Automatic stopword Identification Technique for Gujarati text

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Abstract*—Natural Language Processing (NLP) is an Artificially Intelligent (AI) mechanism for computers to analyze, understand, and derive meaning from human language in a smart and useful way. In natural language text processing, common words like 'a', 'the', 'is', 'an', etc. are known as a stopwords. They are typically considered having no informative value. It is proved that one of the major benefits of removing stopword in NLP text-based processing is the reduction of the text in the corpus by 35 - 45%, without compromising on the efficiency of the target application performance. There are many stopword lists existing for Non-Indian languages like English, Arabic, French and German. Even for a few Indian languages like Hindi, Sanskrit and, Tamil substantial lists are available. But as of date very little research work is reported for one of the widely used Indian language namely Gujarati. As per our survey, for the Gujarati language, two major approaches have been suggested for stopword identification. The first approach is giving a static generic stopword list, and another approach is a Rule-based approach. The major drawback of these method is their inability to handle neologism. In this paper, we have suggested domain-specific, robust and dynamic stopword list identification mechanism developed for documents written in the Gujarati language. In our proposed approach, we take the top "N" words as seed words based on their frequency and later add other "M" similar context word which are identified by word embeddings. Further the effectiveness of removing these listed (N+M) stop words was checked by applying the stopword removal preprocessing phase in the Text Classification (TC) and Information Retrieval (IR) applications. In TC model, the feature vector reduces by approximately 16%, and on other hand, the accuracy of the TC model increased by nearly 3 %. The experiments also found, removal of the these stop words in IR application, increased the Mean Average Precision (MAP) of the system by nearly 31%. Thus, the overall time and space requirements were decreased without compromising on the end results of system.

Keywords—stopword, Information Retrieval, Text Classification, Bag-of-words, Noisy Word, Text Mining, Natural Language Processing, Indian Language, Gujarati Language, Word embedding, Word2vec model

I. INTRODUCTION

Nowadays NLP (Natural Language Processing) is gaining lots of attention in research community. In the NLP application, removing stopword is the pre-processing step. It is considered optional pre-processing however results have proved in many cases positive outcomes when used in certain applications. The stopword concept was first introduced in 1958 by H. P. Luhn. In NLP applications, useless words or data are referred to as stopword. A stopword is a commonly used word with low discrimination power, no meaning, never has any predictive capability and which frequently appears in the text. For example in the application, if we search a query "કમ્પ્યુટર શું છે" ("what is computer") the search engine tries to find web pages that contain the terms "કમ્પ્યુટર" ,"શું", "છે" ("what", "is", "computer"). In this case the search engine is going to find a lot more unwanted pages also as they match the terms "શું", "છે" ("what", "is"), whereas it was expected to returns only those content which gave information about "કમ્પ્યુટર" ("computer"). This happens because the terms "શું", "છે" ("what", "is") are very commonly used in the Gujarati language. If we remove these two terms, the search engine can only focus on retrieving pages that contain the keyword namely ("computer") "કમ્પ્યુટર"– which would bring up pages that are actually of interest. Thus, by removing these words it reduces the processing power, indexing entries for searching, and subsequently, space and time complexity improves. For the TC applications, where the text is to be classified into different categories. If stopword are excluded from the given text, more focus can be given to those words which define the meaning of the text[1][2].

II. STOPWORD IDENTIFICATION TECHNIQUES

In this section we discuss about stopword identification techniques used in our proposed system.

A. *Zipf's law*

Zipf's law is a law about the frequency distribution of words in a language (or in a collection that is large enough so that it is representative of the language). To illustrate Zipf's law, let us suppose we have a collection and let there be V unique words in the collection (the vocabulary). For each word in the collection, we need to compute the freq(word)= how many times word occurs in the collection. Then we rank the words in descending by their frequency (most frequency word has rank 1, the next frequent word has rank 2, …) [1][5].

$$\mathrm{TF(t)} = \frac{\text{No. of times term t appears in a doct}}{\text{Total no.of terms in the doct}} \quad (1)$$

B. *Word embedding model*

Word Embedding is a type of word representation that allows words with similar meaning to be understood by machine learning algorithms. Technically speaking, it is a mapping of words into vectors of real numbers using the neural network, probabilistic model, or dimension reduction on word co-occurrence matrix. It is a language modelling and feature learning technique. Word embedding is a way to perform mapping using a neural network. There are various word embedding models available such as word2vec (Google), Glove (Stanford) and fastest (Facebook).

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Deep learning towards Solar flare prediction

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Abstract

Solar flares are a natural phenomenon of brightening the local region of the Sun, thrusting away a large amount of energy and charged particles all around it. Before releasing, this extra energy is stored inside the magnetic flux loops originating from active solar regions. Any such major event on the line of sight from Earth can be disastrous. Moreover, such events can affect the overall space weather. With the advent of our understanding and observations in solar astronomy, our ability to study the Sun in minute details enables us to build a better model and consistently correlate them. However, existing models can still not portray the correct triggering mechanism and possible intensity of such flares.

Statistical analysis built upon different available observational data from Sun can bring new opportunities to look at this problem differently. Machine learning analysis, especially the deeper ones, has a tremendous capacity to exploit in such a direction. In this present report, we are looking to explore the same. We want to examine different deep neural networks in conjugation with available observational data to find their capability toward Solar flare prediction and further refine the same with theoretical inputs.

1. Introduction

As our nearest star, different aspects of the Sun are very closely observed. Among them, transpiring in a local area over the solar surface, succeeding flare can have significant consequences on Earth, satellites, space station and overall space weather around the solar system. Solar flares are associated with electromagnetic radiation and energetic charged particles, which can potentially endanger modern civilisation through significant solar eruption if that occurs on the line of Earth. Amidst all the historical records on September 1, 1859, the Carrington event [https://doi.org/10.1093/mnras/20.1.13] observed the strongest flare and accompanying CME. More recently, during 2012, another solar eruption is noticed of a similar class. Fortunately, Earth has avoided its trajectory narrowly. In the modern era of technology, such an occurrence would significantly disrupt communication systems, power

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Abstract:
Information retrieval from scanned handwritten digital copies is a very challenging task especially in Indian scripts like Gujarati due to the presence of joint and conjuct characters as well as matras, cursive nature and varying size of the characters. There are two methods namely recognition-based and recognition-free for document image retrieval. The difference in both approaches lies in the level of segmentation. There are two levels of segmentation namely Fine and Coarse Grain. In Fine-Grain segmentation, the base character and the matras are considered as separate and are two different units of segmentation. In Coarse-Grain segmentation, the base character and matras are considered as a single unit of segmentation. The accuracy of the segmentation highly affects the result of information retrieval. The research here heads towards addressing these issues. Deep learning has been very effective in many domains but has not been used much in this domain. In this research, we propose a Coarse Grain segmentation method using the object detection model Faster RCNN and a Fine Grain segmentation method using a combination of Connected Component Analysis and Faster RCNN. The annotation of the dataset for training these models has been carried out manually using LabelImg tool.

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Contents

I. Introduction

India has a rich cultural heritage and a large number of manuscripts, handwritten letters by eminent personalities, literature works and religious works have been preserved. Because of their uniqueness and great importance, it's a necessity to preserve them in a digital format. Over the past few decades, a huge number of handwritten documents have been scanned and preserved worldwide in the repositories. Retrieval of relevant information from these repositories is a very difficult task. Recognition based and recognition free approaches are used for retrieval.

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Experimental and analytic study of the uplift capacity of a horizontal plate anchor embedded in geo-reinforced sand

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Abstract

The foundation systems under uplift loads, in particular, should be designed in accordance with the factors that influence uplift capability. Anchor systems have recently been used successfully in structures that have been subjected to uplift force. These anchor systems are affected by soil properties, loading conditions, embedment ratio, and anchor group configuration. Model tests in the laboratory were used to investigate the uplift behaviour of plate anchors embedded in cohesion-less soil media with and without geosynthetic. Many factors, including the type of geosynthetic, the area of the anchor plate, relative density, the depth of embedment, the type of soil, and the area of geosynthetic inclusion, have significantly influenced plate anchor uplift behaviour. The present paper describes the methodology and experimentation on model horizontal plate anchors embedded in geosynthetic reinforced cohesionless soil bed. Also, the analytical investigation was carried out and the results were compared. It is observed that plate anchor embedded in reinforced soil exhibit 1.4 times more uplift capacity than the anchors embedded in unreinforced soil. The inclusion of a geosynthetic layer increases the effective area of anchorage.

Key Words: *Plate anchors, uplift capacity, reinforced soil, model study.*

1. INTRODUCTION

Tall engineering structures such as chimneys, offshore and onshore wind turbines, transmission towers and communication facility towers etc., are subjected to wind load and hence uplift forces exerted on their foundations. To resist uplift forces, ground anchors are required. Depending on the subsoil conditions and the magnitude of loading, anchor dimensions, embedment depth and orientation of the anchor plate is selected. Horizontal plate anchors are commonly used to resist uplift load in vertical or inclined directions.

Installations of anchors in problematic soil is difficult as well as it offers minimum uplift resistance. (N.R. Krishnawamy,1994) hence the subsoil conditions need to be improved. On the other hand, due to the global meteorological uncertainties, there is increase in frequency of cyclones per year. These situations force geotechnical engineers to improve or reinforce the plate anchors so that it can offer more uplift resistance. The use of geosynthetic inclusions is a well-

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The paper presented was titled as: **Experimental And Analytic Study Of The Uplift Capacity Of A Horizontal Plate Anchor Embedded In Geo-Reinforced Sand**

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(Conference Chair)

Fibre Reinforced Concrete with Ceramic Waste Powder for Pavement Applications

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Abstract. Infrastructure development has rapidly increased since last two decades in India but most of the concrete constructions are not eco-friendly. Construction industry uses Ordinary Portland cement (OPC) which is known to be a key contributor to the CO_2 emissions. Sustainability and low carbon emission in the construction industry is the need of present and future. By incorporating supplementary cementitious materials, carbon footprint can be decreased indirectly. Compressive strength of the cement concrete is noteworthy but it possesses very limited tensile and bending strength, which can be improved using steel reinforcing bars, various types of fibres and nano additives. Structural design of rigid pavements governs by flexural strength of cement concrete; so, present study focuses on studying concrete with polypropylene (PP) fibre and ceramic waste powder (CWP) as partial replacement to the OPC. Experimental results on effect of varying amount of PP fibre and CWP on compressive strength and flexural strength have been presented here. Thickness and cost of rigid pavement construction can be decreased by using concrete with high flexural strength.

