CONTENTS

1. Mission 10x faculty empowerment workshop

2. Indo US collaboration for engineering education (IUCEE) FLI 2010 workshop on "computer networks"

3. Interactive talk for the students of the society of automotive engineers

4. International conference on “recent advances in bioinformatics”

5. National seminar on frontier chemistry

6. English language teaching workshop on “raising language awareness in the classroom and developing language skills in the classroom”

7. Publications on engineering and applied sciences

8. Short research article

9. Students achievements
MISSION 10X Faculty Empowerment Work Shop held during 06-07-2010 to 10-07-2010

Indo US Collaboration for Engineering Education (IUCEE) FLI 2010 Workshop on “Computer Networks held during 12-07-2010 to 16-07-2010

An Interactive Talk for the students of the Society of Automotive Engineers on 2nd November 2010
School of Mechanical Engineering organized an interactive talk session with Sri Sanjay K Patro of Volkswagon Limited.

Mr Patro explained regarding the challenges and opportunities in current trends related to design and manufacturing aspects related to automotive engineering. Mr. Patro also visited the new design and fabrication centre for automotives in the School. Upon interacting with the students registered in the Automotive Society he expressed his happiness in the current ventures of the School in an application oriented arena.
International Conference on “Recent Advances in Bioinformatics” held during 3rd-5th September 2010

English Language Teaching Work Shop on “Raising Language Awareness in the class room and Developing language skills in the class room” held during 21-22-09-2010

Publications on Engineering and Applied Sciences

• P K Patra - A zero shifted SPIHT based SVC, IJEST, Vol. 2, No. 11, pp6278-6283, 2010

Abstract: In this work, we proposed a modified version of 3D SPIHT based video codec. The codec employs the SPIHT coding algorithm using 3-D spatio-temporal orientation trees in video coding, analogous to the 2-D spatial orientation trees in image coding. We have improved the coding efficiency of the 3D SPIHT based codec by adding a preprocessing step that we call zero-shifting. The video codec is fully embedded, so that different degrees of video quality can be obtained with a single compressed bit stream. The codec has been tested using both high motion and low motion standard QCIF video sequences at 10 frames per second. The cost for this embeddedness is the coding delay (latency) to accept 16 frames into a buffer. At low bitrates the proposed scheme outperforms the existing scheme and...
achieves a gain of 1.5 to 5dB in PSNR, depending on the type of video. We have implemented a Scalable Video Codec that produces a bitstream which supports spatial scalability. This layered based codec is proposed by partitioning the spatial domain frame into four groups and encoding them separately with 3D SPIHT kernel to produce the bit stream. This bitstream not only has spatial scalability features but also keeps the full SNR embeddedness property for only lowest resolution level. In fact, our scalable video codec can be realized for a parallel architecture which in turn will be suitable for efficient hardware realization.


*Abstract:* Digital camera is the main medium for digital photography. Digital image takes more memory space and more energy to store, as a digital camera operates on portable battery. Hence, it limits its performance and longevity. An efficient energy management is required to limit this drawback. This paper proposes a new technique by using Discrete Hartley Transform which will give the same result as that of the existing algorithms with low power consumption.


*Abstract:* Pre-processing is one of the vital steps for developing robust and efficient recognition system. Better pre-processing not only aid in better data selection but also in significant reduction of computational complexity. Further an efficient frame selection technique can improve the overall performance of the system. Pre-quantization (PQ) is the technique of selecting less number of frames in the pre-processing stage to reduce the computational burden in the post processing stages of speaker identification (SI). In this paper, we develop PQ techniques based on spectral entropy and spectral shape to pick suitable frames containing speaker specific information that varies from frame to frame depending on spoken text and environmental conditions. The attempt is to exploit the statistical properties of distributions of speech frames at the pre-processing stage of speaker recognition. Our aim is not only to reduce the frame rate but also to maintain identification accuracy reasonably high. Further we have also analyzed the robustness of our proposed techniques on noisy utterances. To establish the efficacy of our proposed methods, we used two different databases, POLYCOST (telephone speech) and YOHO (microphone speech).


*Abstract:* Investigations on an inclined-slot loaded proximity-coupled microstrip antenna are reported. The antenna has very small size, wide bandwidth and moderate gain and may be used as a small, compact antenna for 5 GHz band wireless communication. The antenna is designed using IE3D software, and the results are verified by measurement. Some of the parametric studies are reported.

