

**CHENNAI – PONDICHERRY**

**ENERGY-EFFICIENT MANY-OBJECTIVE VIRTUAL MACHINE PLACEMENT OPTIMIZATION IN A CLOUD COMPUTING ENVIRONMENT**

**Abstract:**

Cloud data centres are faced with the serious problem of increasing energy consumption. Thus, the problem of virtual machine placement for energy saving is becoming a critical issue. Considering various requirements of cloud providers and users, a many-objective virtual machine placement model is built to minimize energy consumption and maximize load balance, resource utilization, and robustness. An energy-efficient KnEA (EEKnEA) algorithm is proposed to address this problem. EEKnEA is improved by proposing an energy-efficient-oriented population initialization strategy based on the knee point-driven evolutionary algorithm (KnEA), which is a high-performance algorithm for many-objective problems. The proposed model and performance of EEKnEA are evaluated in comparison to KnEA and other algorithms. Experimental results show that the proposed model is reasonable, and the EEKnEA algorithm outperforms its counterparts on this type of problem in terms of energy saving, load balance, and robustness.