capacitor (FC) voltage is proposed in this project. A single dc source and three dc sources make up the suggested topology. With the proposed design, a voltage output (Vo) that is twice as high as the input voltage can be generated (Vin). Compared to other topologies recently proposed, this one has a faster discharge time. In addition, the voltage stress on switches is les in relation to the load voltage. The proposed simulation results are studied in MATLAB/SIMULINK environment.

Keywords: PS-PWM, Multilevel inverter, Frequency AC power distribution, Floating capacitor

I.INTRODUCTION

Since there is a huge need for electric power and infinite solar energy sources, PV-fed applications are growing at an ever-increasing rate. As a result, additional PV applications with high power conversion efficiency will be possible thanks to power electronics. High-frequency power distribution systems, such as space, communications, and computer applications, can benefit from the combination of PV with power electronics technologies [1]-[2]. Electrical systems for aeroplane applications with high-frequency AC loads are depicted in the figure to the right. In terms of power converters for medium to large-scale PV systems, the multilayer inverters (MLIs)

are well established and dominant. The MLI's key advantages are its low dv/dt and lower overall harmonic distortion (THD). In addition to the AC drives, FACTS devices, renewable energy, and microgrids, MLI can be used in a wide range of other applications. Cascaded h-bridge, neutral point clamped, and flying capacitor topologies are commonly referred to as MLIs in the literature. High-voltage and high-power applications are better suited for these typical topologies [3]. Despite the low dv/dt stress of these topologies, the number of switches, diodes, and dc-link capacitors or dc sources is large. It is proposed in [4] that a new MLIs topology consumes fewer power components with less stress. However, these topologies are able to reduce the number of switches, but the dv/dt stress they generate is substantial. In addition, the SCMLIs are added in [5]-[15] to reduce the burden on switches and switch count. Topologies using SCMLI topologies are more appropriate for producing high voltage levels with fewer switches. Furthermore, these topologies provide a single dc supply and low dv/dt stress. The FC is utilised in accordance with the number of voltage levels required.

The cascaded structure is suggested for those who want to go even deeper into the hierarchical structure. Compared to the input voltage, the output voltage gain is two times greater. Additionally, new SCMLI topologies with a voltage gain of 1:2 are advocated for 9L in [11]-[13] to reduce switch count and switch voltage stress. However, these topologies only work with a 9L output voltage waveform, thus the cascaded topology is the preferred alternative if you want to go even farther. SCMLI topology for 13L inverter has been presented in [14]-[18] as a way to avoid this. With a voltage gain of 1:2 and a cascaded structure once

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A rotational encoder based hesitance exchanging engine control approach

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Abstract. *Switched Reluctance Motors (SRMs) are becoming more popular in electric drive development due to their advantages and environmental concerns. In terms of development, the SRM has a prominent position because to its ease of use, robustness and cheap cost. It is possible to use a sensorless approach to operate SRM, however this method is more complicated and has a greater number of limitations. Sensor-based rotor position detection, on the other hand, has several benefits, despite the fact that it requires hardware to be attached to the shaft. According to the findings of this study, digital signal controllers may be used to create a control strategy. A solution to the wide-range speed and stationary operating issues may be found in this approach. On-off times of switches may be adjusted through software as well. Simulators and tests were used to confirm the findings.*

1. Introduction

Electrified drives play a major part in industrial applications. They used DC motors and AC induction motors in the past. BLDC and SRM motors are increasingly being used in electric drive systems due to significant advancements in power electronics and digital control.. Environmental concerns have sparked the development of electric vehicles and hybrid electric vehicles [1] and [2, respectively]. In spite of the fact that SRM's torque is less than BLDC's, the simplicity, durability, and cheap cost of SRM make it more intriguing than BLDC. The strategy consists of two stages, the first stage being used to calculate the initial pulse number, and the second stage being used as the SRM's principal controller.

