Recent Advances in Mathematical Research and Computer Science Vol. 1

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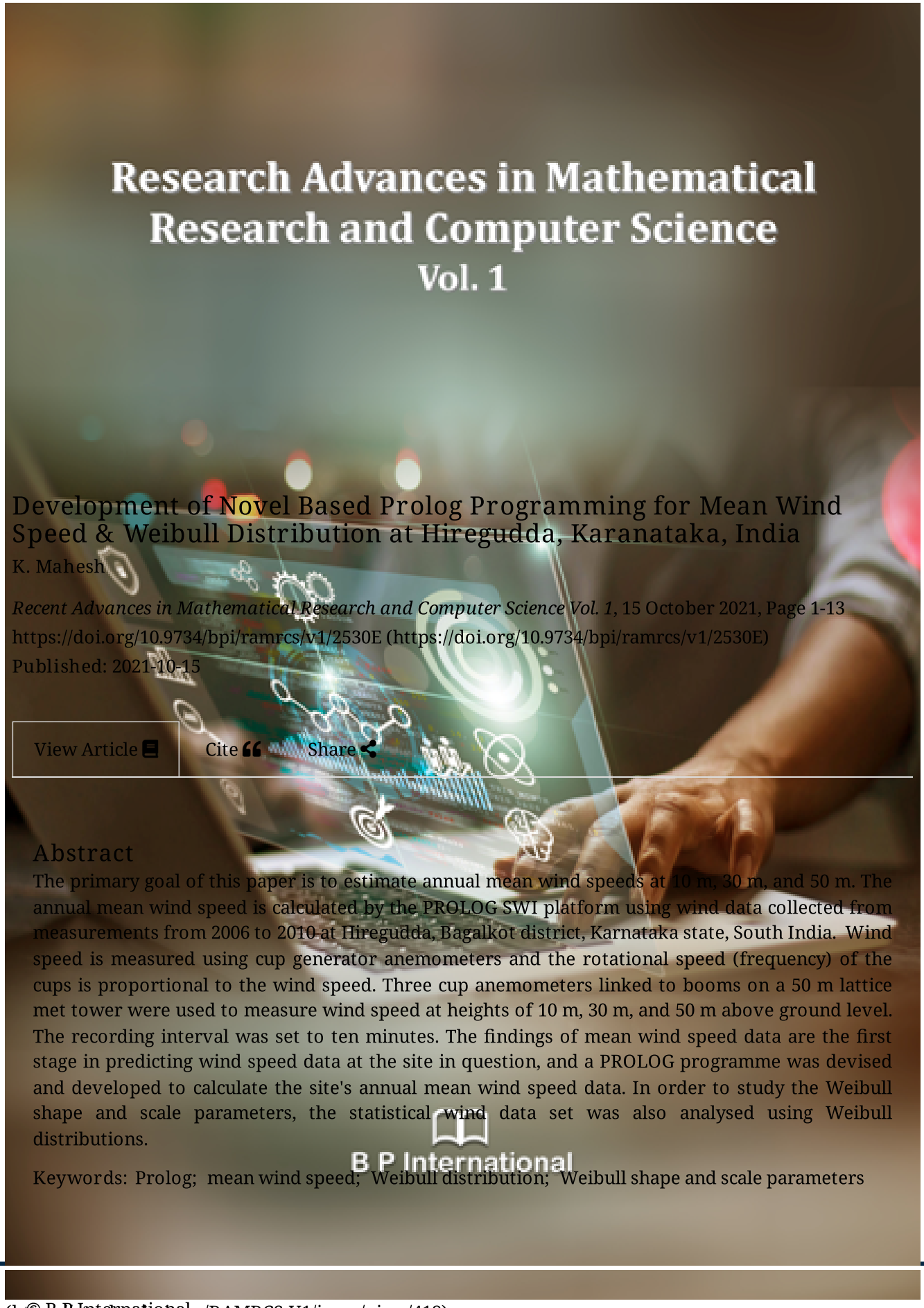

Development of Novel Based Prolog Programming for Mean Wind Speed & Weibull Distribution at Hiregudda, Karanataka, India

