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Interconnected safe and secure systems

Security and safety: tempo and trade-offs

Robin E Bloomfield, Adelard LP and City, University of London,

Peter Popov, City, University of London,

RiTICS Showcase

18th October 2018

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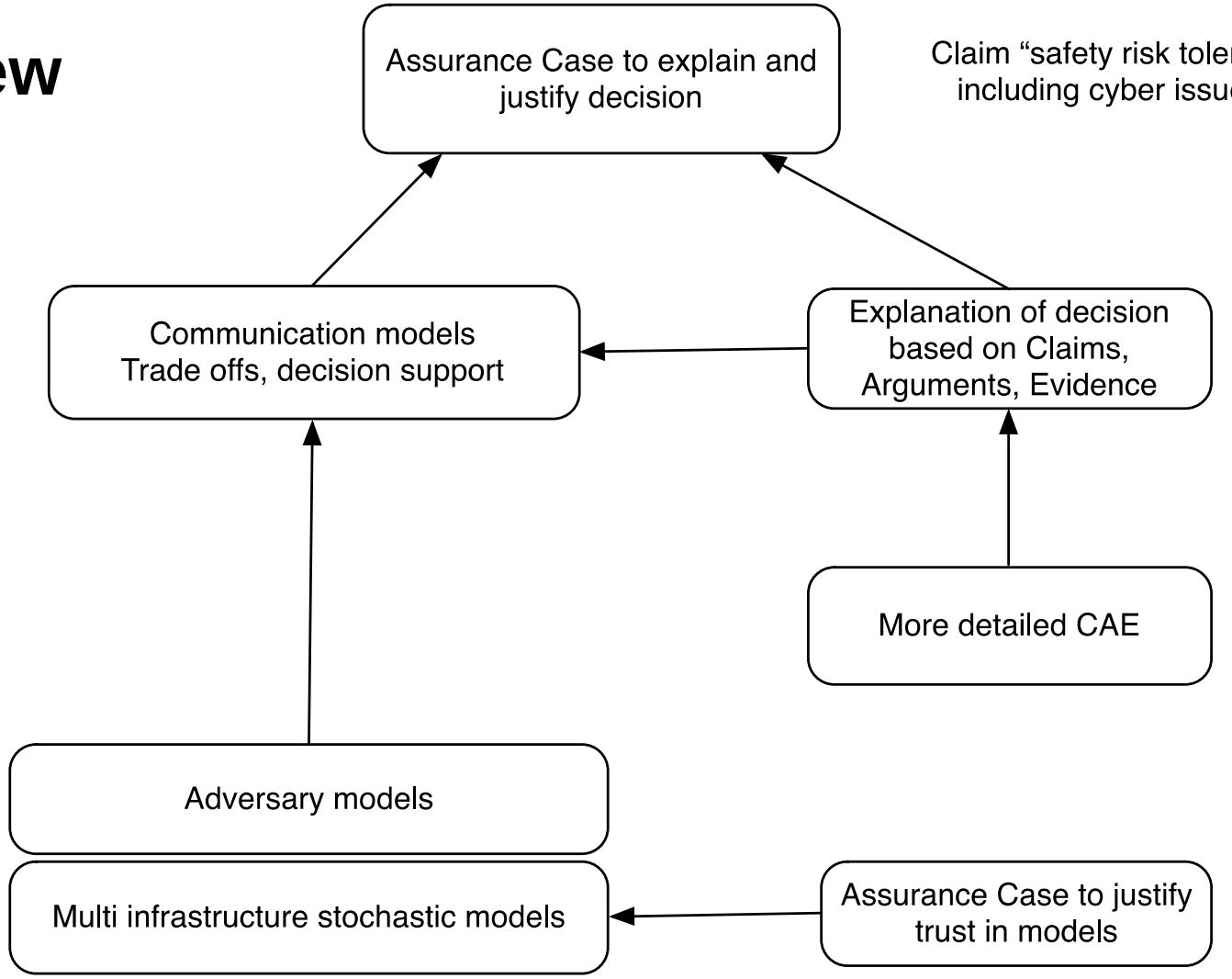
Overview