In the sensorless concept, the rotor position may be determined without the need of any extra equipment. Low and high speed sensorless control implementation is difficult. It is possible to measure voltage and current without using any sensors at all, for example, by monitoring the

AI-READY AUTOMATED VISUAL INSPECTION: CONCEPTUALIZATION AND DEVELOPMENT OF A NEURO-FUZZY SYSTEM

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Abstract

An appealing option for businesses looking to save costs on component inspection is automated visual inspection (AVI). Camera systems for component inspection allow for less manual work and maybe better output rates. For the automobile sector, where product lifespans are often short and where suppliers are under growing pressure to provide flawless components, this is of paramount importance. However, setting up an AVI system may be complicated, particularly for businesses that have little expertise with vision systems. This causes training periods to be lengthy and the advantages to be under-realized. The goal of the work presented in this thesis is to create and build an image-processing algorithm that may aid in shortening the required training period and adjusting for external factors, such as surface lighting, that can affect the accuracy of the results. The software is able to learn the inspection process from samples of excellent and poor components thanks to the use of "intelligent" algorithms (particularly neural networks and fuzzy logic). The user is not only giving the data necessary to generate an accurate classification, but also, indirectly, the predicted variance in the photographs via the provision of sample images. This implies that the intelligent algorithm does not need being informed the maximum permissible variance, in contrast to more conventional systems. The algorithm was put through its paces using data from a customer in the industrial sector as well as photographs created in the lab. Results indicate that training times may be drastically reduced by switching to an example-based method. Classification performance was found to be on par with that of conventional threshold-based methods for pictures with a clear pass/fail distinction. The neuro-fuzzy system somewhat outperforms other methods when dealing with small discrepancies. In order to implement and test in an industrial setting, a user interface was designed.

Introduction

The strain on manufacturers to satisfy a wide variety of customer needs is increasing. Due to the complexity of the manufacturing industry today, fundamental requirements like inspection and quality control are frequently disregarded as potential areas for research and increased efficiency. Rising inspection prices may be attributed to the "zero defect" policies adopted by the car industry (Luke, 2000). Costs are on the rise, but they might be mitigated with better automated inspection methods. The focus of this study is on using intelligent (neuro-fuzzy) technologies to enhance the quality of the manufacturing process's components inspection phase. Currently, five Canadian institutions are working on developing this system at the same time. Each institution has researchers investigating issues related to industrial inspection from

Overview of the Issue

AVI systems have been used in factories for decades. The adaptability of these systems is

appealing since it allows for several uses of the same hardware. Another perk is that operators may rest easy knowing that the technology they're using operates on the same data that people do: visible light. Nonetheless, it's easy to lose sight of the fact that the human visual system is very intricate. The inspection duties that come naturally to people might be challenging for a computer system. Because of the nature of the assembly area at a factory, the situation is considerably more dire there. Light, smoke, dust, and other contaminants may easily enter the inspection area since the process is not isolated from the rest of the facility. Although

While the human visual system is able to immediately adjust to these variations, they may nevertheless make a well-tuned AVI system ineffective. Weaknesses in vision systems originate from their over-reliance on predefined thresholds for analysis. Because the output abruptly shifts anytime the input reaches a fixed threshold, they are quickly disturbed by changes in the surroundings. The incident at Van Rob Stampings is an excellent real-world illustration of this category of issues. They make metal stampings for cars. In order to build a single dashboard mount, 46 metal clips are put into the beam to provide threads for the fasteners (see Figure 1.1). During different points in the procedure, the clips are inserted both manually and using automated machinery. All of the beams are inspected for completeness and accuracy before moving on to the next stage.

The Development of Modern Mechanical Ventilation to Treat Health-Related Studies

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Rationale:

Strong evidence from randomized studies is included in the most up-to-date literature on mechanical ventilation. There is a lack of data on how these studies have altered routine clinical procedures. The goals of this study are to (1) discuss current methods of mechanical ventilation and (2) evaluate the impact of interval randomized trials in comparison to a cohort studied in 1998. Procedures: A prospective, multinational, observational cohort research with a nested comparison analysis was conducted in 349 critical care units across 23 countries. In a one-month period, we included 4,968 patients who were receiving mechanical ventilation on a continuous basis. Throughout the course of mechanical ventilation, we documented patient demographics as well as daily ventilation-related data. Prior to these findings, we conducted a comprehensive literature analysis and formulated 11 hypotheses on potential changes in practice for the aforementioned comparative cohort study. Only information from the 107 intensive care units (1,675 patients) that were part of the 1998 cohort was included in our analysis of practice shifts (1,383 patients). Metrics and Primary Outcomes: Non-invasive ventilation usage rose from 1998 to 2004 (11.1 vs. 4.4%, P, 0.001). Tidal volumes fell (7.4 vs. 9.1 ml/kg, P, 0.001) and positive end expiratory pressure levels rose (by around 1 mm Hg) in patients with acute respiratory distress syndrome (8.7 vs. 7.7 cm H2O, P 5 0.02). Patients' initial attempts at spontaneous breathing were more likely to result in extubating (77 vs. 62%, P 0.001). Significantly fewer patients required synchronized intermittent obligatory breathing (1.6 vs 11%, P 0.001). Our eleven hypotheses on potential changes in procedure were supported by the data. We conclude that the outcomes of randomized trials have improved mechanical ventilation techniques throughout the world since there is a high correlation between the expected and observed improvements in practice.