**Udai Pratap Singh - Application of ionic liquid doped solid polymer electrolyte Ionics (Springer-Verlag), 2010**

*Abstract:* The electrical, structural, and photoelectrochemical properties of the polymer electrolyte PEO:NaI:12doped with an ionic liquid 1-ethyl 3-methylimidazolium dicyanamide (EMImDCN) have been reported. Incorporation of the ionic liquid (IL) increases the membrane homogeneity, decreased surface roughness, and enhances the short current (Jsc). Additionally, the doping of IL provides more charge carriers which enhances overall ionic conductivity (). The optimized was found at 40 wt.% IL composition. The fabricated DSSC using this new solid electrolyte showed 1.43% efficiency at 100 mW cm 2.


For some time, the chalcopyrite semiconductor CuInSe2 and its alloy with Ga and/or S [Cu(InGa)Se2 or Cu(InGa)(Se,S)2], commonly referred as CIGS, have been leading thin-film material candidates for incorporation in high-efficiency photovoltaic devices. CuInSe2-based solar cells have shown long-term stability and the highest conversion efficiencies among all thin-film solar cells, reaching 20%. A variety of methods have been reported to prepare CIGS thin film. Efficiency of solar cells depends upon the various deposition methods as they control optoelectronic properties of the layers and interfaces. CIGS thin film grown on glass or flexible (metal foil, polyimide) substrates require p-type absorber layers of optimum optoelectronic properties and n-type wideband gap partner layers to form the p-n junction. Transparent conducting oxide and specific metal layers are used for front and back contacts. Progress made in the field of CIGS solar cell in recent years has been reviewed.

**Abstract:** For some time, the chalcopyrite semiconductor CuInSe2 and its alloy with Ga and/or S [Cu(InGa)Se2 or Cu(InGa)(Se,S)2], commonly referred as CIGS, has been leading thin-film material candidates for incorporation in high-efficiency photovoltaic devices. CuInSe2-based solar cells have shown long-term stability and the highest conversion efficiencies among all thin-film solar cells, reaching 20%. A variety of methods have been reported to prepare CIGS thin film. Efficiency of solar cells depends upon the various deposition methods as they control optoelectronic properties of the layers and interfaces. CIGS thin film grown on glass or flexible (metal foil, polyimide) substrates require p-type absorber layers of optimum optoelectronic properties and n-type wideband gap partner layers to form the p-n junction. Transparent conducting oxide and specific metal layers are used for front and back contacts. Progress made in the field of CIGS solar cell in recent years has been reviewed.


**Abstract:** In this paper, mathematical modeling of the propagation of Love waves in a fluid-saturated porous layer under a rigid boundary and lying over an elastic half-space under gravity has been considered. The equations of motion have been formulated separately for different media under suitable boundary conditions at the interface of porous layer, elastic half-space under gravity and rigid layer. Following Biot, the frequency equation has been derived which contain Whittaker’s function and its derivative that have been expanded asymptotically up to second term (for approximate result) for large argument due to small values of Biot’s gravity parameter (varying from 0 to 1). The effect of porosity and gravity of the layers in the propagation of Love waves has been studied. The effect of hydrostatic initial stress generated due to gravity in the half-space has also been shown in the phase velocity of Love waves. The phase velocity of Love waves for first two modes has been presented graphically. Frequency equations have also been derived for some particular cases, which are in perfect agreement with standard results. Subsequently the lower and upper bounds of Love wave speed have also been discussed.


**Abstract:** The paper deals with Dynamic Voltage Restorer (DVR) that aims at the integration of series active filter with minimum VA handling. The DVR not only regulates the voltage at load end but also acts as series active filter. The scheme of DVR is modeled and simulated with MATLAB/Simulink under feedback and feed forward controller. It is also thoroughly analyzed, both from the point of view of the choice of the components and their ratings. The proposed scheme provides stability under varying gains thus eliminating the problem of tuning of conventional proportional and integral controller and improves the speed of response of the device. The results of simulation for the proposed scheme are presented.