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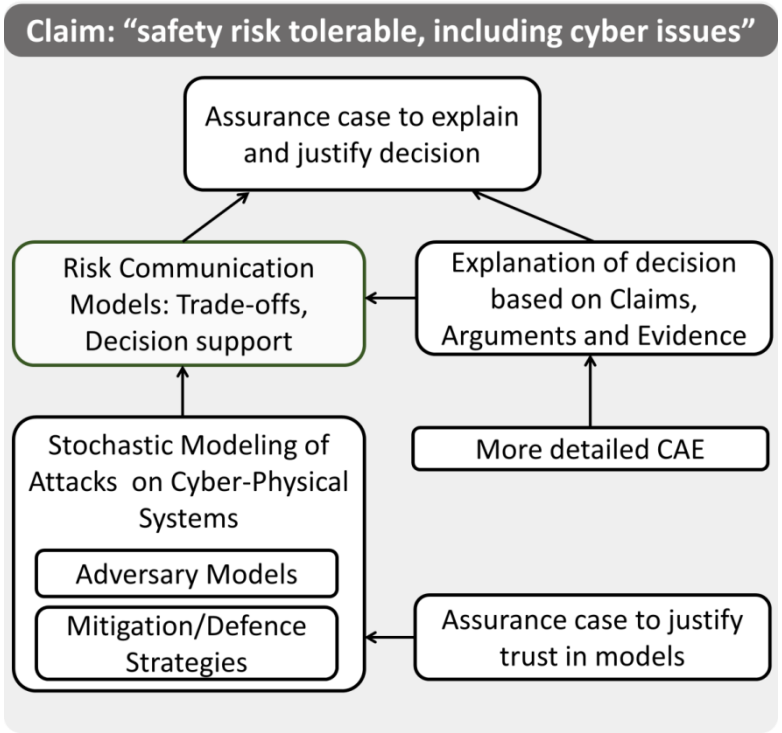
CEDRICS Communicating and evaluating risk and dependencies

Stochastic models of systems and adversaries



Decision analysis and communication based on Claims, Arguments, Evidence

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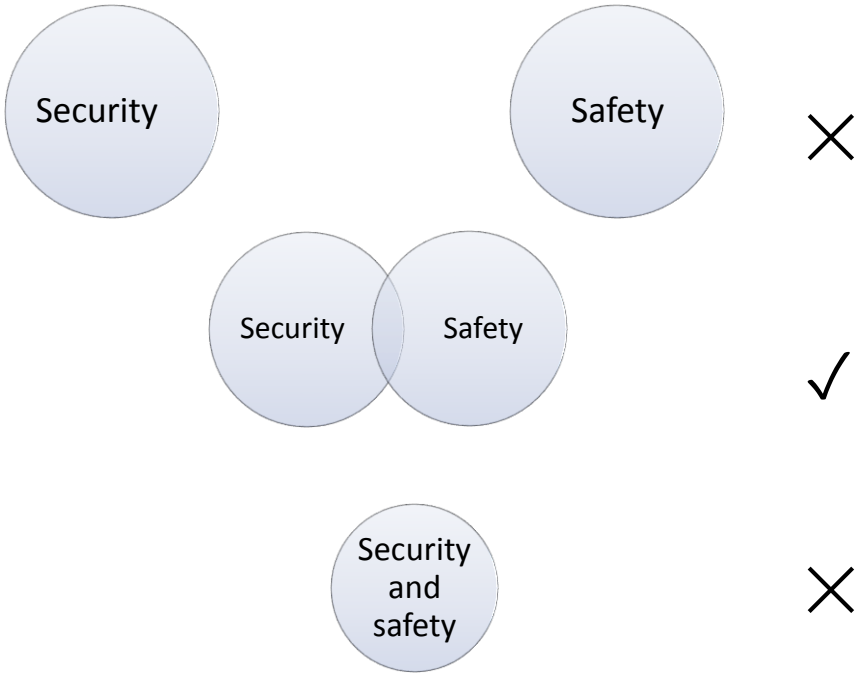
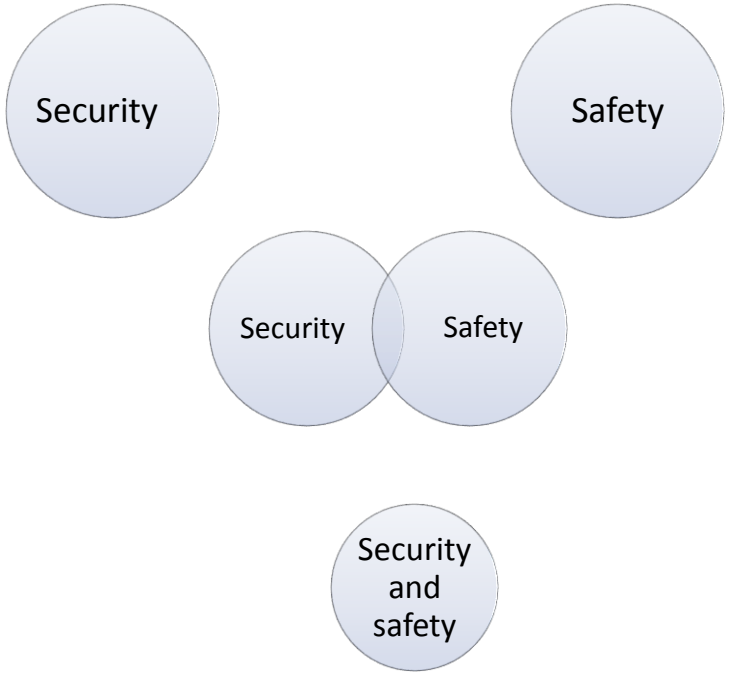
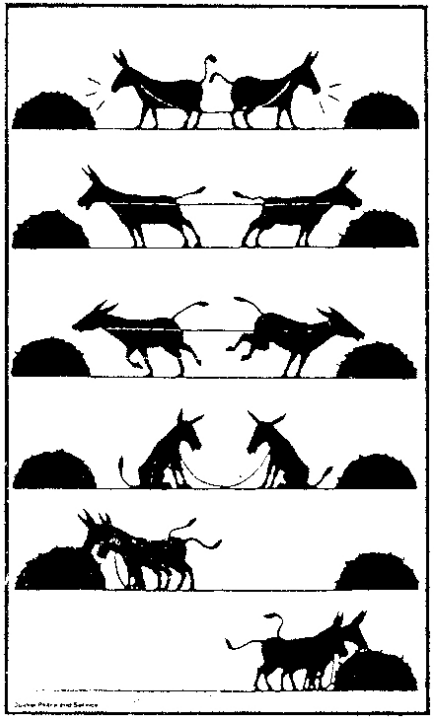
How much should safety and security be integrated?



