The Cloud Computing is considered the latest network infrastructure that supports the decentralization of computing. The main features of the Cloud are the possibilities for building applications and providing various services to the end user by virtualization on .the internet

One of the main challenges in the field of the cloud computing is the task scheduling problem. Scheduling problem is NP-hard issue, and finding a general heuristic way to solve .it is difficult

This thesis presents an algorithm, which aims to achieve task scheduling for producing minimum makespan without violating the precedence constraints.It provides better performance in terms of speedup, efficiency and response time. The proposed algorithm is based on two phases: first, using artificial intelligence algorithm Q-Learning to sort the original task order to find the best tasks order, we verify that the agent's action selection on each state is lawful, which means that it follows the dependence relationship between tasks on the Directed Acyclic Graphs(DAG). By using a random selection technique in state s and transferring to state s'. When the agent selects action in states, the appropriate Q-value Q(s,ac) in the Q-table is updated. All states are covered in each episode, and an updated Q-table is obtained. We generate a Q-table that no longer changes in the iterative process after a finite number of iterations, indicating that the method has converged. The maximum Q-value technique is employed. The second phase assigns the best processor to a task based on the optimal order, the minimum execution time allocation technique is used in this phase. The proposed algorithm is compared with the ,algorithms in the same field

Heterogeneous Earliest Finish Time (HEFT),QLearning Heterogeneous Earliest Finish Time (QL- HEFT) and Parental Prioritization Earliest Finish Time (PPEFT). The results show that the giving better results than other algorithms in terms of average response time , .speedup, and efficiency with improving ratio 10.86%, 16.3%, and 16.30% respectively

The performance evaluation results implemented Cloudsim toolkit 3.0.3 using WorkflowSim 1.0, simulation based analysis was used to verify the proposed scheme run simulations with three real world scientific workflows in addition to the Random Task Graph Generation (RTGG) are Montage ,CyberShake and Epigenomics. Findings show that .the proposed algorithm performs better than other algorithms