Response Surface Methodology based Optimization of In-Situ Transesterification of Dry Algae with Methanol, H_2SO_4 and NaOH

Rahul Chamola, Mohd. Fazil Khan, Anna Raj, Manthan Verma, Siddharth Jain
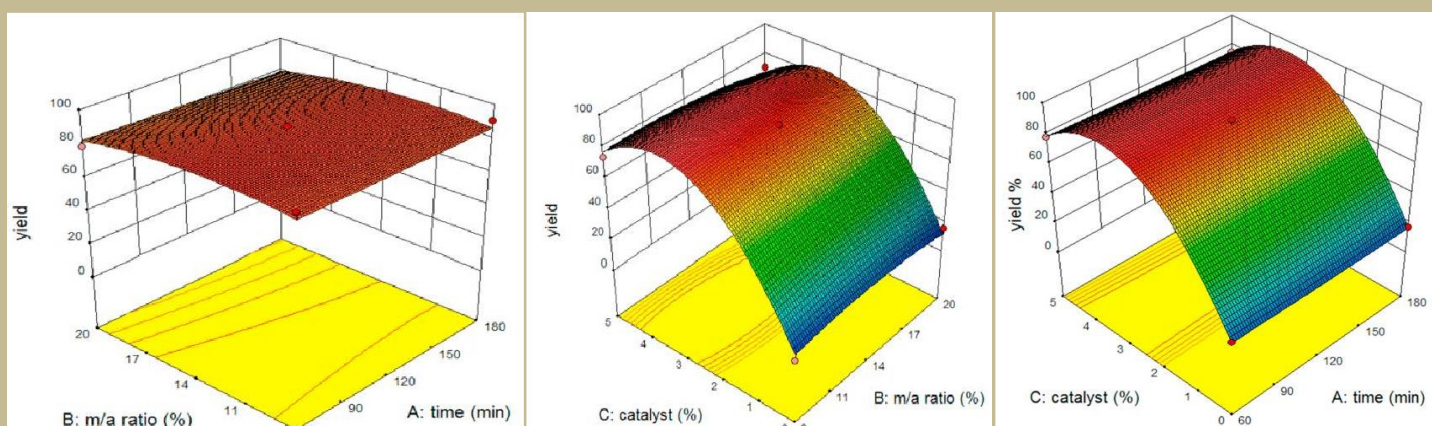
3D Response curve for Acid Catalyst

Highlights

- An investigation of in situ acid and base catalyzed transesterification of dry algae was carried out.
- Different experimental conditions were calculated using three independent process variables.
- Three independent variables were methanol to dry algae ratio, catalyst and time.
- The maximum output yields of 89.58% and 87.42% were achieved for acid and base catalyst respectively.

Correspondence:

Dr Siddharth Jain, Associate Professor, ME   Dr SP Gupta, Director General

Research and Development (R&D) activities are the backbone of academic life of any Institute. The initiatives of College of Engineering Roorkee are always in line with this objective. The basic aim has been to pursue knowledge through various programmes for developing and training highly skilled technical manpower. The College of Engineering Roorkee has research programs aimed at advancing knowledge, improve our world, and shape the future. Scientific and technological innovation has always created social and economic transformation. But the past decade showed, as few others have, the speed and scale at which such change can happen. If it continues at the present rate, the shape of the next ten years — from information technologies to applied bioscience, energy and environment — looks ever more contingent on the discoveries made in that time.

To showcase and enhance the COER activities in this regard, research newsletter is designed to highlight the wide range of ongoing research activities within the institute. It also focuses on industry/ Government funded projects, recently organized conference or symposiums, Research papers/ patent published by the faculty members and students. The Research newsletter is a bi-monthly publication.

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Title: Robust Sign Recognition for Hearing Impaired in Low Resolution, Variable Lightening and Variable Background Conditions

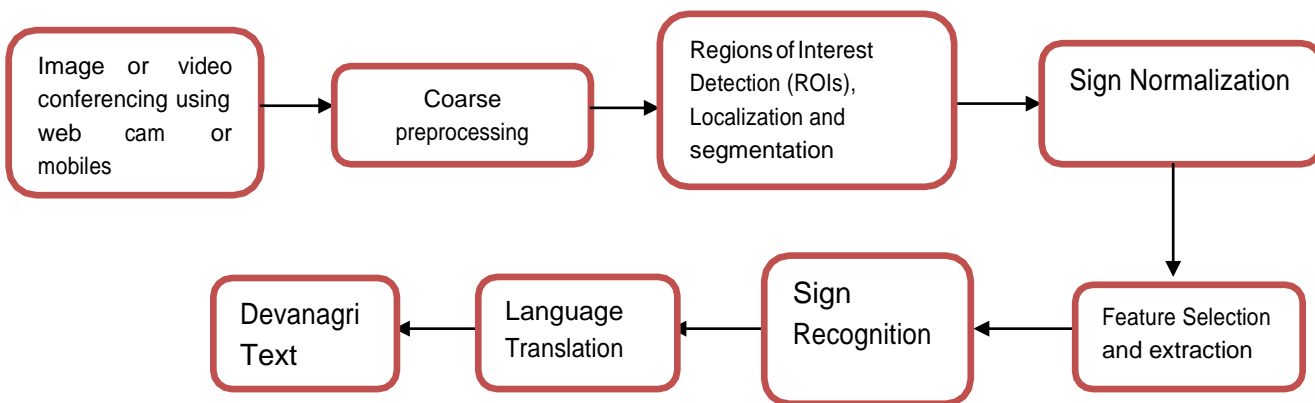| Dr B M Singh	Dr Mridula
Professor	Assistant Professor
CSE Department	CE Department
College of Engineering Roorkee	College of Engineering Roorkee
Principal Investigator	Co- Investigator

Abstract: The objective of the project is to develop a system for the Indian Sign Language (ISL) recognition system for hearing impaired people in low resolution and variable lightening conditions. This system is based on the capturing of sign gestures such as movement of finger, hand, arm, face and body using web or mobile phone's camera, and thereby conversion into digital text in the Devanagari language format.

This project aimed to perform sign recognition in some uncontrolled situations such as low illumination, presence of cluttered backgrounds, moving objects in the background, gesturing hand out of the scene during gesture, pause during the gesture, and presence of other people or skin colored regions. Proposed system are based on the seven steps i.e. capturing of images using mobile phone camera or web cam, pre-processing of captured images using binarization and noise removal approaches, hand gesture area detection, localization and segmentation from the images, captured gesture normalization such as slant and size, contour smoothing, next step after normalization is gesture sign recognition, and final step is language translation.

