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Dr. Muhammad Irfan Uddin

Urdu Word Sense Disambiguation System Using Long Short-Term Memory

Muhammad Luqman, Dr. Asad Habib and Dr. Jawad Ashraf

Abstract: Word sense disambiguation (WSD) refers to the phenomenon of automatically determining the "sense" (meaning) of a word, which must be "activated" by using a word in a particular context, its challengeable problem in Natural Language Processing. Most of these efforts have focused on computational developed languages, particularly English. Research on WSD for South Asian languages, especially Urdu, is still in its infancy. In recent years, deep learning methods have proved highly successful for a variety of natural language processing tasks. The aim of this study is to develop a System for Urdu WSD. We apply and evaluate modern approaches i.e Recurrent neural network, Long-Short Term Memory (LSTM). To obtain our goal evolution is carried out on Urdu sense annotated corpus. Results (Accuracy = 64.41% and F1-Measure = 0.51) on LSTM show that increasing the size of sense annotated corpus would maximize our system accuracy.

Sentiment Analysis for Real Time Classification Of Diseases In Tweets

Asif Nawaz, Muhammad Irfan Uddin and Abdul Shahid

In the current era, social media platforms/applications are providing a huge amount of data from users of all fields across the world. This data is very helpful in sentiment analysis as well as analyzing users' views and perspectives of various fields i.e. sports, entertainment, shopping, education, etc. The aim of this study is to propose an approach for the detection of novel coronavirus disease also known as covid-19 from one of the biggest social media platforms Twitter. This approach is designed to detect the presence of covid-19 disease in tweets of the user in real-time but not based on historic data. For this spark, streaming capabilities are utilized. This will help health professionals for taking necessary action in time for the control of disease spread. This approach only access tweets of the users with specific hashtags without accessing the personal information of the user. This research work is based on machine learning models for automatic and efficient detection of the disease by classifying the tweets into positive (disease infected) and negative (not infected). The proposed model works in two phases i. offline phase ii. Online phase. In the offline phase the four ML models LR, RF, SVM, and DT are trained and tested on historical tweets data using TF-IDF and n-gram textual feature extraction method. The model's performance is evaluated using standard performance matrices. Decision Tree (DT) performed well with an accuracy of 93%. This model is then utilized in the online phase for real-time detection and classification of the tweets into covid positive and negative. The online part of the model is built using Twitter streaming API and Apache spark.

Refinement and Segregation of SPARQL Queries for Enhanced Performance on Knowledge Graph

Arshad Iqbal, Abdul Shahid and Shafi Ullah

The World Wide Web (WWW) is one of the rich sources for storing information in an unstructured format, without manual interpretation, users cannot find their desired information on the web. This vacuum was filled with the invention of the Semantic Web. In the Semantic Web, RDF and XML are platforms used to organize and interchange data on the web. Each entity, object, or event of a document/data is linked with semantic metadata to form a network called a knowledge graph. According to one study, billions of linked data exist on the web in the form of RDF knowledge graphs. Without accessing or extracting information from these graphs, it is useless. SPARQL (a recursive acronym for SPARQL Protocol and RDF Query Language) is a query language used to extract information from these RDF graphs.

In querying these enormous amounts of RDF knowledge graphs, we have encountered several problems, such as the unavailability of SPARQL endpoints, the complexity of SPARQL queries, etc. Several approaches and methods i.e. the data dump, triple pattern fragment, linked data document, and cached based technique etc are proposed by the researcher to solve this problem. In this work, I address the problem of SPARQL endpoint unavailability, and proposed an approach referred as Refinement and Segregation of SPARQL Queries for Enhanced Performance on Knowledge Graph. This approach has the functionality of caching and automatically generating new queries for the user queries whose fraction results are not found in the cache. The primary goal of this approach is to keep the availability rate of the SPARQL endpoint high, the secondary goal of this approach is:

- To reduce the load on the knowledge base server.
- To reduce the computational cost of the user.
- And to make the query evaluation process effective and efficient.

