DEPARTMENT OF ECE

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ADITYA

Institute of Technology and Management

(An autonomous institution)

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ADITYA INISTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
Department of Electronic and Communication Engineering

Vision of the Institute:

To evolve into a premier engineering institute in the country by continuously enhancing the range of our competencies, expanding the gamut of our activities and extending the frontiers of our operations.

Mission of the Institute:

Synergizing knowledge, technology and human resource, we impart the best quality education in Technology and Management. In the process, we make education more objective so that the efficiency for employability increases on a continued basis.

Vision of the Department:

Create high-quality engineering professionals through research, innovation and teamwork for a lasting technology development in the area of Electronics and Communication Engineering.

Mission of the Department:

1. To offer a well-balanced Program of instruction, lab practices, research & development activities, product incubation.

2. Develop accomplished technical personnel with a strong background on fundamental and advanced concepts, have excellent professional conduct.

3. Enhance overall personality development which includes innovative and group work exercises, entrepreneur skills, communication skills and employability.

4. Ensuring effective teaching–learning process to provide in-depth knowledge of principles and its applications pertaining to Electronics & Communication Engineering and interdisciplinary areas.

5. Providing industry and department interactions through consultancy and sponsored research.

Message from Dr. K. Someswara Rao, CHAIRMAN

At AITAM, we are committed to excellence in everything we do. We strive to mould the students in balancing intellectual and practical skills to become leaders in all the fields of Technical know-how and Management. We have created the finest facilities for the students to make the most of their scholastic pursuits. We are closely aligned with the corporate world which ensures exchange of ideas and experiences that keep our curricula focussed on current developments and challenges in the field of engineering. We are firmly committed to research and consulting activities to contribute to the development of the discipline of engineering. Our vitality lies in our spirit of innovation. Our strength lies in our pragmatic approach. Our success lies in our will to do.

Message Sri L.L. Naidu, SECRETARY

Aditya Institute of Technology and Management is founded to meet the increasing demand for competent engineering graduates. Within a short span of its inception, AITAM has grown to be a premier engineering college of its kind and has won laurels and kudos from the industry. The faculty and staff in AITAM are dedicated to providing first-class education that instils strong and potent basic knowledge for sound practice in science and engineering for the well-being of the society. The Institute offers curricula that nurtures creative thinking and prepares students for productive and rewarding careers. The Institute offers programmes that deepen learning experiences of our students and prepare them for successful careers as engineers.

Message from Prof. V.V. Nageswara Rao, DIRECTOR

Engineering education at AITAM is indeed a rewarding intellectual experience. The Institute prepares the engineering professionals of tomorrow imbued with insight, imagination and ingenuity to flourish as successful engineers. Our programs are attuned to the needs of the changing times. The classrooms are ultra-modern; the library and labs are cutting-edge; and all the members of the faculty are workaholic professionals and masters in their fields. Not surprisingly, our students are recruited by such renowned organizations as HCL, Satyam, WIPRO, INFOSYS, TCS, Visual Soft, Innova-Solutions and InfoTech. The exceptional dedication of our students, faculty and staff, and our collaborations with Industry and other institutions ensure that the Institute is well-poised to create a unique niche in the horizons of engineering education.

Message from Dr. K.B. Madhu Sahu, PRINCIPAL

It is only through knowledge that man attains immortality. Knowledge has to expand or grow to remain as knowledge. The road to excellence is toughest, roughest and steepest in the Universe. The world requires and honors only excellence. Available information has to be directed by wisdom and intelligence to create new knowledge. Promotion of creativity is the new role of education. It is only through creative thinking that the present and future problems can be addressed to find dynamic solutions. Technology should be used to help remove poverty from the world. In fact forty per cent of the world's poor are in India. Confidence leads to capacity. It is faith in oneself that produces miracles. Education at AITAM helps build character, strengthen the mind, expand the intellect and establish a culture of looking at problems in a new perspective. The student is put through rigorous training so that he can stand on his own feet after leaving the portals of the Institute.

Message from Dr. Sateesh Kumar, H.O.D of ECE

Aditya Institute of technology and management (AITAM) is one among the reputed engineering colleges imparting finest quality education. The department of Electronics and Communication Engineering was established in the year 2001. Our aim is to produce graduates capable of effectively using professional skills with values for betterment of society and to meet the varying demands of industry and research environment. The department is well equipped with significant infrastructural design and state of art laboratories for both academics and research purpose.

Our department has a fine blend of a team of qualified and experienced faculty. The faculty members have excellent academic credentials. The notable asset of our department is the available diversity of expertise and highly motivated, well experienced faculty members ensure quality education from our department. The faculty and students are associated with memberships of professional bodies such as Institution of Electronics and Telecommunications Engineering (India), Institution of Engineers (India), Indian Society for Technical Education.

