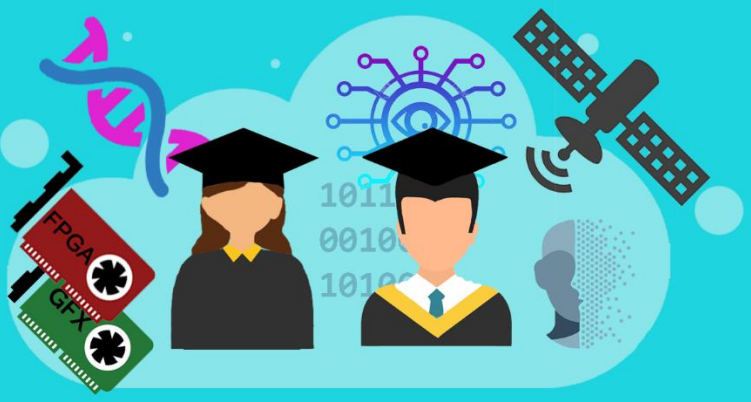
Diploma Thesis

Microproccessors and Digital Systems Laboratory



Approximate computing-aware system design and management

Heterogeneous multi-core systems that are resource constrained exacerbate the run-time management challenge with i) diverse performance requirements of applications ii) fixed power budgets iii) dynamic workload characteristics iv) core-level heterogeneity. Existing resource management techniques use Dynamic Voltage and Frequency Scaling (DVFS), task migration, power gating and CPU quota scaling etc., for power optimization. Such techniques propose joint actuation of power knobs and application characteristics exploitation to maximize performance within the fixed power budgets

The goal of this thesis is to explore the approximate computing domain and develop methodologies for designing system under performance and power constraints. Additionally, run-time resource management techniques will be developed in order to support the scaling of these systems.

PREREQUISITES:

Good knowledge of C/C++, computer architecture

READING MATERIAL:

1. Approximation-aware coordinated power/performance management for heterogeneous multi-cores. A Hierarchical Distributed Run-time Resource Management Scheme for NoC-Based Many-Cores

Thermal optimization using adaptive approximate computing for video coding

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