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**LEARNING AND INFORMATION RESOURCE CENTRE  
BIBLIOGRAPHY OF M.E. - ELECTRONICS AND  
TELECOMMUNICATIONS DISSERTATIONS**

[1] PR1156 AUTOMATIC SPEECH EMOTION RECOGNITION USING  
MODEL-BASED APPROACH

By CHANDRASEKAR, PURNIMA

2014

621.380412 CHA

Project Guide DR DEEPAK JAYASWAL

Abstract

With the aim of detecting the real meaning of the speech hidden between words, one of the research areas to be explored is recognizing the emotional state of the speaker in communication. In this dissertation work, it is proposed to recognize and classify the emotions through speech into various categories: anger, boredom, disgust, fear, happiness, sadness and neutral, for the standard Berlin database of emotional speech (Emo-DB) and anger, boredom, sadness, happiness, surprise and neutral for a Hindi database. The framework for speech emotion recognition (SER) typically involves feature extraction, dimensionality reduction and feature classification. With the intention of extracting distinctive features that contribute to the accurate detection of emotions, features extracted include Mel Frequency Cepstral Coefficients (MFCC), pitch, energy, spectral flux, spectral roll-off and spectral stationarity. To overcome the 'curse of dimensionality' problem, suitable dimensionality reduction techniques need to be applied to the extracted features. Therefore, the mean, variance, median, maximum, minimum and index of dispersion are the six chosen values that are calculated to obtain the reduced feature set. To choose an appropriate feature classification technique that will provide an accurate predicted result for effective emotion recognition, the classification technique of Support Vector Machines (SVM) is chosen in which one-v/s-all multi-class SVM is implemented. Suitable classification metrics viz. precision, recall and F-score are calculated to determine the overall performance of the implemented system. Through experimentation, an average classification accuracy of 86.6%

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and 61.11% is achieved for Emo-DB and the Hindi database respectively which is further improved to 100% and 96.67% when considering the emotions on a two-dimensional arousal-valence plane. A comparative analysis between the dimensionality reduction techniques of calculating the six chosen values, Principal Component Analysis (PCA) and Greedy Feature Selection (GFS) in terms of the classification accuracy of the SER system is further done where it is observed that the technique of calculating the six chosen values yields better results as compared to PCA and GFS.

[2] PR1157 MUSIC GENRE CLASSIFICATION USING TEXTURAL FEATURES

By AGERA, NELSON

2014

006.37 AGE

Project Guide DR DEEPAK JAYASWAL

Abstract

Music genre is an important metadata for classification of music and is important for music consumers since they usually buy music that is similar to their taste. Classifying music into their genre on online music stores, and presenting content based on genre preferred by the customer will reduce the browsing time of consumers. Here, music genre classification is performed using an approach which converts audio signals into spectrograms and Mel-spectrograms. These spectrograms are treated as texture images from which textural features such as Local Binary Pattern (LBP) and uniform Local Binary Pattern (uLBP) are extracted. To extract features from spectrograms three feature extraction strategies are used, namely global feature extraction, linear zoning and Mel-scale zoning. For linear zoning, the spectrogram is divided into a total of three, five and ten number of zones. Results are computed for two databases, namely Latin Music Database (LMD) and GTZAN and for GTZAN two cases are considered, all ten genres are considered for the first case and for the second case a subset of five genres from the database are considered. Support Vector Machines (SVM) are used as classifiers and its multi-class implementation is used for classification. The experiments resulted in a maximum classification rate of 83% using spectrogram for LMD. The maximum accuracy for ten genres in GTZAN is 76.67 % and is 87.33% for five genres in GTZAN. The use of Mel-spectrogram to extract LBP and uLBP

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features has resulted in a maximum recognition rate of 75.67% using LMD and 72.33% using all ten genres from GTZAN and 78% for 5 genres from the GTZAN dataset. uLBP gave better classification compared to LBP for both spectrogram and Mel-spectrogram. Overall Mel-scale zoning has given better accuracy compared to linear and global feature extraction.

[3] PR1158 PEAK TO AVERAGE POWER RATIO REDUCTION TECHNIQUES IN OFDM

By SAROJ, RAKESHKUMAR

2014

621.380412 SAR

Project Guide DR DEEPAK JAYASWAL

Abstract

Communication is one of the important aspects of life. Future digital communications systems reaching for ever increasing data rates require higher bandwidths than those typical used in today's cellular networks. Orthogonal Frequency Division Multiplexing (OFDM) is an efficient method of data transmission for high speed communication. OFDM is a multicarrier modulation technology used in many wireless digital communication systems and has numerous advantages such as high bandwidth efficiency and less inter-symbol interference (ISI) but it also has some drawbacks of high Peak to Average Power Ratio (PAPR). When these high peak signals are passed through the power amplifier they tend to cause non-linear distortion of the signals and hence increases the dynamic range of the amplifier. PAPR problems are tackled using different techniques and the technique that we propose here is a hybrid scheme using Selective Level Mapping (SLM) & Partial Transmit Sequence (PTS) for reducing the PAPR in OFDM system.

[4] PR1159 DESIGN OF RECONFIGURABLE AND TUNABLE MULTIBAND PATCH ANTENNA FOR WIRELESS DEVICES

By DHAMANKAR, SHRUTI

2014

621.3824 DHA

Project Guide DR UDAY PANDIT KHOT

Abstract

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This report presents the design of a low-profile tunable and reconfigurable multiband patch antenna. Antenna design has been fabricated on FR4 substrate having dielectric constant of 4.4. The proposed antenna design can be used for various wireless applications such as Wi-Fi, Wi-Max, and Bluetooth within a microwave S and C frequency bands in electromagnetic spectrum. Nowadays, different antennas are preferred and devised for different wireless applications. This increases the complexity and size of the device. The proposed work deals with the design of an antenna which can be used for most of the wireless applications. Thus, the selection of band in communication systems can be conveniently served by only one antenna. This will make an overall antenna a compact one. The Parameters that shall be considered in this work for performance analysis are Return Loss, Gain, VSWR and Directivity. Minimum return loss has been achieved. At the same time VSWR has also been achieved which is less than 2 for all resonant frequencies. Gain improvement from 0.3 dBi to 3.15 dBi is achieved for the frequencies in the range of 1.5 GHz to 2.5 GHz.

[5] PR1160 METAMATERIAL-BASED TUNABLE MICROSTRIP PATCH ANTENNA FOR WIRELESS APPLICATIONS

By JACOB, SUSHAMA BABY

2014

621.3824 JAC

Project Guide DR UDAY PANDIT KHOT

Abstract

Metamaterials have been intensively investigated due to the particular features such as ultra-refraction phenomenon and negative permittivity and/or permeability. A popular method to engineer metamaterial structures is to use periodic structures of resonant unit-cells with periods and unit cell dimensions that are much smaller than the operating wavelength. A simple metamaterial design formed by a periodic surface printed on grounded lossy dielectric layer seems is a very successful one and such a sub wavelength periodic structure known in the microwave regime with the name of Frequency selective surface (FSS). To satisfy the demand of commonly used wireless communication systems, an antenna which can operate at multiple frequencies is desirable. A metamaterial- Based microstrip patch antenna with enhanced multiple frequencies of operation is investigated in this work. Here the FSS metamaterial

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structure included in the design of a suspended MSA as superstrate providing tunability as well as improving antenna characteristics. The metamaterial-Based tunability is achieved here by means of varying the gap capacitance of the frequency selective surface. It is demonstrated by means of metallic loadings placed in two loops between the patches of frequency selective surface.

The potential impacts of this work is miniaturization, reduced cost and reduced power consumption since multiple antennas operates at different frequencies are replaced by a single antenna which can operate at multiple frequencies. The proposed microstrip patch antenna has its frequencies of operation in the 4-8 GHz band.

[6] PR1161 ARM WEB INTERFACE FOR PATIENT REMOTE MONITORING

By PATNI, NIKITA

2014

004.16 PAT

Project Guide DR JOANNE GOMES

Abstract

Remote Patient Monitoring (RPM) has garnered a lot of interest since the various emerging technologies made it possible to think of; and implement such a concept. Remote monitoring concept raises a lot of interesting possibilities, and helps to address different issues continually faced with effective patient administration. Some notable issues are managing patients in remote areas, monitoring (elderly) patients in their own homes and to provide cost effective medical solutions. The design presented here is unique in creating portable embedded system based on ARM processor that facilitates RPM using wired communication, wireless communication and cellular technology. The proposed system implements ZigBee interface for wireless communication and GSM for mobile based remote monitoring along with wired web interface. It is observed that, wired interface provides reliability in communication while wireless interface gives flexibility in patient movement whereas cellular interface provides solution for emergency situations. An Electronic Health Record (EHR) gives true lifetime, person centered medical record of a patient. It effectively implements the creation, updation, maintenance and transmission of the medical data. The design presented here uses Amazon's cloud service for secure and pervasive use of an electronic health records.

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**[7] PR1180 DESIGN OF DIPOLE ARRAY FOR EFFECTIVE DIRECTION OF ARRIVAL ESTIMATION**

By DSOUZA, VENUS

2014

621.3824 DSO

Project Guide DR JOANNE GOMES

**Abstract**

Antenna is an important block in any wireless system, as it transforms electrical signals to radio signal and vice versa. How well it does this job is a determining factor in how well a wireless system will operate. The performance characteristics of antenna array largely depend upon the spacing between the antenna array elements. This project presents a systematic approach to the optimum placement of elements of a dipole array for effective estimation of arrival angle. It focuses on Circular array consisting of 8 omnidirectional dipole elements for Direction of Arrival estimation in the azimuthal plane using Multiple Signal Classification algorithm. The element positions are optimized by the use of a Genetic Algorithm. Performance parameters like root mean square error and side lobe level have been evaluated initially for no uniform circular array after varying its inter-element positions. Twenty-five iterations of Genetic Algorithm were carried out, where each iteration consisted of forty chromosomes.