Keywords:

Acute respiratory distress syndrome; non-invasive positive-pressure ventilation; weaning; mechanical ventilation; mortality

Introduction

The provision of high-quality health care includes the goal of putting into practice treatments that have already been shown to be beneficial (1–3). Still, delays in applying findings from clinical research constitute a systemic problem (4, 5), and the field of critical care medicine is no exception (6–10). In 1998, 5,183 consecutive eligible patients from 20 nations participated in a prospective, observational research of machanictal breathing methods (11). Our mission was to provide doctors and clinical researchers in the area of mechanical ventilation with comprehensive data on natural history and prognosis; to analyse practice variability; and to establish "usual care" benchmarks.

We also discovered that the typical patient still spends 40% of their time on mechanical ventilation weaning, and that the overall incidence of death in the ICU is high (31%; 95% confidence range, 29-32%). (11). When it comes to mechanical ventilation, interventions that have been proved to increase survival rates will have far-reaching consequences. There have been many randomized trials in the past decade looking at different ways to decrease the need for mechanical ventilation (such as non-invasive ventilation trials), decrease the duration of mechanical ventilation (such as weaning and extubating studies), and increase the safety of mechanical ventilation (e.g., trials of lung-protective ventilation in acute respiratory distress syndrome [ARDS]). No one knows how this amount of research will affect clinical practice, and data from 1998 is quickly becoming outdated (11, 12).

As a result, we repeated the original research's methodology to perform a second worldwide

Analysis of Ground Vehicle Inertia Properties Using Real-Time Estimation Parameters

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abstract

Handling, stability, and the inclination to roll over are all significantly affected by vehicle factors. This research presents two techniques for real-time estimation of a ground vehicle's inertia values. The uncertain vehicle model provides a probability density function for each of the variables by using the Generalized Polynomial Chaos (gPC) method of prop agating the uncertainties. Many different statistical techniques may be used to these PDFs in order to estimate the parameters' values. Maximum A-Posteriori (MAP) estimation is utilized here. Where is the vector of PDFs of the parameters and z is the observable sensor comparison, the MAP estimate optimizes the distribution of P(|z)? One more approach is to use an adaptive filtering technique. An instance of an adaptive filter is the Kalman Filter. By combining it with the gPC theory, the PDFs of the parameter distributions may be updated at each time step. The filter adjusts the median values of these PDFs so that they are more closely in line with the true values.

Introduction

Inaccurate parameter values are tolerated by vehicle control systems because they are built to be resilient. The act of loading (items) and emptying (fuel, etc.) the vehicle produces these incorrect parameter values. When it comes to most systems, this isn't a big issue, but when it comes to preventing cars from rolling over, it may be disastrous. Because vehicle rollovers are inherently discontinuous occurrences, control systems benefit from more precise parameter readings.

This research is intended to give updates for the on-board systems and estimate these shifts. Several issues should be taken into account. Choosing a suitable data collection strategy is the first step. The second is to choose a model with low data requirements while yet being able to predict the relevant parameters. In this study, we offer two techniques for determining a vehicle's mass and moment of inertia during operation in two dimensions (pitch and roll) without resorting to a terrain profile. We use

Bayesian statistics and a hybrid of the Extended Kalman Filter and the mathematical approach of Generalized Polynomial Chaos to achieve our goals

(gPC). Quantifying the uncertainty in the parameters is made computationally efficient by the Generalized Polynomial Chaos approach [4, 12, 23, 24].