AUTOMATICALLY IDENTIFYING REGRESSION IN THE LAYOUT OF RESPONSIVE WEB PAGES USING VISUAL ANALYSIS

Sana Nousheen, Dr. Abdul Shahid and Dr. Muhammad Roman

Since the number of mobile devices used to access the Internet is growing at an exponential rate, it is critical that websites are effective and consumer across a wide variety of web-enabled devices. For a better user experience, responsive web testing is a critical task. Testing the web design guarantees the website is working well on all devices or screen sizes. The website design is controlled through CSS code. Thus, changes to the CSS rules of the web pages may result in page layout unintentional regressions for the developer and mostly result in unintended viewport widths. The objective of the proposed system is to identify potential regression automatically, increase the regression testing coverage due to the accumulation of test cases. We proposed image processing and computer vision technique to compare the images of both versions of the selected websites and identify the unintended regression on responsive web design.

Reducing data sparsity in movie recommender system

Aamir Fareed and Saima Hassan

Recommendation plays an important role in our digital lives. One can get lost in a web of data without recommendation. Movies are also a very important form of entertainment. We watch most of the movies that are recommended by others. Each person likes a specific type of movie. Most websites like Netflix, IMDB are working based on recommendations. The only problem that can cause the recommendation system to fail is the sparsity problem. In this paper, we have used a new approach that can solve the

Detection of traffic density in smart cities

Muhammad Junaid

Due to the exponential increase in traffic density on roads, traffic management in smart cities remained an active research topic in the last few years. Existing surveillance devices, such as loop detectors, can easily monitor volume and speed on the road [5], however, density detection is a difficult process due to the number of vehicles occupying a unit length of a lane of a roadway at a given instant of time [6]. Researchers have utilized machine learning algorithms for detecting, tracking, and classifying Vehicles/cars from video images with promising results. In recent years, Deep Learning (DL) models have demonstrated better performance in a variety of application fields. Since 2015, a large number of papers have been published based on vehicle detection using different deep learning algorithm. Consequently, the major challenge Was to improve the performance, accuracy, and speed. In this review, the state of the art algorithm Yolov4 is used with ROI for better results of object detection.

Modeling Security Threats to Blockchain: A Survey

Rabia Khan and Amjad Mehmood

Secure data communication is the ultimate objective of every application of IoT. IoV is one of the applications of IoT where CAVs are capable to disseminate tons of data internally and externally every time. A decentralized and fair data exchange scheme is the need of the day which must remain confidential at the same time. Blockchain technology seems to be the solution to the problem but it is not insulated completely from cyber threats. This study provides an overview of the attack vector being employed on Blockchain network when it comes to CAVs and also the effective solution to secure the Blockchain network is presented. This study also highlights the effectiveness of zk-SNARK protocol to enhance the confidentiality, fairness and integrity of the Blockchain network. Together with Blockchain and zk-SNARK, a secure environment can be provided to travelers of CAVs avoiding privacy breach.

SYSTEMATIC ANALYSIS OF AUTHOR RANKING PARAMETERS AND PROPOSAL OF NOVEL INDEX

Ilyas Ahmad

The ranking of authors in their respective fields is the dire need of scientific community .The researchers has been provided different parameters to the community such as publication count, citation count, h-index and its variants. But each has own limitations. It either may be evaluated on imaginary scenarios or small date set. To date, no single standard parameter or index for ranking researchers has been proposed. Because these indices are evaluated on different and small datasets, it's difficult to understand how each index differs from the others in terms of contribution and significance. These indices should be extensively analysed on some comprehensive dataset to analyze the individual behavior of each index. This study focuses on developing a comprehensive dataset of different domains, such as computer science, civil engineering, and mathematics, in order to assess all of the existing parameters. Secondly, if none of the existing indices have been successful in accurately ranking the researchers, a new index will be presented. The prestigious award winners of three different domains are considered as a benchmark. (,, Findings)

Churn Prediction using DNN and XGBOOST: A Case study of PTCL

Muzamil Hussain, Dr.Asad Habib and Dr.Jawad Ashraf

Customer churn prediction is one of the critical tasks for any service and products providing sector, especially the telecom sector and it became more complex due to the dense competitive environment. This paper mainly focuses on wireline (PSTN, BB, IPTV) and post-paid telecom customers. Different types of raw data were extracted from different sources and prepared 46714 customers dataset for model building. After exploratory data analysis, the most important and significant feature was selected and the model was trained using XGBoost and DNN techniques as it is an advanced and mostly used technique and has good accuracy and performance score. The trained model achieved 91% accuracy and 85 r-call score. Results show that the churn rate is low in non 3G\4G services area and there is a more likely chance that the new customer churn in the first 6 months after subscription. Irregular bill paying and low usage customers are also high potential churners.

