# CAREER: Designing and Defending Novel Ultra-stealthy and Controllable Design-time Analog-domain Hardware Trojans

Challenge:

- What threats does ignoring the analog-domain pose to hardware security?

- How can we detect analog-domain hardware Trojans without full fidelity analog-domain simulation?

Scientific Impact:

- Exposes the fundamental limitations of digital-domain-only defenses

- Motivates and guides a new class of analog-aware hardware Trojan defenses
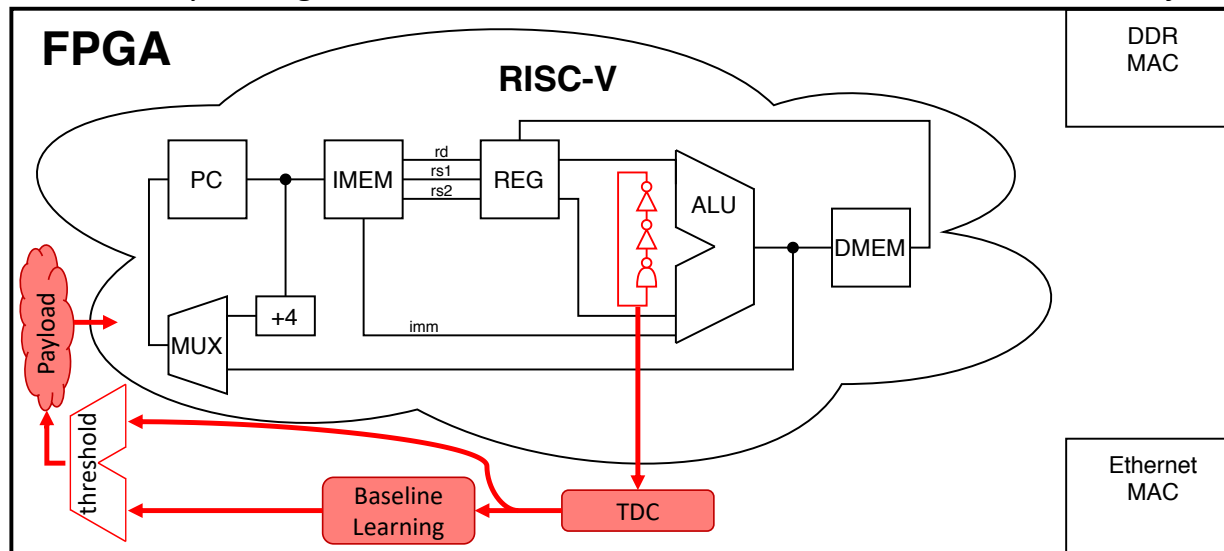
Solution:

- Capture short- and long-term analog-domain changes with a digital circuit

- Monitor time-dependent changes to Ring Oscillator frequency

Broader Impact and Broader Participation:

- Allows for more secure outsourcing of chip fabrication

- Will be used by industry and government to secure the chips that underly critical infrastructure

- Will create the first generation of native hardware security researchers

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