Summarizing the Available Research Estimating parameter values may be done in a variety of ways, each as specific to its area as the techniques themselves. Perhaps the relevant factors are characteristics of electrical devices [11]. Kalman Filtering, Least Squares Error, Lyapunov Stability, Genetic Algorithms, and many more [1, 13, 14, 17, 21] are all viable estimate strategies. The estimation of parameters in vehicle dynamics is no different from the estimation of parameters in other fields [6]. Vehicle mass, inertia, aerodynamic drag coefficient, spring stiffness, suspension damping, and many other factors may all be sources of uncertainty. Numerous techniques are used to calculate an approximate vehicle mass and moment of inertia. To calculate a vehicle's mass, one may use variables such as the engine's torque, the drivetrain's inertia, the wind's resistance, the tires' rolling resistance, and the road's grade [7, 13, 21]. According to [21], this issue arises because the assessment of the vehicle's rolling resistance, a metric that fluctuates non-trivially over time, is particularly sensitive to the estimation of the other parameters. In [17],

we see an example of a technique that may be used to estimate multiple vehicle characteristics. The horizontal center of gravity, mass, and pitch and roll moments of inertia of the vehicle are all determined by the authors of this research. Unfortunately, it is not always the case that the road noise is Gaussian white noise, which is what is needed for this estimate method to work. Errors in the expected parameters might lead to non-trivial estimate errors, which is why a terrain profile is necessary.

Mechanics of Moving Vehicles

Vehicle dynamics often use seven-DOF base excitation models like the one shownin Figure 1. The chassis, also called the sprung mass, is what holds the model's suspension components and wheels together (denoted as unsprung masses). The model first utilizes the tire dynamics to get the unsprung masses excited by the terrain profile, and

Analyzing and Estimating Errors in Model Exchange and Co-Simulation Using FMI, Version 2.0

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Abstract

Models of system dynamics, which might span many disciplines, are often constructed of such subsystems. The model, like large technical systems, is divided into separate modules. In commercial settings, the various subsystems are often modeled in silo using specialized software for each discipline. The Functional Mock-Up Interface (FMI) is a standard interface for coupling simulations. combines physical models from several fields and tackles issues like export The use of Industrial Simulation Tools for Importing Model Components (FMI for Model Exchange) nonlinear system dynamics, and the standardization of co-simulation interfaces For further information on co-simulation, see [10].A fresh focus on the algorithmic and numerical details of co-simulation It has prompted fresh research into error estimate and stabilizing methods in A co-simulation environment that complies with the FMI for Model Exchange and Co-Simulation v2.0 standard. In this work, we investigate effective methods of error estimation in telecommunications. Modulating the step size in this framework.

Introduction

The simulation of coupled technical systems and coupled physical phenomena in engineering with a focus on time-dependent issues is known as co-simulation. In the current ITEA2 project MODELISAR, theoretical and practical elements of cosimulation were investigated (2008- 2011). In order to address issues like the export and import of model components in commercial simulation tools (FMI for Model Exchange) and the standardization of cosimulation interfaces in nonlinear system dynamics (FMI for Co-Simulation), a functional mock-up interface (FMI) was developed. For more information, see [10]. Currently, the Modelica Association Project "FMI" maintains and develops the interface standard. The fourth -version of FMI for Model Exchange and Co-Simulation v2.0 was made available in August 2012 [15].
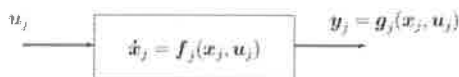
Co-Simulation takes use of the decomposable nature of linked issues by performing model setup, pre- and post-processing in parallel for each subsystem using specialized simulation software. During temporal integration, each component is simulated in isolation once again; with inter-component communication limited to a set number of discrete nodes ten (see [2]). Communication points Ten, steps TN TN+1, and step sizes HN: = TN+1 TN are also known as sampling points (synchronization points), macro steps, and

sampling rates, respectively [15]. Mathematically speaking, a modular time integration approach is produced when many numerical solvers are coupled in a co-simulation environment, with the (unknown) subsystem inputs uj(t) between the communication points Ten being replaced by a polynomial approximation.