Outcome expected from the project

i. A prototype for the sign gesture recognition service for hearing impaired in low resolution and variable lightening conditions.

ii. Software for robust pre-processing of images or videos captured in low resolution and variable lightening conditions.

iii. A software for sign normalization

iv. A software for Feature Selection and Extraction

v. A framework for language translation

Image or video conferencing using web cam or mobiles → Coarse preprocessing → Regions of Interest Detection (ROIs), Localization and segmentation → Sign Normalization → Feature Selection and extraction → Sign Recognition → Language Translation → Devanagri Text

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Title: low temperature insitu transesterification of dry algae and dry Jatropha seeds and performance evaluation of IC Engine using biodiesel
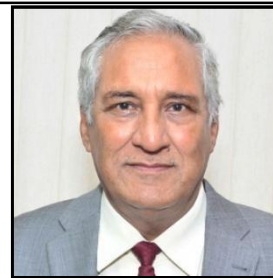
Dr Siddharth Jain	Dr Rajesh Kumar	Dr M.P. Sharma
Associate Professor	Assistant Professor	Professor
ME Department	ME Department	Department of Hydro and
College of Engineering Roorkee	College of Engineering Roorkee	Renewable Energy
Principal Investigator	Co- Investigator	IIT Roorkee
		Co- Investigator

Abstract: The free fatty acids of Jatropha curcas oil are very high and therefore 2-step acid base catalyzed transesterification technique is used for biodiesel production which is time and energy consuming. On the other hand the unsaturated fatty acids are very high in Jatropha curcas oil and biodiesel which cause it to be highly unstablized and responsible for increase in biodiesel viscosity with respect to time. Contrary to this algae oil is highly saturated oil and the amount of FFA is also very less which causes it to be converted into biodiesel using single step transesterification.

As a conclusion it is advisable to blend the Jatropha and algae oil in a suitable proportion so that FFA would be optimized so that one can convert the oil into biodiesel using single step transesterification. The resulted oil will also have less unsaturated fatty acids which ultimately increase the stability of the biodiesel. One step forward to this, the objective of the present work is to go for low temperature insitu transesterification of dry algae and dry Jatropha seeds and performance evaluation of IC Engine using biodiesel.
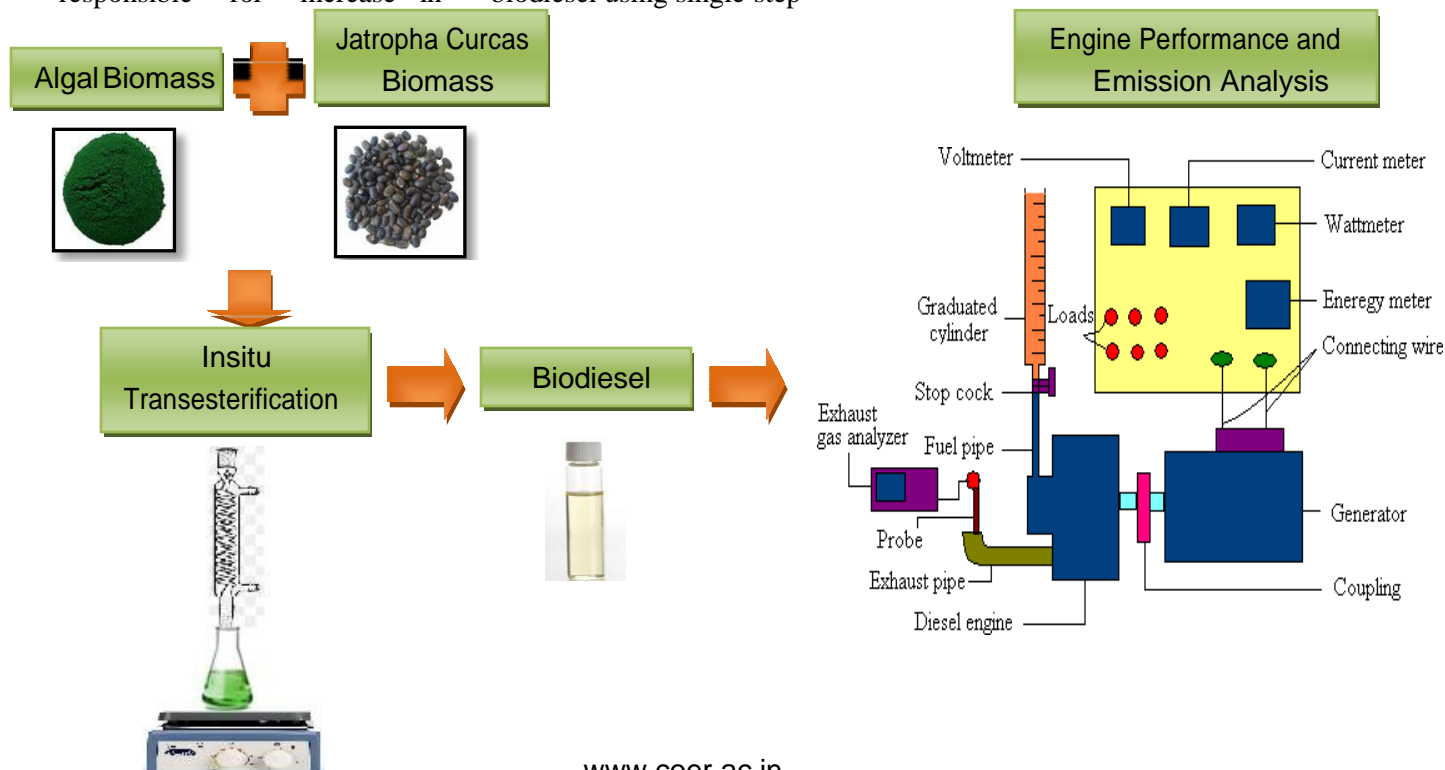
Title: Title: Design and Implementation of MIMO Antenna for Improved wireless Connectivity in Uttrakhand

Dr. Swati Yadav	Dr. Pinku Ranjan
Assistant Professor	Assistant Professor
ET Department	Atal Bihari Vajpayee-Indian Institute of Information
College of Engineering Roorkee	Technology and Management Gwalior
Principal Investigator	Co- Investigator

Abstract: Multiple Input Multiple Output (MIMO) is an antenna design technology in which multiple antennas are used on both transmitting and receiving side in order to increase the radio link capacity. In this technique, more than one data signal is simultaneously transmitted or received over a same radio channel.

The proposed research develops the prototype of MIMO antenna and also its implementation and integration in portable devices to solve the main problem of poor connectivity in hilly regions of Uttrakhand. Even through MIMO antennas are in use for wireless application, in the present condition use of MIMO antenna lacks because of its large size. Hence its implementation with portable devices is difficult. In this research PI proposes a very compact size multi band MIMO antenna for wireless application. Hence the contribution from the proposed research will advance the state-of-art of MIMO antenna as well as successful accomplishment of the goals of the proposal will have significant impact on wireless industry.