BACKGROUND

Cement concrete is largest used construction material owing to its superior compressive strength. Plain cement concrete possesses very limited tensile and flexural strength. Conventionally, tensile and flexural strength can be increased using steel reinforcing bars. In modern days, various types of fibres and nano additives are also used to improve it.

When any type of fibrous material is added to plain cement concrete then it would be called as fibre reinforced concrete (FRC). Fibres exhibits reinforcing properties and provides structural integrity. Fibres can be of two types: Natural and Manmade. Coir and Jute are some of the examples of natural fibres while Polyvinyl alcohol fibre, Polypropylene fibre, Recron fibre, Alkali Resistant Glass fibre, AR Glass fibre, Steel fibre, Glass fibre, Nylon fibre, etc. are common examples of artificial fibres for cement concrete to improve mechanical properties of conventional concrete. Due to dense skeleton structure, FRC possesses higher durability, higher tensile and bending strength compared to ordinary cement concrete. Also, it reduces crack growth so it has intrinsic self-healing properties. These superior properties of FRC, make it more suitable for rigid pavement applications.

Cement production plants omit higher level of CO_2 in the environment causes pollution and environmental damage. To bring the sustainability and to reduce the usage of cement into the construction, supplementary cementitious materials are commonly used. Supplementary Cementitious Materials (SCM) are pozzolanic materials generally used in combination with Portland cement to enhance the properties of fresh and hardened concrete. Mostly industrial waste or byproduct based pozzolanic materials like Fly ash, Glass Granulated Blast Furnace Slag, Sugarcane bagasse ash, Ceramic waste, etc. are used as SCM. As these materials are industrial byproducts or waste and used as partial replacement to cement, it contributes in lowering the environmental damage.

India is the second largest ceramic articles manufacturer country in the world. At various production stages like firing, glazing and packing, solid ceramic waste generates in millions of tones. Various researchers used these solid

(Ex Ordo Abstract # (ex: 129)

A Comparative Analysis of Differential Charging for Triple Junction of Space-Grade Materials in Single and Double Maxwellian Plasma Models

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Abstract—This article analyzes the differential charging developed due to the effect of secondary electron yield (SEY) and backscattered electron yield (BEY) at adjacent different material surfaces present on a spacecraft. Subsequently, the differential potential creates electrostatic discharge (ESD). The threshold potential for generating the ESD is captured for the generalized case of differential charging on metallic patches embedded over a thin layer of the dielectric surface with the help of Spacecraft Plasma Interaction Experiments-II (SPIX-II) facilities. In view of the limitations of the experimental setup, numerical modeling is implemented to compute the differential charging for the normal and worst cases in the single and double Maxwellian plasma model. Our work reveals a considerably lesser time scale to reach the differential charging in a double Maxwellian plasma model than with a single Maxwellian plasma model. Besides,the threat of an ESD event is indicated when the computed differential charging exceeds the ESD inception threshold voltage obtained from the experiments. Computation of the capacitance between material surfaces, which governs the transient profile of differential charging, is carried out with the help of the method of moments (MoM). The impact of diverse SEY and BEY of different materials on steady-state body potential is investigated. The validity of the analysis is also established with the results available in the open literature.

I. INTRODUCTION

Spacecraft charging is caused by the incidence of energetic geomagnetic substorm electrons and ions in Geostationary Earth Orbit (GEO). Spacecraft surfaces accumulate charges and develop potentials on the surfaces (Lai, 2012). Since spacecraft surfaces are of different materials with dissimilarity in Secondary Electron Yield (SEY) and Back-scattered Electron Yield (BEY), surfaces obtain different absolute potential relative to the spacecraft ground. This, in turn, can lead to *differential charging* across the surfaces of different materials (Hastings et al.,1996). Most prominently, *differential charging* creates Electro-Static Discharge (ESD) or arc discharge between neighboring surfaces through layers of the solar arrays. In the recent past (2011), spacecraft had anomalies because of differential charging induced ESD (Ferguson et al.,2015). Moreover, it is reported in the literature that more than 33% of the spacecraft failures have been occurred due to ESD on solar panels (Toyota et al., 2007, Frost et al., 2003). This demands a critical examination of *differential charging* on the most arc plausible structure of a spacecraft.

Typically the differential charging and capacitance between surfaces (coupled capacitance) greater than several orders of 100V and 10pF respectively are the major factors leading to ESD (Vélez et al., 2010). Several computational tools such as NASCAP-2K (Mandell et al., 20060, spacecraft plasma interaction software (Roussel et al., 2008), multiutility spacecraft charging analysis tool (Cho et al., 2012), PTetra (Marchand et al., 2012) and COLOUMB-2 (Novikov et al., 2017) have been developed to estimate the spacecraft charging. Details of absolute and coupled body capacitance formed in a spacecraft are not available in any of these tools. The coupled capacitance is a crucial parameter for investigation of body potential transient profile and subsequently differential charging. Study and analysis of variations in the results produced by the tools are difficult in the absence of the details of absolute and coupled body capacitance. However, in recent past, computation of absolute (free space) capacitance of spacecraft and its isolated metallic structures are reported in the literature (Hwang et al., 2004; Ghose et al., 2008; Karthikeyan et al., 2013; Alad et al., 2015). In the works of Karthikeyan et al., 2013 and Alad et al., 2015, estimated free space capacitance and *absolute charging* of a spacecraft with body potential transient profile are presented. Additionally, Alad *et al.* have computed a capacitance matrix of an artificial orbiting satellite. The work discusses the impact of an increase in capacitance due to the coupling effect in the transient variation of body potential. The body potential analysis is limited to *absolute charging* without including SEY and BEY properties of a material.

Considering the fact that the most ESD prone site on spacecraft is a triple junction formed on a solar panel, various space research laboratories have developed a ground experimental facility to study the arcing phenomenon on neighboring metal-dielectric surfaces present on a solar panel (Hastings et al., 1992; Mateo-Velez et al., 2008; Yehia et al., 2013; Gupta et al., 2015). Joshi *et al.* predicted the vacuum arc location occurring on an artificial triple junction. In order to facilitate the prediction of ESD events, in this paper, we find ESD inception voltage for a triple junction on a solar coupon through SPIX-II set-up (Gupta et al., 2015). The set up involves a structure formed of Copper patch and Kapton sheet that mimics triple junction and a flood beam type electron gun. The custom-designed electron gun guarantees uniform charging of a substrate. In order to obtain ESD inception threshold voltage, the experimental set up captures potential

MSFC to monitor electrical behavior of the collector. Since its launch in 2018, the PSP spacecraft and science instruments have successfully executed nine encounters with the sun. A summary of SPC performance to date is briefly discussed.

Efficient Computation of Differential Charging Time Scales between Cover Glass and Spacecraft Body in Severe GEO Plasma Environment

Ashish Pandya, DDU, Nikhil KothariI, DDU, Rizwan Alad, DDU, Suryakant Gupta, FCIPT-Institute for Plasma Research, Gandhinagar

This article presents the efficient computation of the capacitance matrix and transient variation of body potential of an artificial orbiting satellite modeled as a structure consisting of a cuboid with two coplanar square plates. To mimic the cover glass on the solar panel, a thin layer of an insulator is considered on top of the metallic plates. Transient variation of body potential is obtained by numerically integrating differential equation using Runge Kutta method. The numerical data on the capacitance matrix which includes the absolute as well as the coupled capacitance of this structure have been presented. The capacitance for estimation of body potential is evaluated using the Method of Moments. The evaluation is based on boundary conditions for the potential on the conductor surface and the normal component of displacement density at the dielectric-free space interface. Charging analysis for the coupled bodies is carried out with reference to that of the isolated bodies. The consequence of diverse secondary and backscattered electron yield on the intensification of differential charging is investigated between the solar array cover glass and the spacecraft body in the normal and worst case of a single Maxwellian plasma environment.

Adding Radiation Induced Conductivity Test Capability to the JPL Dynamitron

Nelson Green, JPL, Dennis Thorbourn, JPL, Allen Andersen, JPL, Anthony Eyre, JPL, Michael McKee, JPL, Jarrett Chai, JPL

The Europa Clipper space environments test campaign has made extensive use of the Dynamitron electron accelerator located at the Jet Propulsion Laboratory. One of the most common uses of this facility was to gather data on the internal electrostatic discharge (IESD) properties of the various elements of the spacecraft. These testing needs often required some reconfiguration of the accelerator system. One of the most recent and most unique upgrades was adding the ability to measure Radiation Induced Conductivity (RIC) for spacecraft materials. Adding this one of a kind capability required incorporating a new low energy electron flood gun to the existing higher energy electron beam from the Dynamitron accelerator. This new system was also designed to obtain RIC data on multiple samples per test run allowing for the acquisition of a large quantity of data in a relatively short time period. This presentation will review the design of the new system. The preliminary results will be discussed in a separate presentation.