Slogan “If it’s not secure, it’s not safe”





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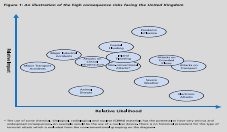
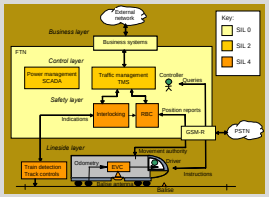
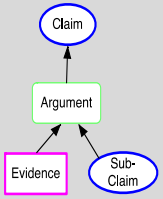
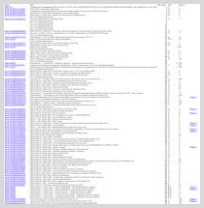
Security-informed safety and resilience - overview

Systems of systems	Risk assessment	Training	Assurance and policy Framework	Standards and policy
				

MINDSET

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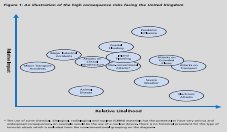
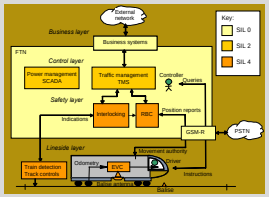
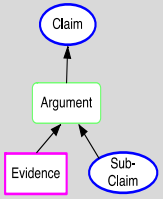
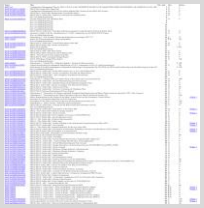
Security-informed safety and resilience

Systems of systems	Risk assessment	Training	Assurance and policy Framework	Standards and policy
				

Many projects: Sesamo, Aquas, IEC, BSI, IET …

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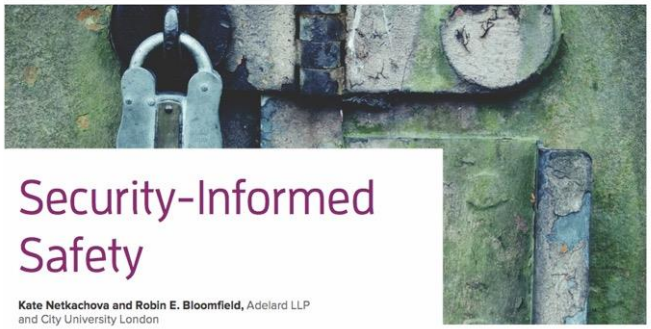