Interpolation, or extrapolating, to fill up the gaps [2]. As a consequence of the extension of the signal, the modular time integration may become numerically unstable and suffer from new error terms. These issues are addressed in FMI for Model Exchange and Co-Simulation v2.0 through the use of interface routines that allow for higher-order extrapolation and interpolation of subsystem inputs, communication step size control (including step rejection), and Jacobean-based linearly implicit stabilization methods. Managing the size of each step in a communication and estimating errors is the subject of this research. We refer you to [1] and the more recent findings in [3], [18] for further information on stabilizing approaches based on the Jacobean. This paper follows the following structure: To rule out the possibility of algebraic loops in a block-structured coupled system, we provide a suitable condition in Section 2. In Section 3, the fundamentals of a convergence analysis in this context are laid forth. We get credible estimates of the local error by generalizing Richardson extrapolation methods from ODE and DAE theory to modular time integration. Section 4 covers both the theoretical and practical elements. Numerical experiments for a quarter-car model validate the conclusions of the theoretical research (Section 5). Section 6 is where the paper wraps up with a few last thoughts. The benchmark issue of a quarter-car was numerically tested in a Mat lab-based testing environment. Fraunhofer IIS/FMI

CONDITION NUMBER OF THE GENERALIZED INERTIA MATRIX OF A SERIAL-CHAIN AND ITS CORRELATION WITH THE DIAGONAL RATIO

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Abstract

One way to quantify the degree to which a serial chain is in poor condition is to look at its Generalized Inertia Matrix (GIM) condition number. However, it is computationally costly to calculate the condition number. Therefore, this research looks at several methods of estimating the condition number, especially for a very long serial-chain. This is done by looking at the GIM's diagonal components. Scaled using an initial estimate of the condition number, the ratio of the GIM's greatest and smallest diagonal elements is found to closely reflect the condition number. This greatly streamlines the procedure for identifying GIM MA conditioning, which might be used to determine the system's stability.

Introduction

For modelling and control purposes, the GIM of a multibody system is a crucial function of its joint variables. Specifically, inadequate training of the GIM leads to errors in forward dynamics [1] and subpar joint control ability [2]. That's why the condition number is such a useful tool for assessing the degree to which the GIM is in poor shape [2]. The condition number is the ratio of the greatest and lowest singular values if norm-2 definition [3] is applied. Since the GIM is symmetric and positive-definite, its condition number is just the ratio of its largest and smallest eigenvalues [3]. However, computing the condition number using eigenvalues is computationally highly costly, despite the fact that it is extensively used as a means to measure ill-conditioning of the GIM.

Thereby, huge computational savings may be realized if the GIM's health can be determined using any other attribute of the GIM. To the best of our knowledge, such non-traditional methods were seldom mentioned in published works. It is interesting to note that the pivot ratio, defined as the ratio of the largest to the smallest pivot element, may be used to foretell instability, as shown by Mitra and Klein [4] in 1975. They implemented the idea in electromagnetics integral equations. Nonetheless, it became clear throughout the course of this investigation that pivot cannot be relied upon to accurately predict the trajectory of the condition number. We use the ratio of the largest to smallest diagonal elements of the GIM as a measure of ill-conditioning of the GIM because 1) the trace of GIM is equal to the sum of eigenvalues,

and 2) each diagonal element of the GIM carries the knowledge of the system ahead of the body corresponding to the index of the diagonal element. For the purpose of brevity, we shall refer to this proportion as the diagonal ratio from here on. The GIM's constituents are easily accessible as a by-product of either inverse or forward dynamics techniques [1], therefore the diagonal ratio may be computed without any further work. We used the diagonal ratio to condition number correlation to determine poor conditioning. Scaled diagonal ratio is then implemented later on. The remainder of the paper is laid out as follows: Section 2 introduces GIM ill-conditioning. Section 3 introduces the GIM and its key features, while Section 4 offers a number of numerical examples. Conclusions are presented in Section 5.

preparation of the GIM

As stated in [5], a tree-structured multibody system's equations of motion may be modelled as a

$$I\ddot{q} + C\dot{q} = \tau$$

When GIM (represented by I), a generalized coordinate vector (generalized coordinates), a matrix of convective inertia components (represented by C), and a generalized external force vector (represented by) are all given. A poorly-conditioned GIM may have repercussions on a system's control performance, as shown in [2]. Therefore, the ill-conditioning metric may be useful for making adjustments in simulation or control. However, this is beyond the purview of the research; instead, we concentrate on efficient estimate of ill-conditioning, which may be used as a reference. Here, we merely utilize simulation to show how the GIM degrades with time.

Solving a set of linear algebraic equations in joint accelerations is the first step in simulating a multibody system. The second step is numerical integration. The q-valued joint accelerations are calculated using Eq. (1).