Preliminary Results of Radiation-Induced Conductivity Testing of Europa Clipper Dielectric Materials

Allen Andersen, JPL, Nelson Green, JPL, Qian Nataly Chen, JPL, Denis Thorbourn, JPL, Brian Xiaoyu Zhu, JPL, Wousik Kim, JPL

A key component to internal electrostatic discharge (IESD) mitigation for Europa Clipper is ensuring that charge accumulated in spacecraft dielectrics from the Jovian radiation environment decays to the spacecraft chassis ground quickly enough to avoid retaining charge from one orbit to the next. The charge-decay time-constant depends on the dielectric's conductivity, which needs to be short enough to bleed off charge accumulated during the short high-radiation portion of the orbit, around each Europa flyby. For some dielectrics with very low intrinsic

(Ex Ordo Abstract # (ex: 96)

Electrostatic Analysis of GSAT-19 Satellite Structure for Absolute Charging

Keyurkumar M. Patel[1], Dr. Rizwan Alad[1], Ashish Pandya[1], Dr. S. B. Gupta[2], Dr. Nikhil Kothari[1]

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Abstract— **This work derives the lumped equivalent capacitance circuit of the GSAT-19 satellite modelled as a structure consisting of a metallic cuboid with two coplanar plates and parabolic reflector antennas. Integral equations are formulated by relating the unknown charge density to the known potential on the metallic surface of these bodies. These integral equations are solved using the Method of Moments (MoM) based on pulse function as basis functions and delta functions as testing functions. In order to apply MoM, the surfaces of the metallic bodies are discretized by non-uniform triangle meshing. With the help of the numerical data on the capacitance circuit of this structure, the transient profile of body potential is obtained by numerically integrating the differential equation using the fourth-order Runge-Kutta method. This analysis reveals the decisive dependence of saturation time for the body potential on the capacitance matrix of the spacecraft.**

I. INTRODUCTION

The electromagnetic radiation (EM) from the sun and other terrestrial systems accumulate significant loads on the surfaces of exposed bodies of a sate.(H. B. Garrett at al,2000; M. Cho et al., 2006). During the Sun's erratic magnetic storm, the amount of charge particles deposited on the surface of the satellite's exposed body quickly varies [3]. Any change in the rate of change of the charge accumulated on the satellite surface results in a current pulse through the satellite body, and resulting in the generation of an electromagnetic impulse causing electromagnetic interference (EMI). This can be harmful to the heath of the embedded electronics (M. Cho et al., 2006; H. Jeong, et al,2008; H. B. Garrett et al, 2008; J. F. Fennell et al., 2008). It might influence telemetry, following, information transmission, and, surprisingly, the survivability of the space apparatus (J. F. Fennell et al., 2008). The circling shuttle structure comprises chiefly of a metallic rectangular cuboid fenced in area, which obliges every one of the satellite subsystems, sunlight based chargers for power age, payloads, and the types of gear expected for its activity. To moderate the impacts of shuttle charging, the EMI peculiarity of spacecraft bodies can be anticipated from the capacitance network of the satellite bodies(M. J. Mandell et al, 2006; T. Muranaka et al., 2008). The space apparatus charging investigation has been introduced utilizing accessible tools, for example, NASCAP-2K (M. J. Mandell et al, 2006), multiutility spacecraft charging analysis tool (MUSCAT) (T. Muranaka et al., 2008), spacecraft plasma interaction software (SPIS)(J. F. Roussel et al, 2005; J.F.Roussel et al., 2012), and PTetra (R. Marchand,2012). The NASCAP-2K (M. J. Mandell, et al, 2006) code depends on boundary element method. MUSCAT (T. Muranaka et al., 2008) has the capacity to ascertain the fleeting profile of spacecraft body potential as well as the surface insulator potential for a given arrangement of plasma conditions. Spacecraft charging examinations were completed for huge Geostationary satellites utilizing MUSCAT (T. Muranaka et al., 2008), Notwithstanding, the subtleties of the mathematical strategies utilized in MUSCAT(T. Muranaka et al., 2008) have not been uncovered.

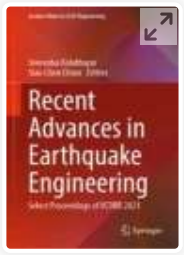
The SPIS programming (J. F. Roussel et al, 2005; J.F.Roussel et al., 2012) is fit for spacecraft charging calculation, including secondary electron, backscattering electrons, photoemission and spacecraft surface potential, sheath, etc. The SPIS programming tool (J. F. Roussel et al, 2005; J.F.Roussel et al., 2012) depends on the finite element method. In (R. Marchand,2012), a strategy to register mutual capacitance of spacecraft surfaces utilizing the PTetra simulation tool has been accounted for. The technique utilized in PTetra is limited component Taylor-Galerkin using liner interpolation functions.

In order to calculate the temporal profile of the spacecraft potential, the spacecraft geometry is considered as a sphere and the capacitance is computed approximately (T. Muranaka et al., 2008). As of late, Karthikeyan et al, 2012; Alad et al, 2013) introduced the information on the absolute capacitance of satellite bodies thinking about a cuboid and solar panels. In both the papers, the absolute value of the capacitance of the entire structure was presented considering only the cuboid and the solar panels only. The contribution of the capacitance by other relatively voluminous exposed subsystems, like antennas, was not considered in approximately (T. Muranaka et al., 2008) and Alad et al, 2013). In (T. Muranaka et al., 2008) and Alad et al, 2013) uniform meshing using triangular patches and nonuniform meshing using rectangular subsections, respectively, have been considered in the method-of-moment (MoM)-based analysis. Since the charge distribution is nonuniform and shoots up at corners and edges, it is imperative to use nonuniform meshing in the MoM analysis for a quicker and exact calculation.

It is importance to compute the capacitance matrix of the different exposed subsystems of a satellite, representing the self-capacitance and mutual capacitance of different bodies. The capacitance matrix technique may be used to calculate the charge distribution during the process of electrostatic discharge. It is also necessary to predict accurate values of the capacitance matrix for the spacecraft bodies, since the capacitance matrix depends on the geometry of the object. To the best of our knowledge, the data on the capacitance matrix of GSAT-19 spacecraft (A. Damodaran et al, 2019) and temporal body profile, including different exposed subsystems, such as different antennas is not available in the open literature.

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Recent Advances in Earthquake Engineering pp 115–126

Assessment of Seismic Performance and Vulnerability of a 20-Storied Reinforced Concrete Moment-Resisting Frame Designed by Direct Displacement-Based Design and Force-Based Design

Sumit Ganvit, Sejal Purvang Dalal, Ronak Motiani & Purvang Dalal

Conference paper | First Online: 21 September 2021

269 Accesses

Part of the Lecture Notes in Civil Engineering book series (LNCE,volume 175)

Abstract

This study presents seismic performance and vulnerability assessment of a 20-storied reinforced concrete (RC) building designed by direct displacement-based design (DDBD) and conventional force-based design (FBD) approach as per Indian Standard codes. The study frames are evaluated for strength and deformation using nonlinear static pushover analysis. The vulnerability for predefined damage states was evaluated based on the responses obtained from

End-to-End Automatic Speech Recognition for Gujarati

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Abstract

We present a novel approach for improving the performance of an End-to-End speech recognition system for the Gujarati language. We follow a deep learning based approach which includes Convolutional Neural Network (CNN), Bi-directional Long Short Term Memory (BiLSTM) layers, Dense layers, and Connectionist Temporal Classification (CTC) as a loss function. In order to improve the performance of the system with the limited size of the dataset, we present a combined language model (WLM and CLM) based prefix decoding technique and Bidirectional Encoder Representations from Transformers (BERT) based post-processing technique. To gain key insights from our Automatic Speech Recognition (ASR) system, we proposed different analysis methods. These insights help to understand our ASR system based on a particular language (Gujarati) as well as can govern ASR systems' to improve the performance for low resource languages. We have trained the model on the Microsoft Speech Corpus, and we observe a 5.11% decrease in Word Error Rate (WER) with respect to base-model WER.

1 Introduction

ASR is the process of deriving the transcription (word sequence) of an utterance, given the speech waveform. Speech Recognition has been an active area of research for many decades. Initial work in ASR was based on statistical modeling techniques like Hidden Markov Model (HMM) (Baker, 1975) and used phonemes to represent distinct sounds that make up the word. With the rise of Deep Learning based techniques and the increasing availability of data, the End-to-End speech recognition systems started showing competitive results. Initial deep learning based ASR models, based on Recurrent Neural Network (RNN) and CTC (Graves et al., 2006), overcame the issues of statistical systems and provided the mapping of variable length input to output. With the further advancements in algorithms and resources, various complex deep learning architectures have been introduced for an effective End-to-End speech recognition system. End-to-End speech recognition for low resource languages has not gained significantly from the advancements in deep learning due to lack of training data compared to other high resource languages. Linguistic diversities[1] also makes it difficult to adopt models across languages.

In this paper, we present a speech recognition system for the Gujarati Language. Gujarati is a rich language consisting of 34 consonants and 13 vowels. While the more number of vowels may reduce the homophones, more number of consonants may increase the ambiguity.

The key contributions of this paper are as follows,

- We have adopted the state of the art ASR model described in (Amodei et al., 2015) for the Gujarati Language.
- We present a novel approach of combining two language models, 4-gram word-level language model (WLM) and bi-gram character-level language model (CLM) to improve performance of prefix decoding.
- We propose a *Spell Corrector BERT* based post-processing technique to correct erroneous prediction and further improve the performance of the ASR System.

[1] http://www.cs.cmu.edu/ ytsvetko/jsalt-part1.pdf

Towards Performance Improvement in Indian Sign Language Recognition

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Abstract

Sign language is a complete natural language used by deaf and dumb people. It has its own grammar and it differs with spoken language to a great extent. Since people without hearing and speech impairment lack the knowledge of the sign language, the deaf and dumb people find it difficult to communicate with them. The conception of system that would be able to translate the sign language into text would facilitate understanding of sign language without human interpreter. This paper describes a systematic approach that takes Indian Sign Language (ISL) video as input and converts it into text using frame sequence generator and image augmentation techniques. By incorporating these two concepts, we have increased dataset size and reduced overfitting. It is demonstrated that using simple image manipulation techniques and batch of shifted frames of videos, performance of sign language recognition can be significantly improved. Approach described in this paper achieves 99.57% accuracy on the dynamic gesture dataset of ISL.

1 Introduction

According to (Durkin and Conti-Ramsden, 2010), sign language can be considered as a collection of gestures, movements, postures, and facial expressions corresponding to letters and words in spoken languages. Comparing sign language with spoken language, main difference exists on modality. Deaf and dumb people use sign language as means of communication to express their thoughts and emotions. Each country has its own sign language with high degree of grammatical variations. Indian sign language is largely dominated by object features, and is different than other sign languages.