K. Mahesh

Recent Advances in Mathematical Research and Computer Science Vol. 1, 15 October 2021, Page 1-13
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Abstract

The primary goal of this paper is to estimate annual mean wind speeds at 10 m, 30 m, and 50 m. The annual mean wind speed is calculated by the PROLOG SWI platform using wind data collected from measurements from 2006 to 2010 at Hiregudda, Bagalkot district, Karnataka state, South India. Wind speed is measured using cup generator anemometers and the rotational speed (frequency) of the cups is proportional to the wind speed. Three cup anemometers linked to booms on a 50 m lattice met tower were used to measure wind speed at heights of 10 m, 30 m, and 50 m above ground level. The recording interval was set to ten minutes. The findings of mean wind speed data are the first stage in predicting wind speed data at the site in question, and a PROLOG programme was devised and developed to calculate the site's annual mean wind speed data. In order to study the Weibull shape and scale parameters, the statistical wind data set was also analysed using Weibull distributions.

Keywords: Prolog; mean wind speed; Weibull distribution; Weibull shape and scale parameters

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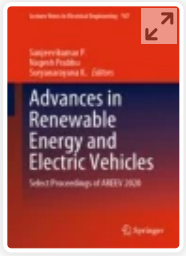

Advances in Renewable Energy and Electric Vehicles pp 55–64

Comparative Analysis of MPPT Techniques in Grid-Connected and Stand-alone PV System

B. B. Tara & H. L. Suresh

Conference paper | First Online: 21 August 2021

Part of the Lecture Notes in Electrical Engineering book series (LNEE,volume 767)

Abstract

Solar energy is recognized as most promising energy source. MPPT technique is the optimized technique to track the MPP and to extract the maximum power out of PV panel under all available condition. There are different MPPT techniques available for different applications, and these techniques are used to get the maximum output power regardless of the existing

conditions such as solar irradiance, and temperature. The paper discusses about various MPPT strategies in stand-alone and grid-connected PV system considering some features. There is a brief overview on various conventional methods and modern techniques, and all the methods are compared considering the significant key features.

Keywords

Maximum power point tracking (MPPT)

Photo voltaic (PV)

Adaptive neuro-fuzzy inference system (ANFIS)

Perturbation and observation (PO)

Artificial neural network (ANN)

Maximum power point (MPP)

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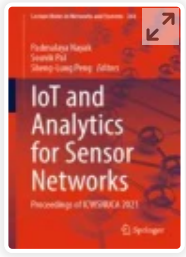


IoT and Analytics for Sensor Networks pp 207–223

Design and Simulation of MEMS Based Capacitive Accelerometer

S. Veena, Newton Rai, Amogh Manjunath Rao Morey, H. L. Suresh & Habibuddin Shaik

Conference paper | First Online: 12 September 2021

Part of the Lecture Notes in Networks and Systems book series (LNNS,volume 244)

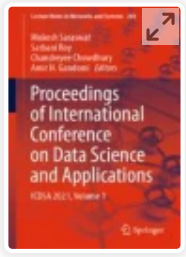
Abstract

Accelerometer is an electromechanical device,

simulation, analytical modelling, and finite element modelling of each MEMS comb type capacitive accelerometer with different operating frequencies. The accelerometer was designed using COMSOL Multiphysics and MATLAB simulator tool.

Keywords

Accelerometer **MATLAB** **COMSOL**



Proceedings of International Conference on Data Science and Applications pp 297–308

A Comparative Study of Firefly and BAT Algorithm-Based Maximum Power Point Tracking for Partially Shaded Photovoltaic Systems

Rekha Radhakrishnan, P. Sumalatha & R. Subha

Conference paper | First Online: 23 November 2021

525 Accesses

Part of the Lecture Notes in Networks and Systems book series (LNNS,volume 288)

