Department of Computer Science

St. Francis Xavier University

Presents

Dynamic Slack Sharing DVFS Technique for Real-time Systems

Using Reinforcement Learning

by

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M.Sc. Thesis Proposal Presentation

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Power consumption is one of the most vital issues in modern computing systems. In recent years, power consumption problem has continued to receive a lot of attention because of the higher computational demand under limited battery life. Especially, smartphones nowadays are equipped with large screens with very high resolution and also performing very complex tasks. In order to reduce power consumption, dynamic voltage and frequency scaling (DVFS) has been commonly used in modern processors. In this thesis proposal, we propose dynamic slack share (DSS) scheduling method of periodic tasks through DVFS to reduce CPU energy consumption. Dynamic slack is an important factor for DVFS mechanism. Dynamic voltage and frequency scaling (DVFS) is an extensively studied energy management technique, which dynamically scales the CPU frequency to reduce the energy consumption of computing platforms. Our slack share scheduling solution focuses on learning how much slack to use and how much to share using Reinforcement learning method. The scheduler automatically learns and changes scheduling from experience on the fly in different situations. This also guarantees to meet all deadlines. Preliminary experimental result shows that this technique can reduce energy consumption significantly.