**Abstract:** Soft-switching techniques have gained popularity in recent times because they offer many advantages over hard-switched PWM inverters such as higher efficiency, higher power density and better performances. The resonant topologies employing soft-switching are classified based on the location of resonant network in the inverter with respect to load and dc link. This is an exhaustive study of various resonant link inverter topologies that appeared in the literature in recent times. This critical literature review brings out merits, demerits, and limitations besides giving the basic operating principles of various topologies.


**Abstract:** Electrophoretic deposition of doped ceria has been carried out in non-aqueous solvent to prepare coatings on different substrates and free standing films. It has been found that uneven deposition occurred in ethanol, while in butanol deposition yield is low having very little variation with deposition time. On the other hand, good deposit obtained in acetyl acetone medium, but had a porous structure. The best result however was obtained in mixed solvent. Effect of adding charge modifying additives in the ceria suspension on the deposit microstructure has been studied. Mechanism of
charging in the non-aqueous medium to modify the surface properties of the suspended particles has been discussed.


Hexagonal fine aluminium nitride powder (size 5 to 7 μm) were synthesized by carbothermal reduction of alpha-Al₂O₃ (99.5% purity) in ammonia plasma using indigenously developed extended arc open plasma reactor. The formation of AlN was observed in a very short time period. The structural and optical properties of the product were characterized by XRD, SEM, FTIR and Raman Spectroscope. Well faceted crystals of AlN were observed in the SEM micrograph. The formation of hexagonal aluminum nitride with small amount of carbon was observed in the final product. The FTIR peak corresponds to hexagonal AlN was observed at 1357, 520 cm⁻¹. The A₁ (TO), E₂ (high), E₁(TO) peaks of Raman spectroscopy are observed at 612, 656, 667 cm⁻¹ respectively.


Hexagonal ultrafine aluminium nitride powder has been synthesized via carbothermal reduction of alumina in an in-flight thermal plasma reactor. The formation of AlN is confirmed from XRD report. The broad XRD peaks of the AlN suggest the powder to be ultrafine in nature. The product is further characterized by TEM, EDX and FTIR. The TEM report shows the average particle size of the powder to be around 50nm. The presence of Al and n in the product is confirmed from the EDX spectrum. Fourier transform infrared spectroscopy (FTIR) analysis implies the presence of AlN peak at around 544 cm⁻¹, 1353 cm⁻¹.


Power-system stability improvement by a static synchronous series compensator (SSSC)-based damping controller is thoroughly investigated in this paper. The design problem of the proposed controller is formulated as an optimization problem, and real coded genetic algorithm (RCGA) is employed to search for the optimal controller parameters. Both local and remote signals with associated time delays are considered in the present study and a comparison has been made between the two signals. The performances of the proposed controllers are evaluated under different disturbances for both single-machine infinite-bus power system and multi-machine power system. Simulation results are presented and compared with a recently published modern heuristic optimization technique under various disturbances to show the effectiveness and robustness of the proposed approach.


Abstract: This paper presents the applications of computational intelligence techniques to economic load dispatch problems. The fuel cost equation of a thermal plant is generally expressed as continuous quadratic equation. In real situations the fuel cost equations can be discontinuous. In view of the above, both continuous and discontinuous fuel cost equations are considered in the present paper. First, genetic algorithm optimization technique is applied to a 6-generator 26-bus test system having continuous fuel cost equations. Results are compared to conventional quadratic programming method to show the superiority of the proposed computational intelligence technique. Further, a 10-generator system each with three fuel options distributed in three areas is considered and particle swarm optimization algorithm is employed to minimize the cost of generation. To show the superiority of the proposed.


Abstract: It is a challenge to design long span suspension bridges to ensure stability in wind flow, because of their flexibility. The risk of flutter induced vibrations is significant when the torsional natural frequency is only slightly greater than the vertical natural frequency, which is
usually the case for slender long-span bridge decks. In recent years wind flow around bridges has been investigated using numerical methods such as Computational Fluid Dynamics (CFD). In current work, to transfer the continuous fluid flow into discrete grid cells, the flow domain is discretized by developing automatic mesh generation. Thereafter, the outcome of h-adaptive technique is discussed in this paper. Once appropriate grids are generated for the two different example bridge sections, the critical velocity for bridge flutter is evaluated. Great Belt East Bridge suspension span (GBEB) and Alternate Chesapeake and Delaware Canal Bridge (ACDCB) deck section are considered here as example sections.