Genetic algorithm showed substantial improvement of approximately 10 dB in side lobe level. This helped in reducing the antenna array size and yet achieves optimum results.

**[8] PR1181 HIGH SPEED PHYSICAL LAYER FOR SIMULATING WIRELESS NETWORK**

By SURTI, OBED ALI

2014

621.3845 SUR

Project Guide DR JOANNE GOMES

**Abstract**

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Wireless network refers to any type of network that utilizes some form of wireless connection for communication. Wireless communication networks are generally implemented and administered using radio frequency. In this implementation a physical layer of the Open Systems Interconnection (OSI) model plays an important role and the implementation of this layer is often termed as 'PHY' for wired networks and 'wireless PHY' for wireless networks in the network simulator. Most common simulators are essentially packet level network protocol simulators which use simple channel models for computational efficiency. Wireless network often gets exploited because of different forms of noise. One such type of noise is jamming. The attack from such noise is called jamming attack. This research work explores the effect of high speed modulation technique on performance parameter such as BER, SNR and throughput under jamming attack. OPNET modeler is used to evaluate the performance of wireless network and simulation results are shown for the same. A comparative study of network parameters has been done for different simulation scenarios by changing modulation techniques, communication distances, transmission power and jamming power.

[9] PR1182 HIGH BANDWIDTH MICROSTRIP ANTENNA USING ELECTROMAGNETIC BAND GAP STRUCTURES

By GOSWAMI, DIPSHIKHA DIPTENDU

2015

621.3824 GOS

Project Guide MRS.ANJALI CHAUDHARI

Abstract

Now-a-days wireless communication is a rising technology for a wide range of high performance applications such as satellite communication, mobile communication, spacecraft etc. As the need of bandwidth is growing with times, there has been an increasing worldwide interest for wide bandwidth antennas. The microstrip patch antennas have attracted much attention for their appealing features like low profile, light weight, and low manufacturing cost. But with limited bandwidth, it needs further improvement to facilitate more applications in the telecommunication field. To satisfy the demand of bandwidth requirement for wireless communication, a microstrip antenna using Electromagnetic Band gap (EBG) structure is proposed here. The EBG structure(s) can give high bandwidth along with solutions to the problems of switching noise, surface and leaky waves. In this thesis a microstrip

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antenna with Square with a circular slot EBG structures is designed to achieve high bandwidth. The antenna has been fabricated on FR-4 substrate having dielectric constant of 4.4. The parameters being considered in the proposed work are frequency of operation, bandwidth, VSWR, gain, radiation pattern, and current distribution. Considering 3:1 VSWR, the achieved range of frequency is 1.79 -22.02 GHz, whereas the covered frequency range is 2.125 – 17.35 GHz considering 2:1 VSWR. At the same time minimum return loss as low as -45.44 dB has also been achieved. Along with the bandwidth, here the effect of EBG structures on gain, directivity, current distribution, radiation pattern are also studied thoroughly. Performance parameter i.e. bandwidth is observed for different no. of slots and different no. of elements in the array of EBG structures. A comparative study is also done for the proposed antenna with different height and also with the reference antenna.

[10] PR1183 EVALUATION OF MUSIC FEATURES FOR GENRE CLASSIFICATION

By LOPES, RENIA MELVIN

2015

006.4 LOP

Project Guide DR DEEPAK JAYASWAL

Abstract

Musical genres are categorical descriptors of music and used to organize the digital content in music stores and on internet. Since the annotation of music as per genres is currently done manually, there has been tremendous research on automatic music genre classification and its commercial development that will be an addition to music information retrieval systems. In this work, various features are extracted from music signal to classify music into five genres namely Electronic, Jazz, Pop, Hiphop and Rock. The feature set comprises of total 144 features extracted from four categories of music: dynamics, rhythm, spectral and tonal. The size of feature set is further reduced to 39 features using correlation based feature selection technique (CFS) to remove the correlated features. Support vector machine with flexible Pearson Universal Kernel (PUK) that can adapt behavior from linear to Gaussian shape is used to train the classification system. The reduced feature set outperforms the complete feature set achieving accuracy of 82% with features mostly from spectral and rhythm categories. Higher accuracy is obtained for reduced feature set which identifies the impact of feature selection on the performance of the proposed music genre



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classification system.

**[11] PR1185 OPTIC DISC AND CUP DETECTION IN DIGITAL FUNDUS  
IMAGE FOR GLAUCOMA ASSESSMENT**

**By LOTANKAR, MEGHA LALITKUMAR**

**2015**

**006.37 LOT**

**Project Guide MRS JAYASUDHA KOTI**

**Abstract**

Glaucoma is one of the major causes of visual impairment and blindness in which optic nerve damages progressively due to the increased Intraocular Pressure (IOP) of the eye. Early detection and appropriate treatment of glaucoma is hence important for the prevention of disease. Manual screening for glaucoma at a larger scale is challenging as availability of skilled clinicians in ophthalmology is low. The research focus of this dissertation is to investigate the potential of digital Color Fundus Image (CFI) analysis in glaucoma assessment towards developing automatic glaucoma screening system. This automatic glaucomascreening system analyzes various fundus features to detect the presence of glaucoma. Optic Cup to Disc Ratio (CDR) and ratio of Blood Vessels (BV) area in Inferior Superior region to that in Nasal Temporal region of the Optic Disc (OD) (ISNT ratio) are believed to be strongly related to glaucoma. Glaucoma patients tend to have larger CDR and less ISNT ratio. Therefore, automated method that can accurately detect OD, cup and BVs are highly desirable in order to design an automated glaucoma screening system. In this work, various fundus features like vertical CDR, Cup to Disc Area Ratio (CDAR), Horizontal to Vertical CDR (HV CDR), Rim to Disc Area Ratio (RDAR) and ISNT ratio are extracted from digital CFI through segmentation of OD, cup and BVs. Geodesic active contour model is used for OD segmentation. Adaptive thresholding and a knowledge based Circular Hough Transform (CHT) is utilized to initialize a model. Color information of the pallor region in M channel of CMY color space is used for cup segmentation. Morphological techniques are used for BVs segmentation. The performance evaluation of the proposed technique has been carried out on the images collected from the ophthalmology department of Kasturba Medical College, Manipal, India, using a Support Vector Machine (SVM) classifier. A ten-fold cross validation strategy is employed to test the classifiers. A Receiver Operating Characteristic (ROC) curve analysis has been performed for all the feature sets used for the

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classification. The proposed system yields the highest accuracy, specificity, sensitivity, Positive Predictive Value (PPV) and Negative Predictive Value (NPV) respectively of 98.5%, 97%, 100%, 97.08% and 100% using SVM classifier with linear kernel on private database. The results obtained by proposed technique indicate that this automated glaucoma detection system can be used for mass screening and to assist the clinicians.

[12] PR1197 DESIGN OF WIDEBAND PLANAR PRINTED QUASI-YAGI ANTENNA

By CHACKO,PATHALIL PRINCY

2015

621.3824 CHA

Project Guide DR GAUTAM SHAH

Abstract

Conventional Yagi antenna provides a unidirectional radiation pattern but is not preferred for wideband applications. A quasi-Yagi antenna is similar to the classic Yagi antenna in the fact that it also has a driver, a reflector and one or more directors, but the difference lies in the fact that the quasi-Yagi antenna uses the ground plane as the reflector instead of using a Separate metallic patch as a reflector. Many designs have been proposed to enhance the bandwidth of a quasi-Yagi antenna. The proposed quasi-Yagi antenna consists of a driver Dipole, two directors and the ground plane as the reflector. Four extended stubs, with optimized dimensions and spacings, are added to the ground plane to improve the bandwidth Of the proposed antenna. A U-shaped defect is also introduced in the ground plane which enhances the bandwidth further. Simulation results show that the proposed antenna provides a 111.31% bandwidth that ranges from 3.94 to 13.83 GHz. The maximum gain offered by the antenna is 5.92 dBi.

[13] PR1332 BAND REJECT ANTENNA USING MIMO TECHNOLOGY

By JOSEPH,TUSCANO ROJAL

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Abstract

Nowadays, different antennas are preferred/devised for different a wireless application which increases the complexity, bandwidth utilization, power and size of the device. The proposed work presents band reject MIMO Antenna to avoid interference between bands. The antenna can be used for various combinations of wireless applications such as Wi-Fi, Wi- max, Bluetooth etc. within microwave S and C bands in the electromagnetic spectrum. The proposed work deals with the design of a MIMO antenna which can be used for most of the wireless application to avoid interference. Thus the 7.250 - 7.745 GHz (Downlink) band can be rejected to avoid interference with other bands which shall serve the security purpose. By varying the different parameters of the antenna or using a suitable technique, band-notched function can be achieved. The parameters that shall be considered in the proposed work are bandwidth, gain, efficiency, reflection coefficient and resonant frequency.

[14] PR1333 DESIGN OF LOW PROFILE AND BROADBAND MICROSTRIP MONOPOLAR PATCH ANTENNA

By ALOK,MISHRA CHETAN

2015

621.3824 ALO

Project Guide DR UDAY PANDIT KHOT

Abstract

This work presents the design of low profile & broadband microstripmonopolar patch antenna. The designed antenna is having a wide bandwidth & also a monopole like radiation pattern. The antenna is constructed on a circular patch that is coupled with two annular rings & is shorted concentrically with two sets of conductive vias. Thus, a wider bandwidth from 4.87 GHz to 6.7 GHz (31.7 %) along with a monopole like radiation pattern is achieved. The proposed antenna has a profile of 0.029 wavelengths (at 5.8 GHz).The radiation pattern is monopolar and remains stable in the operating band.

[15] PR1334 CONTENT BASED IMAGE RETRIEVAL USING MODEL APPROACH

By SHRIWAS,KUNAL KAMALKISHOR

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621.367 SHR

Project Guide MR VAQAR ANSARI

Abstract

Due to rapid development of digital and information technologies, more multimedia information is generated and available in digital form from varieties of resources around the world. Content based image retrieval systems(CBIR) are designed to allow users to search images in large databases which match closely with a user's query image.