Title: Smart hybrid solar kitchen (for households and community cooking in Uttarakhand)

Mr. Varun Pratap Singh	Dr Siddharth Jain	Dr R.P. Saini
Assistant Professor	Associate Professor	Professor
ME Department	ME Department	Department of Hydro and Renewable
College of Engineering Roorkee	College of Engineering Roorkee	Energy
Principal investigator	Co- Investigator	IIT Roorkee
		Co- Investigator

Abstract: The proposed Smarlrt Hybrid Solar Kitchen can be treated as a complete solution, which can replace the current domestic kitchen and reduce the cost of cooking in a significa2n.t manner while maintaining all features, security and ergonomic comforts of the domesftic kitchen with a smart control panel The proposed system is covering below-mentioned objective:

1. Working in diffused light or in no light condition for at least 3 hours with an automa4tc tracking system, integrated with Solar Concentrator disk.
2. Working for all Indian style of cooking (boiling, steaming, frying, chapatti making, etc.)
3. Better heat transfer and thermal efficiency, insta5n.t heating and cooling, better temperature control, easy operation, and temperatu7r.e range should cater to the cooking requirements
4. Comfortable for cooking personals, having good ergonomic in design, could be operated by one person from one place and having better mountings for control and ease of mobility
5. Working in On-Grid and Off-Grid mood as a standalone unit and in all-weather condition.
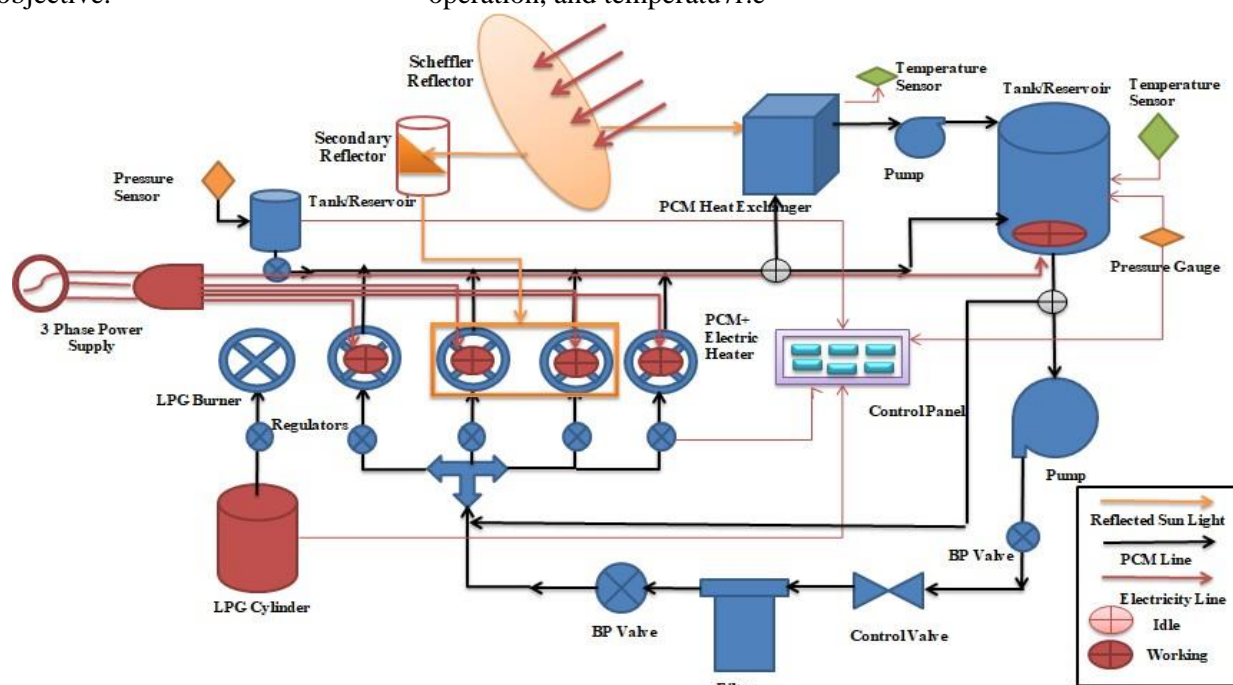
Schematic Diagram of Hybrid Solar Kitchen

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Title: Hybrid Renewable Energy at Remote Area of Uttarakhand- A Technoeconomic Analysis

Anuradha	Dr S.P.Gupta	Dr Sanjay Kumar Sinha
Sr. Asst. Professor and HOD	Director General	Professor
EN Department	College of Engineering Roorkee	Department of Electrical Engineering
College of Engineering Roorkee	Co- Investigator	Amity University
Principal Investigator		Co- Investigator

Abstract: Demand of energy in isolated parts of India cannot be solved by extension of grid power supply as it is neither economical at all as cost varies depending upon distance land and load demand. In view of this problem supply of power to remote area demands advanced skill with updated technical and economical strategies. Because of that, expensive and insufficient grid power in rural places has been replaced by renewable energy sources. Therefore, current work investigates the best hybrid technology for rural electric generation for a village area in Dehradun, Uttarakhand. The solution obtained from using HOMER software presents the economic feasibility of the hybrid generation system for a remote village in Chakrata in Dehradun, with latitude $30^0 42'00''$ N and longitude $77^0 51'00''$E.This paper contains four different type of Hybrid configuration. The optimization result obtained by using a hybrid configuration composed of a wind energy system, a solar PV system and a diesel generator used as a backup system. The study is also extended to analyze the effects of selection of fuel in diesel generator in Hybrid Optimization Model for Electric Renewable (HOMER) software tool on the performance indicators. A sensitivity analysis is demonstrated to examine the effects of various input cost parameters on the COE , NPC & emissions (in case of biodiesel blending).
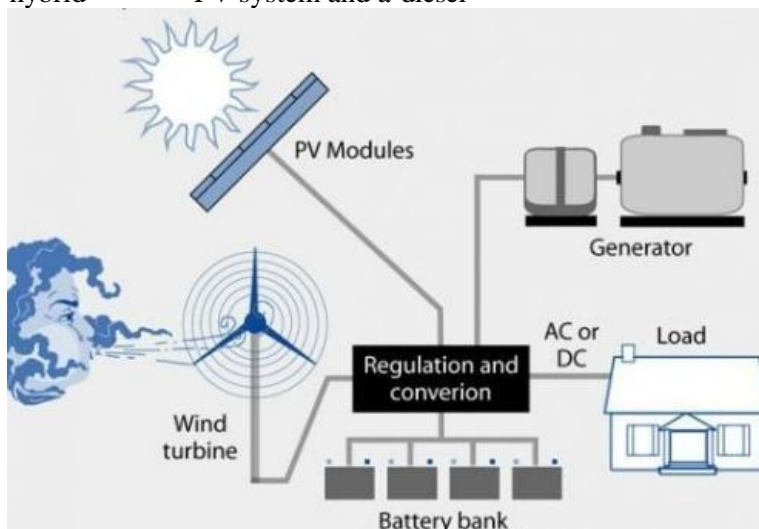
Hybrid Energy System

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Title: Combustion, Performance and Emission Analysis of Pine oil based Biodiesel fueled DI Diesel Engine.