Trained sign language interpreters are needed during medical and legal appointments, educational and training sessions, to provide interpreting services. Over the past few years, there has been an increasing demand for human interpreters. But in India, approximately 300 certified human interpreters are available (vid). Given a shortage of interpreting services, a system can be designed that offers flexible alternative when human interpreters are not available.

Sign language recognition is an approach that converts input sign gesture(s) into text or speech. Sign language recognition is a very challenging task since this task involves interpretation between visual and linguistic information. Deep neural networks (DNN) perform remarkably well for image recognition task (Shorten and Khoshgoftaar, 2019). But these networks are heavily reliant on big data, otherwise they lead to overfitting. Overfitting refers to the phenomenon when a network learns a function with very high variance such as to perfectly model the training data (Shorten and Khoshgoftaar, 2019). Strategies to avoid overfitting and to increase generalization performance of DNNs are dropout, batch normalization, transfer learning, one-shot learning and pretraining. In contrast to these techniques, data augmentation approaches problem of overfitting and generalization from the root of the problem, the training dataset. We have adopted this concept on input videos for ISL recognition to make dataset inflated.

In order to increase dataset size, we have created sequence of frames in batches systematically. We have proposed this approach to generate more instances for ISL recognition task in order to achieve better model performance. In particular, we have addressed the issue of one research question: how to use DNN with very small amount of input videos in order to incorporate both left-handed and right-handed signs without hurting recognition performance of ISL sentences.

The rest of the paper is organized as follows: In Section 2 we have discussed work related to Indian sign language recognition. Section 3 explains steps of our proposed approach in details. Section 4

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Recognition of Isolated Gestures for Indian Sign Language Using Transfer Learning

International Conference on Advances in Computing and Data Sciences

ICACDS 2021: Advances in Computing and Data Sciences pp 107-115 | Cite as

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Abstract

Sign language is a visual and complete natural language used by Deaf to communicate with each other and hearing people. The Deaf community finds it very difficult to express their feelings to the hearing people, because of which human interpreters are needed to help them in emergency situations. But always human interpreting service is not available when needed, because in India only around 300 certified sign language interpreters are available. In order to fill this gap, an automated system can be designed that would facilitate recognition of Indian Sign Language (ISL) gestures. This paper describes such an approach that takes

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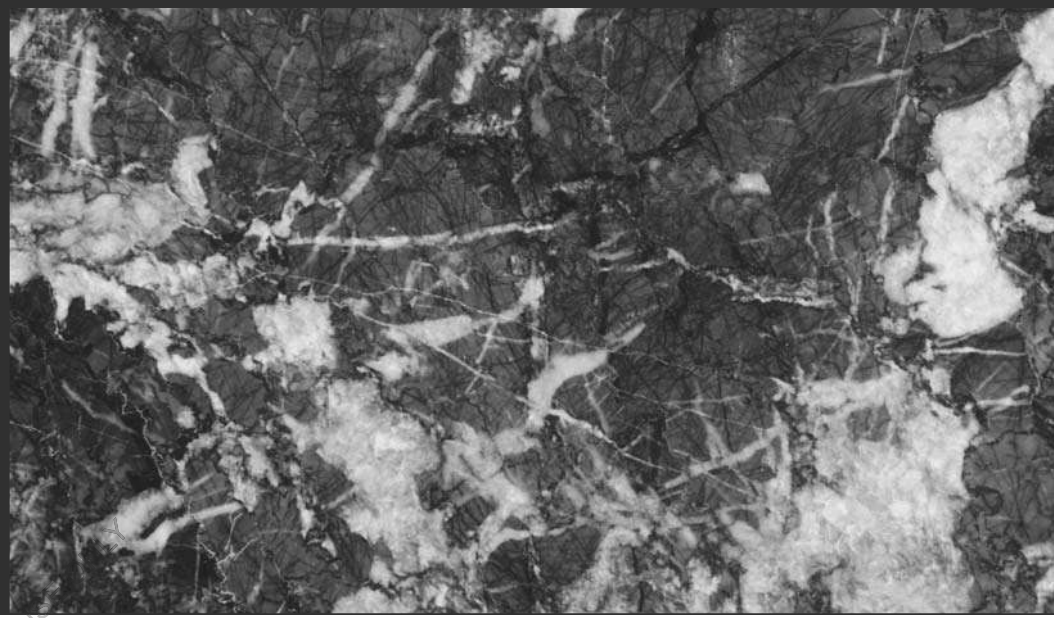
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This certificate is presented to Prof./Dr./Ms./Mr. **Jignesh Bhatt** from **Pandit Deendayal Energy University, Gandhinagar** for participating and presenting his/her paper titled **An Assessment of Indian Smart Grid Pilot for Selection of Best-fit Communication Technology (Paper ID-82)** in the 2nd Electric Power and Renewable Energy Conference (EPREC-2021).

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Remote sensing is not modern science, but being practiced since long. Advances in imaging, communications, and computer science have reinforced the remote sensing technology for applications of complex and challenging nature. The Landsat satellite is the oldest satellite providing data for earth observation. This book covers the fundamentals of remote sensing with its Applications using Landsat data. The characteristics of various Landsat sensors and the recent advances in Landsat products are discussed. The book discusses the concise details required for using Landsat as the source of remote sensing imagery and its suitability for the application in various fields.



Ajay Roy

Remote Sensing Applications Using Landsat Data

The author is affiliated with Dharmsinh Desai University, Nadiad, India. His area of research is Remote Sensing and Geographical Information System. He is working on an automated prediction of ambient air pollution using remote sensing.

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Analysis of search space in the domain of swarm intelligence

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Abstract. The formulation and analysis of complex problems to get optimum solution is an emerging art which inspired new perspective in optimization world. Derived from biological system swarm intelligence algorithm attract many researcher due to its simplicity and adaptable nature with real life problem. But swarm algorithms suffer from its search process. Higher rate of exploitation may trap to pre-mature solution and higher rate of exploration slow down the process or may not true solution. In this paper we present detailed analysis and sorting of search strategies based on its property and structure to get optimum of exploration and exploitation for swarm algorithms. In our study we cluster majority of strategies in to information sharing and change in structure. In first part sharing of information is categorized by population initialization, population update and population control. In second part change in structure is categorized by modification in governing equation, hybridization and new topology. At last the analysis attempt to provide understanding for different strategies, current issues and future research for expert and researcher.

Keywords: Swarm intelligence, Evolutionary algorithm, Exploration, Exploitation, Optimization.

1 Introduction

Bio inspired algorithm which are replication of evolution and foraging pattern of different living entity exist on the world are broadly classified in two sub field: Evolutionary and swarm based algorithm.

Evolutionary algorithms are derived from the theory of survive in nature by increased population, progress, companion, mate selection and breeding. Genetic Algorithm, Differential Evolution, Evolution strategy are few among them.

Swarm algorithms are inspired from foraging process which exhibit social and cognitive behavior, decentralize and self-organized pattern of swarm. Particle swarm optimizer, artificial bee colony algorithm, glowworm swarm algorithm, firefly algorithm, cuckoo search algorithm, bat algorithm, grey wolf optimizer, Spider Monkey Optimization are the algorithms following swarm approach.

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Abstract

Sign language is a visual and complete natural language used by Deaf to communicate with each other and hearing people. The Deaf community finds it very difficult to express their feelings to the hearing people, because of which human interpreters are needed to help them in emergency situations. But always human interpreting service is not available when needed, because in India only around 300 certified sign language interpreters are available. In order to fill this gap, an automated system can be designed that would facilitate recognition of Indian Sign Language (ISL) gestures. This paper describes such an approach that takes



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Recognition of Isolated Gestures for Indian Sign Language Using Transfer Learning

Kinjal Mistree, Devendra Thakor & Brijesh Bhatt

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Abstract

Sign language is a visual and complete natural language used by Deaf to communicate with each other and hearing people. The Deaf community finds it very difficult to express their feelings to the hearing people, because of which human interpreters are needed to help them in emergency situations. But always human interpreting service is not available when needed, because in India only around 300 certified sign language interpreters are available. In

Cascading Adaptors to Leverage English Data to Improve Performance of Question Answering for Low-Resource Languages

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Abstract

Transformer based architectures have shown notable results on many down streaming tasks including question answering. The availability of data, on the other hand, impedes obtaining legitimate performance for low-resource languages. In this paper, we investigate the applicability of pre-trained multilingual models to improve the performance of question answering in low-resource languages. We tested four combinations of language and task adapters using multilingual transformer architectures on seven languages similar to MLQA dataset. Additionally, we have also proposed zero-shot transfer learning of low-resource question answering using language and task adapters. We observed that stacking the language and the task adapters improves the multilingual transformer models' performance significantly for low-resource languages.

1 Introduction

Last few years have seen emergence of transformer based pretrained models like BERT(Devlin et al., 2019), XLNet(Yang et al., 2019), T5(Raffel et al., 2020), XLM-RoBERTa(Conneau et al., 2020) etc. The pretrained models have shown significant improvement in various downstream tasks like question answering, NER, Machine translation and speech recognition when used with word level utilities.(Delobelle et al., 2020; Pires et al., 2019; Pfeiffer et al., 2020a; Pires et al., 2019; Pandya and Bhatt, 2021; Saha et al., 2021; Murthy et al., 2019; Park et al., 2008; Baxi et al., 2015; Raffel et al., 2020).

The emergence of multilingual models: mBERT (Devlin et al., 2019) and XLM-RoBERTa(Conneau et al., 2020) made it possible to leverage English data to improve the performance of low-resource languages. In this paper, we continue to investigate the effectiveness of multilingual pretrained transformer models in improving the performance of question answering systems in a low-resource setup using the cascading of language and task adapters(Pfeiffer et al., 2021, 2020a; Bapna and Firat, 2019). Our work[1] contributes by evaluating cross-lingual performance in seven languages - Hindi, Arabic, German, Spanish, English, Vietnamese and Simplified Chinese. Our models are evaluated on the combination of XQuAD(Artetxe et al., 2020) and MLQA(Lewis et al., 2020) datasets which are similar to SQuAD (Rajpurkar et al., 2016) .