Proposed method presents a general purpose(CBIR) system that uses color, texture, and edge features as visual features to describe the content of an image. The main contribution of these thesis is of four directions. First, extract the colour feature of the image by calculating the colour moments i.e mean and standard deviation. Second, use a gray level co-occurrence matrix to extract texture features. Third, to further increase the efficiency of the proposed approach edge histogram descriptor that include five categories are used as edge features. Fourth, to increase retrieval efficiency of the proposed system, a model approach is used. Results obtained from individual features are assigned with weights. So output images with the highest weights by performing zigzag scanning can be considered as best match images. Euclidean distance is used to find similarity measurement between query image and database images. The experimental evaluation of the proposed system is based on WANG color image database that is widely used for CBIR performance evaluation .WANG database consist of ten classes of images. In simulation analysis, results demonstrate that each type of feature is effective for particular type of image according to its content, and using a combination of those features gives better retrieval results for almost all classes of images.

[16] PR1335 COMPONENT BASED FACIAL EXPRESSION  
RECOGNITION

By CHANDRAN,ANJU

2015

004.019 CHA

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Abstract

In recent years human facial expression recognition (FER) has attracted much attention because of its importance in realizing highly intelligent human-machine interfaces. Facial expression recognition has been dramatically developing, with the advancements in related fields, especially machine learning and image processing. It is an important channel for human communication. The recognition of facial expressions is very important for interactive human computer interfaces. The ultimate objective of FER is the realization of intelligent and transparent communications between humans and machines. The goal of facial expression recognition is to determine the emotional state of the face, e.g. happiness, sadness, neutral, anger, fear, surprise and disgust, regardless of the identity of the face. One critical step for facial expression recognition is the accurate extraction of emotional features. Current approaches on FER have not fully considered the facial component features and muscle movements. The facial movement of component features represent static and dynamic as well as appearance and geometric characteristics of facial expressions. In static images, the performance of FER can be improved by automatically capturing facial movement features based on the distance features. By extracting "salient" patch-based Gabor features and performing patch matching operations these distances are obtained. The effectiveness of the proposed approach is testified by the recognition performance, and comparison with the state-of-the-art performance.

[17] PR1337 ANALYSIS OF WINDOWING TECHNIQUES FOR SPEECH EMOTION RECOGNITION

By PEREIRA, MILDRED RICHARD

2015

621.380412 PER

Project Guide DR DEEPAK JAYASWAL

Abstract

Emotion Recognition from speech has emerged as an important research area in the recent past. The different applications of emotion recognition such as E-learning and customer service is a motivation to carry further research in this field. Traditionally, spectrum estimation is obtained using a single window but this results in large variance. Multitapering provides a reduction in the variance between the true spectrum and the estimated spectrum and hence helps in

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obtaining better emotion recognition. The different multi-taper methods for spectrum estimation include Thomson multi-taper, SWCE (Sine Weighted Cepstrum Estimator) and Multipeak multi-taper. In this dissertation, the effect of variable frame size on the accuracy of speech emotion recognition is evaluated and best results are obtained for a frame size of 10-30ms. Also different windowing techniques are incorporated to observe their effect on recognition accuracy and we observe that Hamming window outperforms the other windows. The effect of different multitaper methods on the accuracy of speech emotion recognition is evaluated. For the various spectral features taken into consideration, in case of multitapering an improvement of upto 2% was found as compared to traditional Hamming window when tested on Berlin Emotion database. In addition to this, the number of tapers used for multitapering are varied and we infer that six tapers provide maximum accuracy in recognition of emotion from speech.

[18] PR1338 DGS BASED MICROSTRIP FILTERS FOR WIRELESS COMMUNICATION APPLICATIONS

By JAGDISH,SAPTARSHI JULY  
2016

621.382 JAG

Project Guide DR UDAY PANDIT KHOT

Abstract

In a communication system, there is an increasing demand for newer microwave and millimeter-wave systems to meet the emerging telecommunication challenges with respect to size, performance, and cost. Most of the communication system requires an RF front end which performs the signal processing with RF filters. For such RF front ends, microstrip filters are widely used because of low cost and simplicity. Microstrip filters play very important roles in wireless or mobile communication systems. In this paper, suitable shapes of dumbbell type DGS for respective filters have been investigated in order to achieve low insertion loss (less than 2 dB), stop band as high as 21 GHz, high return loss, improved Q-factor, high band width, and low profile (less than 35 sq. mm). Such a low profile wide stop band filters will be very much useful in RF front end of any communication system which performs signal processing. The proposed filters have been designed, analyzed, and simulated for comparison purpose. For the design and simulation, ADS

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simulation tool is used.

[19] PR1341 BIOMETRIC IDENTIFICATION THROUGH DETECTION OF RETINAL VASCULATURE

By JIU, FLYNN DENNIS

2015

006.4 JIU

Project Guide DR DEEPAK JAYASWAL

Abstract

In recent times biometric identification has become a very important part of secure identification. Biometrics are certain characteristics unique to an individual. Various biometric identifications include DNA, Finger prints, Iris, Retina, Voice, Face etc. The proposed method uses retinal vasculature for biometric identification. In this method the green plane of a color retinal image and 2D Gabor Wavelet transform help to enhance the blood vessels. These enhanced blood vessels are then segmented using Adaptive thresholding. Bifurcation points and end points of blood vessels from the feature points. The feature points are detected using the crossing number method and then validation process is carried out to eliminate falsely identified feature points. These valid feature points are used to establish the identity of a person.

[20] PR1343 MULTICARRIER COMMUNICATION TECHNIQUES FOR UNIPOLAR COMMUNICATION

By DSOUZA, NORITA WILLIAM

2016

621.3845 DSO

Project Guide MRS JAYASUDHA KOTI

Abstract

Unipolar Communication refers to a type of communication which transmits only real and positive signals. The systems which employ unipolar communication include optical wireless communication systems, optical fibre communication, amplitude modulated RF wireless communication systems, RF single wire communication and so on. Out of these, optical wireless

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communication which offers unlimited bandwidth is a potential alternative resource for the congested RF wireless spectrum. However, this type of communication system usually suffers from several performance impairments such as frequency selective fading and inter-symbol interference (ISI). To overcome these issues, one of the efficient multicarrier communication techniques called Orthogonal Frequency Division Multiplexing (OFDM) can be employed. However, the conventional OFDM signal developed for RF communication is bipolar in nature, whereas the optical channel is unipolar. Therefore, to address this problem different unipolar form of OFDM techniques such as DC-offset OFDM (DCO-OFDM), asymmetrically clipped optical OFDM (ACO-OFDM) and Flip-OFDM for indoor optical wireless channel have been listed in literature. Amidst these optical OFDM techniques, Flip-OFDM is one of the promising power-efficient unipolar OFDM technique analysed and studied in this work. The key constraint in optical medium is the transmitted power due to ocular safety issues which limits the average transmitted optical power. Along with power efficient modulation technique like Flip-OFDM, the transmitted optical power can be further reduced by using error control coding to achieve target error probability. In this work, Flip-OFDM is combined with forward error correction to provide significant improvement in system performance in terms of reduced error probability. The uncoded and channel coded Flip-OFDM is compared. Coded Flip-OFDM with QAM (Quadrature Amplitude Modulation) performs better in terms of bit error rate with reduced  $(E_b(\text{elec})/N_0)$  thus increasing optical power efficiency of system.

[21] PR1344 NO REFERENCE IMAGE QUALITY ASSESSMENT USING EXTREME LEARNING MACHINES

By KUMAR, PARIKH NIKUNJ VIJAY

2015

006.6 KUM

Project Guide DR GAUTAM SHAH

Abstract

Image Quality Assessment (IQA) is one of the growing research areas in the field of image processing. IQA deals with assessment of perceptual quality of an image by computing systems. In this work a No Reference Image Quality Assessment technique is proposed using Extreme Learning Machines (a single



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hidden layer feed forward neural network) along with kernel function making use of spatial and spectral features. The proposed NR-IQA algorithm can quantify amount of distortion present in image for distortion occurring due to JPEG and JPEG2000 compression, addition of white Gaussian noise, Gaussian image blurring and Rayleigh's fast fading effect on image. The proposed NR-IQA algorithm is a two stage algorithm, which starts with classification of image in to different types of distortions using ELM kernel and followed by regression with help of ELM kernel to quantify amount of distortion. For performance measure, Spearman's Ranked Ordered Correlation Coefficient (SROCC) and Root Mean Square Error (RMSE) is calculated using Differential Mean Opinion Scores (DMOS) provided along with database and scores provided by regression model. SROCC and RMSE values are compared with the existing NR-IQA techniques.

[22] PR1347 COMPACT DUAL BAND ANTENNA FOR 2.4/5.2/5.8-GHZ  
WLAN APPLICATIONS

By VAZ,SAMSON

2016

621.3824 VAZ

Project Guide DR GAUTAM SHAH

Abstract

The problem with compact antenna is that, with decreasing size, the gain of the antenna also decreases, since the area of the antenna and the gain are in direct relation with each other. In order to tackle this problem, several efforts are being made by the antenna designers like using arrays etc. A compact dual – band (15 x 40mm<sup>2</sup>) to cover lower band and upper band of 2.4/5.2/5.8GHz of WLAN applications is proposed. The antenna consists of two elements, a C shaped element and a E shaped element. Both of these two elements results in excitation of two resonant modes for dual – band operation. The C shaped element is fed directly with co-axial feeding technique. The E shaped element is coupled with ground plane using a connecting cylindrical via.