**Abstract:** The present investigation deals with finding the trajectories of the drug dosed magnetic carrier particle in a microvessel with two-phase fluid model which is subjected to the external magnetic field. The radius of the microvessel is divided into the endothelial glycocalyx layer in which the blood is assumed to obey Newtonian character and a core the external magnetic field. The expression for the fluidic force for the carrier particle traversing in the two-phase fluid in the microvessel is obtained first. Several factors that influence the magnetic targeting of the carrier particle in the microvasculature, such as the size of the carrier particle, the volume fraction of embedded magnetic nanoparticles, and the diameter of the micro-vessel are considered in the present problem. An algorithm is given to solve the system of coupled equations for trajectories of the carrier particle traversing in the impermeable micro-vessel. Both the Herschel–Bulkley fluid and Casson models are considered to analyze the present problem. The expression for the fluid velocity in the impermeable microvessel is obtained using the analogy given by Decuzzi et al. (2006, “The Effective Dispersion of Nanovectors Within the Tumor Microvasculature,” Ann. Biomed. Eng., 34, pp. 633–641) first. Then the expression for the fluidic force for the carrier particle traversing in the microvasculature is made for different radii, distances and volume fractions in both the invasive and noninvasive cases.


**Abstract:** In this investigation we consider to extended the work of Furlani and Furlani [15] by taking non-Newtonian fluid model for the blood in the impermeable micro-vessel. The behavior of blood is considered as the Herschel-Bulkley fluid which is more suitable for the micro-vessel of radius 50 m. The expression for the fluidic force for the carrier particle traversing in the Herschel-Bulkley fluid is obtained first. Several factors that influence the magnetic targeting of the carrier particles in the microvasculature, such as the size of the carrier particle, the volume fraction of embedded magnetic nanoparticles, and the diameter of the micro-vessel are considered in the present problem. An algorithm is given to solve the system of coupled equations for trajectories of the carrier particle in the invasive case. The trajectories of the carrier particles are found in both invasive and noninvasive targeting systems. A comparison is made regarding the trajectories in these cases. Also, a prediction of the capture of therapeutic magnetic nanoparticle in the human microvasculature is made for different radii and volume fractions in both the invasive and noninvasive cases.


**Abstract:** The present investigation deals with finding the trajectories of the drug dosed magnetic carrier particle in a microvessel, which is subjected to the external magnetic field. We consider the physical model that was given in the work of Furlani and Furlani (2007, “A Model for Predicting Magnetic Targeting of Multifunctional Particles in the Microvasculature,” J. Magn. Magn. Mater.,312, pp. 187–193), but deviating by taking the non-Newtonian fluid model for the blood in the permeable microvessel. Both the Herschel–Bulkley fluid and Casson models are considered to analyze the present problem. The expression for the fluid velocity in the permeable microvessel is obtained using the analogy given by Decuzzi et al. (2006, “The Effective Dispersion of Nanovectors Within the Tumor Microvasculature,” Ann. Biomed. Eng., 34, pp. 633–641) first. Then the expression for the fluidic force for the carrier particle traversing in the
The geochemical association of some trace metals (Fe, Mn, Ni, Cu, Cr, and Pb) were sequentially extracted from bulk sediments of the Chilika lagoon, India. The low elemental concentration, except Pb, in the exchangeable phase suggests poor availability to bottom dwellers. However, slightly higher abundance of Pb in the exchangeable phase at station 4 (9.9%) and station 6 (9.5%) is mainly related with waste from major fishing jetties. The carbonate-bound phase reflects heavy metal distribution of detrital origin along with biological decomposition in the lagoon. A relatively higher percentage of Mn in the reducible phase is attributed to the flocculation of its colloids. The concentrations of Cu, Ni, and Pb show their higher affinity to the organic-bound fraction. The absolute metal concentrations in the residual fraction was Fe > Mn > Ni > Cu > Pb > Cr, which reflects the predominance of physical weathering, a high erosion rate, and a high sedimentation rate in the lagoon. According to Risk Assessment Code, Pb, Cr, and Mn at almost all sites remain in the medium-risk category and can pose some environmental problems, mainly to the benthic community. Multivariate statistics (i.e., factor analysis, FA) was applied to the data set of geochemical fractionation of heavy metals in sediments of a coastal wetland. In this study we present the usefulness of the FA technique for evaluation and interpretation of a large, complex metal fractionation dataset and the apportionment of pollution sources and factors, with a view toward better information on chemical processes occurring in brackish environments. The roles of textural characteristics, organic precipitation, oxy-hydroxide formation and the processes of flocculation and adsorption into fine sediments in different geochemical phases were evaluated. The interpretation of the distribution of metals in different phases related to the relative location of sampling and the environmental characteristics of the fluvial as well as the lagoonal environment.