To this end, our contributions are as follows:

- We have trained multilingual variants of transformers, namely mBert and XLM-RoBERTa with a QA dataset in seven languages. Both the MLQA and XQuAD datasets contain validation and test sets for the above languages but not the training set. To finetune the model we have combined the test set of XQuAD and MLQA datasets and evaluated the model with the MLQA development dataset as the test dataset. By splitting the dataset in this way we can get train and test data with the considerable length for low-resource languages which helped us to conduct various experiments. Table 1 highlights the size of our train and test set for all the above-mentioned languages.

- We exhaustively analysed the fine-tuned models by evaluating them with the tasks adapter[2]

*Equal contribution
†Corresponding Authors

[1]Our code and trained models are available at : https://github.com/Bhavik-Ardeshna/Question-Answering-for-Low-Resource-Languages

[2]Pre-trained task adapters from https://adapterhub.ml/explore/qa/squad1/

Proceedings of the 13th Conference on Language Resources and Evaluation (LREC 2022), pages 7088–7095
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GujMORPH - A Dataset for Creating Gujarati Morphological Analyzer

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Abstract

Computational morphology deals with the processing of a language at the word level. A morphological analyzer is a key linguistic word level tool that returns all the constituent morphemes and their grammatical categories associated with a particular word form. For the highly inflectional and low resource languages, the creation of computational morphology-related tools is a challenging task due to unavailability of underlying key resources. In this paper, we discuss the creation of an annotated morphological dataset- GujMORPH for the Gujarati - an indo aryan language. For the creation of this dataset, we studied language grammar, word formation rules, suffix attachments in depth. This dataset contains 16527 unique inflected words along with their morphological segmentation and grammatical feature tagging information. It is a first-of-its-kind dataset for the Gujarati language and can be used to develop morphological analyzer and generator models. The dataset is annotated in the standard Unimorph schema and evaluated on the baseline system. We also describe the tool used to annotate the data in the standard format. The dataset is released publicly along with the library. Using this library, the data can be obtained in a format that can be directly used to train any machine learning model.

Keywords: Language resources, Morphology,Gujarati

1. Introduction

Morphological analysis is a key word level natural language processing task, used to analyze an inflected word. The morph analyzer outputs constituent morphemes and grammatical feature sets associated with an inflected word form. It is necessary to have a powerful morphological analyzer system for the downstream NLP tasks such as question answering, machine translation, sentiment analysis, etc. The morph analyzer usually requires knowledge in form of word formation rules, language grammar understanding, and extensive feature engineering in order to achieve decent accuracy (Goyal and Lehal, 2008; Sharma et al., 2021).

As the demand for web-based technologies is increasing day by day, language resources have a crucial role to play to prevent the extinction of the natural language. Nearly all European and East Asian languages are resource-rich languages but most of the south and southeast asian Languages including Gujarati can be still considered as low resourced.(Ali et al., 2020) Gujarati is an Indo-Aryan language, spoken mainly in the Gujarat state of India. It is the 26th most widely spoken language with approximately 55 million speakers across the world.(Magueresse et al., 2020; Suba et al., 2011)

In the literature, there are mainly two methods for building a morphological analyzer. The first is the classic rule-based method and the second is a machine learning-based methods(PJ and KP, 2012). For the rule-based methods, a substantial amount of knowledge is required in form of word formation rules, suffixes, and other language-specific characteristics. When the language is highly inflectional such as Gujarati, the task becomes more challenging due to a large number of possible suffixes and language-specific ambiguities in the word-formation rules. For the machine learning methods, most of the approaches are focused on the supervised learning methods. Supervised methods introduce two new problems: manual feature engineering and requirements of the training dataset. With the progress in the deep learning-based methods in the last few years, researchers have worked on deep neural network-based models for the morph analysis task. These models do not require any manual feature engineering but they require an enormous amount of training data for efficient results. This fact has introduced the need of creating a dataset for building a morphological analyzer. It is also desirable that the dataset should be annotated in some standard format so that it is widely accepted and remains inconsistent with the dataset of other languages. The typical format of such a dataset is each word should be mapped with its corresponding root word along with the possible set of grammatical features.(Kirov et al., 2018)

The existing work in the field of the morphological analyzer for different languages is largely done using the datasets available in either Universal Dependencies treebank(Nivre et al., 2016; Nivre et al., 2020) or Unimorph schema(Kirov et al., 2018). The Gujarati language is still not part of these

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General Type-2 Fuzzy Logic Systems Using Shadowed Sets: A New Paradigm Towards Fault-Tolerant Control

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***Abstract*—Fuzzy Inference Systems (FIS) are now widely employed to regulate a wide range of safety-critical engineering systems. The main reason for this is that FIS may be created using expert human knowledge.Furthermore, with the introduction of Type-2 Fuzzy Logic, the ability to handle uncertainty offers an alluring improvement for fault-tolerant abilities in fault-tolerant control methods, and, in fact, recent studies have shown that the use of Interval Type-2 Fuzzy Inference Systems (IT2 FIS) provides better results than Type-1 Fuzzy Inference Systems (T1 FIS).The current research intends to suggest a novel strategy employing Shadowed Type-2 Fuzzy Inference System (ST2 FIS) for significant features in fault-tolerant capability in the Passive Fault-Tolerant Control (PFTC) method based on the performance increase shown by IT2 FIS.The ST2 FIS is based on the ideas of Shadowed Fuzzy Sets and is an approximation of General Type-2 Fuzzy Inference Systems (GT2 FIS). The fundamental rationale for utilising ST2 FIS instead of GT2 FIS is that the computational cost of GT2 FIS is too high for this application. The simulation results for the FTC using IT2 FIS and FTC using ST2 FIS for Coupled Conical Tank Level Control (CCTLC) system with 30 % and 40% loss of effectiveness in the main actuator are presented in this study. In addition, the article compares the proposed FTC approach using ST2 FIS to FTC using IT2 FIS in terms of fault-recovery time.**

***Index Terms*—Shadowed Type-2 Fuzzy Logic, fault-tolerant control, coupled conical frustum tank, actuator fault**

I. INTRODUCTION

To achieve higher efficiency and cost savings, safety-critical systems now require plant availability and mortal protection. Stimulating these scenarios to lead to a cutting-edge Fault-Tolerant Control (FTC) scheme that can manage uncertainty and prevent the pant from shutting down and creating an accident.As a result of these scenarios, FTC has been a focus of active study for the past three decades.

To name a few applications, fuzzy logic has arisen as a paradigm for controlling systems, complex industrial processes, electronic systems, diagnostic systems, and expert systems. Fuzzy logic is a good paradigm for designing robust systems that can operate satisfactorily in an uncertain or ambiguous environment.Although type-1 fuzzy logic (T1 FL) is the most widely used in various applications [1], there has been a significant increase in research in recent years toward more complex forms of fuzzy logic, particularly interval type-2 fuzzy logic [2] and, more recently, general type-2 fuzzy logic [3].The evolution from T1 FL to fuzzy logic complex forms was inspired by the fact that T1 FL has limitations in modelling the uncertainty present in real-world applications.The T2 FL is a more accurate uncertainty model. In comparison to the T1 FS, the T2 FS has a tridimensional FOU (Footprint of Uncertainty) with a higher degree of freedom.In a number of situations, several investigators have shown that the IT2 FS outperforms the T1 FS. Because they are made up of an infinite number of embedded T1FSs, the IT2 FSs are better at dealing with uncertainty.

According to prior experience with the IT2 FS, the GT2 FS is projected to outperform the IT2 FS' capacity to model uncertainty with greater precision; nonetheless, the GT2 FS are complex in their design and computing capabilities [3].The computational burden of Interval Type-2 Fuzzy Systems is almost double that of Type-1 Fuzzy Systems, while the computational cost of General Type-2 Fuzzy Systems is equivalent to the number of α-planes employed in approximating the model.The deployment of Shadowed Type-2 Fuzzy Systems as a strategy for approximated General Type-2 Fuzzy Systems modelled with the α-planes representation was presented in this paper.he major difference is that the Shadowed Type-2 Fuzzy Inference System (ST2 FIS) technique only needs two α-planes to simulate the GT2 FIS, but the α parameters are chosen using Pedrycz's optimization criterion for shadowed sets in [4].

Different industries, such as chemical, petrochemical, pharmaceutical, food manufacturing, and refinery, employ the level control method frequently. [5], [6], [7], [8].Ambiguities in the level control process include actuator faults, sensor bias faults, system component faults, and process disturbances, like control valve (actuator) Loss of Effectiveness (LOE), sensor miss calibration, and leaks due to corrosion tank

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Weather-aware selection of wireless technologies for neighborhood area network of Indian smart grid

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Abstract. As a contemporary bidirectional intelligent instrumentation telemetry system, wireless technology is pivotal in serving crucial communication requirements of smart grid. As a result, research into the influence of weather variations on communication system availability is critical. The goal of this research is to investigate and examine the influence of weather variations on communication system's run-time availability, as well as to recommend better alternatives for the specific region. The proposed methodology was validated on a real-time dataset from an Indian smart grid installation and found to be simple, adaptable, and viable for field engineers and design engineers planning for modifications and future expansions respectively.

Keywords: Communication design, Evaluation, Instrument telemetry, Smart cities, Smart grids, Weather impacts, Wireless technologies.

1 Introduction

Governments throughout the world are promoting smart city initiatives to upgrade existing cities into smart cities, with the goal of increasing inhabitants' quality of life. Smart cities provide a wide range of unique applications that not only ease routine tasks but also provide much more user-friendly environment for living and working. There are a few interesting studies available that provide a comparative analysis of Indian smart cities based on a variety of parameters[1]. Uninterrupted, high-quality electricity is unquestionably a necessary consumable for residents' daily lives, lifestyle development, and long-term economic growth. As a result, a new smart grid is emerging as a smart, self-diagnostic, and self-healing alternative to the present archaic and non-intelligent electric grid, which is prone to frequent malfunctions. The smart grid, in reality, is the backbone of the smart city's energy system[2].