Multidrug-resistant bacteria are no match for silver nanoparticles, a potent nanoweapon.

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Abstract

The pharmaceutical and biomedical industries are now confronted with the issues of an ever-increasing number of people who are multidrug resistant (MDR). microorganisms that cause disease Drugs aid in the reemergence of MDR microorganisms. for the bacteria' survival, which is the acquisition of antibiotic resistance, or as well as the ability to reproduce under unfavourable conditions. Bacterial infections that are multidrug resistant mortality, morbidity and the expense of long-term therapies are all significantly increased as a result Consequently, the creation, modification, or search for antimicrobial agents is essential..

The development of chemicals capable of killing MDR bacteria is a top goal. of study. Silver has been used for thousands of years in different compounds and bhasmas. Ayurveda has used it for centuries to treat a variety of bacterial diseases. As Silver nanoparticles may be a novel treatment option for antibiotic-resistant bacteria. The bactericidal activity of silver nanoparticles against MDR bacteria is examined in this review. Multi-actional mechanism Resistance to drugs may be treated and prevented using nanotechnology.microbes.

Keywords

Multiple -drug- resistant methicil lin -resistant Staphylococcus aureus silver nanoparticles as a nanoweapon Staphylococcus aureus that is resistant to vancomycin

Introduction

Resistance in human infections is a major problem in pharmaceutical and biomedical industries. Anxieties regarding the development and reemergence of drug-resistant microorganisms are fueled by data on antibiotic resistance.

organisms that feed on other living things (Tenover 2006). Once a person has been infected, they are at

risk. It's almost impossible to treat an infection caused by MDR bacteria. And Because of this, he or she will have to stay in the hospital for longer, and A multi-drug regimen of broad-spectrum antibiotics, which are less effective, toxic and costly, is required (Webb et al. 2005). As a result, the creation or improving the effectiveness of antibacterial chemicals Bacterial activity is an important study focus in this field. in the present day and age (Humberto et al. 2010). Nanotechnology offers a solid foundation for future changes and improvements to the potential diagnostic, biomarker, cell-labeling, contrast agents for biological imaging features of metal nanoparticles, treatment of different illnesses using antimicrobial agents, medication delivery systems, and nanodrugs Duran (2008) and Singh and Singh (2011) Because of this, researchers are looking into the matter. universal nanoparticles, as well as silver

The issue of MDR bacteria emerging may be addressed with the use of nanoparticles (Gemmell et al. 2006). As a result of its high antibacterial properties, silver been in widespread usage since antiquity In spite of this, though, advances in antibiotics and the medicinal uses of silver decreases in use of antimicrobials were seen

as well as Schluesener (2008)). The antimicrobial properties of silver may be used in a variety of ways. Increasing their size at the nanoscale is possible. To combat bacteria, silver nanoparticles have changed their physiochemical characteristics. their large surface area to volume ratio and their small volume unique chemistry and physics (Kim et al.) Silver

Antioxidant activities of aqueous extracts from 12 Chinese edible flowers in vitro and in vivo

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ABSTRACT

Edible flowers' antioxidant properties are gaining attention. Food-borne oxidative damage, including hypoxia-reoxygenation and hyperlipidemia, has not been studied in detail. Aqueous extracts from 12 Chinese edible flowers were tested in four distinct antioxidant models, including total antioxidant capacity (TAC), oxygen radical absorbance capacity (ORAC), scavenging hydroxyl radical capacity (SHRC) and scavenging superoxide anion radical capacity (SARC) (SSARC). When hypoxia-reoxygenation and hyperlipidemia were combined, the possible antioxidant effects on rat cardiac microvascular endothelial cells (rCMEC) were investigated. Lonicera japonica Thunb., Rosa rugosa Thunb., Chrysanthemum indicum L. and Rosa rugosa Thunb. had the highest TAC, ORAC, SHRC, and SSARC values, respectively. When hypoxia-reoxygenation damages rCMEC, the antioxidant properties of most aqueous extracts of edible flowers may be relied on. Lonicera japonica Thunb, Carthamus tinctorius L., Magnolia officinalis Rehd. et Wils., Rosmarinus officinalis L., Chrysanthemum morifolium Ramat., and Chrysanthemum morifolium Ramat. aqueous extracts were also shown to reduce malonaldehyde content in hyperlipidemia rats. Edible flowers should be investigated for their antioxidant properties and potential use in the treatment of disorders associated with chronic exposure to free radicals, according to these results.