Our students earned name and fame all over the globe and rendering best of their services to topmost companies. The department of ECE endeavors to provide to our students best professional opportunities and look forward their bright future. We as a team resolve to take the department to heights of success and prepare our students for future challenges. We are striving hard continuously to improve upon the quality of education. Our goal is to ensure that the education we provide opens the doorway to greater opportunities.

B.TECH PROJECT ABSTRACTS

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Evaluation of Radar Cross Section in Aerial Operations by using POFACETS for a standard Unmanned Aerial Vehicle (UAV)

P. Sirish Kumar, K. Krishnam Raju , G.Sateesh Kumar, M. Bala Krishna, P. Krishna Rao

Abstract: In military and common applications, radar assumes an exceptionally noteworthy job in exploring the vehicle, recognizing for flying machines, ships and so on. Radar cross section is a measure of a target's ability to reflect radar signals in the direction of the receiver. It is obvious that RCS depends on the shape of the reflecting objects. In this paper, a brief overview of various radars used in surveillance applications and radar cross section (RCS) measurement techniques are presented. The objective of this paper is to illustrate methods for obtaining the Radar Cross Section (RCS) of a typical Unmanned Aerial Vehicle (UAV) for various frequencies in radar bands. UAV technologies have advanced tremendously and are being developed successfully. These features lead UAV to patrol even in civil airspace for civilian applications. These objects operate with small radar cross-section and/or on low altitude which imposes security threat. Keeping this view the RCS of a UAV which are flying in civilian airspace has to be determined drastically for security purposes. Several shapes are considered for the estimation of RCS. The results on the variations of RCS for the above objects as a function of frequency, aspect angle are presented. The POFACETS plays a crucial role and provides the user an easy–to–use GUI that allows the input of all necessary parameters, while preventing erroneous data input and other user errors. In this paper the RCS of sphere, ellipsoid and UAV are determined. Index Terms: Radar, RCS, UAV, POFACETS, Ellipsoid.

Design and Performance Research of SlottedΠ Microstrip Patch Antenna for LTE Applications

M. Lakshmu Naidu, B. Rama Rao

Abstract --- This paper propose the design of microstrip antenna which is used in cellular communication application especially at LTE network. The antenna was printed using FR-4 substrate material with dielectric constant of εr =4.4 and thickness of h = 1.6 mm. The overall dimension of the antenna is 135mm x 32 mm x 1.6 mm with 50 Ω impedance. This antenna operates between 400 MHz to 900 MHz for return loss of less than -10 dB. The simulation results suggest that the antenna gain is 4.725 dB with omni-directional radiation pattern. The antenna is designed to operate in the 2800 MHz, 4100-6200 MHz, and 8.85 GHz 10.00GHz, frequency bands. The characterization of the antenna in free-space as well as in the proximity of the user hand is presented. The results confirm the excellent performance of the proposed diversity antenna. Index Terms --- Long-Term Evolution (LTE), Wireless Fidelity (Wi-Fi), π-Shaped

A Hypothetical Analysis on GPS Evolution, Error Sources, Accuracy Measures and Positioning Services

P Sirish Kumar

Abstract: People have invented different solutions to find out the location of a person or an object on the earth. In the beginning, mariners used angular measurements to calculate their location for celestial bodies such as the sun and stars. In the earlier 1920s, implemented a more sophisticated radio navigation scheme depends on radio waves that give access to the navigators to determine the direction of the transmitters. Soon after, the advancement of satellites made it achievable to transmit with high accuracy, line of sight radio navigation signals created a new era in the technology of navigation. To find the position of an object, a 2-dimensional navigation system called transit was used in olden days. This method was to set the basic building blocks to introduce the global positioning system. This new GPS concept provided outstanding innovative methods to find the position of an object to the public, scientists, military, etc. The predominantly GPS known as Global Positioning System is a range-based positioning system that yields an obscure object's 3D position on top of the earth. This system collects estimates or range data from realized emanating sources to determine the position of obscure objects and the system is also called as a positioning system based on satellites. The precision of the object location frequently relies on the error of the satellite clock, atmospheric delays, multipath, positioning of the satellite, noise and multiple parameters of the receiver. Mostly, none of the above parameters have consistent behavior worldwide and should be checked to provide an exact solution. This paper mainly focuses on the study of GPS evolution, error sources, popular accuracy measures and positioning services of GPS. Index Terms: GPS, accuracy parameters, precision, line of sight, multi-path, clock error, atmospheric delay