[23] PR1351 DESIGN OF MICROSTRIP ANTENNAS FOR GLUCOMETER  
APPLICATION

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By KAUL, RAHUL

2016

621.3824 KAU

Project Guide DR UDAY PANDIT KHOT

Abstract

Millions of people are suffering from Diabetes worldwide. According to the World Health Organization (WHO) number of diabetes patients is likely to rise to 101 million in India by 2030 and will become the world's seventh largest killer. Hence, we have to utilize technology to eradicate this disease. We can make use of WBANS (Wireless Body Area Networks) systems to monitor vital sign of the body such as glucose concentration in blood of a diabetic patient. Measuring glucose level in a diabetic patient on a regular basis and administering insulin are the keys to keep patient safe and device which measures blood glucose level is called Glucometer. Presently glucose can be measured using two techniques, that are invasive and non-invasive, also known as in-vivo and in-vitro respectively. In invasive techniques one drop of blood is taken from finger tip of a patient and is then collected on a test strip, that strip is then inserted into glucometer and blood glucose measurement is done. This technique is both costly and painful; also, there is a chance of infection. Therefore, a non-invasive glucose measurement is desirable. In non-invasive technique various technologies are used such as near infrared spectroscopy, Optical coherence tomography, Raman spectroscopy, Ultrasound technology, Thermal spectroscopy, Fluorescence technology, Impedance spectroscopy, etc. These methods have limitations like size, calibrations problem, discontinuous monitoring, etc. Hence microwave resonator antenna is used in this work for non-invasive technique as a new approach towards blood glucose measurement. In this work, Low profile microstrip antennas for glucometer application are proposed. As dielectric constant of the material as a superstrate placed above antenna changes, resonant characteristic of antenna varies and shift in the frequency is observed. The proposed microstrip antenna resonators are designed using Advanced Design System for an operating frequency as low as 1 GHz. The operating frequency of antenna should be low as the low frequency microwave signal penetrate deep into tissues and have potential for practical application because of low physical area, low cost and better frequency resolution. Further, a high frequency resolution i.e. for a small change in

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glucose concentration leads to considerable shift in operating frequency, is achieved. The proposed microstrip antennas are designed and tested with aqueous glucose superstrate. This is advancement towards developing microstrip sensor for non-invasive glucometer application.

[24] PR1352 LIFETIME ENHANCEMENT OF WIRELESS SENSOR NETWORKS

By GEHLAUT,SONU

2015

681.2 GEH

Project Guide MRS JAYASUDHA KOTI

Abstract

Significant advances in technologies led to the development of Wireless Sensor Networks (WSNs). They have attracted much attention in recent years. The potential applications of WSNs are immense. They are used for collecting, storing and sharing sensed data. WSNs have been used for various applications including habitat monitoring, agriculture, nuclear reactor control, security and tactical surveillance. The sensor network is based on the IEEE802.15.4 standard. WSN composes of large number of sensor nodes, which are tiny, low powered, densely deployed in an ad hoc fashion either inside a physical phenomenon to be sensed or very closely to it. The region around the sink forms a bottleneck zone due to heavy traffic flow, which reduces the lifetime of WSN. One of the constraints in the WSNs is limited battery power of the sensor nodes which in turn can reduce the lifetime of WSN. This paper attempts to improve the network lifetime by considering duty cycle, network coding and clustering techniques. The results show that the lifetime of the WSN can be enhanced by combining duty cycle, Network coding and clustering. Performance metrics like Energy Consumption, Packet Delivery ratio and Latency were also analyzed using NS2.

[25] PR1353 REDUCTION OF MUTUAL COUPLING IN UWB MIMO ANTENNA USING DEFECTED GROUND STRUCTURE

By SING,YOGESH

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2016

621.384 SIN

Project Guide MRS.ANJALI CHAUDHARI

**Abstract**

ULTRAWIDEBAND (UWB) for use in high-speed wireless communication has drawn great attention. The Federal Communication Commission (FCC) defines specifications for UWB systems to use in the band of 3.1-10.6 GHz. In recent years, multiple-input-multiple-output (MIMO) communication systems use the multiple antennas that are equipped at receiver and transmitter ends to enhance the available data rate in multipath environments.

Mutual coupling between the antenna elements in an antenna array is a potential source of performance degradation. This report presents, UWB MIMO antenna with high isolation performance.  $S_{11} < -10\text{dB}$  is obtained over the 3.1 GHz 10.6 GHz frequency band which is suitable for the UWB applications. Two ground slots are implemented in the existing system to improve the isolation performance of UWB MIMO antenna system. Mutual coupling between the antenna elements is reduced below in the entire UWB band. MIMO performance parameter, Envelope Correlation Coefficient (ECC) is also investigated. The ECC of the antenna is less than 0.0025 over the entire UWB band. The proposed antenna is fabricated and tested. The measured results agree with the simulated results. The antenna has stable radiation patterns. Thus, the proposed antenna is good candidate for MIMO applications in UWB band.

[26] PR1355 METAMATERIAL BASED RECONFIGURABLE AND TUNABLE ANTENNA FOR WIRELESS APPLICATIONS

By PILLAI,SHRUTI SANTOSH

2015

621.3845 PIL

Project Guide DR UDAY PANDIT KHOT

**Abstract**

This work represents the design of a reconfigurable and tunable multiband patch antenna integrated with metamaterial for achieving high directivity and

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high gain. The antenna to be designed is to be considered for wireless applications. It can be used for various combinations of wireless applications such as Wi-Fi, Wi-max, Bluetooth within a microwave S and C frequency bands in Electromagnetic Spectrum. The main patch consists of four sub-patches, and a ground plane achieving reconfigurability. However, the design of microstrip yields low gain and low bandwidth. To overcome this issue, metamaterials are used along with patch antenna so as to increase the directivity and gain with reconfigurability and tunability. Therefore, a single compact antenna can be used for different applications saving the cost and the size of the antenna.

[27] PR1357 SMART RECONFIGURABLE WIDE-BAND ANTENNA FOR COGNITIVE RADIO

By VAZE, SAYLI

2015

621.3824 VAZ

Project Guide DR UDAY PANDIT KHOT

Abstract

This work represents the design of a smart reconfigurable wideband patch antenna for selecting frequencies as per the requirement. The antenna to be designed is to be considered for cognitive radio applications. It can be used for various combinations of wireless applications such as Wi-Fi, Wi-max, Bluetooth within a microwave S and C frequency bands in Electromagnetic Spectrum. Therefore, a single compact antenna can be used for different applications saving the cost and the size of the antenna.

[28] PR1358 DESIGN AND ANALYSIS OF HYPER-CHAOTIC IMAGE ENCRYPTION SYSTEM

By SHAIKH, NAZIRA

2016

005.82 SHA

Project Guide DR DEEPAK JAYASWAL

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Abstract

Security is a major concern in digital image transmission applications. In this dissertation work, a novel color image encryption scheme is proposed to enhance security and efficiency. The proposed scheme is a single round based hyper chaotic system due to bi-directional pixel diffusion which contributes towards increased security and improved efficiency. A Bit division process is introduced during pseudo random sequence generation which shows improvement in encryption speed. Security analysis such as key sensitivity, histogram, information entropy, correlation coefficient and diffusion is conducted. The proposed system passes all 15 standard NIST SP800-22 tests for pseudo random numbers.

[29] PR1360 EDGE BASED IMAGE ZOOMING

By WARBHE,SWATI

2013

006.6 WAR

Project Guide DR JOANNE GOMES

Abstract

With the large use of images for the communication, image zooming plays an important role. Image zooming is the process of enlarging the image with some factor of magnification, where the factor can be integer as well as non-integer. Applying zooming algorithm to an image, this generally results in aliasing; edge blurring and other artifacts. So the main focus is on the reduction of these artifacts. The proposed work deals with the implementation of Edge Based Image Zooming technique using non-linear fourth order Partial Differential Equation (PDE) method combined with edge directed bi-cubic algorithm. The proposed method uses high resolution image obtained from edge directed bi-cubic interpolation algorithm to construct the zoomed image. This technique preserves edges and minimizes blurring in the zoomed image which is shown in results section. In order to evaluate image quality obtained after zooming, the visual comparison and quantitative analysis will be performed

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[30] PR1361 MIMO LTE ANTENNA WITH REDUCED MUTUAL COUPLING

By KAMAL, SHAHANAWAZ SHAHED

2014

621.3824 KAM

Project Guide MRS. ANJALI CHAUDHARI

Abstract

Multiple-input and multiple-output (MIMO) is currently regarded as key technology for long term evolution (LTE) but a critical effect is mutual coupling (S<sub>21</sub>) due to space constraint in miniaturized design. A compact-size antenna with low mutual coupling would be an ideal choice for better system performance. This paper describes the design of a small-size (48×48mm<sup>2</sup>) MIMO antenna system with low mutual coupling for LTE 800 MHz applications. The antenna system comprises of two FR-4 substrate layers; one printed with two meander line antennas (MLAs), the other printed with reactive impedance surface (RIS) and defected ground structure (DGS). The properties of the antenna like S-Parameters, excited surface current distribution, far-field radiation pattern and diversity performance characteristics were studied. The results indicated that MLAs rendered compactness to the system. Introduction of air gap (AG) between the two substrates, DGS and periodic square patches of RIS resulted in 452 MHz bandwidth and mutual coupling of -41.18 dB between antenna elements. The performance of the proposed design compared with other reported geometry has been demonstrated. Parameters including bandwidth, ratio of antenna area/improvement in S<sub>21</sub>, antenna efficiency and the envelope correlation coefficient were compared. Considering the results, the present system appears to be comparatively more efficient.