Improved Firefly algorithm with different distance formulae

Wahid Ullah, Muhammad Asif Jan, Emel Khan and Muhammad Sagheer

Modern optimization algorithms are often meta heuristic algorithms and they are promising in NP - hard problems. Nature inspired meta heuristic algorithms, those based on swarm intelligence, have attracted much attention in the last ten years. Firefly algorithm and its literature has expanded dramatically with diverse applications appeared in about five years ago. In this research work, we show that how to use the developed Firefly algorithm to solve non-linear designed problems, and briefly review the fundamentals of FA together with a selection of recent publications. Then we discuss the optimality associated with balancing exploration and exploitation which is essential for all meta heuristic algorithms.

Firefly algorithm is an unconstrained and nature-inspired optimization algorithm, that works on the behavior of attraction to the flashing lights of fireflies at night. In this research work, we will use different distance formulae on FA search technique, which give us more better results. In order to demonstrate the performance of FA on different distance formulae, CEC 2019 unconstrained real-parameters test functions suite will be used. The algorithm will be run 50 times independently for each problem in MATLAB environment. For performance evaluation, the simulation results of FA on different distance formulae will also be compared with the top three performing algorithms of CEC2019 and some other algorithms designed for unconstrained optimization.

A Swarm Intelligence Based Hybrid for Numerical Optimization.

Farman Ullah Khan, Dr. Muhammad Asif Jan, Dr. Hidayat Ullah Khan and Muhammad Sagheer

Grey Wolf Optimizer (GWO) is a population based swarm intelligence optimization algorithm. It was inspired by the hunting strategy and leadership hierarchy of grey wolves. Cuckoo search algorithm (CSA) is a meta-heuristic population based optimization algorithm, which is based on the brood parasitism of some cuckoo species, along with Levy flights random walks. In this study, GWO and CSA are hybridized to benefit from their good features and design a new algorithm for unconstrained optimization. The efficiency of the newly suggested hybrid algorithm is tested on the test functions suit, CEC 2017. The simulation results show that our proposed hybrid algorithm produced better results than GWO and CSA.

Decision-making model under complex picture fuzzy Hamacher aggregation operators

Adnan Ahmad and Wali Khan

The paper aims are to propose a new concept called as complex picture fuzzy set (CPFS), as anextensionofcomplexintuitionisticfuzzyset(CIFS).Theadditionofaneutralmembership degreetothedefinitionofCIFSmakesCPFSageneralizedformofCIFS.Theuniquenessof thisnewtheoryliesinthecapabilitytoattainthewiderrangewiththehelpofdegreeofneutral membership,non-membership,andmembership.Therangeofvaluesofmembershipdegrees is broaden to the unit disk in a complex plane. We define elementary operations and properties of CPFSs and explore the MCDM issues with the help of CPFSs, based on Hamacher operations and some aggregation methods. Then, we introduce some operators to aggregate the CPF data, namely complex picture fuzzy Hamacher weighted averaging, ordered weighted averaging, hybrid averaging and complex picture fuzzy Hamacher weighted geometric,orderedweightedgeometricandhybridgeometricoperators,benefitedfromthebasic Hamacher operations, and averaging, geometric aggregation techniques. We also construct MCDM problem using these operators and perform a calculation for the selection of best ERPsystem,todemonstratetheauthenticityandefficiencyofthismanuscript.Moreover,we study a comparison to validate the consistency and superiority of our techniques

Survival Selection Strategies Based Hybrid Algorithms for Numerical Optimization Problems.

Mohib Ullah, Dr. Muhammad Asif Jan, Dr. Hidayat Ullah Khan and Muhammad Sagheer

The TLBO (teaching learning based optimization) algorithm is a population-based meta-heuristic for unconstrained optimization. It is based on the classroom setting. Learners receive knowledge from their teachers and interact with one another to enhance their grades and results. For optimization problems, the Firefly algorithm (FA) is a bio-inspired meta-heuristic method. The algorithm is based on the nighttime flashing behavior of fireflies. In this study, TLBO and FA are combined using Hybrid Versions 1,2,3 to create a new unconstrained version. On the unconstrained problem suit, CEC 2017, the efficiency of the new suggested Hybrid Versions 1,2,3 is tested. In comparison to the TLBO and FA, the simulation results suggest that Hybrid Version 3 produces better results.