Dr. Rajesh Kumar	Dr. Siddharth Jain	Dr. Sudhakar Subudhhi
Assistant Professor	Associate Professor	Associate Professor
ME Department	ME Department	Mech. & Ind. Engg. Department
College of Engineering Roorkee	College of Engineering Roorkee	IIT Roorkee
Principal Investigator	Co- Investigator	Co- Investigator

Abstract: Diesel engines are widely used for transportation due to higher fuel efficiency. Biofuels having the properties similar to diesel has been proved a suitable alternative to replace the petroleum diesel. Due to its oxygen content, biofuel leds to complete combustion in diesel engines. Triglyceride oil (TG oils) and turpene oil (light oil) can be used for the production of biofuels. Turpene oils are available in some plant species namely eucalyptus, pine tree, etc. Pine trees are one of the major causes for fire hazards in hilly regions. Utilization of pine products can help in limiting the fire hazards in hilly regions.

Pine trees can grow up to 40 meters tall, have a flat crown and a reddish-brown, deeply fissured bark, needle-like gray-green leaves that grow in pairs, orange-yellow flowers and pointed brown cones. Pine oil is pale yellow in color with a forest smell, alcoholic compounds and watery in viscosity. The main chemical composition of pine oil is α-turpene and 3-carene.

The main objective of this project is to improve the combustion, Performance and Emission characteristics of pine oil fueled small DI Diesel Engine. Combustion in diesel engine is a complex phenomenon due to heterogeneous combustion. Combustion depends on spray characteristics that can be improved by varying injection timing and injection pressure. In the present work experiments will be performed with pine oil and its blends with N-Butenol. The results will be compared with petroleum diesel. The experiments will be conducted according to layout suggested by Design of Experiments to reduce the number of experiments. Fuel blend ratio and engine parameters like injection timing and injection pressure will be optimized using Optimization Techniques.

Title: Interlocking Plastic Pavement Block

Dr Mridula
Assistant Professor
CE Department
College of Engineering Roorkee
Principal Investigator

Mr Aman Kumar Mishra
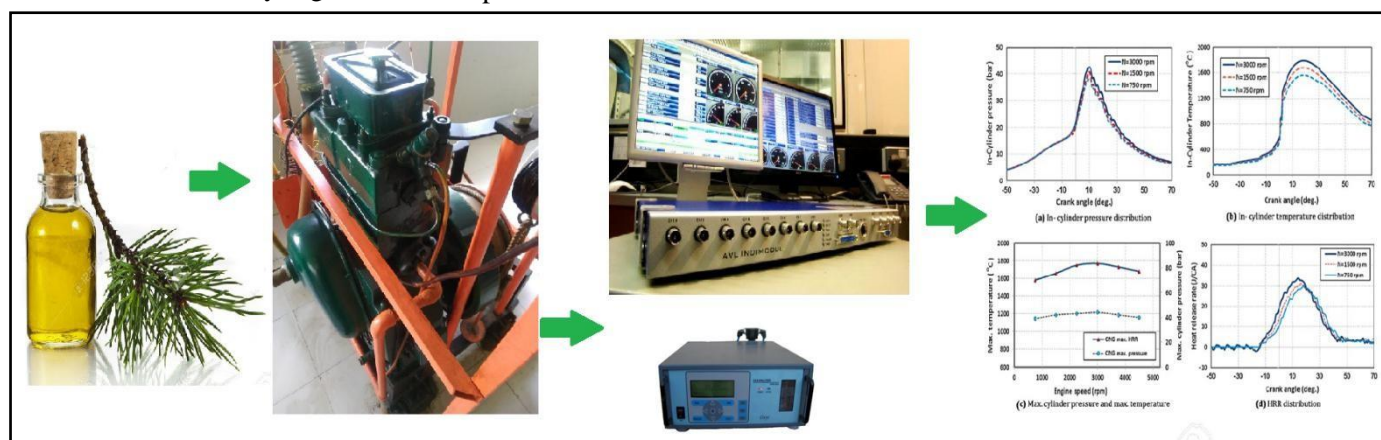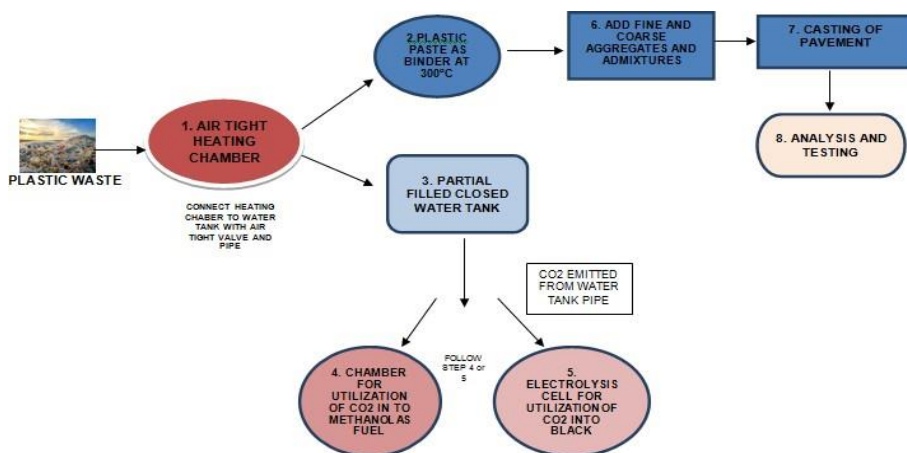CE Department
College of Engineering Roorkee
Co- Investigator

Abstract: The objective of this project is to develop the technique for preparation of interlocking pavement block using the plastic wastage as a principle binder without creating any pollution in surroundings and also to evaluate its engineering properties. This project work will comprise with three stage objectives; in first stage this project work will be focused on the utilization of plastic waste in the mix as complete binder with the help of chemicals to improvise the behavior of plastic waste as binder. The second stage of project work will be focused of the environmental impact during the process of waste utilization, in which the project work will be concentrated on the developing the methodology of waste utilization without creating any pollution in the environment, during the process of plastic waste conversion in to binder many type of toxic gases emitted, which will be utilized in secondary application. Third stage of project work will be focused on the attaining the engineering properties of pavement block as like durability, strength, adequate friction, block life span, aesthetic appearance, ecofriendly, shape and size, stability, easy installation and interlocking pattern, manufacturing cost, easy transportation in bulk without damage and the actual performance and feasibility test of pavement block will be also tested in application field.