[31] PR1362 MULTI-EXPOSURE IMAGE FUSION USING GUIDED FILTER

By FERNANDES, DONALD SAVIO

2017

006.37 FER

Project Guide MR VAQAR ANSARI

Abstract

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Imaging technology has advanced such that the capture and storage and broad dynamic range is now possible, but the output limitations of common desktops as well as hardcopy prints have not followed the same advance. There is always loss of information in under-exposed and overexposed regions. In order to solve this problem of tone reproduction on display or on the paper, HDR imaging is used. In this technique images of the same scene with different exposure levels are taken multiple times for weighted sum based multi exposure image fusion. This method consists of two main steps: three image features composed of local contrast, brightness and colour dissimilarity are first measured to estimate the weight maps refined by guided filters. Then the fused image is constructed by a weighted sum of the source images. The main advantages of the proposed method lie in a guided filter-based weight map refinement step which is able to obtain accurate weight maps for image fusion due to its edge preserving property. Another advantage is that a novel histogram equalization and median filter-based motion detection method is proposed for fusing multi exposed images in dynamic scenes which contain motion objects. Furthermore, the proposed method is quite fast and thus can be directly used for most consumer cameras. Experimental results demonstrate the superiority of the proposed method in terms of subjective and objective evaluation.

[32] PR1363 LEARNING VISUAL SALIENCY WITH STATISTICAL PRIORS

By DESHPANDE, GAURIG

2017

00637 DES

Project Guide DR DEEPAK JAYASWAL

Abstract

Saliency is the quality by which any object or a pixel in an image stands out relative to its neighbors. Detecting such regions from an image is a crucial problem of research, since it has wide applications in advertising, automatic image compression, image thumbnailing, etc. In this work, a salient region detection approach is proposed by using machine learning. In order to train the saliency model, low level features such as color channels and their probabilities,



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also probabilities using 3D color histograms, subband features along with statistical priors such as frequency prior, color prior, chance of happening (CoH) and center bias prior (CBP) are used. The proposed model is compared with existing state of art algorithms. Human eye fixation points are used to compare the models by estimating area under ROC curves. Other parameters such as precision, recall, F-measure are also used for comparison. This comparison shows that the proposed saliency model gives better performance than the existing salient region detection approaches.

[33] PR1498 IMAGE ALIGNMENT ALGORITHM FOR VIDEO STABILIZATION

By PEREIRA, SWETHA SILVESTER

2016

629.4 PER

Project Guide MR VAQAR ANSARI

Abstract

Video stabilization is an important technique in the present day. With the introduction of the video camera as an integrated part of mobile equipment creates the need for video stabilization. The work presented here is based on local motion estimation, characterization and its applications, primarily in the areas of video stabilization. Many people in the world today, without any proper knowledge about video camera recording are able to capture high quality video. Due to the advancement of the mobile devices like personal digital assistants, mobile phones, digital cameras etc. But the unwanted movements of cameraman's hands introduce typically blurriness and disturbing jerkiness in the recorded video sequences. A stable output video will be attained without the effect of jittery that caused by shaking the camera during video recording. Different video stabilization techniques have been hence developed with different performances till today. However, fast and low computational complexity approaches can be implemented. The method for fast and image alignment algorithm for video stabilization purposes will be discussed. The direct based motion estimation is used to find optimized local motion vectors using Integral projection. The proposed algorithm contribution is a fast and accurate block based local motion estimation together with an image alignment algorithm. Effectiveness of the

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algorithm is shown by series of experiments on the video based on the quantitative evaluation using TIF as error function.

[34] PR1499 AUTOMATIC CLASSIFICATION OF DIABETIC RETINOPATHY USING FUNDUS IMAGE

By PURANDARE,MANASI DEEPAK

2016

617.7 PUR

Project Guide DR KEVIN NORONHA

Abstract

Automatic retinal image analysis is emerging as an important screening tool for early detection of eye diseases. Uncontrolled diabetes retinopathy (DR) and glaucoma may lead to blindness. DR is caused by damage to the small blood vessels of the retina in the posterior part of the eye of the diabetic patient. Diabetes over long duration causes damage to the tiny blood vessel that nourishes the retina. These blood leak the blood and other fluids that cause swelling of retinal tissues which leads to the diabetic retinopathy. Prolonged DR leads to the vision loss. To prevent blindness, accurate detection of DR at an early stage is essential. Routine Eye screening of patients with diabetes helps to detect diabetic retinopathy at the early stage. It is very laborious and time consuming for the doctors to go through many funds images continuously. In the proposed system we present a system for automatic classification of subjects as normal and DR by using funds images which gives fast results when there is mass screening of DR. Clinical features like blood vessel area, bifurcation and end point and texture based features such as energy, entropy, homogeneity, contrast, correlations were extracted from funds images SVM is used as a classifier which classifies the subjects as Normal and DR.

[35] PR1504 PERFORMANCE EVALUATION OF LDPC CODE BASED OPTICAL COMMUNICATION SYSTEM USING MATLAB WITH SUITABLE MODULATION SCHEME

By PRAJAPATI,VIJENDRA KUMAR SHYAMLAL

2016

621.38275 PRA

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Project Guide MRS MRINMOYEE MUKHERJEE

Abstract

In optical communication, while sending the data through the optical guided channel, error occurs as signal gets degraded due to linear and nonlinear effects. To deal with these errors, Forward Error Correction (FEC) code is used. The most commonly used FEC technique is Low Density Parity Check (LDPC) code. It is a 3<sup>rd</sup> generation linear block code with soft decision theory. Its near Shannon capacity approach and lower decoding complexity makes it perfect error correcting code for optical communication. The project aims to study the linear and non-linear effects on the Gaussian pulse and apply LDPC encoding for the reduction in the number of bits in error using MATLAB. It has been shown that linear effects are visible at an approximate distance of 30 km and non linear effects are visible at an approximate distance of 70 km.

[36] PR1506 MULTIFOCUS IMAGE FUSION BASED ON HUMAN VISUAL PERCEPTION

By PATIL, RAHUL

2014

006.37 PAT

Project Guide DR DEEPAK JAYASWAL

Abstract

Image fusion is the process by which two or more images are combined into a single image retaining the important features from each of the original images. The fusion of images is often required for images acquired from different instrument modalities or capture techniques of the same scene or objects. Multifocus image fusion constructs an all in-focus fused image from multiple source images having focus on different objects from the same scene. To achieve this, a spatial domain algorithm is implemented which finds the minima between two images for smooth blending. This information is used to divide each source image into blocks of adaptively varying sizes and from these blocks adaptive thresholds are computed. To improve the result of the final image, cross bilateral filtering is used to capture any details not recognized by adaptive thresholding. For the purpose of testing the proposed work, a readily-available

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database of Laboratory for Image and Video Engineering (LIVE) will be used. To demonstrate the quality of the final fused image, ten performance parameters are compared using additional four techniques, namely average method, maximum technique, Fixed Block Size-Adaptive Threshold (FBS-AT) and Adaptive Block Size-Adaptive Threshold (ABS-AT). The performance of the method have been tested on several pairs of multifocus images and compared quantitatively with existing methods. Experimental results shows that the proposed work improves fusion quality by reducing loss of information and noise by more than 99.99%.

[37] PR1507 PILOT BASED CHANNEL ESTIMATION IN OFDM SYSTEM

By NADAR, JEBA INBARAJ

2014

621.3845 NAD

Project Guide DR DEEPAK JAYASWAL

Abstract

Wireless communication is a promising technology for a wide range of applications from TV remote control to satellite based TV systems. As the need for high data rate is increasing day by day the need for multicarrier communication has come in to picture. Orthogonal frequency division multiplexing (OFDM) is a multicarrier transmission technique used for high data rate wireless transmission. In OFDM the transmitter modulates the message bit sequence in to symbols, performs IFFT, converts in to time domain signal and transmits through a wireless channel. The information usually gets distorted due to characteristics of the channel so it is required to estimate the channel characteristics and compensate at the receiver to recover the information sent. So, the information is recovered through coherent method by inserting a Pilot between the subcarrier. In this thesis we explore two estimation techniques Least Square (LS) and Minimum Mean Square Error (MMSE) using Additive White Gaussian Noise (AWGN) and Rayleigh Channel using International Telecommunication Union (ITU) specified standard models. Performance criteria Mean Square Error (MSE) is calculated for different Doppler shift further Bit Error Rate (BER) is also calculated. It is being observed that channel estimation using MMSE algorithm with DFT gives a better performance compared to LS-linear and LS spline algorithm and MMSE

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algorithm without DFT.

[38] PR1509 DESIGN OF LOW PROFILE STABLE HIGH GAIN  
ANTENNA USING ANNULAR SECTOR DIRECTORS

By INAMULLAH, KHAN

2016

621.3824 INA

Project Guide MRS NITIKA RAI

Abstract

A multiband antenna using circular sector and an annular sector director is proposed. A via-hole is inserted at a suitable position within the circular sector. A parametric analysis of the effect of the position of the via-hole is carried out. Simulation results indicate that the antenna is found to be capable of exhibiting multi-band operation with acceptable gain. The proposed design is a promising solution for wireless devices supporting multiple technologies.

[39] PR1510 IMAGE SPLICING FORGERY LOCALIZATION

By PATIL, BHAVIKA A

2017

621.388 PAT

Project Guide DR DEEPAK JAYASWAL

Abstract

Forgery of image can be executed easily by using advanced image editing applications, but the recognition of such forged images is difficult for the human eyes. Image splicing is a popular way of image tampering. In this work, the goal is to recognize whether a given image is forged or not, as well as to localize the forged part of image. Since images of JPEG format are highly popular and broadly used, we use JPEG images as input and detect splicing as well as its localization, i.e. determining the location of splicing in the image. Benford's law and Markov chain model features are extracted using first digits of DCT coefficients. These features are given to Support Vector Machine classifier for training the model at various quality factors of compression, by

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considering two scenarios of Single Compressed Patch and Double Compressed Patch. Compared to state-of-the-art techniques, the experimental results of proposed work provide improved forgery detection and Localization.