CLASSIFICATION OF SECOND ORDER ORDINARY DIFFERENTIAL EQUATIONS BY NOETHER SYMMETRIES

Kainat Begum

Second order linear and non-linear ordinary differential equations (ODEs) often arise in physics, mechanics, chemical engineering and other fields of sciences. We want to classify second order linear and non-linear ODEs using the Noether symmetries for which we need to determine the Lagrangian function for second order linear and non-linear ODEs. Firstly we have to make various classes of second order ODEs, then we have to determine the Lagrangian function for all classes of second order ODEs. Noether symmetries describe physical features of the ODEs in terms of conservation laws they admit. It is observed that Noether point symmetry algebra for linear ODEs is five dimensional. For non-linear cases the dimension of Noether point symmetry algebra may belong to {0,1,2,3}.

Hybrid of Swarm and Evolutionary Algorithms for Global Optimization Problems

Hira Zubairy, Asif Jan, Hidayat Ullah and Muhammad Sagheer

Stochastic optimization techniques are recommenced for highly dimensioned and hard global optimization problems. Swarm intelligence based and evolutionary algorithms are two major classes of nature inspired algorithms those are stochastic in nature. Differential Evolution (DE) and Particle Swarm Optimization (PSO) are two leading nature inspired algorithms. PSO is swarm optimization algorithm which is the mimicry of foraging strategies of birds and fish etc. DE is evolutionary optimization algorithm which is mainly based on Darwin's theory of evolution. PSO is famous for fast convergence that creates premature convergence phenomenon in it. DE is famous for high exploration that decelerates its convergence rate. In this research work the occurrence of mentioned phenomena are tried to diminish through hybridization of PSO and DE via commutative performance scheme. The performance of hybrid algorithm is evaluated with unconstrained problems suit CEC-2020 with the remarks that proposed algorithms is efficient and robust as compared to its parent algorithms.

Correlation measures of complex dual hesitant fuzzy sets and their applications

Rizwan Ullah and Muhammad Sajjad Ali Khan

Since complex dual hesitant fuzzy sets (CDHFSs) is a better tool to deal with periodic or two phase information. Also correlation measures is important tool that reject linear relationship between two variables. Therefore, we define correlation metrics for complex dual hesitant fuzzy information and their properties are analyzed in detail. We develop an algorithm based on the correlation measure to deal with multi-criteria decision making problem. A numerical example is also given in order to demonstrate the application and e§ectiveness of the proposed method. Finally the proposed method is compare with the existing approaches.

A Finite Element Method with Bernstein Polynomials for Biharmonic Equation on Domain with curve Boundary

Muhammad Ruman

We introduce Bernstein-Bezier polynomials technique with Galerkin finite element method for curved domains enclosed by piecewise conics satisfying homogeneous boundary conditions, construct local basis for them using Bernstein-Bezier
techniques, and demonstrate the effectiveness of these finite elements for the numerical solution of the Biharmonic equation equation.

Investigation of gamma-rays induced defects in samarium doped BaF2-Bi2O3-Li2B4O7 glass

Shah Zeb Ullah, Fawad Ullah and Gul Rooh

When glasses are exposed to ionizing radiation (Gamma-rays, X-rays), as a result of high-energy of radiations will change physical, optical, and electrical characteristics of glass [1, 2]. Gamma rays have high energy, which imported to glass matrix and induced absorption bands in the visible and ultraviolet region. However conclusion that glasses containing heavy metals like (Bi2O3) shows good shielding ability towards successive gamma irradiation [3]. In the present work optical properties of bismuth borate glass before and after gamma irradiation was examined. The bismuth tetraborate glass has been synthesized through melt quenching technique, with the chemical composition 15BaF2-15Bi2O3-68Li2B4O7:2%Sm2O3. The non-crystalline nature of the glass was confirmed by X-ray diffraction. Before irradiation, at 402 nm excitation wavelength four emission peaks were observed which are 564 nm, 598 nm, 644 nm and 708 nm due to 4G5/2 to 6H5/2, 6H7/2, 6H9/2 and 6H11/2 respectively. Glass samples were irradiated by using Co-60 radioisotope. After irradiation, peaks intensity changes but no shift in wavelength was observed. Similarly drastic changes were reported in result for excitation spectra at emission wavelength 598 nm. UV-vis spectra revealed the changes in absorbance of irradiated sample. Band gap was studied which decreases with increasing dose. Optical, excitation and emission spectra were examined by using UV-visible spectrometry, photoluminescence spectrometry.

