Mithra: Controlling Quality Tradeoffs in Approximate Acceleration

Presented by: Hadi Esmaeilzadeh
hadi@cc.gatech.edu

Divya Mahajan, Amir Yazdanbakhsh, Jongse Park, Bradley Thwaites
Hadi Esmaeilzadeh

Alternative Computing Technologies (ACT) Lab
Georgia Institute of Technology
Overview

**Approximate Acceleration**
- Core invokes approximate accelerator in lieu of safe-to-approximate function. Always invoking the accelerator leads to **fixed degree of error**
- Only a small number of invocations lead to large error
- We introduce MITHRA, a mechanism that tries to only filter accelerator invocations that lead to large error
- MITRA reduces error while saving benefits from approximate acceleration

**Architectural Overview**
- Mithra sits between core and approximate accelerator
- Idea is that \( \text{Output}_{\text{accelerator}} \) is only \( f(\text{accelerator inputs}) \)
Thank you