Abstract

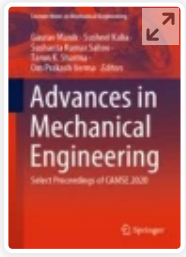
There has been tremendous rise in solar-based power generation in the recent years due to the economic viability and the environment-friendly nature of these systems. One of the major problems encountered with these systems is that their output is sensitive to variations in environmental conditions. To obtain maximum power from the

panel, several algorithms have been developed over the years. Conventional algorithms miss the maximum power point (MPP) when the photovoltaic (PV) system is operating under partially shaded conditions. Hence several intelligent algorithms have been adapted to track MPP of partially shaded PV systems. Algorithms mimicking the behavior of biological entities in nature exhibit good adaptability to changing surroundings. Bats use echolocation for locating their food is used in the development of an algorithm called bat algorithm. This paper presents a comparison on the MPP tracking performance of bat algorithm, firefly algorithm and conventional Pertub and Observe (P&O) algorithm under partial shading.

Keywords

Bat algorithm **Firefly algorithm** **MPPT**

Partial shading **PV system**



Advances in Mechanical Engineering, pp 499–507

Linear and Nonlinear Gravity Field Variation on Double-Diffusive Convection in a Porous Layer

Y. H. Gangadharaiah, T. Y. Chaya & S. P. Suma

Conference paper | First Online: 27 June 2021

Part of the Lecture Notes in Mechanical Engineering book series (LNME)

Abstract

This paper analyzes the instability of a gravity field in a double-diffusive convective motion in horizontal porous matrix, heated from below uniformly with the inclusion of the Soret parameter. The critical Rayleigh numbers for the onset of stationary and oscillatory modes have been calculated by using the higher-order Gelerkin technique. We addressed four separate cases of linear and nonlinear gravity variation: (1) H\left(z

\right) = - z (2) H\left(z \right) = - z^{2} (3) H\left(z \right) = - z^{3} and (4) H\left(z \right) = - \left({e^{z} - 1} \right). The gravity parameters Soret parameter and solute Rayleigh number on stationary and oscillatory convection and heat and mass transfer are graphically illustrated.

Keywords

Soret effect **Steady instability**

Oscillatory motion **Gravity field**

Theory and Practice of Mathematics and Computer Science Vol. 6

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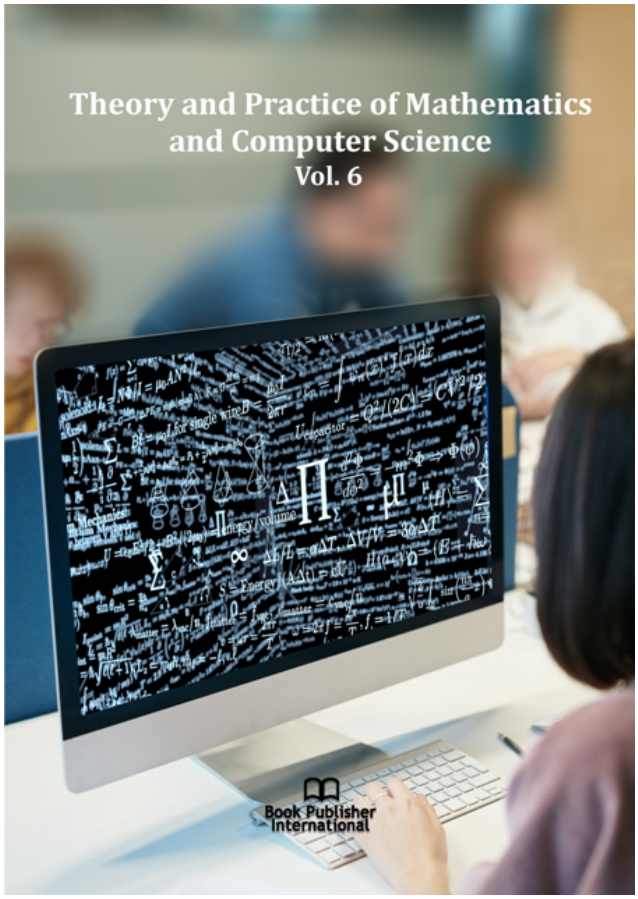

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(https://stm.bookpi.org/TPMCS-V6/issue/view/6)