ischaemia/reperfusion; HDL-C: high density lipoprotein cholesterol; lactate dehydrogenase; LDL-C: low density lipoprotein cholesterol; malonaldehyde. RCMEC: rat coronary microvascular endothelial cells; SHRC: hydroxyl radical scavenger; SUPEROXIDE DISMUTASE: Superoxide dismutase; SSARC: radical scavenger for superoxide anion; ORAC: oxygen radical absorbance capacity Triacylglycerol (TG) is a polyunsaturated fatty acid that is a component of total cholesterol.

introduction

Numerous studies have shown the importance of free radicals, particularly reactive oxygen species (ROS), in several aspects such as cellular signal transmission, growth and differentiation of cells as well as cell death [1,2]. Many chronic disorders, such as hyperlipidemia, diabetes mellitus, hypertension, ageing and cancer may be caused by an excess of ROS in the body. Natural antiox idants have been extensively considered as preventative and therapy agents because of the possible health concerns and toxicity of synthetic antioxidants [6,7]. The practise

Based on Genome-Derived Minimal Metabolic Models of MG1655 Escherichia coli, the in-vivo respiratory ATP stoichiometry

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ABSTRACT:

A genome-scale model of E. coli was used to develop metabolic network models that describe the growth of Escherichia coli on glucose, glycerol, and acetate. The precise stoichiometry of energy producing and consuming processes is one of the metabolic network uncertainties. The ATP stoichiometry is critical to accurate biomass and product yield estimations. Eight distinct aerobic chemostat experiments with E. coli MG1655, cultured at various dilution rates (0.025, 0.05, 0.1, and 0.3 h 1) and on various carbon substrates, were used to determine the unknown ATP stoichiometry parameters of the E. coli network (glucose, glycerol, and acetate). Correct information on biomass composition and precise assessments of net conversion rates under well-defined circumstances are required for proper calculation of the ATP stoichiometry. Based on observations and literature data, a growth rate-dependent biomass composition was developed for this purpose. A metabolic network model was used to estimate an effective P/O ratio of 1.49 0.26 mol of ATP/mol of O, KX (growth-dependent maintenance) of 0.46 0.27 mol of ATP/C-mol of biomass, and mATP (growth independent maintenance) of 0.075 0.015 mol of ATP/C mol of biomass/h after incorporating the growth rate-dependent biomass composition. In order to precisely estimate all other fluxes and yields, just the particular growth rate, m, is required as an input.

KEYWORDS: Energy, P/O ratio, maintenance, and Herbert–Pirt relationships in Escherichia coli

Introduction

Using industrial microbes to make new and better products from renewable resources requires quantitative knowledge of cellular response networks and the management of those networks. This knowledge is critical. An method based on systems biology includes mathematical modeling of metabolism as a key tool. Metabolic engineering of microorganisms is increasingly guided by stoichiometric modeling, which has grown in popularity in the previous decade (Kim et al., 2008). In part, this is due to the fact that stoichiometric modeling only needs to know about the structure of the metabolic network and not about the specific biological events involved. Annotated genome sequences and subsequent curation based on biochemical and physiological information from the associated organism may be used to develop whole genome-scale metabolic

networks (Durot et al., 2009). Escherichia coli has had its genome-scale metabolic model extended several times, for example, as work on genomic reconstruction continues (Feist et al., 2007). Realize, however, that the metabolic model does not necessarily need to integrate the whole database of potential reactions for certain well-defined development circumstances. It has been shown that genome-scale reaction datasets may be reduced to specialized metabolic network models by utilizing proper model reduction methods (Burgard et al., 2001). While most metabolic pathways have stoichiometry established, the stoichiometry for some processes remains a mystery, such as the transport mechanisms, compartmentation, and the stoichiometries of the processes themselves, such as the P/O ratio for the generation of ATP and growth-dependent or growth-independent maintenance energy requirements (i.e., KX and mATP). Parameter values are often derived from either theoretical assumptions (Kayser et al., 2005) or in vitro investigations (Varma and Palsson, 1993). (Hempfling and Mainzer, 1975).