**Indrajit Chakraborty -Wittig-selectivity in mixed ketones: exploring 1,3-interaction and enolization**

* Tetrahedron(Full Paper), vol. 66, pp164-171, 2010

**Abstract:** The present work explored the primary factors governing regioselectivity of writing olefination in bicyclo[2.2.2] oct-5-en-2-ones having 5-aryl or acyl or acyl substitutions. In absence of steric congestion less enolizable ketone kinetically favored the initial formation of the oxaphosphetane ring whereas, in presence of 1,3-interaction between phosphonium ylide and ketone substitutions could switch over the selectivity in other direction.

**Prasanta Rath -Application of Factor Analysis to Geochemical Speciation of Heavy Metals in the Sediments of a Lake System- Chilika(India) : A Case Study,**


**Abstract:** The geochemical association of some trace metals (Fe, Mn, Ni, Cu, Cr, and Pb) were sequentially extracted from bulk sediments of the Chilika lagoon, India. The low elemental concentration, except Pb, in the exchangeable phase suggests poor availability to bottom dwellers. However, slightly higher abundance of Pb in the exchangeable phase at station 4 (9.9%) and station 6 (9.5%) is mainly related with waste from major fishing jetties. The carbonate-bound phase reflects heavy metal distribution of detrital origin along with biological decomposition in the lagoon. A relatively higher percentage of Mn in the reducible phase is attributed to the flocculation of its colloids. The non-Newtonian fluid is obtained. Several factors that influence the magnetic targeting of the carrier particles in the microvasculature, such as the permeability of the inner wall, size of the carrier particle, the volume fraction of embedded nanoparticles, and the diameter of the microvessel are considered in the present problem. The trajectories of the carrier particles are found in both invasive and noninvasive targeting systems. A comparison is made between the trajectories in these cases in both the Casson and Herschel–Bulkley fluid models. The present results for the permeable microvessel are compared with the impermeable inner wall trajectories given by Shaw et al. (2010, “Effect of Non-Newtonian Characteristics of Blood on Magnetic Targeting in the Impermeable Micro Vessel,” J. Magn. Magn. Mater., 322, pp. 1037–1043).

Also, a prediction of the capture of therapeutic magnetic nanoparticle in the human permeable microvasculature is made for different radii and volume fractions in both the invasive and noninvasive cases.

**Samaresh Mishra -Effort Estimation Based on Complexity and Size of Relational Database System,**


**Abstract:** Software cost estimation is an important activity of software project management. Database plays a very important role in data centric software. In this paper a model for estimating the effort of database development based on complexity and size of the database of relational model has been proposed. The proposed work also includes the new metrics on estimation of complexity and size of the database part of data centric software. The metrics has been validated with student projects.

**Samaresh Mishra -A Study on Size and Complexity Metrics for Software Development Environment”**


**Abstract:** Software cost estimation has been an important but difficult task for software project management. The success of software development depends on the accurate and timely estimation of cost at the early phase of its development. Many factors contribute to the overall estimation process, but factors like size and level of
complexity of software affects more for a better estimation of effort and time of development. In this paper, the extensive study has been made on different metrics used for estimating size and complexity of software for both function oriented and object oriented development approaches. Again, the comparison has been conducted on the popular metrics sited by different researchers based on some factors related to their strengths and weaknesses and popularity has taken into our consideration.

  
  **Abstract:** This paper analyzes a finite-buffer renewal input single server discrete-time queuing system with multiple working vacations. The server works at a different rate rather than completely stopping working during the multiple working vacations. The service times during a service period, service time during a vacation period and vacation times are geometrically distributed. The queue is analyzed using the supplementary variable and the imbedded Markov-chain techniques. We obtain steady-state system length distributions at pre-arrival, arbitrary and outside observer's observation epochs. The analysis of actual waiting-time distribution and some performance measures are carried out. We present some numerical results and discuss special cases of the model.