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Passive Fault-Tolerant Control Scheme for Nonlinear Level Control System with Parameter Uncertainty and Actuator Fault

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Abstract. In recent time, the use of artificial intelligence techniques in control domain has been increasing in popularity, and this is mainly due to the incorporating ability of human cognitive knowledge and better capability to handle the modelling and parameter uncertainty. The main contribution of this work is using the concept of neural network in a fault-tolerant controller (FTC) design for nonlinear level control system subject to parameter uncertainty and actuator fault. Neural Network (NN) based controller has been shown to improve performance and accuracy in a wide range of engineering g applications. For this reason, we propose and method for passive fault-tolerant controller (PFTC) design for specific nonlinear level control system. The proposed PFTC architecture designed with two-layer Feedforward Backpropagation Neural Network (FFBPNN) and for the training of FFBPNN we used two significant signals normalized mean and residue data that can generated from nonlinear level system model. Benchmark level control system considered for testing the proposed approach. Simulations are performed and results demonstrate the effectiveness of the proposed control scheme. The residue signal measurement carried out from healthy and faulty system model.

Keywords: Actuator fault · Nonlinear level system · Passive fault tolerant control · Parameter uncertainty · Neural network

1 Introduction

Now a days, system reliability and performance are key performance criteria for any industry. To achieve the maximum level of reliability and system performance required state-of-art control scheme which is known as Fault Tolerant Control (FTC). FTC scheme objective is to maintain the system control performance at satisfactory level under faulty conditions and other uncertainty [1]. The primary task of the FTC is to inhibit that normal faults develop into severe failure and exactly how the system availability increased and minimize the risk of safety exposure [1–3]. Due to these reason FTC has been the focus research area for the last three decades [4, 5]. This research effort has succeeded in many practical industrial applications [6–9]. The two basic FTC scheme are there one is active

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Morpheme Boundary Detection & Grammatical Feature Prediction for Gujarati : Dataset & Model

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Abstract

Developing Natural Language Processing resources for a low resource language is a challenging but essential task. In this paper, we present a Morphological Analyzer for Gujarati. We have used a Bi-Directional LSTM based approach to perform morpheme boundary detection and grammatical feature tagging. We have created a data set of Gujarati words with lemma and grammatical features. The Bi-LSTM based model of Morph Analyzer discussed in the paper handles the language morphology effectively without the knowledge of any hand-crafted suffix rules. To the best of our knowledge, this is the first dataset and morph analyzer model for the Gujarati language which performs both grammatical feature tagging and morpheme boundary detection tasks.

1 Introduction

As Natural Language Processing is increasingly becoming an active area of research with many important applications, most of the research is focused only on a few languages. Developing NLP tools for under resource languages is an essential task, as it not only opens considerable economic perspectives but also prevents its extinction and foster its expansion (Magueresse et al., 2020)

In this paper we present a morph analyzer for Gujarati. Gujarati is an Indo-Aryan language, spoken mainly in the Gujarat state of India. It is the 26th most widely spoken language with approximately 55 million speakers across the world. We identify various grammatical features of Gujarati morphology and prepare a gold data set of 16527 unique words. We have developed Bi-LSTM based morph analyzer inspired from (Premjith et al., 2018) and (Tkachenko and Sirts, 2018). For the training and evaluation of the morph analysis task, we have built the dataset for Gujarati language in the standard Unimorph format (Kirov et al., 2018). The neural architecture proposed in this paper does not require any language specific rules and captures linguistic characteristics of the language effectively.

The remaining of the paper is organized as follows : Section 2 describes related work. Section 3 describes the dataset details. Section 4 describes proposed approach. section 5 describes experiments and observations. Section 6 describes result analysis from the linguistic perspective. In section 7, we discuss conclusion and future research direction.

2 Related Work

Morphological analysis is the task of analyzing the structure of the morphemes in a word and is generally a prelude to further complex NLP tasks such as parsing, machine translation, semantic analysis. It is observed that for development of high end NLP tasks such as text summerization, question answering, NLI, machine translation systems, the word level utilities like morph analyzer, POS taggers can help in performance improvement.(Hedderich et al., 2021)(Pandya and Bhatt, 2021)(Parida and Motlicek, 2019)

Existing approaches to build a Morphological Analyzer can be broadly classified as Rule Based approaches and Machine Learning based approaches. Recent breakthroughs in the field of Deep Learning has motivated researchers to apply the neural models to the Morphological Analyzer problem.

Two-level morphology(Koskenniemi, 1984) was the first practical general model in the history of computational linguistics for the analysis of morphologically complex languages. The current C version two-level compiler, called TWOLC, was created at PARC(Beesley and Karttunen,

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A Machine Learning Approach for Data Visualization and Parameter Selection for Efficient Disruption Prediction in Tokamaks

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Abstract: Disruption prediction in tokamaks is a challenging task and often involves processing of huge amount of diagnostic database, either through physics based or artificial intelligence based detection models. This paper presents a novel tool for quick data visualization and parameter selection for disruption prediction based on a machine learning technique using ADITYA tokamak data. This study involves a data set of 2216 ADITYA discharges, including both disrupting and non-disrupting ones. Firstly, a subset of 1000 labeled shots is utilized, each having 156 recorded parameters, thus a total dataset of 156000 data sets. An elaborate offline artificial neural network (ANN)-based correlation algorithm is developed to compute the score of each measured diagnostic parameter with respect to plasma current. The combined result of the ANNs presently predicts the shot-type with overall 97.11% accuracy, whereas share of disruption classification accuracy is 99.0%. This is possibly due to the subset of database with human errors, which is taken care of by the neural network. Elaborate visualization tool with 2D color-coded map for the entire dataset is developed for easy decision making. Furthermore, this tool will be useful to develop a numerical system for prediction of plasma disruptions using state-of-the-art machine learning algorithms applied on diagnostic data, which will be compatible with the real time hardware-based solution for avoidance or mitigation actions.

Motivation

- For tokamaks to be attractive as the core of future fusion based power plants, it must operate in steady state or at least quasi-steady state without plasma current disruptions.
- Early and effective disruption prediction is essential for disruption avoidance or mitigation.
- Disruptions are multi-dimensional in nature. Physics based prediction is difficult as it needs simultaneous tracking of many plasma and machine parameters for effective disruption prediction.
- Perhaps a better way for effective predictions technique would be based on machine learning technique, which has received a lot of interest in recent times across several tokamaks.
- ADITYA is a small tokamak, but excellent for disruption studies.
- Tools based on Machine learning algorithms are developed for efficient ADITYA data visualization, parameter selection for disruption analysis and finally disruption detection and prediction
- Final goal is to predict disruption events 16-20 msec prior to disruptions in ADITYA with >99% accuracy

1

ADITYA Database used for this work

- Total 2216 plasma discharge data of 14000, 25000 and 26000 series are used including both disrupting and non-disrupting shots
- 14000 series was already used earlier by Sharma et al for disrution prediction using a convoluted neural net
- Each of the diagnostic parameter of these shots have 2048 samples collected at a sampling rate of 5 kHz

Ser.	Para.	Shots Used	Year	Label			Sampling Rate (kHz)		Data Range (msec)	
				Nor.	Dis.	Oth.	Min	Max	Min	Max
14000	96	216	2004	80	110	36	5	5	-51	358.4
25000	181	1000	2012	354	347	299	5	1000	-409.4	409.6
26000	214	1000	2013	0	0	0	5	1000	-409.4	409.6
Ser=ADITYA Data Series; Para=Number of Parameters; Nor=Normal; Dis=Disrupted; Oth= Other type										

2

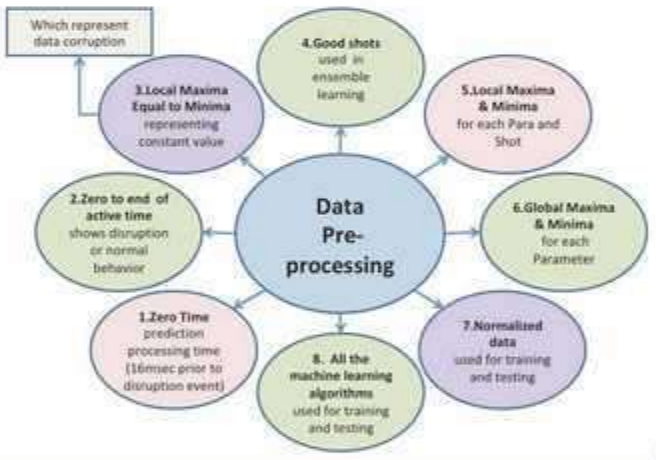
Data Viewer & Automated Shot Classification

- ADITYA tokamak diagnostic data viewer is designed using C#.NET framework for rapidly examining 20736 time series dataset (216 x 96) consisting of approximately 50 million data points.
- ANN tools developed for automated classification of the discharges inFour shot types – Normal shots, Disruption shots, Small Discharges and No Discharges



3

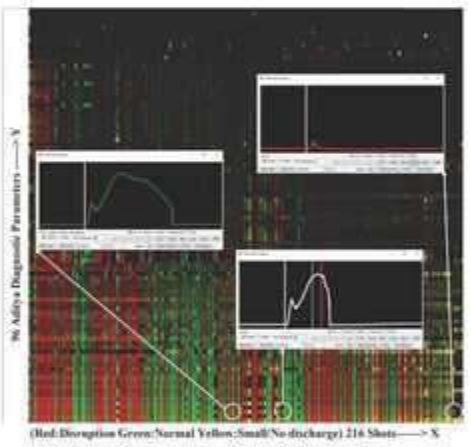
Data Selection and Disruption Prediction using ANN Tools