Anderson Localization in disordered magnetic quantum walk

Nasir Jahangir, Muhammad Sajid and Niaz Ali Khan

Discrete-time quantum walks offer favorable platforms to simulate various physical phenomena of condensed matter systems. For example, quantum transport in the presence of an electric or magnetic field can be simulated. Here, we simulate the physics of a charged particle subjected to a magnetic field in presence of a periodic potential. This system is analogous to the well-known quantum Hall system underlying a lattice, and known as a system of magnetic quantum walks (MQWs). We extend the work by introducing disorder in the magnetic quantum walk system with both rational and irrational values of the magnetic field strength. We investigate conditions resulting in Anderson localization in the considered system of the magnetic quantum walk. We compute the probability distribution and standard deviation of the walk, and identify condition for localization, delocalization, and the so-called localization-delocalization transition.

HYDROTHERMAL SYNTHESIS OF V2O5-MOO3 NANOCOMPOSITE FOR ETHANOL SENSING PROPERTIES

Asad Iqbal, Sajid Khan and Abdul Hakim Shah

Transition metaloxide is one of the most interesting classes of solids, having a variety of structures and properties [1]. Vanadium pentoxide (V2O5) is an important n-type transition metal oxide, which has already been successfully investigated as a gas sensing material on the nanoscale with one-dimensional morphologies [2].The interplay betweenV2O5 and MoO3 is peculiar because their ionic radii and the structure in their highest oxidation state are similar [3].Synthesis of vanadium pentoxide (V2O5) nanostructure through hydrothermal method using 3g of ammoniummetavanadate (NH4VO3) and 20 ml of hydrogen peroxide(H2O2).Synthesis of Molybdenum Trioxide (MoO3) through hydrothermal method using 1.5g of Ammonium heptamolybdate (AHM) ,0.25g of polyvinlypyrolidone (PVP) and 10ml ethanol.Preparation of the nanocomposite through physical composition of the above material. The gas sensor based on these composition exhibits remarkable gas sensing properties in both static and dynamic modes. The sensor also shows enhanced optimum sensitivity (~14), which is 3.90 times that of the pure V2O5 nanorods. References [1] C. N. R. Rao, "Transition metal oxides," Annu. Rev. Phys. Chem.,vol. 40, no. 4, pp. 291326, 1989. [2] A. H. Shah, Y. Liu, G. S. Zakharova and I. Mehmood, "Enhanced ultra-stable npropylamine sensing behavior of V2O5/In2O3 core-shell nanorods," RSC Adv., vol. 5, no. 3, pp. 54412-54419, 2015. [3] C. Prameela and K. Srinivasarao, "Structural, Raman and Infrared properties of V2O5 and (MoO3) x-(V2O5) composites."Inter. Conf. Mater. Char. Tech., vol. 6, no. 5, pp.17461748, 2014

ONE DIMENSIONAL SPLIT-STEP ELECTRIC QUANTUM WALKS WITH DISORDER IN THE COIN ANGLES

Muhammad Tufail Yousaf and Muhammad Sajid

A walk is a simple procedure that contains a set of atomic steps. Classical
walks are basic natural science models in which the position of a classical particle is altered based on the outcome of a classic coin toss. Quantum walks
are a quantum-mechanical counterpart of classical walks. Split-step quantum
walk divides each step of the walk into two half-steps, each of which contains
two quantum coin operations. By adding an electric field operator Fˆ
E = eιφxˆ to the split-step quantum walk operator, the walker may be transformed
into an electric quantum walk. We investigate the effects of disorder on
quantum transport in the electric quantum walk. We consider the so called
split step quantum walk in one dimension to simulate the effects of an electric field. Disorder effects in the system are introduced by varying the coin
angles randomly. Anderson localization is demonstrated for both rational
and irrational values of the electric field strength by investigating the spatial
profile of the wavefunction from the initial position of the quantum particle.
Furthermore, we investigate conditions for localization, delocalization and
localization-delocalization transition in the considered system of the quantum walk. Our work is important for simulating and controlling quantum
transport with electric quantum walk.

