
# Empirical Evaluation of Modified Dynamic Time Quantum Round Robin Scheduling

## Dissertation

**Submitted To:**

Central Department of Computer Science & Information Technology

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In partial Fulfillment of the requirements for the Degree of Master of Science in Computer Science & Information Technology

Submitted by:

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September, 2015

Supervisor

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## Student's Declaration

I hereby declare that I am the only author of this work and that no sources other than the listed here have been used in this work.

… … … … … … …
**Shiv Shankar Pant**
**Date: 10 September, 2015**


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### Supervisor's Recommendation

I hereby recommend that the dissertation prepared under my supervision by **Mr. Shiv Shankar Pant** entitled "**Empirical Evaluation of Modified Dynamic Time Quantum Round Robin Scheduling**" be accepted as in fulfilling partial requirement for the completion of Masters Degree of Science in Computer Science & Information Technology.

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# LETTER OF APPROVAL

We certify that we have read this dissertation work and in our opinion it is appreciable for the scope and quality as a dissertation in the partial fulfillment of the requirements of Masters Degree of Science in Computer Science & Information Technology.

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**Abstract**

There are number of scheduling algorithms used in computer system today. They all have their own characteristics. Thus selection of the particular scheduling algorithm depends upon the need of the system. One of the most widely used scheduling algorithms in multiprogramming operating system is round robin. Round robin scheduling algorithm is most widely used scheduling algorithm in multitasking and real time environment. In RR scheduling the time quantum play a very important role, because if time quantum is very large then RR scheduling algorithm is same as the FCFS scheduling. If the time quantum is extremely too small then the number of context switches is very high. In recent days there is more research in dynamic quantum scheduling policies that can adopt automatically according to nature of incoming jobs. "Dynamic time quantum RR scheduling algorithm" is based on 'Q' which is the quantum for one complete round and 'n' number of jobs in ready queue. This research work modifies the quantum selection strategy in case of fraction (f) of jobs finished in previous round of round robin scheduling algorithm and the value of f is checked with 6.25%. If f is greater than or equal to 6.25% then the quantum value is decreased and if f is less than 6.25% then the quantum value is increased. And at last, experimentally verifies that modified algorithm policy gives better performance than dynamic time quantum RR scheduling policy by reducing number of context switches, average waiting time and average turnaround time.

Keywords: RR scheduling, CPU scheduler, Dynamic quantum, Static quantum, context switches, AWT, ATT

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**List of Abbreviations**

AMRR - Average Max Round Robin

ATT - Average Turnaround Time

AWT - Average Waiting Time

CPU - Central Processing Unit

CS - Context Switch

CTQ - Changeable Time Quantum

DQRR - Dynamic Quantum with Re-Adjusted Round Robin

DTRR - Dynamic Time Quantum Round Robin

EMP- Empty

FCFS - First Come First Service

IRR - Improved Round Robin

I/O - Input and Output

MDTQRR - Multi-Dynamic Time Quantum Round Robin

MDTRR - Modified Dynamic Time Quantum Round Robin

MOS - Multiprogramming Operating System

RR - Round Robin

SARR - Self Adjusted Round Robin

SJF - Shortest Job First

TPBCS - Two Processor Based CPU Scheduling

VRR - Virtual Round Robin

VTRR - Virtual Time Round Robin

WRR - Weighted Round Robin