IT250 - OS Project

Efficient Task Scheduling using Machine Learning

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Abstract

Current operating systems do not use the Machine Learning approach to improve task scheduling, and they rather rely on different algorithms like EDF & LLREF to improve efficiency.

With the advancement of Machine Learning in various computing domains, it is imperative to improve the efficiency of existing Task Scheduling algorithms by applying Machine Learning concepts like Neural Networks and Predictive Analysis.

Using this approach, while analysing the earlier performance of the system, scheduling knowledge is obtained whereby the right dispatching rule for a scheduling algorithm at each particular moment can be determined and chosen.

This can also be further extended to other computational tasks like CPU burst time prediction.

Literature Review

S. No.	Title	Year	Technique Used	Advantages	Shortco
1	A Machine Learning-Based Approach to Estimate the CPU-Burst Time for Processes in the Computational Grids	2015	Use of machine learning models such as K-NN, Decision Trees, A-NN.	> Improve accuracy of CPU burst time prediction by using historical data. > Correct feature selection based on covariance.	> Would dataset model w > In pra predictio
2	Online Job Scheduling in Distributed Machine Learning Clusters	2018	1. OASiS algorithm to compute best schedule. 2. Splitting the dataset	> Judging whether the potential job utility outweighs resource consumption, the algorithm decides admitting the job or not, and runs the job according to the best schedule if admitted. > Huge Datasets can be used. > Give rigorous proof for polynomial time complexity.	> Comp
3	Intelligent scheduling with machine learning capabilities : the induction of scheduling knowledge	1990	Dynamic Job Scheduling (Heuristic Scheduling) ,Decision Trees. (base paper)	> Dynamic rule selection (Not pre-planned as in the case of other scheduling algorithms)	> Dynar pattern
4	An Optimal Scheme for Multiprocessor Task Scheduling: a Machine Learning Approach	2009	NQ-Wrap with improvements	> Improve efficiency of scheduling on multiprocessor systems > Reduce number of preemptions and overhead??	> Adher > Suppo > No cr

Thank you!