GREEN SYNTHESIS AND PHOTOLUMINESCE STUDY OF DYSPROSIUM DOPED CaCO3

Majid Ali, Fawad Ullah and Muhammad Iqbal Khan

In this study, we used water-soluble polysaccharides derived from melon to develop a unique green method for the biological production of calcium carbonate crystals. Scanning electron microscopy (SEM), Fourier transform infrared (FT-IR) spectroscopy, and X-ray powder diffractometry were used to analyze the resulting crystals (XRD). To use a green synthesis approach to make Dysprosium doped CaCO3. For the preparation of host material appropriate weight of Calcium chloride (CaCl2) and Sodium Carbonate (Na2CO3)is taken. In sintering process material is heated in a furnace below its melting point and then cools down at constant rate. Various concentration of Dy is doped with Calcium Carbonate CaCO3 phosphor. SEM images confirm the nano structure of material necessary for luminescence process. SEM images shows that the grain size increases when Dy is doped with CaCO3phosphor and hence increases the luminescence property. Sharp XRD peaks confirm the crystal nature of the material. UV Photoluminescence spectra show that the major emission peak is at 578nm. This peak is due to transition between (4F5/26H13/2). Also it shows that CaCO3 phosphor can be used as yellow color phosphor. Quenching curve shows that the luminescence intensity is higher at 3mol% concentrations of Dy. However, beyond 3 mol % of Dy, quenching phenomena decreases the intensity of luminescence.

RADIATION DAMAGE EFFECT ON OPTICAL PROPERTIES OF DYSPROSIUM DOPED Li2O–PbO– GdF3–SiO2

Junaid Rehman, Dr. Fawad Ullah and Dr. Gul Rooh

When glasses are exposed to high-energy radiation (Gamma-rays, X-rays), they change their physical, optical, and electrical characteristics. Because gamma rays are radiation, they primarily cause induced absorption bands in the visible and ultraviolet spectra.
The melt quenching process was used to prepare the Lithium Lead Gadolinium Silicate Glass, which has the chemical formula 25Li2O-15PbO-05Gd2O3 – (55 - X)SiO2. X-ray diffraction proved the glass's non-crystalline character. Prior to irradiation, four emission peaks were seen at 350 nm excitation wavelengths. Co-60 radioisotope was used to irradiate glass samples. After irradiation (3-24 Gy), peaks intensity changes but no modification in wavelength was noticed. Similarly, substantial variations in excitation spectra at emission wavelength 575 nm were recorded. Seven peaks (420-780 nm) were detected as being allied to the Dy+3 ion transition. Although there was a significant blue shift in wavelength was recorded, it is feasible that gamma-irradiation will cause modest changes in the bond angle or bond length of certain structural groups. The variations in absorbance of the irradiated sample were indicated by UV-vis spectra. Band gap studied from UV-vis spectra with help of Tauc's plot, which revealed changes with gamma irradiation dose.

EFFECT OF TEMPERATURE ON FREQUENCY- DEPENDENT CHARGE TRANSPORT IN Nd0.4Ca0. 6MnO3

Muhammad Zaryab, Fawad Ullah and Matiullah Shah

In this study the effect of temperature on frequency-dependent charge transport in Nd0.4ca0.6Mn03 was investigated. For the sample synthesis solid state reaction route will be used. To know the phase purity and structural study of the synthesized sample, XRD (D8 Brooker, Germany) were used. XRD data was refined with the help of freely available software “FullProf”. This refinement will define give space group of the system as well as, lattice parameters, bond angles and bond lengths of the unit cell. Impedance Spectroscopy is applied for calculating electrical parameters of the investigated sample at different values of temperature. In the form of frequency for phase competition and transport mechanism different conduction models are applied. Activation energies of charge carriers as well as relaxation frequencies that are belongs to imaginary part of various electrical parameters were examined as well as conversed in perspective of great hopping of double exchange mechanism with the help of Mn+3 and Mn+4. By using double exchange mechanism activation energies of the charge carriers and the frequency where the change occur in graph (fr) related to part which are imaginary of different electrical parameters are analyzed.

