Date: October 14, 2025 (Tuesday)

Time: 05:15 PM

Venue: RM101, CSE

Title: Unlocking GPU Performance Potential — the Software Key

Speaker: Prof. R. Govindarajan

Abstract:

Over the last two decades, we have witnessed remarkable growth in both general-purpose accelerators (e.g., Graphics Processing Units, Many Integrated Cores) and domain-specific architectures (e.g., Tensor Processing Units, Neural Processing Units), ushering the "New Golden Age of Computer Architecture." While these architectures offer immense performance potential, they also introduce major challenges in programmability, performance portability, and developer productivity.

In this talk, I will first present our group's research on compiler and runtime techniques that enable synergistic program execution on heterogeneous accelerator-based systems. In the second part, I will describe our efforts toward building a retargetable compiler framework for a representative machine learning workload—decision-tree traversal—that leverages the capabilities of both multicore CPUs and GPUs to achieve high performance across platforms.

Bio:

Prof. R. Govindarajan received his Ph.D. in Computer Science from the **Indian Institute of Science (IISc), Bangalore** in 1989. He has held postdoctoral researcher and visiting faculty positions at leading universities in the USA and Canada. Since 1995, he has been a faculty member with the **Supercomputer Education and Research Centre (SERC)** and the **Department of Computer Science and Automation at IISc, Bangalore**.

His pioneering research spans High Performance Computing, Compilation Techniques, and Computer Architecture, areas in which he has made significant and lasting contributions. He is recognized as a Fellow of the **Indian National Academy of Engineering, a Distinguished Member of the ACM**, and a **Senior Member of the IEEE**-honors reflecting his impact on both national and international research communities. In recognition of his outstanding contributions to advancing High Performance Computing research, he was awarded the **APJ Abdul Kalam HPC Award** in the lifetime achievement category in 2025.