A Statistical Analysis and Artificial Neural Network Behavior on Wind Speed Prediction: Case Study

K. Mahesh

Theory and Practice of Mathematics and Computer Science Vol. 6, 6 February 2021, Page 38-56

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Published: 2021-02-06

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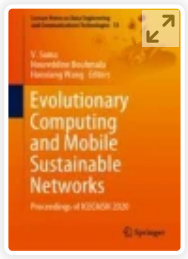
Abstract

The increased use of energy and the depletion of the fossil fuel reserves combined with the increase of the environmental pollution have encouraged the search for clean and pollution-free sources of energy. One of these is wind energy. The wind power industry has seen an unprecedented growth in last few years. The surge in orders for wind turbines has resulted in a producer's market. This market imbalance, the relative immaturity of the wind industry, and rapid developments in data processing technology have created an opportunity to improve the performance of wind farms and change misconceptions surrounding their operations. This research offers a new paradigm for the wind power industry, data-driven modeling. Each wind Mast generates extensive data for many parameters, registered as frequently as every minute. As the predictive performance approach is novel to wind industry, it is essential to establish a viable research road map. This paper proposes a Statistical analysis and data-mining-based methodology for long term wind forecasting (ANN), which is suitable to deal with large real databases. The paper includes a case study based on a real database of five years of wind speed data for a site and discusses results of wind power density was determined by using the Weibull and Rayleigh probability density functions. Wind speed predicted using wind speed data with Datamining methodology using intelligent technology as Artificial Neural Networks (ANN). MATLAB R2008a Neural Network Toolbox used for the training the ANN back propagation algorithm and a PROLOG program is designed to calculate the monthly and Annual mean wind speed. The Statistical analysis of wind speed prediction shows that Weibull distribution is more suitable than Rayleigh distribution and by seeing the values of the k we can conclude that Higher values of k imply a sharper maximum in the frequency distribution curve and consequently a lower wind power density.

Keywords: Wind speed prediction; datamining; ANN; Weibull; Rayleigh; backpropagation training algorithm; PROLOG



Evolutionary Computing and Mobile Sustainable Networks pp 103–112

Review of Python for Solar Photovoltaic Systems

R. Sivapriyan, D. Elangovan & Kavyashri S. N. Lekhana

Conference paper | First Online: 01 August 2020

Part of the Lecture Notes on Data Engineering and Communications Technologies book series (LNDECT,volume 53)

Abstract

In recent years, the usage of solar energy as a source to produce power has increased exponentially as it provides a clean and efficient alternative to depleting non-renewable resources. The normal working period of a photovoltaic (PV) panel is 20 years, but due to defects in manufacturing or atmospheric condition changes, the efficiency and the lifespan of the panel decrease each year. The objective of this review article is to

present and analyze the different methods that can be used to reduce the degradation rate of the PV cells in an economically viable way. Open-source frameworks are important to make any solution affordable; hence we explore the usage of python language in developments relating to improvement in the performance of PV cells. Based on this review a practically employable solution to improve working conditions for PV cells can be obtained.

Keywords

Solar energy **PV panels** **Python**

Modeling **Monitoring** **Analysis**

Fault detection

Novel Cognitive Radio Framework for Optimized Resource Management over IoT Ecosystem

Vani B P ; R Sundarguru **All Authors**

Abstract: Adoption of Cognitive Radio Network (CRN) is increasing owing to its potential facilitation towards accessibility of data services in wireless network. It is considered a... **View more**

Metadata

Abstract:
Adoption of Cognitive Radio Network (CRN) is increasing owing to its potential facilitation towards accessibility of data services in wireless network. It is considered as an integral part of IoT system which demands faster connectivity with better admission control. However, IoT system has massive number of connected users with both home access point and core base station and it is quite resource consuming in order to relay the data communication even using 5G over IoT. Therefore, this paper introduces a very simple and novel mechanism for resource management in CRN particularly targeting to large scale IoT environment. This analytical model is implemented in MATLAB considering a standard simulation parameter, where the outcome shows that proposed system offers better throughput in less time in contrast to existing channel assignment approaches towards resource management in CRN.