An extended COPRAS method for multiattribute decision making based on complex dual hesitant fuzzy Maclaurin symmetric mean

Shahid Shehzad and Sajjad Ali

The known Maclaurin symmetric mean (MSM) and the dual MSM (DMSM) are found as in principal operators to pick up mltiattribute group decision making (MAGDM) information . The MSM and the DMSM operators have the important quality of precisely relate the interrelationship of multi-input argument . Because of their advantages we extend the MSM and DMSM into Complex dual hesitant fuzzy environment to find different information and we propose some new operators , namely complex dual hesitant fuzzy MSM, complex weighted dual hesitant fuzzy MSM, complex dual hesitant fuzzy dual MSM , and complex weighted dual hesitant fuzzy dual MSM operators , Moreover , we discuss some properteis and remarks of diferent operators and we formulate new approach for complex dual hesitant fuzzy MAGDM , finaly we test the applicability and feasibilty of our proposed method by solving selection of information system to improve Health managment system during covid-19 in KP hospital.

MODELING LATTICE CONSTANTS OF FLUOROPEROVSKITES USING MACHINE LEARNING

Muhammad Abbas Khattak, Rashid Ahmad and Sajid Khan

Fluoroperovskites compounds form an interesting class of materials with mechanically stable crystal structure while showing good electronic behavior having band gap energy ranging from semiconductors to insulators. These are the group of compounds with the common chemical formula ABF3, where A and B are metallic cations, while F (fluorine) is an anion. The ABF3 structure of Fluoroperovskite is a common structure of perovskites with the space group Pm-3m (no. 221). Using density functional theory the lattice constants of these compounds have been calculated for the data development. To further refine the correlation, linear regressions model is used for analysis. Then, utilizing ionic radii of these compounds, for the prediction of lattice constant Artificial neural networks (ANN) model has been trained. We use this model for symbol of compounds, ionic radii for individual elements and for both ionic radii and symbols as an input features. The ANN outputs were then compared to experimentally and theoretically validated lattice constant values. A reasonable match was observed between predicted and theoretical results.

COMPLEX INTUITIONISTIC FUZZY ACZEL- ALSINA OPERATORS AND THEIR APPLICATIONS

Rashid Ullah and Muhammad Sajjad Ali Khan

Complex Intutionistic Fuzzy Number (CIFN) is a productive extension of the Intutionistic Fuzzy Number (IFN) for dealing with ambiguity in information.In light of these situations, we use the Aczel-Alsina operation in this work to develop various Comlex Intutionistic Fuzzy (CIF) Aczel-Alsina aggregation operators: Operators of CIF Aczel-Alsina weighted average (CIFAAWA), CIF Aczel-Alsina Archemindeen weighted average (CIFAAAWA),CIF Aczel-Alsina Hamacher weighted average (CIFAAHWA),CIF Aczel-Alsina Einstien weighted average (CIFAAEWA), and CIF Aczel-Alsina weighted hybrid average (CIFAAHA). The distinguishing characteristics of these recommended operators are explored.The primary advantage of using the advanced operator is that it provides decision makers with a more comprehensive view of the problem. In compared to prior techniques, the mathode proposed in this study delivers more complete, executable, and creative results.As a result, this strategy makes a significant contribution to resolving real-world problems. Finally, we use the proposed operator to handle multi-attribute decision-making (MADM) difficulties using CIFN data. The approach has been demonstrated numerically to demonstrate the legitimacy, usefulness, and efficacy of the proposed strategy.

Investigation of structural and conduction mechanism in Pr0.7Ca0.3MnO3 using Impedance Spectroscopy

Arshad Khan, Fawad Ullah and Matiullah Shah

In this project, a polycrystalline Pr0.7Ca0.3MnO3 was synthesized using conventional solid-state reaction method. In Pr0.7Ca0.3MnO3, the response of different electrical parameters under the variation of temperature and frequency were studied using this technique. Other structural data of their unit cell at atomic level is explored with the assistance of open access program Fullprof for the refinement of XRD profile. For the electrical characterization of the system the impedance spectroscopy technique is used. The resistance of grain and grain boundaries were probe for conduction mechanism using various conduction models such as Arrhenius model, Small polaron hopping model and variable range hopping model. A microscopic description of grain and grain boundaries, especially around magnetic transition, charge ordering, metal to insulator transition temperature was definitely improve our understanding about the properties related to strongly correlated electron system.