[40] PR1511 AN OPTIMIZED HDL IMPLEMENTATION OF SHA-256 ARCHITECTURE

By PADHI,MEELU BISHNUCHARAN

2017

621.382 PAD

Project Guide DR RAVINDRA CHAUDHARI

Abstract

Real time applications of digital communication systems are rapidly increasing. Due to this, there is a huge demand for high level of security. In cryptographic algorithms, SHA-256 has become an integral part in many applications. A hardware implementation of the SHA-256 hash algorithm is physically separate from the main processor and hence, it has more security and higher performance than the software implementation. An execution of a hash algorithm on FPGAs is convenient, as it is flexible and easily upgradable. However, implementation of this algorithm on hardware has been challenging, due to the demand of high processing speed. In this report, an optimized pipelined architecture of SHA-256 hash function has been implemented in hardware HDL Verilog language and synthesized in Xilinx Virtex-4 FPGA. The compressor and expander block of hash function are modified. Carry skip adder is also used to improve the performance of the architecture. The obtained result shows a significant improvement in the performance of the proposed SHA-256 algorithm and it is compared with existing various architectures. Its maximum clock frequency is 170.75 MHz, throughput of 1344.98 Mbps and an improved efficiency of 2.2 Mbps/ slice.

[41] PR1512 HIGH SPEED UWB TRANSCEIVER USING PROLATE SPHEROIDAL WAVE FUNCTION

By JADHAV,PRIYANKA PRAKASH

2016

621.38456 JAD

Project Guide DR JOANNE GOMES

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Abstract

Wireless technologies provide quick and easy access to information. High-speed data rate/throughput is very important for multimedia communication. High-speed communication is recently achieved by using technologies such as UWB, OFDM etc. One of the resources in the wireless communication system is the limited frequency spectrum. Many wireless communication systems are hindered by the bandwidth limitation and are not able to provide high speed communication. However, Ultra-Wide Band (UWB) communication promises a high-speed communication because of its very wide bandwidth of 7.5GHz (3.1GHz-10.6GHz). N-Dimensional Pulse Shape Modulation (N-PSM) is one of the modulation techniques used recently to achieve high data rate based on the family of orthogonal pulses such as Prolate Spheroidal Wave Function (PSWF) and Hermite pulse. In this research work the design of transceiver system based on N-PSM modulation technique using PSWF and Hermite has been implemented in MATLAB Simulink. Here simulation is performed for different values of  $N=2$  and  $3$  to achieve higher data rate of  $2R$  and  $3R$ . Performance evaluation of the N-PSM based system is carried out over Additive White Gaussian Noise (AWGN) channel and UWB SV-CM1 (Saleh Valenzuela Channel Model) for different values of  $N$  to measure Bit Error Rate (BER). It has been found that a combination of PSWF and Hermite pulses can be used for high-speed modulation if these pulses are orthogonal to each other since both the types of pulses achieve almost same bit error rate over AWGN.

[42] PR1513 IMAGE INPAINTING SCEMES

By MARATHA, PRIYANKA

2016

006.601 MAR

Project Guide DR RAVINDRA CHAUDHARI

Abstract

Object can be completely removed from an image by using image inpainting process; it is the art of filling in the missing region or object region of an image using the available information from surrounding known region. It reconstructs the missing region by sampling values from the surrounding block by block in a visually plausible way so that it seems reasonable to the human eye. Criminisi

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has proposed an exemplar-based image inpainting approach, which is most commonly used because it can propagate structure information and texture information into target region simultaneously. Although this method has advantages such as simplicity and ease of implementation, but it has some flaws of perceptual quality of image and computational efficiency. In this proposed algorithm, improved method for exemplar-based image inpainting by considering regularize factor, isophote curvature and variance to compute patch priorities is presented. This proposed approach can inpaint large regions as well as recover small portions of the image and provides good visual quality of inpainted images. The basic approach is to find the similar patches from the known source region of an image and replace the lost data with it. This technique can be used in restoring old photographs or damaged photos. It can also remove superimposed text like dates, subtitles etc.; or even entire objects from the image like microphones or wires to produce special effects. The resulting images obtained with proposed method are improved and good quality relative to existing methods.

Keywords: Image inpainting, Exemplar-based, Priority, Patch matching, Isophote curvature, Regularized factor.

[43] PR1514 MULTI-FEATURED FRACTAL MICROSTRIP PATCH ANTENNA FOR WIRELESS COMMUNICATION APPLICATIONS

By VICHARE, DEEPIKA PRAMOD

2017

621.3845 VIC

Project Guide DR UDAY PANDIT KHOT

Abstract

This work presents the design of multi-featured fractal microstrip patch antenna. The fractal antenna leads to multiple features such as low profile, wide band and/or multiband frequency response. The antenna is constructed on a square patch using combination of Sierpinski fractal geometry and Koch fractal geometry. Initially, the antenna is designed separately with Sierpinski fractal geometry and Koch fractal geometry. Later, both the geometries are clubbed together. This leads to a multiband fractal patch antenna because of the space-filling property of Koch, a low-profile patch antenna due to Sierpinski fractal geometry, and a wide band separation between frequency bands by using appropriate number of iterations. Such antenna is suitable for wireless communication applications. The antenna is being designed and simulated using



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ADS software.

[44] PR1516 IMAGE OBJECT SALIENCY DETECTION

By SHINDE,APARNA NAMDEO

2017

006.37 SHI

Project Guide DR DEEPAK JAYASWAL

Abstract

Human visual system can quickly and efficiently estimate salient regions in a scene. Saliency detection is the capacity to replicate human visual considerations by estimating significant regions of an image i.e. limiting our focus on important or relevant parts of data. Detection of visually salient locations in a picture is helpful for various image processing and computer vision applications such as object segmentation, adaptive compression, object recognition, etc. In the proposed work, conversion of input image to LAB color space is done followed by color quantization, using which histogram of the quantized colors is computed. The center and variance of the obtained colors from histogram is used to calculate the position and size of salient objects. Contrast computation is an important step in this method which is obtained using twin pyramid with multi-scale resolution. Finally, after fusing probability of saliency with centre-surround contrast, the saliency map is computed, in which the probability of saliency is determined by computing different variables of ground truth images present in dataset. The proposed method is tested using MSRA-1000 dataset and the result obtained with proposed method is improved relative to an existing method.

[45] PR1517 IMAGE FUSION USING TRANSFORM BASED APPROACH

By ALPHONSO,SILVIYA SIMON

2016

006.37 ALP

Project Guide DR KEVIN NORONHA

Abstract

Two or more images are combined to form a distinct image that is sharper as

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well as more informative than source image is called image fusion. The sharper image is then produced in multi-focus image fusion algorithm by merging set of images of similar scene but with different focuses. The calculation of local content information of the source image is the main issue in the multi-focus image fusion algorithm. The degree of image's blur is then measured by exploiting the spreading of wavelet coefficient distribution using proposed sharpness measure technique. The proposed sharpness measure of wavelet coefficients varies for images as per various focus levels.

[46] PR1651 IDENTIFICATION OF ADDITIVE LINK METRICS OF NETWORKS WITH DIRECTED PATHA

By BRAGANZA, OLINDA MARYANN

2017

004.6 BRA

Project Guide DR KEVIN NORONHA

Abstract

Network Tomography is an upcoming field to identify link metrics and improve the quality of network monitoring. From linear algebra, we know that, if the number of unknown link metrics is equal to the number of links within the network, then the network is uniquely identifiable. Previous works include identifying link metrics of networks, in which the links were either undirected or directed bidirectional. By keeping in mind that the link metrics are additive and constant, the focus of this dissertation is on mixed networks with both undirected and directed unidirectional paths. The method employed involves dividing the network into subgraphs and obtaining the conditions of identifiability on the network without the inclusion of monitoring cycles.

[47] PR1652 PERFORMANCE ENHANCEMENT OF DUPIEX ANTENNA FOR WIRELESS COMMUNICATION

By PATEL, SUCHITA

2017

621.3824 PAT

Project Guide MRS NITIKA RAI

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Abstract

A compact and integrated duplex antenna has been designed. The duplex action is made possible by integrating the duplexer and a rectangular dual band patch antenna. A couple of sets of split ring resonators are used for filtering while a stub loaded resonator serve as the junction resonator. A slot in the ground is provided to achieve coupling between the rectangular patch antenna and the hairpin resonator. Further, to make this design compact, the 50 ohms interface and the matching networks between them are eliminated. This proposed duplex antenna provides two frequency channels of 2.41–2.47 GHz for transmitting and 2.71–2.78 GHz for receiving. It provides better isolation and is compact as compared to other designs in the literature. The simulated results indicate that the isolation for both transmitting and receiving bands is 52.5 dB. The measured results agree well with the simulation results.

[48] PR1655 MULTIBAND FRACTAL ANTENNA WITH FRACTAL DGS FOR WIRELESS APPLICATIONS

By SANKHE, AKSHATA RAMESH

2018

621.3824 SAN

Project Guide DR UDAY PANDIT KHOT

Abstract

There are number of methods that can be used to reduce the antenna size. Fractal is one of the ways which can be used to reduce the antenna size due to their space filling property. It helps in fitting large electrical lengths into small volume. Most of the researchers have obtained this reduction in length either by trial-and-error method or by viewing various performance parameters such as gain, bandwidth, return loss, reduction in area etc. at each iteration order and iteration factor. Such methods are either complicated or time consuming. Here the efforts are made in order to reduce the computational complexity in determining optimum iteration order and iteration factor in Sierpinski carpet fractal patch antenna. A systematic way in determining an iteration order and iteration factor is given. In this work a fractal patch antenna with the combination of Sierpinski Carpet and Koch fractal geometry is designed at resonant frequency 5 GHz. The proposed fractal antenna has been designed by introducing fractal DGS. The combined effect of fractal patch and fractal DGS leads to multiband operation with better performance parameters. The antenna is

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tested with performance parameters such as return loss, bandwidth, gain, directivity, and radiation efficiency. This patch antenna operates in S-band (2-4 GHz) and C-band (4-8 GHz) applications. Such combined structure gives 25.39% decrease in profile compare to the basic patch and 11.59% increase in bandwidth without much degradation in gain. The antenna is simulated and tested using ADS software. The simulation and measured results are well in agreement.

