

Abstract

Modern-day computing-capacity relies heavily on efficient energy consumption. Similarly, future computer clusters must administer energy even more efficiently to sustain increasing computational speeds.

Power and energy are some of the constraints we face within High-Performance Computing (HPC) applications.

Mainly due to high operation costs, energy-efficiency has become a critical issue in designing modern HPC clusters. There is a lot to be gained by employing shrewd methods for reducing energy consumption, the majority of which rely on Dynamic Voltage and Frequency Scaling (DVFS) . In this work, we design a Reinforcement Learning algorithm using the well-established Q-learning technique to facilitate energy saving. The energy saving is enabled through the automatic evaluation of energy consumption and the adjustment of voltage and frequency according to said evaluation. In order to allow region based tuning, we use the READEX [SGK+17] approach. This approach uses dynamic tuning to successfully save energy, which we seek to expand upon, by affixing an automatic approach.