Title: Multi-parabolic flat plate solar collector for space heating system in Himalayan region

Dr Nitesh Dutt	Dr Rajesh Kumar	Dr Krishnan Murugesan
Assistant Professor	Assistant Professor	Professor
ME Department	ME Department	Mechanical and Industrial
College of Engineering Roorkee	College of Engineering Roorkee	Engineering Department
Principal Investigator	Co- Investigator	IIT Roorkee
		Co- Investigator

Abstract: It is planned to design and fabricate the solar collector experimental setup at Institute. Two cases would be compared, in which thermal performance of solar collector with and without Ground Source Heat Pump (GSHP) would be done. In first case, experiment would be conducted with the use of solar collector at College of Engineering Roorkee (COER). In second phase, experiment would be done at IIT Roorkee, where IIT Roorkee has existing 120 m bore for GSHP having 9 inch pipe diameter. A comparative study would be done and electrical energy saving study would be conducted. Figure 1 shows the layout of the experimental setup in which solar collector and GSHP is integrated. Energy from the ground and solar collector would be absorbed through flowing fluid, which acts as heat exchanger for the refrigeration system used for space heating in winter season.
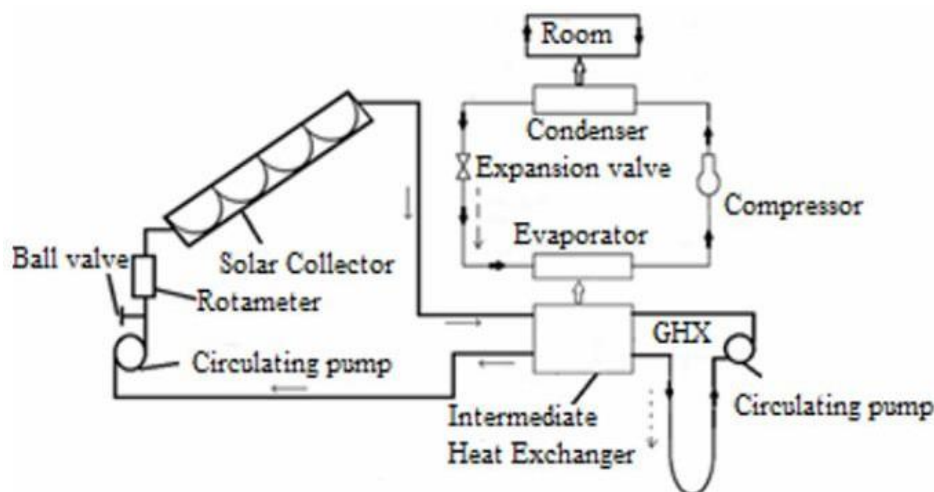
Schematic diagram of SAGSHP

Title: Development of a sustainable model for innovation ecosystem of Uttarakhand, India

Funding Agency: TEQIP-3, UTU

Dr Himadri Phukan
Associate Professor
Management Department
College of Engineering Roorkee
Principal Investigator

Dr Prof. Anil Kumar
Associate Professor
Mechanical Engg. Department
Delhi Technical university (DTU)
Co- Investigator

Abstract: The scope of the present proposal includes collecting data on innovation activities from various government departments, industries, leading academic institutions of higher learning, leading R&D institutes/laboratories and centers in India. The following objectives will be targeted –
To study the present innovation eco-system in India; To identify the challenges to be addressed for strengthening the innovation eco-system; To develop a model for sustainable innovation eco-system in India; To outline future opportunities in India with an advanced innovation eco-system. The obtained data will then be analyzed to identify the challenges and limitations of the present innovation ecosystem in India. The present models of innovation ecosystem practiced by some of the developed counties such as USA, UK, Japan, Germany etc. will be studied. The Indian system will analyze vis-à-vis the performing innovation models. Studies will be carried out to align the Indian innovation ecosystem with the global innovation ecosystem.
Sustainable model Development – A model will be developed based on the data and the prevailing socio-economic system in India for developing a sustainable innovation ecosystem that will be sustainable. A proposed methodology of the model is shown in Figure 1.
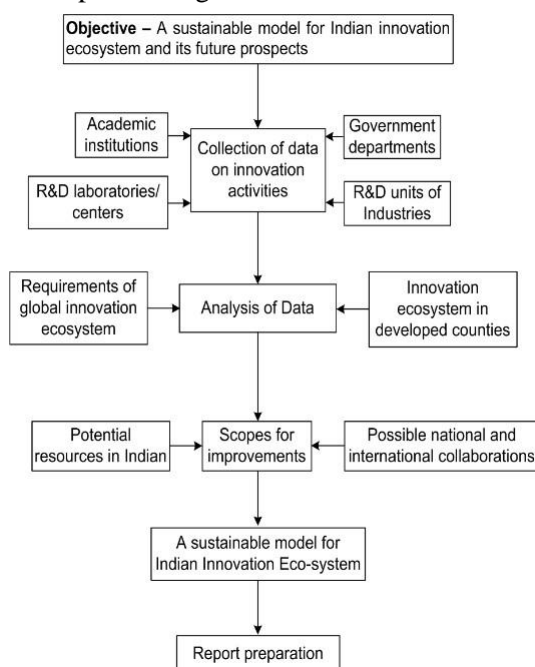
A proposed Methodology for the proposed project

Title: Ultrasonic & Physico-Chemical Stydy Of Biofules

Dr CK Bhardwaj	Dr VK Singh
Assistant Professor	Associate Professor
CY Department	CY Department
College of Engineering Roorkee	College of Engineering Roorkee
Principal Investigator	Co- Investigator