[49] PR1656 CHROMINANCE BASED LOCALIZATION OF SPLICING FORGERIES IN DIGITAL IMAGES

By BASKER, VALENTINA RANI

2018

006.37 BAS

Project Guide SANTOSH CHAPANERI

Abstract

Due to modern technology, image forgery is very much prevalent nowadays. Image forgery may result to misleading facts if used without proper verification. Thus, image forgery detection plays a vital role to confirm the credibility of the digital images with no prior information about the original image. It is known that the luminance component of an image is well perceived by humans, thus tampering may result in some unnatural clues in the chrominance components. In this research work, the goal is to detect and localize the spliced images by analyzing the chrominance components. The underlying statistical inconsistencies and the variations in the noise level of an image due to tampering are evaluated and used as features to classify using Relevance Vector Machine (RVM). The proposed method is also evaluated with Support Vector Machine (SVM) and the obtained result is compared with that of RVM classifier. The training time using RVM is approximately 15 sec less than SVM and is atleast 2.25 times faster than the existing technique. Also, the accuracy of the chrominance component for  $64 \times 64$  non-overlapping blocksize is 98.3% using RVM which is relatively higher than SVM having an accuracy of 87.65%.

[50] PR1657 BIOMETRIC VERIFICATION USING IRIS

By DESHPANDE, BHAGYASHREE

2018

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006.4 DES

Project Guide DR DEEPAK JAYASWAL

Abstract

This research focuses on iris verification, the most accurate form of biometric system. The robustness of iris verification comes from the unique characteristics of the human, and the permanency of the iris texture as it is stable over human life, and the environmental effects cannot easily alter its shape. The iris localization is first step in the iris verification, which is followed by the normalization, feature extraction and the iris-template matching, but the iris localization is most time-consuming task in an iris verification system. Also there exists three main problems facing the existing iris verification systems: lack of robustness of the algorithm to handle non-ideal iris images, slow speed of the algorithm and the applicability to the existing systems in real world situation. The accuracy of iris recognition is most important for the applications demanding high security, where confidential data/resources must not be compromised. Iris localization is an important stage in an iris recognition system, which involves image processing. The accuracy and speed of iris recognition depends on the iris localization algorithm. A novel fast and accurate segmentation approach is used. The objective of this research is to improve the performance of iris verification system with better accuracy and with less execution time. The proposed algorithm achieved the accuracy of 91 percent with the execution time of 0.467 seconds.

[51] PR1658 PIXEL BASED MULTIFOCUS IMAGE FUSION USING NON LINEAR FILTER

By SAWANT, SUKHAJI TANAJI

2018

006.37 SAW

Project Guide DR DEEPAK JAYASWAL

Abstract

Image fusion is the process of merging the information from multiple images of a scene into single composite image that is more informative and suitable for visual perception and computer processing. This thesis explores a method of multi-focus image fusion which is the process of fusing different parts of

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several digital images, all with different focus settings but representing the same scene, in order to produce an all-in-focus image. In our work three methods for Multifocus image fusion in pixel domain are proposed namely Dual Gaussian Intensity Scaling, Edge Enhanced Cross Bilateral Filter, Modified Cross bilateral filter. In these methods, details are taken into consideration to obtain the weights that are normalised to acquire final fused image using fusion rule. The proposed method has shown better performance in most of the cases in terms of quantitative analysis and visual quality.

[52] PR1659 NON DATA AIDED SNR ESTIMATION IN NAKAGAMI-M FADING CHANNEL

By TIWARI, AKANKSHA

2018

621.3822 TIW

Project Guide DR GAUTAM SHAH

Abstract

An accurate Signal to Noise Ratio (SNR) estimation is a major concern to measure the performance of the channel. This necessitates for an appropriate channel estimation scheme to acquire efficient SNR estimates in wireless fading channels. SNR is one of the major figures of merit, which characterizes the channel quality. Modern communication systems require knowledge of SNR, such as power control or iterative soft-decoding procedure for proper operation. Due to this reason, the performance of estimated SNR should be more accurate for any channel. This estimated SNR can be computed by a data-aided (DA) approach or Non-data-aided (NDA) approach. In this thesis, a NDA SNR estimation for MPSK signal is proposed in Nakagami-m fading channel as well as Rician fading channel using M2M4 and SVR estimation techniques. SNR estimation is performed for low to high values of SNR. The estimation of M2M4 and SVR algorithm is tested and verified by different test cases to ensure its validity.

[53] PR1660 PERFORMANCE EVALUATION OF LTE NETWORK USING QAM AND MIMO CONFIGURATION

By SHAH, PAYAL

2018

621.3824 SHA

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Project Guide DR GAUTAM SHAH

Abstract

Mitigating exponentially increasing data and higher data rate demand requires continuous innovation in mobile broadband technology. Recent standard introduced by Third Generation Partnership Project (3GPP) group promises high-speed data, multimedia unicast and multimedia broadcast services is Long Term Evolution (LTE). This project work gives insight of the LTE network performance under different radio conditions to improve throughput and spectral efficiency of the system. Identification of LTE system bottlenecks affects the performance and their solutions. Performance analysis is conducted for each solution through network simulations using MATLAB and Vienna system level LTE-A simulator. Simulation results show that up to 33% of peak throughput can be improved using 256QAM under good radio condition. Comparison between network with coordinated multipoint on (CoMP On) and coordinated multipoint Off (CoMP Off) shows significant improvement for cell edge throughput by 30 % to 50%. Comparative performance analysis for various multiple input multiple output (MIMO) configurations is conducted to understand system capacity improvement that shows Multiuser MIMO (MU-MIMO) (TM-5) provides higher capacity over Single user MIMO (SU-MIMO) for same antenna configuration. Beam forming (TM-7) increases the capacity further with additional antenna port. TM- 9 up to 8-Layer transmission is a future solution which would improve the peak throughput as well as provides higher capacity

[54] PR1662 A SOPHISTICATED LOW PROFILE MICROWAVE FLAT LENS USING PERIODIC STRUCTURES AT C BAND

By KHOMBAL,MINAL

2018

621.381 KHO

Project Guide MRS.ANJALI CHAUDHARI

Abstract

Metamaterial lenses have received increasing attention due to their unique electromagnetic properties. One of the most important properties is negative refractive index which does not exist in natural material. Various types of metamaterial have different characteristics such as huge chirality and magnetic

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conductivity. These unusual properties play an important role in modern antenna design, which can provide better performance, more functions, and more flexibility. The main objective of the proposed work is to study the characteristics of metamaterial lens, and to improve the performance of microwave antennas. New topology of square-circular ring resonator (SCRR) metamaterial unit cell is proposed. This unit cell exhibits negative refractive index characteristic in C-band from 5.7GHz – 6GHz. Also, the real part of both the permittivity and permeability of SCRR metamaterial unit cell attains negative value at 5.81GHz. To support the existing moisture measurement system which includes transmitting and receiving rectangular waveguide antenna, a metamaterial lens is proposed and designed to operate at 5.81 GHz. Metamaterial lens has improved the gain and directivity of transmitting antenna. Also the designed prototype shows improved gain at the receiver section.

[55] PR1664 FAST FRACTAL VIDEO COMPRESSION

By GOMES, MACLENA LUIS

2018

006.37 GOM

Project Guide DR RAVINDRA CHAUDHARI

Abstract

With The Rapid Increase In The Use Of Computers And Internet, The Demand For Higher Transmission And Better Storage Is Increasing As Well. The Way To Solve This Problem Is By Doing Compression Of Data, Compression Techniques Are Used To Reduce Redundancy From The Data. In Which Compact Amount Of Data Can Be Represented By Huge Amount Of Actual Data. Fractal Is A Replication Of Similar Pattern That Repeat Itself At Different Level. Fractal Video Compression Is A Method Relies On The Concept Of Reducing Self-Similarity With Frame And Between Successive Frames In The Video. In Fractal Video Compression The Computational Complexity Is High Due To Different Approaches. In This Work, To Reduce The Computational Complexity Fractal Video Compression Using Walsh Transform With Ncc Is Proposed. A Frequency Domain Based Fractal Video Compression Is Proposed To Accomplish High Processing Speed And Good Visional Aspect. The Searching Speed Is Increase By Using Normalized Cross Correlation Based Walsh Transform Of Overlapped Domain Block Either Calculating Single Block And Further Time Is Reduced By Getting Geometric Operation Of Specific Block Directly Instead Of Find Each Opeartion Separately. The



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Advantage Of Using Walsh Transform Over Fft Is Only Addition And Subtraction Is Required Instead Of Complex Multiplication Which Ultimately Reduce Complexity Of Encoding System. The Experimental Results Shows That Encoding Time Require For Experimental Results Shows That Encoding Time Require For Walsh Based Transform Is Much Less Than Fft Based, With Good Psnr And Compression Ratio As Well As Same Quality Of Decoded Video Sequence.

[56] PR1668 PROCEDURAL DEVELOPMENT OF RF TRANSMIT/RECEIVE QUADRATURE FED(TROF) BIRDCAGE COIL FOR FULL BODY SCAN IN 1.5T MR SYSTEM

By YADAV, NIRAJ

2018

616.0757 YAD

Project Guide MR INDERKUMAR KOCHAR

Abstract

Magnetic Resonance Imaging (MRI) is an imaging technique which is used to view the inner part of the human body in a non-invasive manner. This imaging technique is based on the principle of Nuclear Magnetic Resonance (NMR). The Radio-Frequency coil in MRI can be of various types depending upon the uniformity of the signal required. Birdcage Coil is a type of volume coil which is selected for the implementation due to better field homogeneity and high signal to noise ratio which in turn guarantees a large field of view. This dissertation describes the procedural flow required for a strip-based birdcage coil for a human body operating the high pass, low-pass and band-pass modes along with demonstration of Magnetic field and Electric field which is responsible for high Specific Absorption Rate(SAR). Since its introductions determine the resonant modes for high pass and band pass structures. The dimensions of the coil are kept constant in all the designs. High Pass birdcage coil is constructed as well for the same frequency. The resonant frequency for a 1.5T MR system is 63.87 MHz which is obtained by the Larmor equation and is known as the Larmor frequency. Impedance matching along with tuning of the coil is discussed, The theoretical ideas were further validated in a computer simulation and measurement.