Priority degree and distance measures of complex hesitant fuzzy sets and their application to decision making problem

Fariha Anjum, Muhammad Sajjad Ali Khan and Ikhtesham Ullah

The notion of complex hesitant fuzzy set (CHFS) is one of the better tools in order to deal with complex information. CHFS is characterized by a set of possible complex fuzzy values. Motivated by the CHFS in this paper, we develop priority degree, variety of distance measures and closeness coe¢cient in order to rank the complex hesitant fuzzy set. We propose some distance measure of CHFS including generalized complex hesitant normalized distance (GCHND), generalized complex hesitant normalized Hausdro§ distance (GCHNHD), generalized complex hesitant hybrid normalized distance (GCHHND) and their weighted and continuous forms. Furthermore, we develop a multi-criteria decision making approach based on TOPSIS method under hesitant fuzzy environment. In addition, numerical examples and comparative analysis are shown to demonstrate the novel approaches usefulness and practicality in decision-making applications.

GAMMA RAYS INDUCED EFFECT ON OPTICAL PROPERTIES OF SAMARIUM DOPED (CAO-NAO2- B2O3-TLO2-SM2O3)

Karamat Ullah, Dr Fawad Khan and Dr Gull Rooh

When high-energy radiation (gamma rays, X-rays) strikes glasses, it changes the physical, optical, and electrical properties of the glass. Because gamma rays are radiation, they are primarily responsible for induced absorption bands in the visible and ultraviolet spectra. However, it has been shown that glasses containing heavy metals, such as (TlO2) demonstrate good conduct in the face of gamma radiation. Certain features of samarium doped Tellurite glass with the chemical composition are investigated in this paper. [10CaO-10Na2O-79B2O3-0TlO2-15Sm2O3] and [10CaO-10Na2O-69B2O3-10TlO2-15Sm2O3]and also [10CaO-10Na2O-59B2O3-20TlO2-15Sm2O3]. It will be tested both before and after gamma radiation. A Co-60 radioisotope will be used to irradiate all glass samples. UV-visible, photoluminescence, and the Archimedes principle will be used to investigate the optical, excitation and emission, density, and refractive index of the glass.

Complex hesitant fuzzy frank operator and their applications

Shamim Akhtar, Muhammad Sajjad Ali Khan and Ikhtesham Ullah

In this paper, The multiple-attribute decision-making (MADM) problems
are investigated by using the Frank operator in complex hesitant fuzzy environments. Frank operator is a traditional mean type aggregation operator with
high modeling capabilities in modern information fusion theory, with particular
lar advantages for aggregating multi-dimension arguments.The Frank operator
is notable for its ability to capture the interaction between multiple input
arguments.
Motivated by the Frank operator concept, we create the complex
hesitant fuzzy Frank (CHFF) operator for aggregating complex hesitant fuzzy
information. Some desirable properties are investigated, including monotonicity, boundedness, and idempotency with also some examples. Furthermore, we
have thoroughly discussed some special cases with respect to various parameter
values of the CHFF operator.We further develop the complex hesitant fuzzy
Frank weighted arithmetic operator to aggregate complex hesitant fuzzy information in situations where the input arguments are of varying importance. On
this foundation, a method for dealing with MADM problems involving complex
hesitant fuzzy information is developed.

Relation of LDD-Groupoid With Some Other Algebraic Structures

Shahid Shehzad and Sajjad Ali

In this article we have connected LDD-Groupoid with LA-Semigroup, RDD-groupoid, AG-Groupoid, inverse semigroup, orthodox semi group and regular semigroup. We also proved some results to connect these algebraic structures.

SYNTHESIS AND CHARACTERIZATION OF HOLMIUM SUBSTITUTED STRONTIUM SPINEL FERRITES

Muhammad Suleman and Fawad Ullah

Ferrites nanoparticles (SrHoyFe2-yO4; y = 0.0, 0.025, 0.05, 0.075, 0.10) were prepared by the sol-gel assisted by auto combustion technique. The samples were analysed by powder X-ray diffraction and scanning electron microscopy. These two characterization tools provide structural details. Two probe method was used for DC resistivity measurements which is further used to calculate drift mobility and activation energy. Within the applied field of 2kOe, the magnetic study was completed. At room temperature, the dielectric aspects were measured within the frequency range of 1MHz to3 GHz frequency