Abstract: As the state of Uttarakhand is rich in biomass resources specially Algae which is undiscovered and unused up to the mark therefore present project is focused on different types of algae as a solute and it will be studied with the different solvents (ethanol, methanol & propanol). By this study we can select the appropriate solute and solvent for the production of good bio fuel. Such type of study is very useful in giving insight into the structure, solute –solvent interaction and bonding of associated molecular compound. Ion-ion and ion – solvent interactions play an important role in deciding the structure and properties of different biofuels. Literature survey reveals that molecular interaction between different types of Algae and alcohols have not been studied so far through ultrasonic measurements. Therefore in our present project the interaction of alcohols with Algae will be studied ultrasonically. The objective of the present study is to analyze the effect of temperature on ultrasound velocity, density, & viscosity have been determined by measuring the thermodynamic parameters at 30ºC, 35ºC and 40^{0}C. The solutions of various concentrations of each Algae were prepared by adding weighed quantity of solute in known volume of samples. The nine systems are so prepared that entire range is covered.
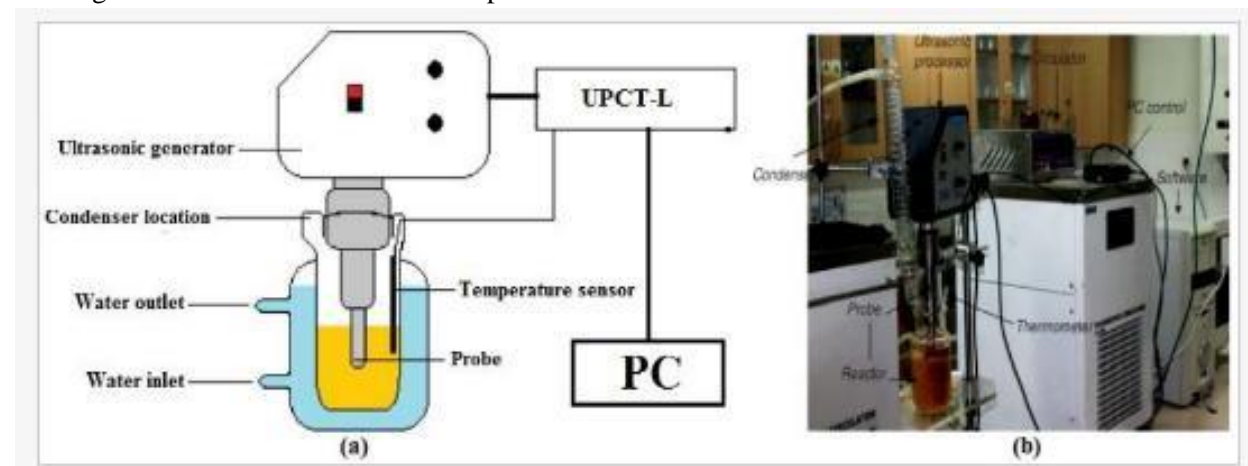
Title: Automatic sketch packing station for Luxor sketch for 2 lakh sketch packet packing per day

Funding Agency: Texplas Pvt Ltd, Haridwar

Mr. Varun Pratap Singh	Mr. B D Patel
Assistant Professor	Assistant Professor
ME Department	ET Department
College of Engineering Roorkee	College of Engineering Roorkee
Principal investigator	Principal investigator

Abstract: Texplas Private Limited having order of 5 lakh sketch pen production per day from Luxor company, which will further increase up to 10 lakh sketch per day. To meet this demand company having their own production facility as well as a separate packing facility where 60+ employees are involved in packing process. Currently Texplas having five line operating in parallel mode with 10 operator associated with each line and having a packing capacity of 8400 packets in 12 hours shift. To meet current demand company is operating in 12-hour shift mode with one shift with 60 employees. Currently company having huge operating cost due to manual operation in packing which is more than 70 lakh rupees per annum. Currently company applied zero automation in packing facility which can be father improve to semi-automation to fully automation. Objective:

To develop Semi-automatic packaging machine for Luxor sketch pens with production rate of 2, 00, 000 Sketch pen per day

Reference Setup CADD Design

Working Scale Model of proposed machine

Title: Design a Smart Energy Controller for Home Appliances using DR & IoT

Dr. Adesh Arya	Mr. Dhanneshwar Kumar
Associate Professor	Assistant Professor
EN Department	IT Department
College of Engineering Roorkee	College of Engineering Roorkee
Principal Investigator	Co- Investigator

Abstract: Now-a –days, the electricity prices is varying at every 15 minutes interval at the whole sale market of electricity. Till date, the consumers is paying the fix electricity price per unit in retail market and continue received the electricity during whole day in distribution side. As per the Smart Grid technology, the electricity supply will be providing according to real time prices (RTP) in future. Due to this phenomenon the consumers can be save electricity bill and load management profile can be managed easily. The proposed smart energy controller will be helpful to maintain the supply – demand energy gap. The proposed research will be beneficial for consumers as well as utilities. The objectives of the project are:

1. To develop a mathematical model for smart household appliances

2. RAC and EWH. To design a novel demand response algorithm based on real time prices (RTP)

3. To implement the optimization techniques and interface to hardware prototype

4. To implement home area network (HAN) and IoT for Smart Energy Controller and household appliances
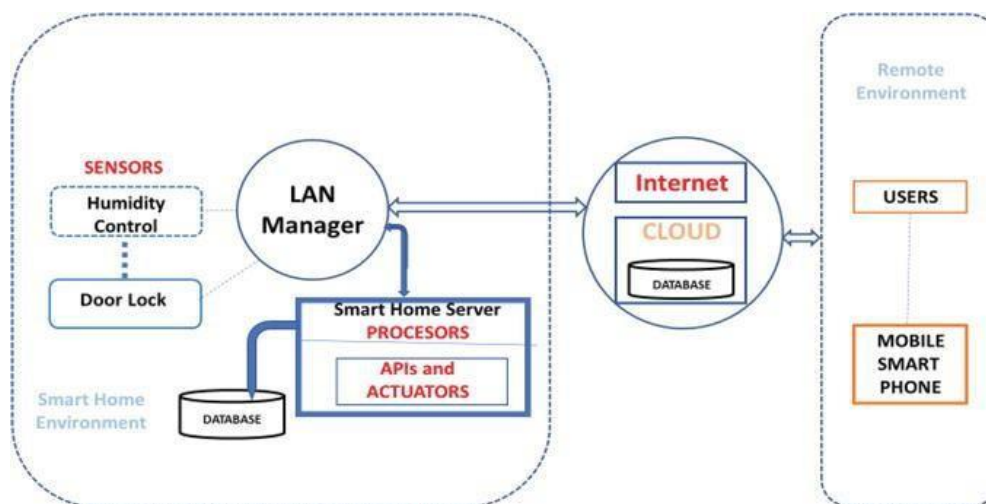
Smart Home System based on Internet of Things

Title: Title: Design and Implementation of MIMO Antenna for Improved wireless Connectivity in Uttrakhand

Dr Gunjan Agarwal
Associate Professor
ME Department
College of Engineering Roorkee
Principal Investigator