ATP stoichiometry parameters may be determined in vivo using Van Gulik and Heijnen (1995)'s new approach. For Saccharomyces cerevisiae and Candida utilis, they used literature data from carbon-limited chemostat cultures at the same growth rate but on different substrates to estimate the P/O ratio and KX. Using just one growth rate for all experiments made it impossible to distinguish between maintenance energy needs that are growth dependent and independent. It was also anticipated that the growth limiting substrate had no effect on the parameters of the experiment. S. cerevisiae growth on glucose and ethanol mixtures, the prediction of operational yields of amino acids, and the derivation of network-derived irreversibility limitations have all been successfully predicted using this technique (Van Gulik and Heijnen, 1995). When it came to the metabolic network in Penicillium chrysogenum, the technique had been expanded to include both growth and

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Breaking down the pulses of clients who participate in hasty shopping

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Abstract:

This study investigates the impact of context on in-store impulse purchase behavior in the retail setting. These antecedents are examined in detail to see if they have an impact on the desire to buy impulsively. There is evidence from a field study that impulsive buying is influenced positively by factors such as interactions with salespeople, an inclination toward impulsive purchases, the fun of shopping, and browsing in-store. This study also found that a bad interaction with a salesperson in a retail context is connected with regret. Six causal links between impulsive purchasing, guilt, and situational antecedents have been confirmed as a result of this study.

Keywords: In-store browsing and consumption are all examples of impulsive purchase behavior, or IBT.

Introduction

Both marketing and social awareness are being raised by this study, which seeks to gain insight into consumer behavior and push individuals to be more aware of their own impulses in the process.

Imprudent purchases that are made for hedonic reasons rather than financial ones are known as "impulsive buying," which is an extremely common phenomenon. Marketers and retailers frequently exploit people's natural desire for immediate fulfillment. Unplanned purchases are something that many people do on a regular basis, even when they weren't planning on it. People often feel the need to act quickly and impulsively in response to external influences, such as those found in shopping malls and eateries as well as in exhibitions and food stands at night markets and supermarkets as well as in showrooms for entertainment services and department stores and e-commerce (1). Some of the influences on our shopping decisions include the nice ambience and the stunning displays and the powerful advertising and salespeople's persuading techniques Individuals are more likely to return and make additional purchases when presented with all of these in-store incentives. Their essentials that they would not have considered differently in their daily lives (2)

2. Literature Review

2.1. Impulse Buying

Business venture contrasts and advancement in immature and arising nations

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Abstract

As much as entrepreneurs are often regarded development engines, it is not always apparent whether policies actually encourage them. Knowing which individuals are eager to start their own businesses might be helpful in formulating such policies. If a country is more developed or less developed, people become entrepreneurs at a different age. An inverted U-shape has been discovered in relation to the relationship between entrepreneurship and age, and younger individuals are the most likely to start their own businesses.

1. Introduction

For those people who do not want to or cannot find employment, entrepreneurship is not just a status but also a complicated It has already been studied in a range of environments. To a large extent, the drive to become an entrepreneur stems from a combination of factors, including the need for money, the desire for growth, and a feeling of calling (4). There have been several studies looking into the advantages of passing down knowledge and skills orally and intergenerationally (5) as well as building social capital and improving one's level of living. Entrepreneurship is frequently linked to youth, however this

national phenomena and an ideal way of living (1). Entrepreneurs often utilize their expertise to invent and push technical advancement (2). To put it another way, entrepreneurship fosters development and progress. Politicians and policymakers in Europe are presently placing an emphasis on fostering a culture of entrepreneurship. In Naudé, however, the efficiency of policies has been deemed to be in doubt. In this case, it would be really beneficial to learn about the qualities of those people who are most eager to start their own business. With regard to "a golden age" of entrepreneurship, literature has pointed out that age is one of the most essential of these traits (3). In addition, age is linked to other factors, such as the strength of one's social network. Resampling approaches are used to examine how young people decide to become entrepreneurs in developed, emerging, and non-developed countries.

hasn't been shown by all the authors.

It bills itself as "the world's premier study of entrepreneurship. According to 2014 GEM Adult Population Survey (APS) statistics, entrepreneurs in developing and developed nations alike have an average age of 35. Machine learning techniques based on bootstrapped prediction errors are used for this purpose since results and conclusions may be wrong otherwise (6). Machine learning tools have been neglected in the