4

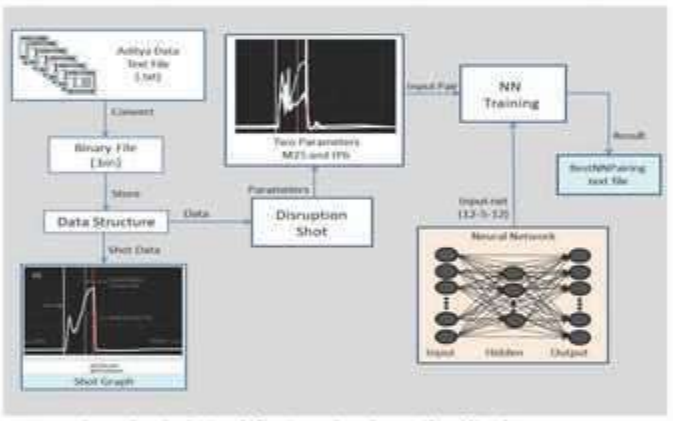
2D Color-Coded Entropy Plots

- Color coded Entropy Plot - single panel contains data of 216 shots x 96 parameters for each shot
- Information density is highest to lowest across the diagonal, with top right corner with minimum information and bottom left corner with maximum information



5

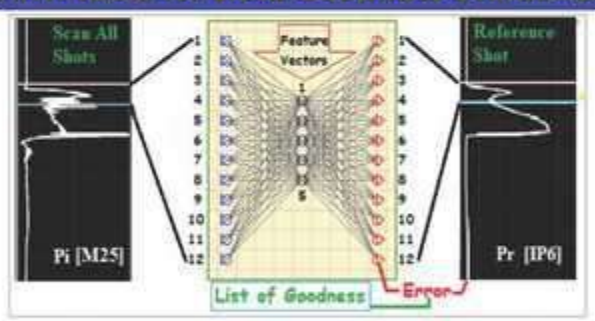
Data Goodness Classification using ANN



- Vector Quantize Code Book for Data Goodness Classification
- 15-45 msec data is used for all the diagnostic parameters

6

ANN tools for Data *Goodness* evaluation



- A 3-layer ANN is used to extract and encode the feature vectors of 12 input points of parameter of the shot in its hidden 5 nodes. These 5 feature vectors are decoded to reconstruct 12 output points of reference parameter of the shots
- The Net is trained for 1000 cycles. The inverse of error between Net output and Pr represents the goodness of feature match. All 96 Pi parameters are sorted according to their goodness numbers as parameter selection list to be used for shot type prediction.

7

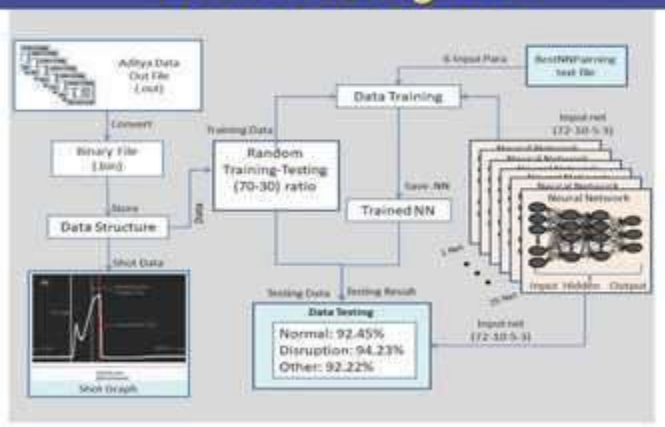
Data Goodness Score

Sr. No.	Top 12 Parameters Name in sorted order (channel no)	Parameter description	Goodness Score(%)of Parameter with respect to Plasma Current
1	Ip5(5)	Rogowski Coil	97.68
2	B1(65)	Radial bolometry	92.61
3	GIM(30)	Grazing Incidence Monochromator	92.56
4	M3(10)	Mirnov Coil	92.02
5	B5(69)	Radial bolometry	86.02
6	B3(67)	Radial bolometry	85.93
7	B6(70)	Radial bolometry	85.59
8	BOL01(17)	Top bolometry	84.11
9	B11(75)	Radial bolometry	83.82
10	M4(11)	Mirnov Coil	82.85
11	B10(74)	Radial bolometry	81.58
12	M1(8)	Mirnov Coil	81.54

All correlations are measured with respect to IP6 Rogowski coil measurements for plasma current

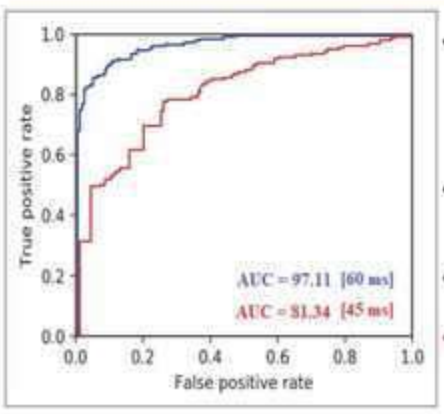
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Ensemble Learning and Disruption Prediction using ANN



9

Disruption Learning and Prediction using ANN



- 2000 shots for 25000 and 26000 series are randomly split in 70-30 ratio for training & testing
- 0-60 msec data for training and 0-45 msec data used for testing
- Blue curve Learning curve for disruptive shots
- Red curve prediction of disruptive shots

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Summary

- Novel tools for quick data visualization and parameter selection for disruption prediction based on a machine learning technique using ADITYA tokamak data have been developed.
- This study involves a data set of 2216 ADITYA discharges with 1D time series data, including both disrupting and non-disrupting discharges.
- Final goal is to predict disruption events 16-20 msec prior to disruptions in ADITYA with >99% accuracy
- The combined result of the ANNs presently predicts the shot-type with overall 97.11% accuracy, whereas share of disruption classification accuracy is 99.0%.
- Prediction accuracies will be further improved by inclusion of 2D profile database.
- These tools will further be applied on ITPA multi-machine disruption database

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References

1. A. Sengupta and P. Ranjan 2000 Nucl. Fusion 40 1993.
2. A. Sengupta and P. Ranjan 2001 Nucl. Fusion 41 487.
3. C.G. Windsor *et al.* 2005 Nucl. Fusion 45 337.
4. M. Cacciola, *et al.* 2006, International Journal of Intelligent Technology, 1.4, pp. 274-280.
5. A. Murari *et al.* 2009 *Nucl. Fusion* 49 055028.
6. William Tang *et al.* 2016, 26th IAEA Fusion Energy conference, 17-22 October, Kyoto, Japan, EX/P6-47.
7. Matthew S Parsons 2017 Plasma Phys. Control. Fusion 59 085001.
8. C Rea *et al.* 2018 *Plasma Phys. Control. Fusion* 60 084004.
9. A. Murari *et al.* 2018 Nucl. Fusion 58 056002.
10. W. Zheng *et al.* 2018 Nucl. Fusion 58 056016.
11. P. Sharma *et al.* 2018, Towards Extensible and Adaptable Methods in Computing, pp. 179-193.
12. K.J. Montes et al 2019 Nucl. Fusion 59 096015.
13. Julian Kates-Harbeck *et al.* 2019, Nature, 568 (7753).
14. Y. Fu *et al.* 2020, Physics of Plasmas 27.2 (022501).
15. A. Mehta and H. Mazumdar 2020, Computational Biology and Chemistry, 84 (107164).
16. M. Patel and H. Mazumdar 2014, Journal of theoretical biology, 361, pp. 182– 189.

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An Insight Into Determinants of Effective Implementation of Strategy

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ABSTRACT—*Successful strategic implementation is crucial to commensurate the benefits from strategic planning. However, from numerous studies conducted by researchers, it has surfaced that it is tricky for an organization to achieve optimum strategic implementation. There are certain factors that are critical to implementation of strategy. The purpose of this study is to examine the factors that influence the implementation of strategy. The paper divides the determinants into three broad dimensions-organizational structure, business processes and institutional culture. It is an attempt to study the role of these determinants in effective implementation of strategy. A structured questionnaire is used to collect data on organizational structure, business processes and institutional culture as factors influencing successful strategy implementation. The data is analyzed using SPSS statistical package.*

KEYWORDS: *Strategy, Strategic Implementation, Organizational Structure, Business Processes, Institutional Culture, Organizational Culture*

INTRODUCTION

Strategy can be defined as the determination of the long-term goals and objectives of an enterprise, and the adoption of courses of action and the allocation of resources necessary for carrying out these goals. (Chandler, 1962) Companies formulate best strategies in order to meet the cut throat competition in today's era of globalization and modernization. But still, it so happens that, the strategies fail to give the desired results to the organization. One of the reasons identified in the studies of research is the effectiveness of implementation of the strategies. Strategic implementation is critical to a company's success, addressing the who, where, when, and how of reaching the desired goals and objectives. A gap has been observed between strategy formulation and strategy implementation. In order to gain the desired results from the strategy, effective strategy implementation is essential. (Igwe, Onwumere and Egbo, 2015) There are many factors that can disrupt the implementation process. Some of them can be related to the system, structure and culture of the organization. (Mithwani, 2015) The same has been addressed in this study. This study is an attempt to identify the extent to which the three broad factors: organizational structure; business processes and organizational culture affect the strategy implementation process. It also gives an insight into other barriers to effective strategy implementation.

OBJECTIVES

The objectives of the study are as follows

- To examine the determinants of implementation of strategic plans
- To study the effect of organizational structure, business processes and organizational culture on strategy implementation in pharmaceutical companies
- To identify the barriers to effective strategy implementation

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Finance Management in the New Normal

Editors
Dr. Jasmin Padiya
Dr. Chinmay Gandhi
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CHAPTER-25

To Study Investment Pattern of working Women in Stock Market and Mutual Fund

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Abstract

Women in India are now actively participating in all activities such as education, politics, media, science and technology & becoming financial independent. With this changing scenario, women have started actively participating in investing their surplus money. Their decision though depends upon the various parameters such as the degree of their risk-taking capability, the influence of family members and friends, and income level etc.

For the study, only two of the Investment Avenues were chosen which are Mutual Funds and Stock Market. A mutual fund is a professionally managed investment fund that pools money from many investors to purchase securities. A stock market is the aggregation of buyers and sellers of stocks (also called shares), which represent ownership claims on businesses.

