RIC VIRTUAL 2021
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Oregon State University
College of Engineering

Dynamic Risk Assessment for Nuclear Cybersecurity

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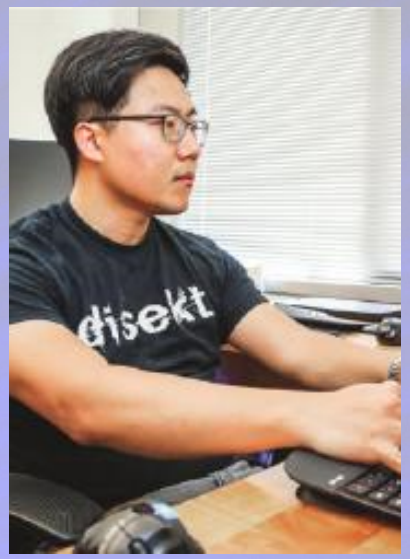
The Team

Dr. Rakesh Bobba



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Nuclear Engineering Student

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Cybersecurity Student

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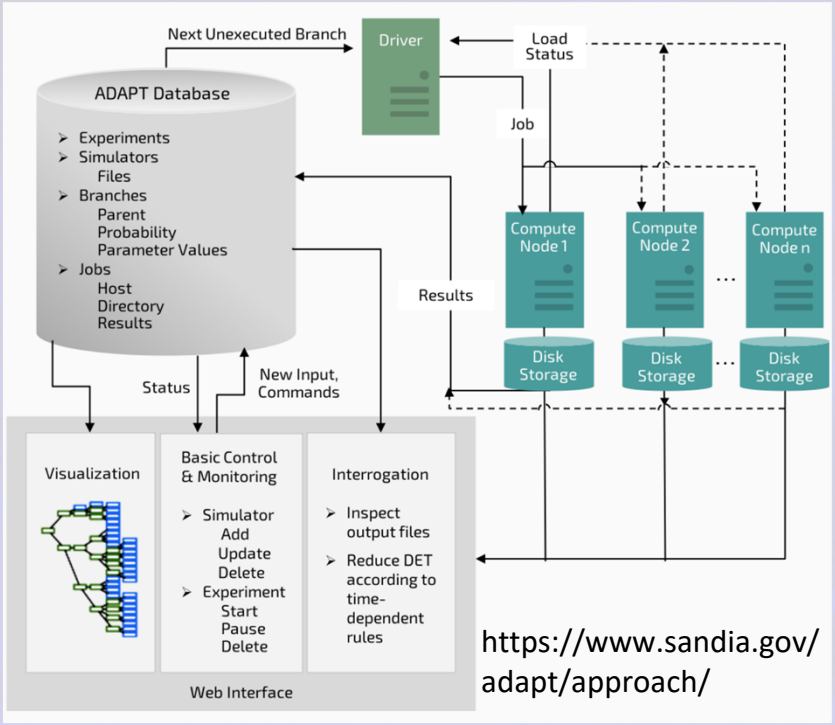
Objectives

- Use dynamic PRA to analyze depencies between cyber physical system of existing LWR
  - ADAPT → RELAP5 consequence analysis (NE)
- I&C cyber risk/attack graph modeling
  - Integrate attack-graph analysis engine with ADAPT (Cyber)
- Generate cyber-physical security metrics
  - Fusion of multiple physical impacts and attacks paths

ADAPT Approach



https://www.sandia.gov/adapt/approach/

Motivation

SANDIA REPORT
SAND2019-XXXX
Unlimited Release
September 2019

Modeling for Existing Nuclear Power Plant Security Regime

Douglas Osborn, M. Joran Parks, Ryan Knudsen, Kyle Ross, Chris Faucett, Troy Haskin, Peter Kitsos, Todd Noel, and Brian Cohn

Sandia National Laboratories
Albuquerque, New Mexico 87185

- Apply aspects of risk-informed techniques for (***cyber***) physical security decisions and activities to account for a dynamic adversary;
- Apply advanced modeling and simulation tools to better inform (***cyber***) physical security posture;
- Assess benefits from proposed enhancements, novel mitigation strategies, and potential changes to regulations; and
- Enhance the technical basis necessary for operating utilities to reevaluate their (***cbyer***) physical security posture while meeting regulatory requirements.

Project Approach

Cyber Vulnerability Information

Cyber Physical Network

- Cyber Topology
- Cyber-physical Interconnection
- Physical Plant Model

ADAPT-DPRA Assessment Engine

- Generate attack paths
- Prune attack paths
- Combine cyber attack paths with plant contingencies

RELAP

- Predict plant response to environmental conditions

Results

- Rank asset by criticality

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