Abstract: Abstract: Machining is an important manufacturing process in which required products are being obtained by removing excess material using cutting tool in the form of chips. Machine tool is being used to obtain relative motion between cutting tool and work piece. Performance of machining processes depends on many process parameters. In which speed, feed and depth of cut are important process parameters. Initially these parameters are being selected on the basis of minimum manufacturing cost and maximum production rate surface finish and material removal rate. These days environment protectionis an important criteria. Products should be produced using lesser resources and at the same time pollution should be less. Machining is producing lot of solid, liquid , gaseous wastes. As machining is a very energy intensive process , lot of carbon footprints are produced in energy consumption during machining and in energy generation also. In Uttarakhand where lot of CNC machines are being used in industrial areas,it is important to reduce resource consumption and less pollute the environment. As 99% of environmental pollution is due to energy consumption in machine tools so it should be minimized. In the present problem, parameters are being selected on the basis of minimization of energy consumption in machining. At the same time material removal rate should be maximum and surface finish at the required level.Experiments are being performed using Response surface methodology.
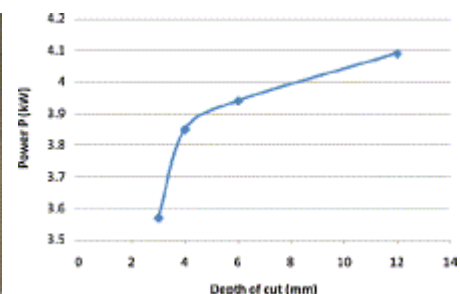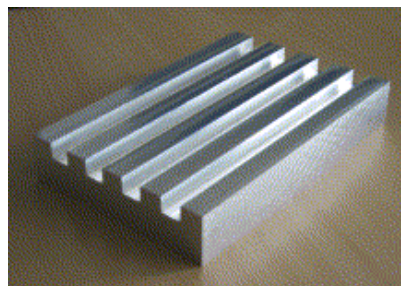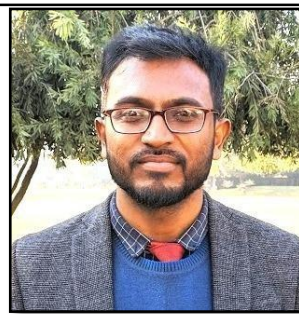
Title: Performance optimization of pine oil based biofuel fueled Diesel Engine.

Dr. Rajesh Kumar	Dr. Siddharth Jain
Assistant Professor	Associate Professor
ME Department	ME Department
College of Engineering Roorkee	College of Engineering Roorkee
Principal Investigator	Co- Investigator

Abstract: The main aim of this project is optimization of performance parameters of pine oil based biofuel fueled small DI diesel engine. The performance of diesel engine is analysed with Brake Thermal Efficiency and Brake Specific Fuel Consumption. As the performance of diesel engine is entirely different when it is fueled with biofuels other than diesel. This variation in the performance in manly due to variation in fuel characteristics such as viscosity, density and calorific values of biofuels. Hence to improve the combustion and performance of biofuel fueled diesel engine it is necessary to operate the engine on optimized engine parameters.

Optimization is fascinating tool to improve the performance of any system. Various optimization techniques such as Taguchi method, Response surface methodology, artificial neural network, Genetic algorithm and other nature inspired optimization techniques have been used for the optimization.

In the present work, taguchi technique with Artificial Neural Network is proposed for the optimization of biofuel fueled engine operating parameters. The pine oil will be used as biofuel. The potential of pine oil to replace the conventional diesel fuel will be observed. Various blends of pine oil with diesel will be used up to 100%

(pure) pine oil and the performance will be compared with diesel. To find the optimized percentage of pine oil, engine load and injection parameters experiments will designed with design of experiments using Minitab software. Further, experiments will be performed according to the layout given by DOE. Analysis of variance (ANOVA) will be used for optimization of engine parameters. Once the optimized combination is obtained, confirmatory tests will be performed on given combination to validate the optimization results.
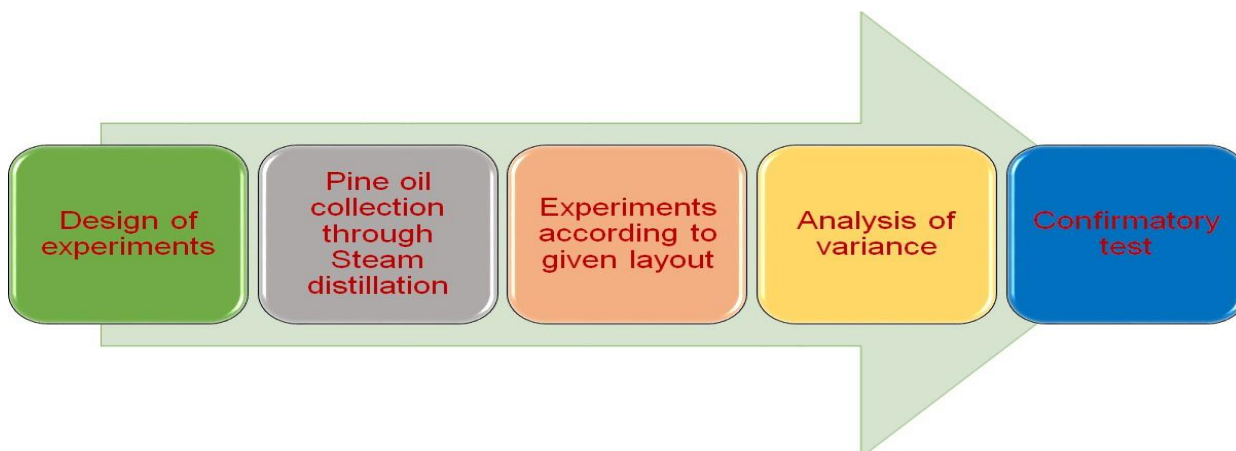
Design of experiments → Pine oil collection through Steam distillation → Experiments according to given layout → Analysis of variance → Confirmatory test

Title: Title: Design and Implementation of MIMO Antenna for Improved wireless Connectivity in Uttrakhand

Dr. Swati Yadav
Assistant Professor
ET Department
College of Engineering Roorkee
Principal Investigator

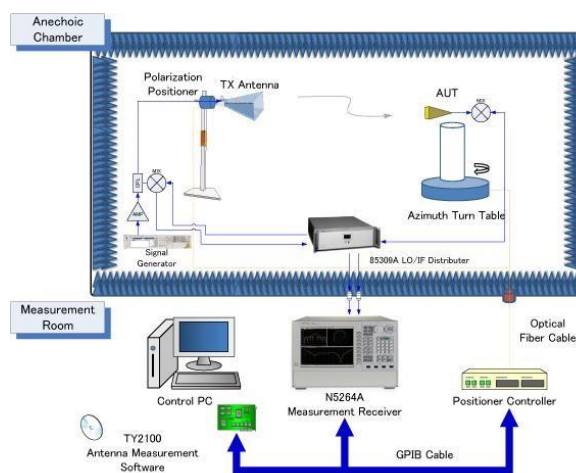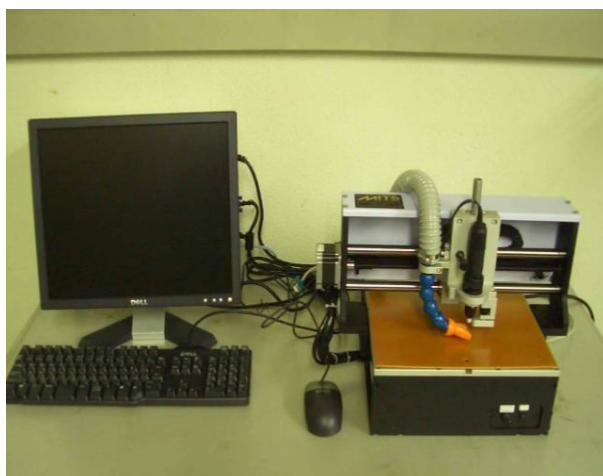**Abstract:** Multiple Input Multiple Output (MIMO) is an antenna design technology in which multiple antennas are used on both transmitting and receiving side in order to increase the radio link capacity. In this technique, more than one data signal is simultaneously transmitted or received over a same radio channel.