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[57] PR1669 DESIGN OF DUAL BAND UWB ANTENNA FOR WIRELESS APPLICATIONS

By KHANKAL, CHAITALEE

2019

621.384 CHA

Project Guide MRS.ANJALI CHAUDHARI

Abstract

Ultra Wide Band is a wireless technology for transmitting large amount of digital data over wide spectrum of frequency bands over less power for short distances. High power or bandwidth is required to transmit high data rate signal but high power is a clampdown in compact devices. Ultra wideband can carry a huge amount of data over large distances at very low power and also has the ability to carry signals through doors and other obstacles that tend to reflect signals at more limited bandwidths and a higher power. The UWB frequency ranges from 3.1 GHz to 10.6 GHz which has drawn attention due to achievable high data rate from large number of short pulses. The objective of this research is to integrate a dual band compact ultra wideband antenna offering 2 - 3 GHz band and upper UWB band (4 - 10.6 GHz ) integrated over a single substrate which can be used for both shorter and longer distances. The antenna structure consists of a comma shaped monopole structure responsible for the upper band resonance and a longer arm resonating in the lower band. The antenna occupies 22 x 41 mm<sup>2</sup> area of the FR4 PCB board. By combining two elements or structures, one saves manufacturing and real-estate costs also in mounting the device. The proposed antenna offers 40% and 90.4% impedance bandwidth. The proposed structure exhibits stable radiation pattern suitable for Bluetooth and UWB applications.

[58] PR1800 HARDWARE IMPLEMENTATION OF PSEUDORANDOM NUMBER GENERATION BASED ON THREE CHAOTIC MAPS

By THANE, ABHIJEET VILAS

2017

004.0151 THA

Project Guide :DR RAVINDRA CHAUDHARI

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Abstract

There are many applications, such as Monte-Carlo simulations, testing, banking, requiring very high run-times and secured random generators. Due to bitwise operations, hardware based random number generators are more efficient than software based. An FPGA based cryptographically secure pseudorandom number generator is proposed in this paper. This method uses a piecewise linear chaotic map along with a linear congruential generator to enhance the performance. It is used to shuffle the bits of the input initial vector. The chaotic map shows good bifurcation and has no periodic window. Piecewise linear chaotic maps are defined in analogue space but FPGA is a digital device, hence in order to implement the chaotic map on FPGA it is digitalized. The FPGA implementation not only increases the speed but also the security. Implementing the algorithm on FPGA was a challenge due to the finite precision problem. In this paper the hardware architecture is implemented using VHDL language and synthesized on Xilinx Virtex-2 FPGA. Simulation results of the proposed algorithm show that the maximum clock frequency is 373.218 MHz. The method yields a pseudo random bit sequence which successfully passed the rigorous National Institute of Standards and Technology(NIST) test.

[59] PR1801 HUMAN GAIT IDENTIFICATION ALGORITHM

By BRITTO, ARUN VINO

2017

612.76 BRI

Project Guide DR RAVINDRA CHAUDHARI

Abstract

The use of radar for geological exploration, among other applications, is gaining widespread acceptance. Specifically, radars are being used to characterize multilayered media. This has led to a whole new class of radars called GPR. The GPR is used to characterize surface and subsurface layers from recorded radar data, In order to achieve this we are faced with the problem of detecting weak signals buried in the clutter and noise. This makes it

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difficult to detect the closely spaced beat frequencies which correspond to the range of the objects present underground. The primary goal of this research is divided into two sections, the development of a GPR radar controller and a signal processing unit. The radar controller section is designed keep all the subsystems synchronized with respect to each other, these subsystems include the frequency sweep generator, the location monitoring subsystem and filter bank selection at the transmitter and receiver side. The signal processing section includes the implementation of an algorithm which will help detect closely spaced beat frequencies in the presence of noise. Once the beat frequencies are obtained other parameters such as depth and permittivity calculation can be done. This research work presents changes done to a homogeneous radar receiver with respect to the signal processing section, the RF mixer from which beat frequencies are obtained is shifted to the FPGA fabric using the concept of DDC. It also includes the use of a Modified Zoom FFT technique which is used to detect the closely spaced beat frequencies of interest. In this instead of using a single FFT on the decimated data, the decimated data is divided into smaller segments and a windowed FFT is applied on it to get more accurate results. A comparison done with other techniques such as FFT and MUSIC showed that the proposed technique was more effective to detect closely spaced beat frequencies in the presence of noise. A multistage decimation approach is used and it is implemented using a polyphase decimator and CIC filter structure to help with resource reduction in hardware.

[60] PR1802 DESIGN AND IMPLEMENTATION OF GPR CONTROL AND DATA PROCESSING SYSTEM

By FERNANDES, NEWTON

2018

621.3848 FER

Project Guide DR RAVINDRA CHAUDHARI

Abstract

The use of radar for geological exploration, among other applications, is gaining widespread acceptance. Specifically, radars are being used to characterize multilayered media. This has led to a whole new class of radars called GPR. The GPR is used to characterize surface and subsurface layers from recorded radar data, In order to achieve this we are faced with the problem of detecting weak signals buried in the clutter and noise. This makes it difficult to detect the closely spaced beat frequencies which

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correspond to the range of the objects present underground. The primary goal of this research is divided into two sections, the development of a GPR radar controller and a signal processing unit. The radar controller section is designed to keep all the subsystems synchronized with respect to each other, these subsystems include the frequency sweep generator, the location monitoring subsystem and filter bank selection at the transmitter and receiver side. The signal processing section includes the implementation of an algorithm which will help detect closely spaced beat frequencies in the presence of noise. Once the beat frequencies are obtained other parameters such as depth and permittivity calculation can be done. This research work presents changes done to a homogeneous radar receiver with respect to the signal processing section, the RF mixer from which beat frequencies are obtained is shifted to the FPGA fabric using the concept of DDC. It also includes the use of a Modified Zoom FFT technique which is used to detect the closely spaced beat frequencies of interest. In this instead of using a single FFT on the decimated data, the decimated data is divided into smaller segments and a windowed FFT is applied on it to get more accurate results. A comparison done with other techniques such as FFT and MUSIC showed that the proposed technique was more effective to detect closely spaced beat frequencies in the presence of noise. A multistage decimation approach is used and it is implemented using a polyphase decimator and CIC filter structure to help with resource reduction in hardware.

[61] PR1803 AN EFFICIENT MICROSTRIP PATCH ANTENNA FOR SPECIFIC ABSORPTION RATE REDUCTION IN HUMAN TISSUES

By PATIL,KAJAL

2020

621.3824 PAT

Project Guide DR UDAY PANDIT KHOT

Abstract

SAR is a value describing how much power absorbed in biological tissue when the Body is exposed to electromagnetic radiation. SAR is measured in units of power per mass (W/kg). The use of microstrip patch antenna for measuring SAR in human tissues leads to various effects such as thermal effect, cancer,

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cognitive effects, MRI biological effects, etc. So to avoid all these biological effects, there is a need of measuring and reducing the SAR. Two SAR measurement techniques mainly depend upon change in induced electric field and change in temperature. SAR can be measured using power absorbed by the tissue using HFSS. SAR can also be measured by electric and magnetic field distribution using FDTD method.

The SAR can be reduced with the help of metamaterials, electromagnetic band gap structures, slotting techniques, etc. all these techniques of SAR reduction can reduce the SAR value with different percentages. Techniques which are giving better SAR will be clubbed together. Here construct the antenna using two methods together such as slotting technique on patch and ground plane with defects. This dissertation demonstrates the technique for microstrip patch antenna to reduce SAR in the human body on an 800 MHz SAR was studied as well to illustrate how on-body communication or mobile phones antennas of GSM band might affect the human body. Patch with DGS can reduce SAR by 10.37% to 28.81% by varying the distance between patch and human tissue from 2mm to 10mm. Similarly patch with DGS and peripheral slotting can reduce SAR by 17.64% to 45.61% by varying the distance between patch and human tissue from 2mm to 10mm.

[62] PR1804 MULTIBAND RECONFIGURABLE ANTENNA FOR WIRELESS APPLICATIONS

By DUBAL,SONAL

2020

621.3824 DUB

Project Guide MRS.ANJALI CHAUDHARI

Abstract

In today's evolutionary world of wireless technology, reconfigurable antenna plays a very important role. Wireless technologies such as mobile communication, military, cognitive radio, radar, satellite communication are needed to be dynamic in their functions to improve the performance in changing scenarios. This can be achieved using a single reconfigurable antenna where various performance parameters like resonant frequency, polarization and radiation pattern are altered as per user end requirement. Proposed work presents compact, light-weight and low cost triband monopole frequency

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reconfigurable antenna for wireless applications. The antenna offers lowest band 1.9 GHz - 2.1 GHz (UMTS), middle band operates between 2.7 GHz - 3.1 GHz (Wi-MAX) while the highest band operates over 4.8 GHz - 8.6 GHz (WLAN and ITS). The lowest, middle and the highest operating bands yield 10%, 13% and 51.5% bandwidth respectively. A compact size antenna within a FR4 substrate board, of area  $20 \times 20 \text{ mm}^2$  makes it possible to be used within portable devices. The top view of the antenna structure comprises a hook shaped radiating patch along with p-i-n diodes, while a rectangular slot in the ground plane completes the resulting in different antenna configurations run single band, pair of dual band and triband response. To validate the proposed work prototype of the antenna is fabricated using the photolithography technology and tested. Simulated and measured return losses are in close agreement with each other. Other parameters like the radiation pattern of the antenna presented are observed to be stable.

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