A COMPARATIVE STUDY OF WINDOWS FOR SPECTRAL ANALYSIS

 D.V.L.N.Sastry, B. Anil Kumar, P.Kameswar Rao, V.Laxmi, A.Jayalaxmi, J.Swathi

ABSTRACT - In this paper we presented a spectral analysis of different windows designed based on cosine functions. this paper includes comparative study of different windows based on their spectral characteristics like side lobe attenuation (SLA) half bandwidth (HBW) and side lobe fall of ratio (SLFOR).since windowing method one of the best method in the design of linear phase FIR filters using in digital signal processing applications like audio processing, video processing, speech processing and bio medical signal processing etc. Windows plays major role in design of Finite Length digital filters for removing pikes in stop band and improves pass band attenuation characteristics. And lot of research also done on windows. Many windows are developed based on their side lobe attenuation characteristics. Optimisation techniques also applied in the filed of window based FIR design, which shows better results compare to conventional methods. Here we proposed basic mathematical kernel functions to develop window functions

Performance Evalution of Gate Diffusion Input and Modified Gate Diffusion Input Techniques for Multipliers and Fast Adders design

Dr. V. Ashok Kumar, A. Jaya Lakshmi

 Abstract - Power consumption is the bottle neck of system performance in VLSI design. Minimization of power consumed by the circuit tends to improve the performance and reduce the cost of the system. Power consumption is mainly due to increased number of transistors and leakage power. The reduction of transistor count and leakage power is done by using techniques like "Gate diffusion input"(GDI) and "Modified gate diffusion input"(MGDI). Multipliers are vital components of any processor (or) computing machine. Performance of microcontrollers and digital signal processors are evaluated on the basis of number of multiplications performed in unit time. Moreover the speed of any digital system heavily depends on the fast adders. Hence, better multipliers and fast adders architectures are bound to increase the efficiency of the system. In this project, fast adders and multipliers design is proposed for low area and power consumption using GDI and modified GDI techniques. The simulated results are expected to obtain in micro-wind. The comparisons are to be made in terms of transistor count and power consumption using GDI and modified GDI techniques as well. The total architecture is designed CMOS technology using micro-wind. Keywords— CMOS technique, GDI technique, modified GDI technique, low power consumption, micro-wind.

Design, Simulation and Experimental Validation of Wideband DGS Circularly Polarized Micro Strip Patch Antenna For C-Band Satellite Communication Applications

Karedla Chitambara Rao

Abstract: Satellites are very prominent for current and future communication applications like broadcasting, 5G and Military Communications. Most of the Satellites are used for radio communication. For communicating purpose, the satellite antenna must have unique characteristics such as circular polarization, broad beam width and good axial ratio. In order to have such type of unique characteristics, the micro strip patch antenna is the suitable antenna for Satellite applications because of its advantages. In this paper, a Wide band DGS circularly polarized micro strip patch antenna has been proposed for C-Band Satellite Communication Applications. Two defects or slots are introduced in the ground plane and those are orthogonally overlapped to get the circular polarization characteristics. In addition to this, these two slots enhance the bandwidth of the patch antenna by tuned to different frequencies. Moreover, the patch with defective ground structure is simulated and fabricated. Also measurements are carried out and obtained results are compared with the simulated results. It is noted that all the simulated and measured radiation patterns of the antenna have been carried out for all the frequencies and data has been compiled. However, some of the simulated and measured radiation patterns are included in this paper due to space constraint. Keywords:Micro strip patch antenna, Defective Ground structure and C-Band Satellite Communication.

Implementation of CPW -Fed Hilbert curve Fractal Antenna for UWB Applications

Dr. Rama Rao Bonula

This paper proposes a compact Hilbert Curve Fractal Antenna (HCFA) design with the thoughts of the fractal concept. The conventional HCFA has been designed using copper clad of a 15.5 mm X 7.5mm with a thickness of 1.6mm on FR4 substrate (er = 4.4). Instead of separate ground plane, a CPW feeding technique is used to feed this HCFA. The antennas receive and transmit in different frequency resonances. The simulation was inhibited in the 3 to 12 GHz band. As per the standards of Fedaral Communications Commission (FCC), the UWB range is 3.1 GHz to 10.6 GHz. The Ultra Wideband (UWB) is hastily advancing as a high data rate wireless communication technology. This antenna is analyzed by using the concept of resonance frequency that depends on the dimension size of the antenna to yield the model of Hilbert curve. The complete design, simulation and all numerical simulations results have been performed using the Ansoft HFSS Software and fabricated prototype is measured by using Vector Network

Compact Rhombus Ring Dual Frequency Microstrip Antenna for Wireless Applications
B.Rama Rao,