  
  **Abstract:** Object-oriented programming has been considered a most promising method in program development and maintenance. An important feature of object-oriented programs (OOPs) is their reusability which can be achieved through the inheritance of classes or reusable components. Dynamic program slicing is an effective technique for narrowing the errors to the relevant parts of a program when debugging. Given a slicing criterion, the dynamic slice contains only those statements that actually affect the variables in the slicing criterion. This paper proposes a method to dynamically slice object-oriented (00)programs based on dependence analysis. It uses the Control Dependency Graph for object program and other static information to reduce the information to be traced during program execution. In this paper we present a method to find the dynamic Slice of object oriented programs where we are finding the slices for object and in case of function overloading.

**SHORT RESEARCH ARTICLE**

EPOXY/REDMUD-JUTE COMPOSITE: AN ALTERNATIVE MATERIAL TO WOOD
Dr.Dibakar Behera and Dr. Tapan Kumar Bastia, Chemistry Wing, School of Applied Sciences

Use of low cost, need based, affordable and location specific technology is of great importance for upliftment of economic standard of the people of under developing countries. As such in India around 70 % of total population lives in rural/semi urban areas and 42 % are below poverty line on national average. Therefore it has been thought proper to develop a simple technology with low cost and a saleable product for upliftment of standard of living. In this direction the use of lightweight, reasonably good strength and weather proof material, which can be used as a substitute of wood for door/window shutters in low cost housing projects, has been thought of.

National Aluminium Company has been established in the state of Orissa in the year 1982 with mineral beneficiation plant at Damanjodi, Koraput and Smelter, Captive power plant at Angul. During the process of extraction of alumina from bauxite ore at Koraput district, huge quantity of red mud is produced and thrown to the pond in wet process after treatment with caustic soda. The statistics reveal that with a capacity of 48 lakhs tonnes of ore beneficiation only around 16 lakhs tonnes of alumina is extracted and rest 32 lakhs tonnes goes to the stockyard as a by – product known as red mud. It means around 2.7 lakhs tonnes of red mud are produced per month. This gives rise to huge quantity of waste deposits and leads to environmental pollution. Under circumstances it has been thought and the research is going on for effective use of red mud thereby reducing the level of pollution and storage space requirements.

Since red mud contains TiO₂ and P₂O₅ which are toxic in nature much work has not been carried out for developing alternate products. However the R & D wing of NALCO (National Aluminium Company) in collaboration with Regional Research Laboratory, Bhopal have developed some composites by using red mud for structural application basically in building construction. Red mud, fly ash, polymer and jute fibres have been used to develop composites having better strength, termite and fungus proof along with
resistance to corrosion. Door shutters and panels have been developed with trade name as R – wood [1].

In this part of research, jute fiber–Epoxy-Red mud composites were prepared and different mechanical properties were studied. To improve the properties of the composites, jute fibers were treated with 2-hydroxyethyl acrylate (HEA)[2]. Comparative property studies are presented for HEA treated jute fiber–Epoxy-redmud composites and untreated jute fiber–Epoxy-redmud composites. In this investigation 5 ply of jute fabric had been reinforced in a matrix composed by red mud & epoxy with weight ratio(30:70), so that at a low cost thin sheets can be produced. This may be used as an alternate material to wood, which has not been carried out elsewhere.

The details of fabrication and some of the results are demonstrated here in figure-1, 2 &3.

![Composite Fabrication](image)

Figure 1: Fabrication of epoxy-red mud-jute fiber composite.

![Mechanical Properties of different composite system](image)

Figure 2: (a) Tensile strength, (b) Bending strength and (c)Bending E. modulus of different network systems

![Corrosion Tests for different Jute fiber composites](image)

Figure 3. Accelerated test on jute fiber composites at temperature 42°C.

From the results it has been verified that the water absorption capacity of jute fibre reinforced composite is very low where as its strength is very high. The corrosion tests conducted for three specimens indicate oxidation for jute fibre composites. Since the weight changes are very low, the materials may be recommended for use in saline environment. However prolonged test results would have given better results for consideration, which
may be carried out later on. Under circumstances it is recommended for use as an alternate material to wood for structural purposes specifically for low cost housing projects and members in marine application in saline environment. In future low velocity impact tests may be carried out to determine the impact strength of the above composite and also to use different types of other fibers for the above purpose.


