Smart Resource Manager on AMPs

Make things much easier by reserving heterogeneous resources efficiently before doing scheduling on Asymmetric Multicore Processors

Teng Yu
ty33@st-andrews.ac.uk

MOTIVATION

Different Workloads

Scheduler-A

Heterogeneous Resources

Scheduler-C

Scheduler-B

NO uniform best scheduler

RESEARCH IDEAS

Scheduler-A

Resource Manager

Scheduler-C

Scheduler-B

Performance Model

Workload Classifier

Benchmark Class-A

Benchmark Class-B

Benchmark Class-C

Multi-thread Workloads

INSIGHTS

(1) Predicting the performance gain for a thread on different types of cores: 
Efficient Core Sensitive Model

(2) Maintaining fairness and handle with thread migration overheads: 
Efficient Fairness Aware Model

(3) Accelerating the most necessary threads: 
Efficient Bottleneck Identification

EXPERIMENTAL SETUP

• Workloads: Parsec Benchmarks
• Proposed Hardware: ARM big.LITTLE architectures
• Simulator: Gem5

School of Computer Science
University of St Andrews