The main focus of the research paper is to identify the investment pattern of working women belonging to different economic condition, social strata, and the purpose of their investments in the Stock market and Mutual funds. The main objective of the study is to determine the factors that women investors consider and their purpose while investing.

Keywords: Women Investor, Investment Pattern, Stock Market, Mutual fund.

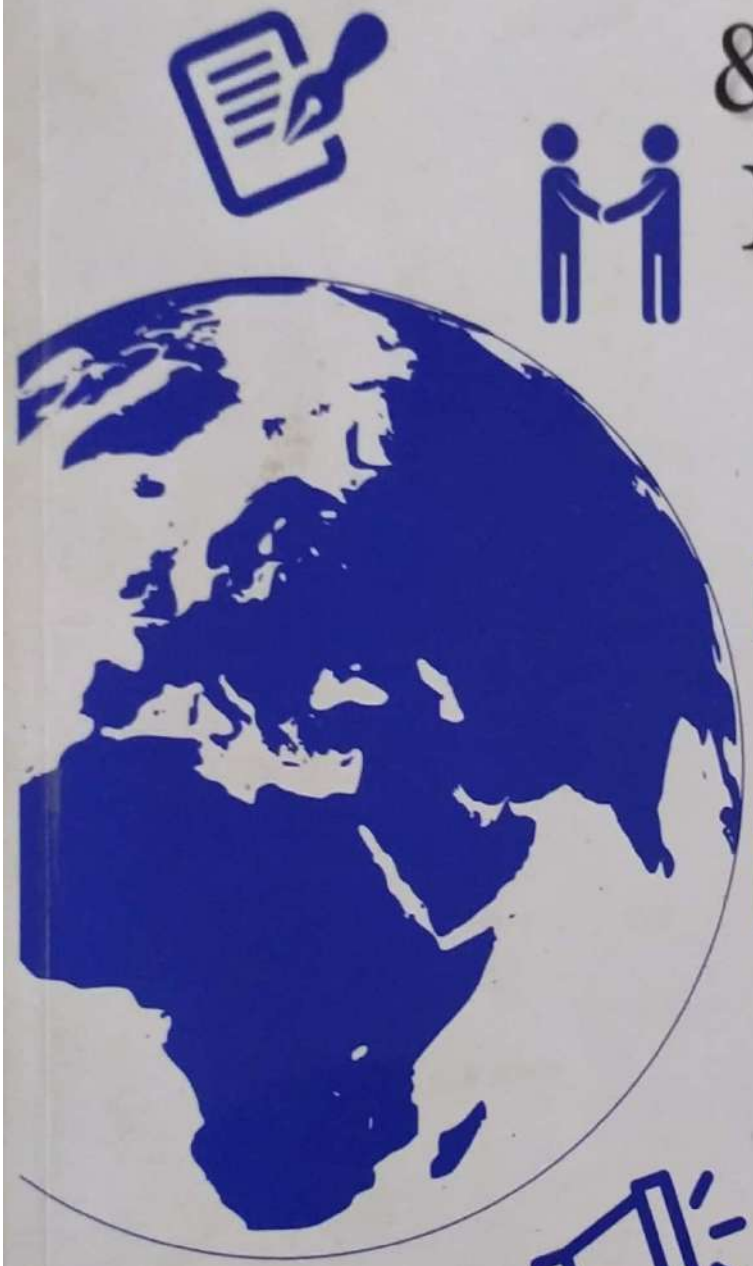
INTRODUCTION

An Investor invests his/her money in the market with an investment objective such as Wealth Maximization, and Future Security etc. There are a lot of investment avenues available for the investors to achieve their objectives. They are Bank deposit, Post office savings, Government securities or bonds, Real estate, Gold, Mutual fund, Commodities, Insurance, Shares, Public provident funds, pension funds, chit funds etc. All these are avenues have different characteristics in terms of Liquidity, Growth, Risk, Return, and Safety etc.

In the past, women were investing, mostly in gold, ornaments etc. But nowadays, the attitude of women towards investment has been changed. Women are more involved than ever in their household's investment and financial decision making. But there are many factors like marital status, education, and age etc. which affect investment decision of women. This study talks about the Investment pattern of women while investing in stock market and Mutual Funds, also which factors they consider while making an investment decision.

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Pharmacokinetics and Toxicokinetic Considerations

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Chapter 22 - Environmental and safety aspects of bionanotechnology

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Abstract

Bionanotechnology (BNT) is a vital tool of translational research. Nano-biointerface has created nanomaterials, which are similar to endogenous biomolecules. It is widely explored as therapeutics and diagnostics and showed great potential in theranostic applications. Moreover, it is a rescue tool for the environment against global deterioration and disturbed ecosystems. The physical and chemical properties of nanoparticles (NPs) affect various aspects of life on the earth. Therefore nanopollution and nanotoxicity caused by these engineered NPs have greatly influenced the environment and resulted in a risk on the ecological and environmental balance. The chapter gives a detailed overview of nanopollution and its hazardous effect on air quality, land, and aquatic toxicity.

Furthermore, it also discusses the effect of nanopollution on each organ of the human body. The majorly overlooked aspect of nanopollution and ecotoxicity is the core of this chapter; however, it also explains the savior aspects of BNT. Health hazards of specific BNT tools such as magnetic NPs, surface plasmon resonance, quantum dots, carbon nanotubes, biophotonic devices, gold NPs, graphene, and dendrimer are also discussed in detail. Finally, we can conclude that risk assessment, regulatory aspects, and ethical challenges need extra attention.

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Keywords

Bionanotechnology; theragnostic application; nanopollution; ecological risk; ethics; regulatory aspect

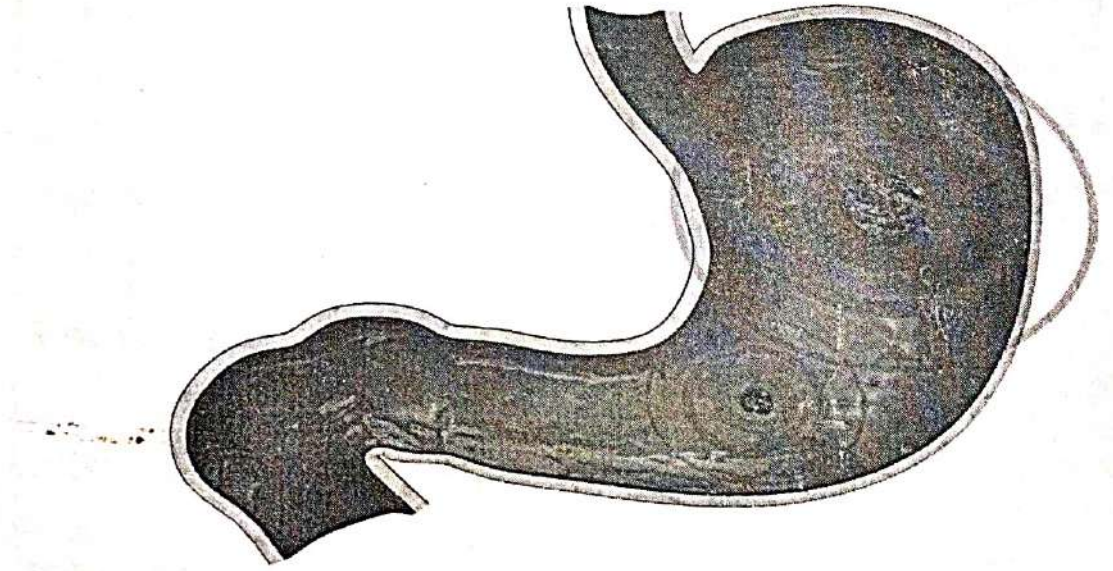
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1. Determination of the manner of death is within the purview of the courts and should be left to them unless specifically asked for by the investigation officer.
2. To only state only when there is no doubt.
3. This needs to be included in the overall documents but may not always be included directly on the autopsy report as the manner of death often requires information from non-medical sources too, which can have a major influence.
4. Best is to state alongside cause of death if it is definitely due to natural in manner. It would definitely save the time to investigate unnatural causes.

References

1. Saukko P, Knight B (editors). Knight's Forensic Pathology. 4th ed. Florida: CRC Press (Taylor and Francis); 2016. p 2.
2. Modi JP. A Textbook of Medical Jurisprudence and Toxicology. 24th ed. Nagpur: LexisNexis; 2012. p 30–49.
3. Roberts ISD, Gorodkin LM, Benbow EW. What is a natural cause of death? A survey of how coroners in England and Wales approach borderline cases. J Clin Pathol. 2000; 53:367–73.
4. Reddy KSN. The Essentials of Forensic Medicine and Toxicology. 34th ed. New Delhi: The Health Science; 2017. p 118–329.
5. Harris A. 'Natural' and 'Unnatural' medical deaths and coronial law: A UK and international review of the medical literature on natural and unnatural death and how it applies to medical death certification and reporting deaths to coroners. Medicine, Science, and the Law. 2017;57(3): 105–14.

INTRICACIES IN FRAMING TIME SINCE DEATH

Sunil M Doshi, Lavlesh Kumar

Introduction

Another important objective of conducting a postmortem examination is to estimate the postmortem interval, i.e. to calculate the 'time since death', where required. Apart from declaring it within the postmortem reports routinely, in many of the cases judiciary asks for the same, specifically during deposition. Practically, in all hospitalized deaths it is of no value to look for the postmortem changes as the actual time of death has already been documented. The value of this aspect is limited to the cases where death of an individual remains unattended, i.e. 'found dead' cases or where the history seems misleading. Two parameters are considered to justify the time since death of a deceased:

1. Parameters based upon body of deceased
2. Parameters based upon circumstantial evidence

While the later incorporates all the direct and indirect evidence including testimonies of witnesses, evidence engendered by technological help, person's day-to-day movements, etc. the former relies upon findings narrated by autopsy surgeon in their postmortem reports.

First of all, the concept of deriving 'time since death' must be understood thoroughly. It is the period between the actual time of death and the time when autopsy surgeon