Published in: 2021 International Conference on Computer Communication and Informatics (ICCCI)

Date of Conference: 27-29 January 2021

Date Added to IEEE *Xplore*: 21 April 2021

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INSPEC Accession Number: 20632214

DOI: 10.1109/ICCCI50826.2021.9402361

Publisher: IEEE

Conference Location: Coimbatore, India

Intelligent Garbage Collection Application for Smart City

Publisher: IEEE

R. Sivapriyan ; N Sakshi ; K. Mahesh **All Authors**

Abstract: This paper put forward an intelligent garbage collection application for Android/iOS mobile phones to benefit the resident and municipal workers. The existing waste colle... **View more**

Metadata

Abstract:

This paper put forward an intelligent garbage collection application for Android/iOS mobile phones to benefit the resident and municipal workers. The existing waste collection system is that the municipality sends a truck to each home and manually picks up the garbage bag. However, if the garbage collection truck is not on time, the garbage is not collected from their respective residence. This results in residents throwing the trash in the open area. Hence, a solution is proposed for a garbage collection system using the flutter-firebase along with geofencing technology. The main objective of this paper is to inform the residents when the garbage collection truck is on its way to collect the garbage via an Android/iOS device, and also list the details to the truck driver's mobile about number of persons waiting to dispose of the garbage. This proposed garbage collection application will ensure that the garbage is collected on time from each resident and waste is disposed of scientifically. Also, this application ensures the minimum waiting time for the residents to dispose the garbage and maximum area coverage in short time for the municipal worker without missing a resident. This application is developed using Flutter Software Development Kit and works well with both Android and iOS based mobile phones.

Published in: 2021 International Conference on Advancements in Electrical, Electronics, Communication, Computing and Automation (ICAECA)

Date of Conference: 08-09 October 2021

INSPEC Accession Number: 21498177

Date Added to IEEE *Xplore*: 18 January 2022

DOI: 10.1109/ICAECA52838.2021.9675572

ISBN Information:

Publisher: IEEE

Smart Android/iOS Application for Smart Learning

Publisher: IEEE

R Sivapriyan ; Sakshi N ; V Sureshbabu **All Authors**

Abstract: The teaching staff in educational institution use the traditional method to conduct Face-To-Face classes with students. The re-accruing of the pandemic has become a need ... **View more**

Metadata

Abstract:

The teaching staff in educational institution use the traditional method to conduct Face-To-Face classes with students. The re-accruing of the pandemic has become a need to supersede the present education system to a new sustainable education system. Currently, the pandemic has forced to shut down several activities, including educational activities and thus resulting in the students not attending the class physically. As learning is a must for every student, educational institution was forced to conduct courses online. However, some students cannot attend the online class on time for various reasons; and unable to follow the subject concept. Hence, this paper proposes an application that helps students retrieve a specific topic for their understanding. Implementing this system, the students need not travel to institutions daily and waste their travel time for attending the classes and also saving teachers travel time. This system will ensure that teachers and students are safe from re-accruing pandemics by avoiding contacting each other to understand the subject. To accomplish this task, this paper proposed an application that runs on the Android/iOS platform by using Flutter SDK and using Dart programming language.

Published in: 2021 Innovations in Power and Advanced Computing Technologies (i-PACT)

Date of Conference: 27-29 November 2021

INSPEC Accession Number: 21705354

Date Added to IEEE *Xplore*: 08 February 2022

DOI: 10.1109/i-PACT52855.2021.9696573

ISBN Information:

Publisher: IEEE

Conference Location: Kuala Lumpur, Malaysia

A Study on Pattern Analysis of Extracted Features from Bearing Fault Vibration Signals

Publisher: IEEE

Nayana B R ; Geethanjali P All Authors

Abstract: In any pattern recognition challenge, extracted features play a vital role. It is important to extract useful features and then proceed with classification. Especially in... **View more**

Metadata

Abstract:

In any pattern recognition challenge, extracted features play a vital role. It is important to extract useful features and then proceed with classification. Especially in applications like mechanical fault diagnosis of machinery, where the characteristics features of the fault are to be captured. This can avoid the need for feature reduction/ selection techniques that would be needed once the number of features is greater and does not help advance the act of the classifier. This work presents an attempt to investigate the efficacy of eighteen features for classification. Among 18 features, 12 are statistical time domain features in which 4 are 1st 4 moments of the signal, 5 are simple statistical features and 3 are counters. Furthermore, 6 frequency domain features are computed directly in time domain, which are log transformed higher order moments of frequency domain. Subsequently, the features are studied for their pattern and their correlation with each other by visualization. Visualization observations are validated using classification performance parameters. The features are extracted from a benchmark dataset and a 13-class classification is implemented using well-established classifiers. Finally, the paper concludes that 4 effective features will suffice to achieve 99.7% accuracy of classification.

Published in: 2021 Innovations in Power and Advanced Computing Technologies (i-PACT)

Date of Conference: 27-29 November 2021

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ISBN Information:

Publisher: IEEE

Comparative Analysis of Smart Voice Assistants

R Sivapriyan ; N Sakshi ; T Vishnu Priya **All Authors**

Abstract: Lately, voice-activated interfaces are becoming more popular, such as Amazon Alexa, Google Assistant, and Microsoft Cortana voice recognition applications. This paper rep... **View more**

Metadata

Abstract:
Lately, voice-activated interfaces are becoming more popular, such as Amazon Alexa, Google Assistant, and Microsoft Cortana voice recognition applications. This paper represents the outcome of gauging these three intelligent voice assistant applications. Their answers are based on user questions and how the user perceives these three intelligent voice assistant applications. As per the survey conducted on these three smart voice assistant applications, users feel that Alexa and Google Assistant applications are superior to Microsoft Cortana. Alexa and Google Assistant applications do not have any remarkable differences. The development and implementation of Artificial Intelligence objects ensure that voice-overs between humans and machines are realistic, and there are not many dependencies on human interactions. The new Voice Protocol Assistants system can be implemented in other different environments of applications, including education assistance, medical assistance, robotics and vehicles, an assistant system for physically challenged persons, home automation, and security access control. This paper compares the three most adopted voice assistants and identifies its strength and weakness compared with their peers.

Published in: 2021 IEEE International Conference on Computation System and Information Technology for Sustainable Solutions (CSITSS)

Date of Conference: 16-18 December 2021

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ISBN Information:

INSPEC Accession Number: 21592161

DOI: 10.1109/CSITSS54238.2021.9683722

Publisher: IEEE

Conference Location: Bangalore, India

An Overview on Single/Multi Output Isolated Resonant Converter Topologies for Vehicular applications

Publisher: IEEE

Reshma P Eldho ; Anchal Chhabra ; C P Ragasudha **All Authors**

Abstract: The applications of DC-DC Converters in the field of electrical and electronics domain is increasing day-by-day. It has applications on areas such as energy storage based... **View more**

Metadata

Abstract:
The applications of DC-DC Converters in the field of electrical and electronics domain is increasing day-by-day. It has applications on areas such as energy storage based charging circuitry, distributed power generating stations, power supplies and so on. As a result, the enhancement of existing technologies for better performance, response, stability and control capabilities is mandatory. Moreover, converters at higher frequencies are used on large scale as it makes the system less bulky and thus improves the power density. Resonance is another feature which enhance the system performance by reducing the switching losses. With the increasing inclination towards Electric vehicle, it is appropriate to take up an elaborate review to understand and summarize on the various isolated topologies and the commonly utilized resonant switching configurations for better converter design and development. The paper presents a detailed study on the current isolated resonant topologies used in vehicular applications. The review mainly focuses on series resonant converter and LLC resonant converters, as it is the commonly used topologies.

Published in: 2021 7th International Conference on Advanced Computing and Communication Systems (ICACCS)

Date of Conference: 19-20 March 2021

INSPEC Accession Number: 20656317

Date Added to IEEE *Xplore*: 03 June 2021

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ISBN Information:

Publisher: IEEE

ISSN Information:

Conference Location: Coimbatore, India