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Lung cancer is the most diagnosed cancer that causes an increased death rate due to cancer worldwide. Smoking is defined to be a prominent cause of lung cancer that increases the rate of the tumor by 80%. For lung cancer, various diagnostic and treatment methods are implemented. The commonly used treatment for cancer is radiotherapy. The study of the treatment phase is necessary to analyze the decrease in cancer cells. In this proposed paper, 3D Lung cancer CT images are obtained from the TCIA dataset for the analysis of the progression of radiotherapy. 3D preprocessing and segmentation of the tumor region for each week of the study are analyzed. Fractal dimensional and geometric features are extracted from the segmented tumor regions. With these results, a weekly comparison of the effectiveness of the radiotherapy is evaluated and the study also defines the level of tumor decrease based on the voxel density. Later, Support Vector Regression models with different kernel functions are used to train and test the dataset and acquire significant weekly analysis of tumor treatment.

26.A HYBRID AGRICULTURE OF BLOCKCHAIN AND DIGITAL TWIN TECHNOLOGIES FOR FOOD SECURITY

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The integration of Hyperledger Fabric blockchain and digital twin technologies offers a transformative approach to managing the agricultural food supply chain by enhancing transparency, efficiency, and resilience. Agricultural supply chains are inherently complex, facing challenges such as lack of real-time visibility, data silos, inefficiencies, and trust deficits among stakeholders including farmers, processors, distributors, and retailers. Hyperledger Fabric, a permissioned blockchain, addresses these issues by enabling secure, tamper-proof, and decentralized transaction recording, thereby strengthening trust and traceability, though its reliance on periodic data inputs limits real-time responsiveness. To overcome this, digital twins—virtual models of physical entities and processes—enable real-time monitoring and synchronization with the physical environment, and when integrated with blockchain, they create a dynamic, continuously updated representation of the supply chain that provides timely insights for decision-making. This combined framework improves visibility across crop growth, harvesting, storage, and transportation, helping stakeholders respond swiftly to disruptions, reduce waste, and enhance coordination. A notable application lies in agri-insurance, where smart contracts linked to digital twin simulations of environmental risks such as drought or pests enable predictive risk management, automated claims processing, and dynamic premium adjustments, thereby increasing farmer resilience and reducing administrative burdens. Furthermore, by complementing blockchain's immutable records with real-time crop health and environmental data, the integration strengthens digital traceability, ensures accurate provenance, and supports predictive analytics for resilience planning. Ultimately, by shifting supply chain management from reactive to proactive, this innovation promotes food security, sustainability, operational clarity, and trust among all participants in the agricultural value chain.

27. MAGNETIC SENSING AND METALLIC ANOMALY DETECTION SYSTEM USING DRONE

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