CPU Burst Time using Machine Learning Algorithm's

Suresh K[1], Sirisha B[2], Divya D S[3], Soumya[4], Sahana Patil[5]

Assistant Professor, Department of Computer Science and Engineering[1]
Students, Department of Computer Science and Engineering[2,3,4,5]
Rao Bahadhur Y. Mahabaleshwarappa Engineering College, Bellary, Karnataka, India

Abstract: *The amount of time required by a process for executing on the CPU is called CPU-Burst Time, on which implementation of some CPU-scheduling algorithms such as Shortest Job First (SJF) and Shortest-Remaining Time First (SRTF) are relied on. There are many vivid methods for prognosticating the CPU-Burst length, one among them is Machine Learning based approach to calculate the burst- time of the processes in the ready queue. This approach involves the selection of most appropriate attributes of the process by making use of selection techniques, and based on these attributes, the CPU-Burst for the process is calculated in the grid. The ML algorithms used for this are Linear Regression, K-Nearest Neighbors (KNN), and Decision Tree (DT). This approach results in higher efficiency as it obtained linear relationship between the process and CPU Burst-Time. When tested and evaluated the workload dataset. The efficiency of ML approach is high because KNN provides better results in terms of CC and RAE, and for the factors like time, space and burst-estimation, attributes selection techniques are used.*

Keywords: CPU Burst Time

REFERENCES

[1]. Silberschatz, Abraham, Peter B. Galvin, and Greg Gagne. Operating system concepts. Vol. 8. Wiley, 2013.

[2]. Mehmood Shah, Syed Nasir, Ahmad Kamil Bin Mahmood, and Alan Oxley. "Analysis and evaluation of grid scheduling algorithms using real workload traces." In *Proceedings of the International Conference on Management of Emergent Digital EcoSystems*, pp. 234-239. ACM, 2010.

[3]. Fernández-Baca, David. "Allocating modules to processors in a distributed system." IEEE Transactions on 15, no. 11 (1989): 1427-1436.

[4]. Mahesh Kumar, M. R., B. Renuka Rajendra, C. K. Niranjan, and M. Sreenatha. "Prediction of length of the next CPU burst in SJF scheduling algorithm using dual simplex method." In *Current Trends in Engineering and Technology (ICCTET), 2014 2nd International Conference on*, pp. 248-252. IEEE, 2014.

[5]. Kasana, Harvir Singh, and Krishna Dev Kumar, eds. *Introductory operations research: theory and applications*. Springer Science & Business Media, 2004.

[6]. Pourali, Abdolghader, and Amir Masoud Rahmani. "A Fuzzy-based Scheduling Algorithm for prediction of next CPU- burst time to implement Shortest Process Next." In *Computer Science and Information Technology-Spring Conference, 2009, IACSITSC'09*, pp. 217-220, IEEE, 2009.

[7]. Kosko, Bart. *Neural networks and fuzzy systems: a dynamical systems approach to machine intelligence*. Prentice-Hall, Inc., 1991.

[8]. Kohavi, R., and R. Kohavi. 1997. "Wrappers for Feature Subset Selection." Artificial Intelligence 97(1-2):273–324. Retrieved (http://linkinghub.elsevier.com/retrieve/pii/S0004370 29700043X).

[9]. Smith, Warren, Ian Foster, and Valerie Taylor. "Predicting application run times with historical information." *Journal of Parallel and Distributed Computing* 64, no. 9 (2004): 1007-1016.

[10]. Matsunaga, Andréa, and José AB Fortes. "On the use of machine learning to predict the time and resources consumed by applications." In *Proceedings of the 2010 10th IEEE/ACM International Conference on Cluster, Cloud and Grid Computing*, pp. 495-504, IEEE Computer Society, 2010.

[11]. Tom Mitchell, *Machine Learning*, 1st Ed, pp: 52- 75, 154-183, 230-244, the Mc-Graw Hill Company. Inc. International Edition, 1997.

[12]. Shevade, S. K., S. S. Keerthi, C. Bhattacharyya, and K. R. K. Murthy. 2000. "Improvements to the SMO Algorithm for SVM Regression." *IEEE Transactions on Neural Networks* 11(5):1188– 93.