**Fuzzy Logic and Applications**

**Dr. S. Nanda**  
**Professor of Eminence, Mathematics Wing, School of Applied Sciences**

Human brain has some special characteristic by which it is possible to learn and reason in a vague and imprecise environment. It has the ability to arrive at decision based on qualitative data in contrast to formal logic which demand precise and quantitative data. John von Neumann gave a serious thought in this direction during fifties, in his Silliman lecture which was to be delivered at Yale University during spring 1956 he wanted to give the improved idea of copying a simplified model of human brain for manmade machine. He could not deliver the lecture because of his ill health and could not complete the lecture note. The last section of the incomplete lecture note which was published by Yale University reads as ‘The language of Mathematics is not the language of human beings’.

After a gap of ten years L A Zadeh thought in this direction and he asked ‘Can computer be made to think like human beings?. Fuzzy set and fuzzy logic has come a long way since it was formally introduced by Zadeh in his classic paper ‘Fuzzy Sets ‘published in ‘Information and Control ‘in the year 1965. This theory is based on multi-valued logic in contrast to Cantor’s set theory which demands law of excluded middle and hence is in agreement with human thought process. Therefore the subject has found applications in every branch of knowledge. Many research investigations by mathematicians, scientists, social scientists, management and computer experts and engineers all over the world have been made in the theory and applications of the subject. Applications of fuzzy logic in decision making, pattern recognition, image processing, artificial intelligence, control system, neural network, and genetic algorithm and in many other areas have given significant results. Therefore the students and researchers of all branches of engineering such as : computer science, electronics, communication, electrical, mechanical, manufacturing, civil and mining etc. have enough opportunity to solve the real world problems with the help of fuzzy sets which could not be solved otherwise. Thus the subject has entered into the curriculum of many Universities in recent years.

There are some strong research centers all over the world in particular in USA, Japan, Europe and India in theory and applications of fuzzy logic. Some notable centers in India are IIT Kharagpur, IIT Kanpur, IIT Madras, ISI Calcutta, Banaras Hindu University, Delhi University, Cochin University of Science and Technology, Gauhati University, Tripura University and KiIT University Bhubaneswar. The center at ISI Calcutta has made significant contribution in application of fuzzy logic to image processing and character recognition of hand written manuscripts, the center at Calcutta University has contributed in fuzzy logic significantly and BHU an Delhi University have contributed more in fuzzy Topology.

Prof. S Nanda has made notable contribution in the application of fuzzy set theory and fuzzy logic to Algebra, Topology, Analysis, Sequence spaces, and optimization. He has introduced for the first time the concepts of fields, vector spaces, algebras, modules, and sequence spaces which has opened up new areas of research. Similarly the concepts of fuzzy convex functions and fuzzy variational inequality introduced by him has opened up new areas of research in fuzzy optimization.

**STUDENTS ACHIEVEMENTS:**

- Kiran Manisha Mohanty (4th yr. IT) won the title” Third Women Grandmaster” at the Parachute Advanced International Chess Tournament in BANGLADESH in 2010 & she
is the first person from Odisha to become a grandmaster.

• Satyanarayan Roy Mohapatra (4th yr. ETC) represented India in CHINA, as an India Youth Delegate for INDO-CHINA BETTER RELATIONSHIP.

• Satyanarayan Roy Mohapatra leaded the Senior NCC Division with a rank Senior Under Officer and won the Best Cadet Award & 1st Prize in the 61st Republic Day Parade for the Best Discipline Troop, KIIT University, Bhubaneswar.

• Sangharsh Soumein Satapathy (4th yr. ETC) & Rajesh Kumar Baral (KISS) represented KIIT University in Global walk Green Earth International Programme in SOUTH KOREA during 2010.

• Varinder Singh (4th yr. Mechanical) stood 1st in ‘India Youth Parliament Simulation’ organized by Confederation of India of Indian Industries-Young Indians (CII-YI) at Kochi, Kerala and his question was selected as the BEST Question of the Session.

• Swapnil Kumar Sharma (3rd Civil) presented his research paper at an International Conference i.e. The 2010 IEANG International Conference on control and Automation at Hong Kong.