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1. Kumar S, Jain S and Kumar H, Implantation of Adaptive Neuro-Fuzzy Inference System and Artificial neural Network for Biodiesel Production From Jatropha-Algae Oil, International Conference on Artificial Intelligence and Applications (IEEE-COER-ICAIA-2019) November, 20, 2019
2. Singh BM, Kannojia R, Chauhan M, Indian Sign Language Recognition System for Hearing Impaired People, International Conference on Artificial Intelligence and Applications (IEEE-COER-ICAIA-2019) November, 20, 2019
3. Verma KK, Singh BM, Kumar D, Chauhan H, 3D Human Activity Recognition in RGB Videos using Convolution Neural Network, International Conference on Artificial Intelligence and Applications (IEEE-COER-ICAIA-2019) November, 20, 2019
4. Painuli D, Mishra D, Approach to the Diagnosis of Parkinson's Diseases, International Conference on Artificial Intelligence and Applications (IEEE-COER-ICAIA-2019) November, 20, 2019
5. Agarwal G, Khare MK, Energy Consumption in Machining Process-A Sustainable Manufacturing Approach, International Conference on Artificial Intelligence and Applications (IEEE-COER-ICAIA-2019) November, 20, 2019
6. Yadav R, Garg S, Malik S, Yadav S and Pal A, Thorax Disease Detection Using Artificial Intelligence, International Conference on Artificial Intelligence and Applications (IEEE-COER-ICAIA-2019) November, 20, 2019
7. Yadav R, Shubhangi D, Tripti, Priyadarshi A, Cognition Based Adaptive WBAN Architecture for Health Care Using Artificial Intelligence, International Conference on Artificial Intelligence and Applications (IEEE-COER-ICAIA-2019) November, 20, 2019
8. Vermani A, Application of Artificial Intelligence in Automobile Safety and Drunk Driving Detection – A Review, International Conference on Artificial Intelligence and Applications (IEEE-COER-ICAIA-2019) November, 20, 2019

Book/ Book Chapters 2019

1. Verma D, Fortunati E, Jain S, Zhang X, Biomass, Biopolymer- Based Materials, and Bioenergy, Elsevier, 2019.
2. Jain S and Verma D, The consideration of economics during the processing of biofuels, Biomass, Biopolymer- Based Materials, and Bioenergy , Elsevier, 2019.
3. Jain S, The current and future perspectives of biofuels, Biomass, Biopolymer- Based Materials, and Bioenergy , Elsevier, 2019.
4. Jain S, The production of biodiesel using Karanja (Pongamia pinnata) and Jatropha (Jatropha curcas) Oil, Biomass, Biopolymer- Based Materials, and Bioenergy, Elsevier, 2019.
5. Gupta D and Gaur SK, Carbon and biofuel footprinting of global production of biofuels, Biomass, Biopolymer- Based Materials, and Bioenergy, Elsevier, 2019.

Editorial Activities/ Membership of Professional bodies

1. Dr Siddharth Jain, Editor, International Journal of Renewable Energy Technology Research, USA
2. Dr Siddharth Jain, Editor in Chief, The Engineering Journal of Application and Scope, India
3. Dr Siddharth Jain, Editor in charge of Special Issue, International Journal of Spatio-Temporal Data Science (IJSTDS), Inderscience, USA
4. Dr Mridula, Editor in charge of Special Issue, International Journal of Spatio-Temporal Data Science (IJSTDS) , Inderscience, USA
5. Dr Siddharth Jain, Life member: International Association of Small Hydro, India

Patents (2019)

1. Water Purification System
   Applicant: Dr Siddharth Jain
   Year of filing: 2019
   Year of publication: 2019
   Indian Patent Journal No. 32/2019 Dated 09/08/2019, Page No. 35259
   Application: 201911031032A

2. Biodiesel composition and a method of preparation there of
   Applicant: Dr Siddharth Jain, Mr Akshay Garg
   Year of filing: 2019
   Year of publication: 2019
   Indian Patent Journal No. 51/2019 Dated 21/12/2019, Page No. 61176
   Application: 201911050683A

International Conference on Artificial Intelligence and Applications
(COER-IEEE--ICAIA-2019)

This year COER organized an International Conference on Artificial Intelligence and Applications (COER-IEEE--ICAIA-2019) jointly with Uttarakhand Technical University, Dehradun and Dr. Babasaheb Ambedkar Technological University, Lonere in association with IEEE UP Section on Nov, 20-21, 2019 at Roorkee.

The focus of the conference was on research and development in the area of Artificial Intelligence. The International Conference saw the participation of experts from different countries. About ten speakers from Universities of India and abroad and Industries addressed the delegates during the plenary and technical sessions of the conference and covered the diversified research applications of Artificial Intelligence in various fields of Engineering and Technology. This included the talks of Professor Gopal Gupta from University of Texas at Dallas who discussed on "Artificial Intelligence: The Road Forward"; Professor Kalyanmoy Deb and Professor Erik Goodman from Michigen State University, on "Evolutionary computation and Machine Learning reinforce each other". Prof Nishchal Verma from IIT Kanpur delivered his talk on "Deep learning and its role in Artificial Intelligence". Dr Harilal from ONGC delivered his talk on "AI in Petroleum Exploration". Other renowned dignitaries and experts in the fields of Artificial Intelligence; Professor Manoj Tripathi, Professor Sudip Roy, Professor Jeevanand Seshadrinath and Professor Debidas Kundu, from IIT Roorkee also discussed different aspects of Artificial Intelligence.

The conference provided a platform which discussed around forty five papers in different technical sessions. The conference received papers from IIT Roorkee, IIT Kanpur, IIT Delhi, Ecole De Technologie Superieure, Quebec, Canada, Pant Nagar University, ONGC, Gautam Buddha University and other institutes. A tutorial session on "Automating Common Sense Reasoning" by Professor Gopal Gupta had been planned one day before the commencement of the conference on 19 Nov 2019. The conference presented a big opportunity to share global experience in the field of Artificial Intelligence and drawn recommendations in the area of Artificial Intelligence.

House Recommendation: The house recognized the increasing importance of Machine Learning and Deep Learning and opined that an introductory course in this area be taught at an early stage in all engineering courses. In view of above the house recommended to "Introducing a full time compulsory course on Machine Learning and Deep Learning in the curriculum of first year of all courses".