Abstract: In paper, a low profile microstrip patch antenna with rhombus model is designed at an running frequency at 2.4 GHz, 5.2 GHz. Microstrip Patch Antenna are suited to non-plane and plane areas, uncomplicated and effortless to design by used Printed Circuit Technology, it is a mechanically vigorous when it is ascended on rigid places and when the particular patch design model and dimension were selected, it has adjustable in view of resonance frequency, radiation design, impedance and polarization. High Frequency Structural Simulator (HFSS) is a definite component method solver for structures of EM (electromagnetic). The outcome values are discussed and analyzed in view of S11 (Return Loss), 3D Polar Plot, Radiation design and Gain. The value of S11 comes out to be -14.16dB for the designed antenna. The antenna measured length is nearly half wavelength in the dielectric; it is a highly censorious parameter, which governs the antenna resonant frequency. And the final values are simulated using High Frequency Structural Simulator.
Keywords: Microstrip, Antenna, microwave, HFSS

GPS Receiver Position Interpretation using Single Point PVT Estimation Algorithm

P. Sirish Kumar

Abstract: In our day-to-day lives, we need to get the correct GPS location information. GPS is based on the calculation of the pseudo-range and four unspecified parameters, but the formula is not linear in navigation observation. A single point position algorithm can solve the nonlinear equation; the algorithm is based on Taylor linearization. This paper provides an overview of the single point PVT algorithm and presents the GPS satellite pseudo-range observation equations, typically over-determined as there are only four unknown satellites, but generally, more than four are monitored and thus more than four pseudo-range observation equations. Single point PVT estimation algorithm is used to solve pseudo range

observation equations in order to find position and clock bias solutions are described in detail. In this article, the position of GPS receiver is estimated w.r.t. to X, Y, Z Coordinates, in addition to that clock bias also estimated.

Adaptive Genetic Fuzzy Decisive Technique Based Moving Target Identification using Multichannel SAR Set-up

Eppili Jaya

Abstract: In the ongoing synthetic aperture radar (SAR) methodology, precise and efficient identification of moving targets is a prominent task. Fractional FT (FrFT) accumulates the energy of the required chirp signal in order to separate it as noise from the chirp. The proposed SAR Moving Target Identification (MTI) process is based on FrFT being combined with the definitive adaptive genetic or neuro fuzzy method. The correlation between the transmitted signal and the received signal's FrFT is determined, optimizing the appropriate signal energy and applying it to the decisive adaptive genetic fuzzy unit, which identifies the object location using the fuzzy linguistic rules adaptively. The simulation is conducted by changing the number of targets and number of iterations and the evaluation is performed based on parameters such as missed target rate, detection time and Mean Square Error (MSE), showing that the proposed Adaptive Genetic Fuzzy decisive MTI system located the object with a minimum missed target rate of 0.12 in 5.02s and MSE of 23377.4 Index Terms: Adaptive Genetic Fuzzy Decisive technique, multichannel SAR, Fractional FT, function of ambiguity, correlation

Millimeter Wave Channel Estimation and Beam forming Techniques

Y. Srinivasa Rao

Abstract: Millimeter-wave (mm-wave) frequencies offer higher bandwidth communication channels. Most of the wireless communication equipment operates with 6GHZ carrier frequencies, where the millimeter-wave communication systems are operated in the frequency range of 30GHZ to 300GHZ. Channel estimation will become a difficult task when the number of antennas is more than the number of radiofrequency chains. Millimeter-wave communication has received large attention from research fraternity and industry. In this paper, we listed the evolution and advancements in antenna beam forming, at the same time we outline some of the channel estimation techniques such as Auxiliary Beam pair (ABP), Adaptive algorithm based Codebook design(AABCD), Estimation of Signal Parameters by Rotational Invariance Technique (ESPRIT).

Implementation of Hybrid Algorithm Based on NSCT for Medical Image Fusion

A. S. Srinivasa Rao, M. Bala Krishna, P. Sirish Kumar,

Abstract: The process of combining the two different modal images into one single image is multimodal image fusion. The resulting image is helpful in the medical field for effective and better detection of disease and the processing of images; surgery, tumor recognition, illnesses, etc. In the only modes of medical images, the merged image attributes cannot be achieved and can be overcome with the image fusion of various modal images. A new hybrid

algorithm for directive multimodal image fusion will be built for this paper based on the non-sub-sampled contourlet transformation. The images will be fuse through the use of the proposed techniques and comparison with existing technological techniques, using quantitative and qualitative measures. MRI and positron-emission tomography (PET) are used. Quantitative steps, like the Entropy (EN) and Structural Similarity Index (SSIM), will be taken to verify the algorithms.