SaTC: CORE: Small: Microarchitectural side channel attacks and defenses in integrated CPU-GPU systems

PI: Hoda Naghibijouybari

BINGHAMTON UNIVERSITY
State University of New York

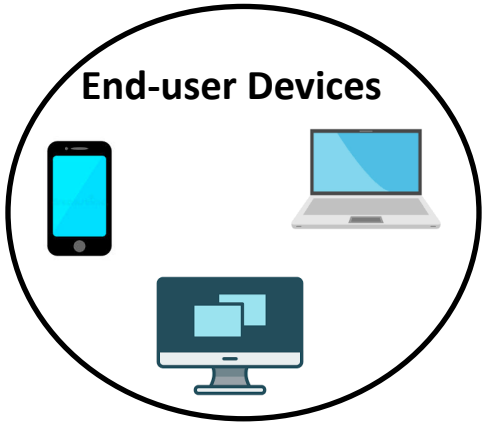
Award # 2130978
Email: hnaghibi@Binghamton.edu

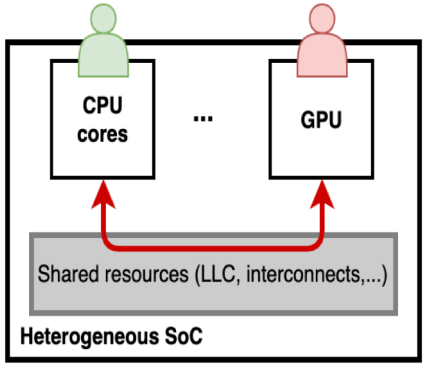
Tight integration of CPUs and GPUs in SoCs, sharing a complex memory hierarchy:

1) Investigate cross-component side channel attacks in native applications

GPU acceleration is also available through modern web interfaces:

2) Investigate remote side channel attacks (in JavaScript)





3) Design hardware and software defense mechanisms (rooted in GPU hardware or device driver; and secure APIs for Web-based GPU acceleration)

Scientific Impact:

- Advance the knowledge and scope of microarchitectural attacks beyond the prior focus on CPUs
- Guide further research into secure design of heterogeneous systems

Broader Impact and Broader Participation:

- Improving the security of modern end-user devices (e.g. laptops, smart phones,…)
- Integrating the research results into both undergraduate and graduate curricula
- Recruiting and training women, minority, and undergrads