• Varinder Singh (4th Mech.) Amrita Sarkar (ETC. 4th year), Aditee Amitabh (4th year ETC), Sangharsh Soumein Satapathy (4th Year ETC), Swarna Singh, Rudra Bhattacharya & Dibyadarshan Acharya, KIIT University stood 1st in Group Level & 3rd in All over India in 9th National Youth Parliament Competition organized by Ministry of Parliament Affairs, Govt. of India.

• Namrata Kar (ETC-2010 batch) was selected for the prestigious Scholarship by Common Wealth in the United Kingdom.

• Varinder Singh (4th Year Mech.) stood 1st in both Case study Solving and Mock Parliament in SYNTech-2010 conducted during the Annual Fest by Synergy Institute of Technology, Dhenkanal.

• Utkarsh Roy (4th Year CSE) & Smita Kausik (4th Year ETC) were selected to Represent India in the Technical Resource and knowledge Exchange Programme, 2010 and to attend the International Conference for Micro Manufacturing, 2010 organized by JICA & MOFA, Japan (15th Oct. 2010 to 31st Oct. 2010).

• Utkarsh Roy (4th yr. CSE) & Smita Kausik of (4th ETC) won 1st Prize, Suraj Kumar Gupta & Anjana Pradhan of KSBT won the 2nd Prize, Torsha Jena & Saswat Das of KIMS won the 3rd prize in ECO Quiz Competition organized at KIIT University.

• Nachiketa Panda & Amrita Pritam Jena (4th year Civil) won the 1st prize in MARCA DE FABRICA in “Kshitiji-2010”.

• Ram Sneha Sharma and Priyatosh (4th ETC won 1st prize in XPLDE (Robotics in KHITIJI-2010 at IIT KGP (28th-31st Jan 2010).


• Sujit Meheta, (4th year IT) bagged 1st prize in Quest of the Spring Fest’ Does Gray Matter’ ‘Bulls N Bears’ during KRITANSH-2010 and in Heads Tail (Alma Fiasta-10) during Q-Zone (Zazen-10).

• Sekhar Suman Basu Dash and Shashank Mittal (3rd Civil) participated in Zazen-10 at OEC, Burla and won 2nd prize and 3rd prize in Srizan-2010 (AD-DICT) conducted by Jadavpur University (18th-21st March 2010).

• Deepshikha Minz (3rd yr, Elect.), B. Nandini (3rd yr, Elec.), Bibhuddita Mishra (3rd yr, Elect.) & Raj Shah (3rd yr, IT) won the 1st prize in Topsy Turby (Dance Comp.) in Alma Fiesta at IIT, Bhubaneswar.

• Anamika (3rd yr, EEE), A. Bibhu Prasad (3rd yr, ETC), Reet Sundaram (3rd yr, ETC) & Anaya (3rd yr, Elect.) won the 2nd prize in Topsy Turby (Dance Comp.) in Alma Fiesta at IIT, Bhubaneswar.

• Pankaj Sahu (3rd yr, ETC) & Vikash Kumar (3rd yr, EEE) won the 1st prize in paper presentation at Samavesh-Tech fest of VSSUT at UCE, Burla.

• Saloni Satpathy (3rd yr, EEE) won the 1st prize in “SNSMT social Change Maker of 2010’ at IIT, Kharagpur.
• Shubham Chandra & Utpal Kiran won the 1st prize in Aeronautical Society of India (Aero Quiz-2010) at Hindustan Aeronautics Limited, Koraput Division on 2nd Oct, 2010.

• Dibyadarshan Acharya, (3rd yr, B.Tech) won the 1st prize in Vigilance Awareness Day Programme (Debate), Sr.Group in OUAT, Bhubaneswar on 30th Oct, 2010.

• Sharmistha Rout, 3rd yr, MBBS, KIMS, won the 2nd prize in Vigilance Awareness Day Programme (Debate), Sr.Group in OUAT, Bhubaneswar on 30th Oct, 2010.

• Satyashiva Das, 2nd yr B.Tech, won the 3rd prize in Vigilance Awareness Day Programme (Debate), Sr.Group in OUAT, Bhubaneswar on 30th Oct, 2010.

• Pankaja Sahu & Vikash Kumar of 3rd yr. EEE received prize for best innovative project at ISTE (Indian Society for Technical Education). This paper has also been sent to MSME, Govt. of India, for its approval.