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(57) Abstract :
The invention presents an adaptive neural network architecture system optimized for resource-constrained devices such as IoT devices and mobile phones. This system includes an adaptive neural network model capable of dynamic adjustments, a resource monitoring module that continuously tracks CPU, memory, and battery levels, and an optimization engine that tunes model parameters in real-time based on available resources. Additionally, the system features an energy management system to optimize power consumption and includes mechanisms for on-device training and inference. The adaptive neural network model employs modular layers, dynamic pruning, and quantization techniques to maintain high performance while reducing computational load. The invention ensures efficient, accurate operation of neural networks on devices with limited resources, overcoming current limitations by providing a balance between performance and resource utilization, thereby extending the usability and functionality of AI applications on such devices.

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