



INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

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Programme of Study : Ph.D.
Thesis Title: Scheduling Policies for Improving Performance, Utilisation, and Longevity of DRAM and PCM Memories
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Thesis Submitted to the Department/ Center : Department of Computer Science and Engineering
Date of completion of Thesis Viva-Voce Exam : 24/02/2025
Key words for description of Thesis Work : DRAM, PCM, Hybrid Memory, Scheduling, Page Migration, BTI
: Aging, De-stress

SHORT ABSTRACT

For the current generation computing systems, we need support from a large, faster and reliable memories. Technologies like DRAM are being supported with emerging non-volatile memories to achieve best results by exploiting advantages of every memory type. Such a high performing memory setup requires better and improved memory controllers. Memory request scheduling is one of the roles of the memory controller. The memory controller manages read/write requests and service operations based on the type of underlying memory. The adopted memory scheduling policy determines the memory service time and, thus, the total execution time of applications executing on the cores. We have designed policies that provide solutions for challenges faced by different memory types.

The contributions of the thesis include various scheduling policies that enable improved service time; attaining memory service predictability; minimising write operations in NVM; and improving longevity.

The scheduling policies are proposed for:

- (i) Read-Write memory requests in Pure DRAM and Pure PCM Memories
- (ii) Page migration in Hybrid DRAM-PCM Memories
- (iii) Aging related de-stress management in Pure PCM Memories
- (iv) and, a Combination of migration and de-stress scheduling.