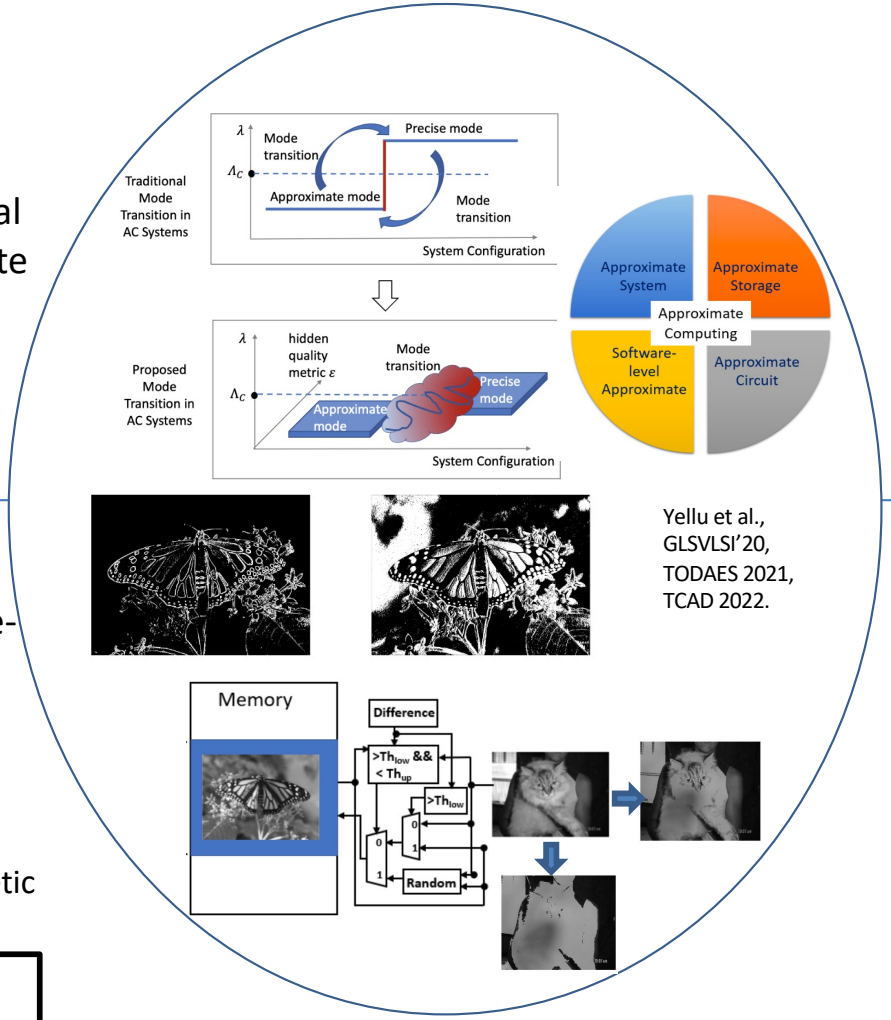
SaTC:CORE:Small: Towards Securing the Hardware and Software for Approximate Computing Systems

University of New Hampshire

Challenge:

- Unique approximate behavior & computational uncertainty in approximate computing (AC) systems expose new attack opportunities.



Yellu et al., GLSVLSI'20, TODAES 2021, TCAD 2022.

Solution:

- Develop holistic hardware-software integrated methods to secure AC systems
  - Boundary-blurring obfuscation
  - Mixed Boolean Arithmetic (MBA) transformation

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Scientific Impact:

- Boundary-blurring introduces a new defense line to complement existing obfuscation methods.
- New obfuscation methods facilitates to securely leverage AC mechanisms to lower power consumption and improve performance.

Broader Impact and Broader Participation:

- Enable the secure usage of AC techniques in recognition, mining, and synthesis applications.
- Support two female Ph.D. students
- Promote undergraduate research via international cybersecurity competition