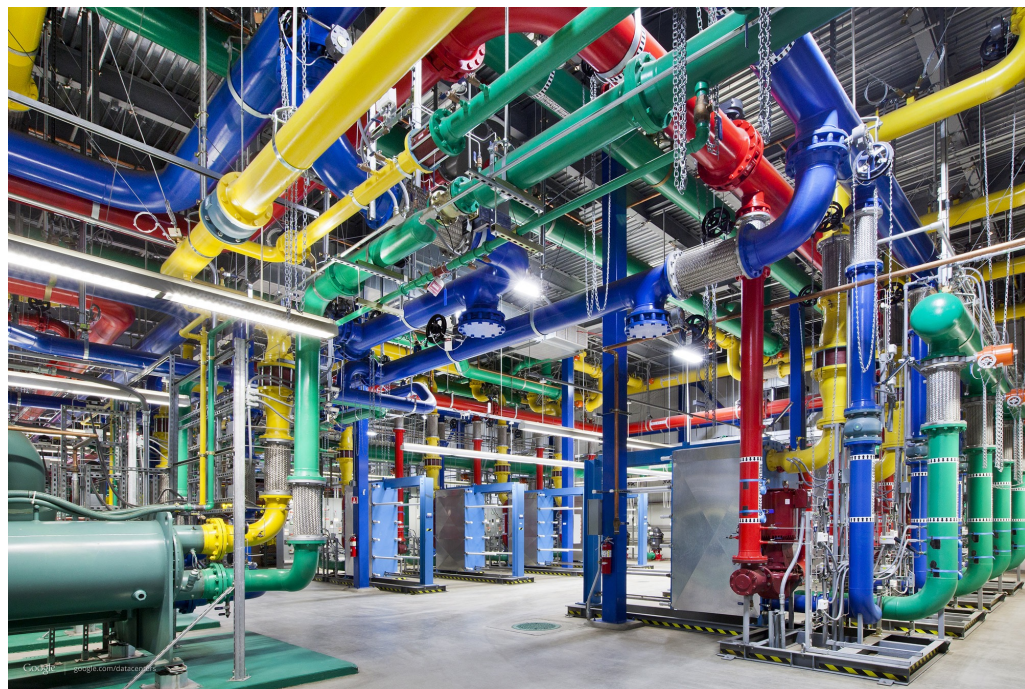# SMiTe: Precise QoS Prediction on Real-System SMT Processors to Improve Utilization in Warehouse Scale Computers

Yunqi Zhang, Michael A. Laurenzano, Jason Mars, Lingjia Tang
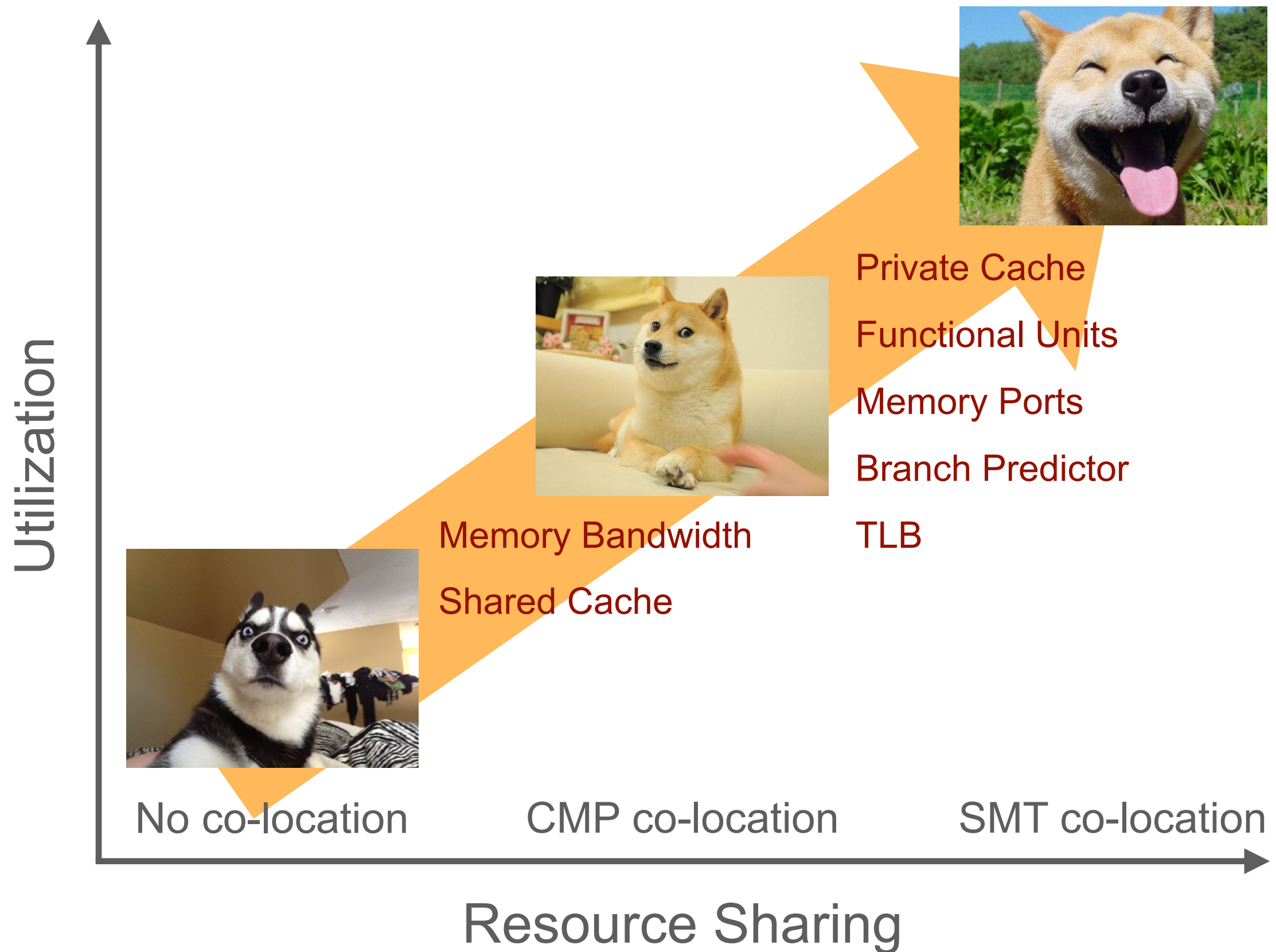
Clarity-Lab
Electrical Engineering and Computer Science
University of Michigan

Data centers are expensive

30%

Low utilization leads to inefficiency

SMiTe: Precise QoS Prediction on Real-System SMT Processors to Improve Utilization in Warehouse Scale Computers

Utilization

Resource Sharing

No co-location

CMP co-location

SMT co-location

Shared Cache

Memory Bandwidth

Private Cache

Functional Units

Memory Ports

Branch Predictor

TLB

SMiTe: Precise QoS Prediction on Real-System SMT Processors to Improve Utilization in Warehouse Scale Computers

< 2%
Prediction Error

42%
Utilization Improvement

Session 5A
Wednesday at 9:50 A.M.