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**Authors:** Avirup Mondal, Bikram Saha, Ananya Biswas, Anurima Majumdar, Antara Ghosal

**Paper Title:** IoT Based Auto-Irrigation System for Agriculture

**Abstract:** This paper describes a cost-effectivewater saving IoT based intelligent irrigation system for agriculture. Today, the farmers are suffering from the lack of resources, rains and scarcity of water. The objective of this paper is to design a smart irrigation system that would be useful for water management. In this IoT based system a moisture sensoris used to sense the moisture content present in the soil and according to that the water irrigation will be controlled by a microcontroller. A filter is also introduced for the purification of water as per requirement. There is no need of GSM modules or any wireless transmission gateway which makes the cost of the system around Rs. 1000/- which makes it economically affordable for Indian farmers. So, there is a need of saving water for which we need a smart technology that is an intelligent irrigation system that will help us to manage the usage of water in agriculture.

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**Keywords:** IoT, Smart Agriculture

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**Authors:** Arvind Pandey, Jiwan Singh Rawat, Sarita Palni, Charu Pundir, Snehal Mohite, Pankaj Kumar Bhatt

**Paper Title:** Monitoring land Use/cover Change using Remote Sensing and GIS Techniques: A Case Study of hill Station Pithoragarh Town, Uttarakhand, India

**Abstract:** Technique of Change Detection using LANDSAT satellite imagery helps in understanding the dynamics of landscape. This study depicts the spatio-temporal dynamics of land use/cover of Pithoragarh town area situated in Uttarakhand district of India. To quantify the changes in land use and land cover in Pithoragarh town over a period of 23 years. LANDSAT satellite imageries of two different time period i.e. LANDSAT Thematic Mapper (TM) of 1990 & LANDSAT OLI of 2013 were obtained with the help of USGS Earth Explorer. To fulfil the classification, purpose unsupervised Classification methodology has been used using the K-means technique. Study area was categorized into four different classes. i) Vegetation, ii) Agriculture, iii) Built-up, and vi) Barren land. Results of this study indicates that built-up land have been increased by 38.73% (3.55km<sup>2</sup>) and while vegetation, agriculture, and barren land, have decreased by -17.20% (-1.57 km<sup>2</sup>), 10.58% (-0.96km<sup>2</sup>), -10.94% (-1.01km<sup>2</sup>), respectively in past 23 years. This study is being conducted first time for this study area. Thus, this paper determine application of GIScience in change detection of land use pattern.

**Keywords:** Land use/ Land cover, Remote Sensing, GIS, Change Detection Technique, Pithoragarh Town.

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**Authors:** Balaji E, Moniha R R, Dharani Krishnan, Umesh K

**Paper Title:** Boundary Based Analysis of Image Fusion using Discrete Wavelet Transform

**Abstract:** Image fusion is the process of conflating or combing two or more images into a single image in order to implicate the necessary information from the source images. There is plenty of technological advancement present in today’s medical imaging field. The main drawback is that each and every imaging modality has its own specialty and limitation. Thus, fusion is used to overcome the shortcoming of displaying vital information in multiple images. CT images would manifest the clear pictures of hard tissue like bone structures but MRI images exhibits the soft tissue. When physician analyze the images where some of the information may not be viewed properly, the proposed methodology helps to extract more features from the images in addition to the boundary analysis carried out to identify the particular portion of the images. The discrete wavelet transform (DWT)of coiflet(COIF) and discrete meyer wavelet(DMEY) applied to the images which decompose the images and the wavelet coefficient of low pass and high pass filters of both images are identified and adjusted to the optimum contrast for a better elucidation. The inverse DWT(IDWT) helps to reconstruct the images by reverse operation of DWT. two input images are fused using Left-Right (LR), Right-Left (RL), Up-Down (UD), Down-Up (DU) methods. The features and results of the above methods are explored and compared with COIF and DMEY.

**Keywords:** Image fusion, CT, MRI, DWT, dmeY and coif, LR, RL, UD, DU Fusion, DWT, IDWT.

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**Authors:** Soma Rajwade, Albert John Varghese

**Paper Title:** Feasibility Analysis of Power Crisis in Remote Area using HOMER in Pahadgaon and Senha

**Abstract:** The paper optimise the hybrid energy system using HOMER PRO by giving the energy production cost analysis .This paper optimize the hybrid renewable energy system considering the metrological data at village of Korba. The proposed energy system including solar(pv model)and hydro sources and the other system is of PV module. Thus the model consist of first PV panels, power converter and battery for storage and the second model consist of PV panels, HYDRO and battery for storage and power convertor. The data considering for homer at KORBA village( Pahandgaw (in Pali) and Senha is taken from (NASA) national aeronautics and space administrator and the hydro flow rate is taken from the Madwa plant and Darri plant of Korba.

**Keywords:** hybride energy system, PV stand alone, solar PV, Hydro, HOMER.

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