

## **JIPS Special Issue on**

### **The Progress of Hybrid Neural Networks for Image Processing Applications**

The modern world has tremendous growth in science and technology that showed a significant impact in almost all other fields. It established the most robust platform for developing various sectors from agriculture to space research. Image processing is one of the techniques that provide multiple benefits. Normally, humans and animals use their eyes to see the object and identify them using their brains. But replicating the same in the computer or the digital machine is not easy. Conventional technology allows us to capture the image and store the data digitally. Processing and analysing the image involves multistep with effective learning programs.

The hybrid neural network combines two or more neural networks, which overcomes the individual drawback and provides more accurate results. Integrating artificial and spiking neural networks helps achieve a tremendous breakthrough in artificial intelligence. Artificial neural networks imitate the human brain's functionality, which are connected with neurons of multiple layers. Each neuron stores a huge amount of data, and the neurons are interconnected using the relationship between the data. The hybrid neural network has a powerful computational capacity that invokes various algorithms, self-learning ability, enhanced decision-making system. These capabilities help analyse the complex data, extract features and insight from the data, and provide an effective conclusion with the strongest reasonable value. The image processing involves various steps that include image enhancement, segmentation, feature extraction, feature identification etc. The hybrid neural network uses separate algorithms and provides the output in each step. The output from the previous step is given as input to the next step to enhance the feature output. Such image processing techniques provide various benefits to the medical sector, such as analysing the MRI scans X Rays, predicting the abnormalities in brain functionality, and identifying the brain tumours. It is also used to identify Alzheimer's disease earlier, thereby diagnosing and providing treatment. Most of the novels and stories are written manually by the authors; digitising it is a difficult task and increasing the number of books increases the time. Implementing Handwritten analysing using hybrid neural network-based image processing simplifies this task and saves time and cost. Image and video processing techniques help to implement smart cities. Images and videos captured from the CCTV cameras are used as a source hybrid neural network to identify physical threats, attacks, dangerous situations, and accidents happening at unusual timing, and automatically send the notification to nearby hospitals and police stations and connect the emergency team for support. In manufacturing industries, it helps to identify fake, damaged products to improve their quality, and an automatic face detection system helps improve security.

With the deployment of hybrid neural networks, great advances in image processing techniques have been accomplished, according to this article. This promotes creative thinking and authentic research to improve image processing techniques for upcoming years.

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Submission Deadline: 30th July, 2023  
Authors Notification: 30th September, 2023  
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