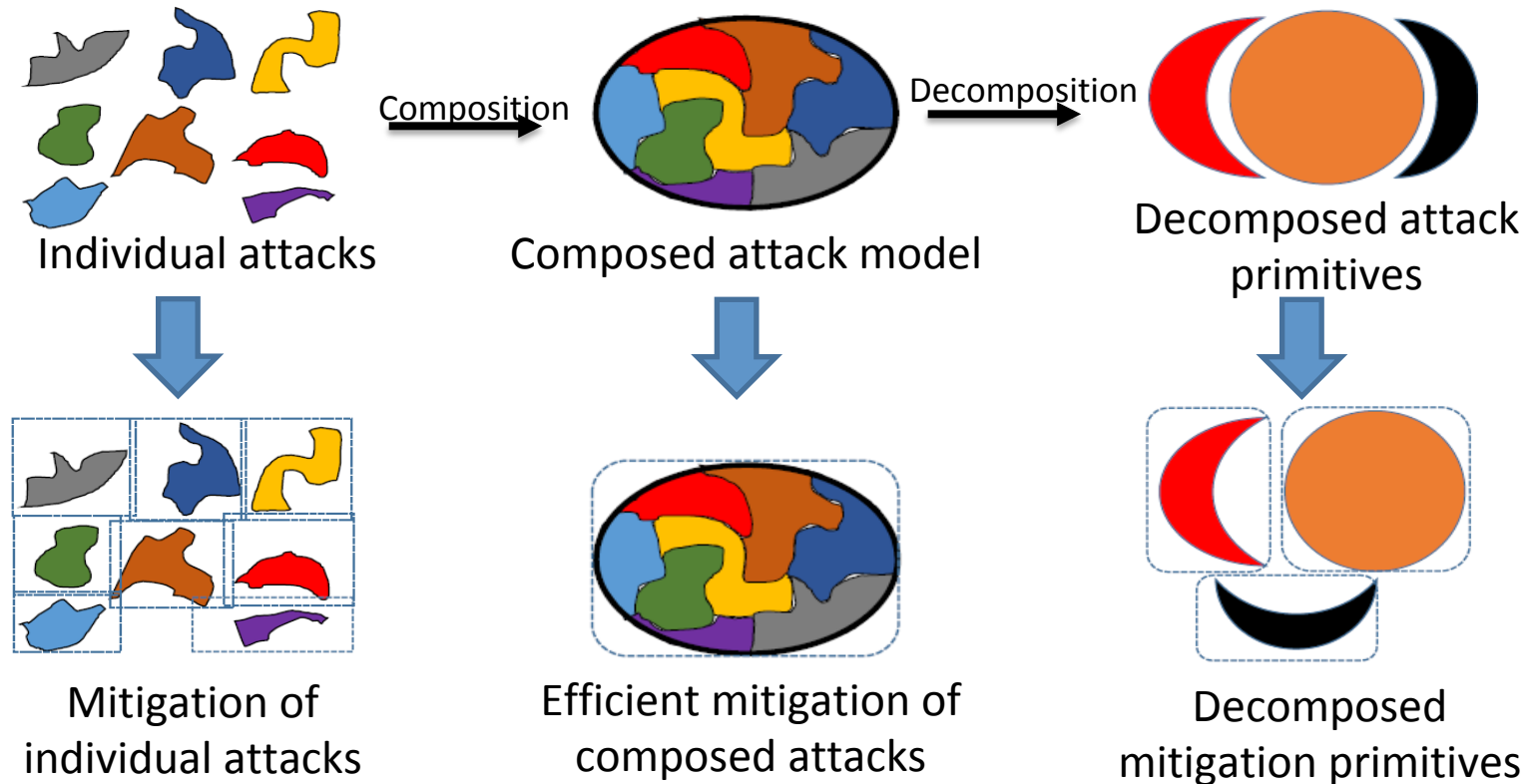




Towards a Science of Attack Composition, Mitigation, and Verification in Cyber-Physical Systems: A Passivity-Based Framework

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Passivity Framework for Science of CPS

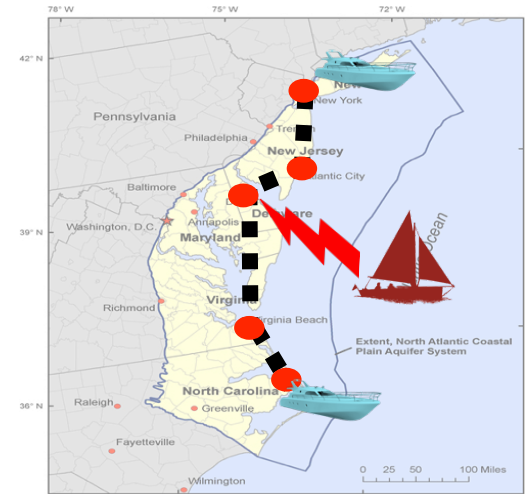
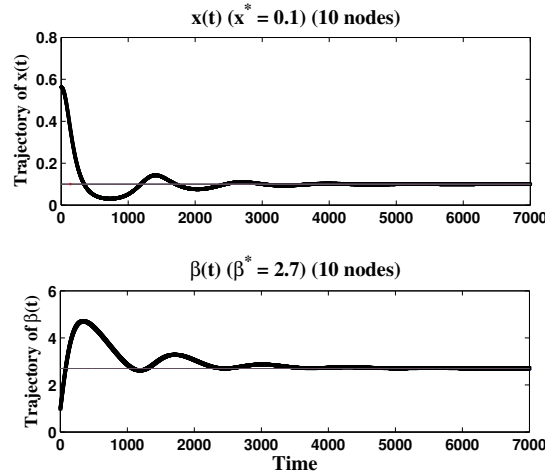
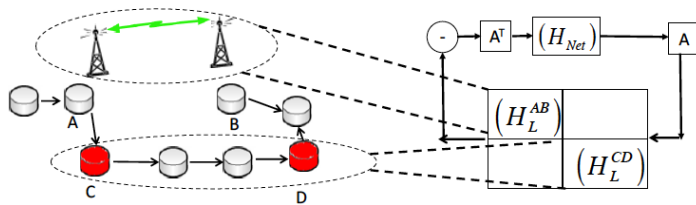


Model cyber attacks in the same mathematical language as physical system

Compose multiple simultaneous and sequential attacks on CPS

Develop efficient mitigation strategies for composed attacks

Findings



- 1) Showed that in-band and out-of-band wormholes can be modeled and composed in a passivity framework
- 2) Proposed passivity-based adaptive patching strategies for mitigating multi-virus propagation
- 3) Developed distributed defense strategies for Stackelberg patrolling games