Security-Informed Safety

Kate Netkachova and Robin E. Bloomfield, Adelard LLP and City University London

For safety-critical systems, if it isn't secure, it isn't safe.

which a system malfunction could lead to accidents with marginal or negligible severity, to high criticality, in which a system failure or malfunction could result in death and

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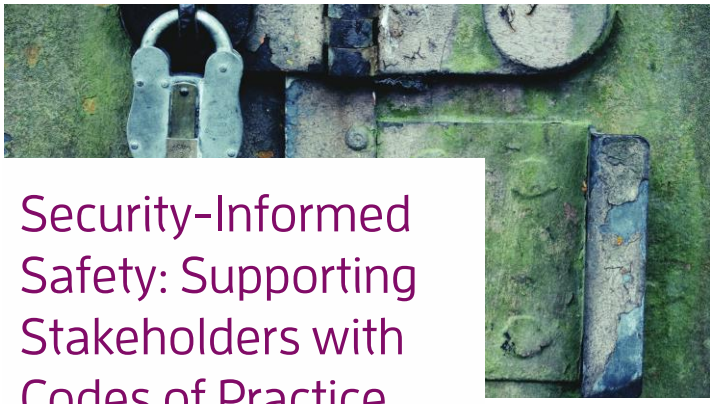


Security-Informed Safety: Supporting Stakeholders with Codes of Practice

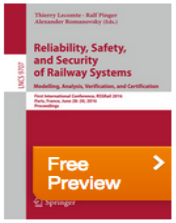
Robin Bloomfield and Peter Bishop, Adelard LLP and City, University of Londo
Eoin Bu
Robert S

Codes
guidar
securi
engine
minde

engineers think, in order to make

» Computer Science » Software Engineering

Programming and Software Engineering



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Reliability, Safety, and Security of Railway Systems. Modelling, Analysis, Verification, and Certification

First International Conference, RSSRail 2016, Paris, France, June 28-30, 2016, Proceedings

Editors: **Lecomte**, Thierry, **Pinger**, Ralf, **Romanovsky**, Alexander (Eds.)

ROYAL ACADEMY OF ENGINEERING

Cyber safety and resilience

strengthening the digital systems that support the modern economy

Kate Netkachova and Robin Bloomfield, City, University of London; and Adelard LLP

Bloomfield, R. E., Bendele, M., Bishop, P. G., Stroud, R. & Tonks, S. (2016). The risk assessment of ERTMS-based railway systems from a cyber security perspective Methodology and lessons learned. Paper presented at the First International Conference, RSSRail 2016, 28-30 Jun 2016, Paris, France.

CYBERTRUST

PAS 11281

Connected automotive ecosystems – Impact of security on safety – Code of practice

September 2018

CPNI
Centre for the Protection of National Infrastructure

RAIL CODE OF PRACTICE FOR SECURITY-INFORMED SAFETY

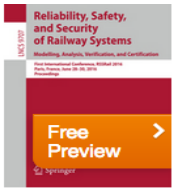
A GOOD PRACTICE GUIDE

OCTOBER 2018 (DRAFT)

-Informed
Supporting
lders with
f Practice

shop, Adelard LLP and City, University

engineers think, in order to make "security mindedness" a common practice—to consider the impact their work might have on security as well as the impact security may have



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Assuring autonomy

Enclosure 2

Lloyd's Register Foundation

UNIVERSITY of York

Assuring Autonomy International Programme
Expression of Interest Form – Call 01

Towards Identifying and closing Gaps in Assurance of autonomous Road vehicleS
(TIGARS)

ADELARD

WITZ

INFORMATION SCIENCE NAGOYA UNIVERSITY

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KANAGAWA UNIVERSITY

90th ANNIVERSARY SINCE 1928

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Short term

- Landscape and road mapping
  - Identify issues with practitioners
    - Transport, Nuclear,
    - Resilience community
  - Develop issues
    - Breadth and selective depth
  - Combine
    - Technology and threat awareness
  - Develop R&D roadmap
- Progress research
  - Tempo and agile assurance cases
  - Model based trade-off analysis

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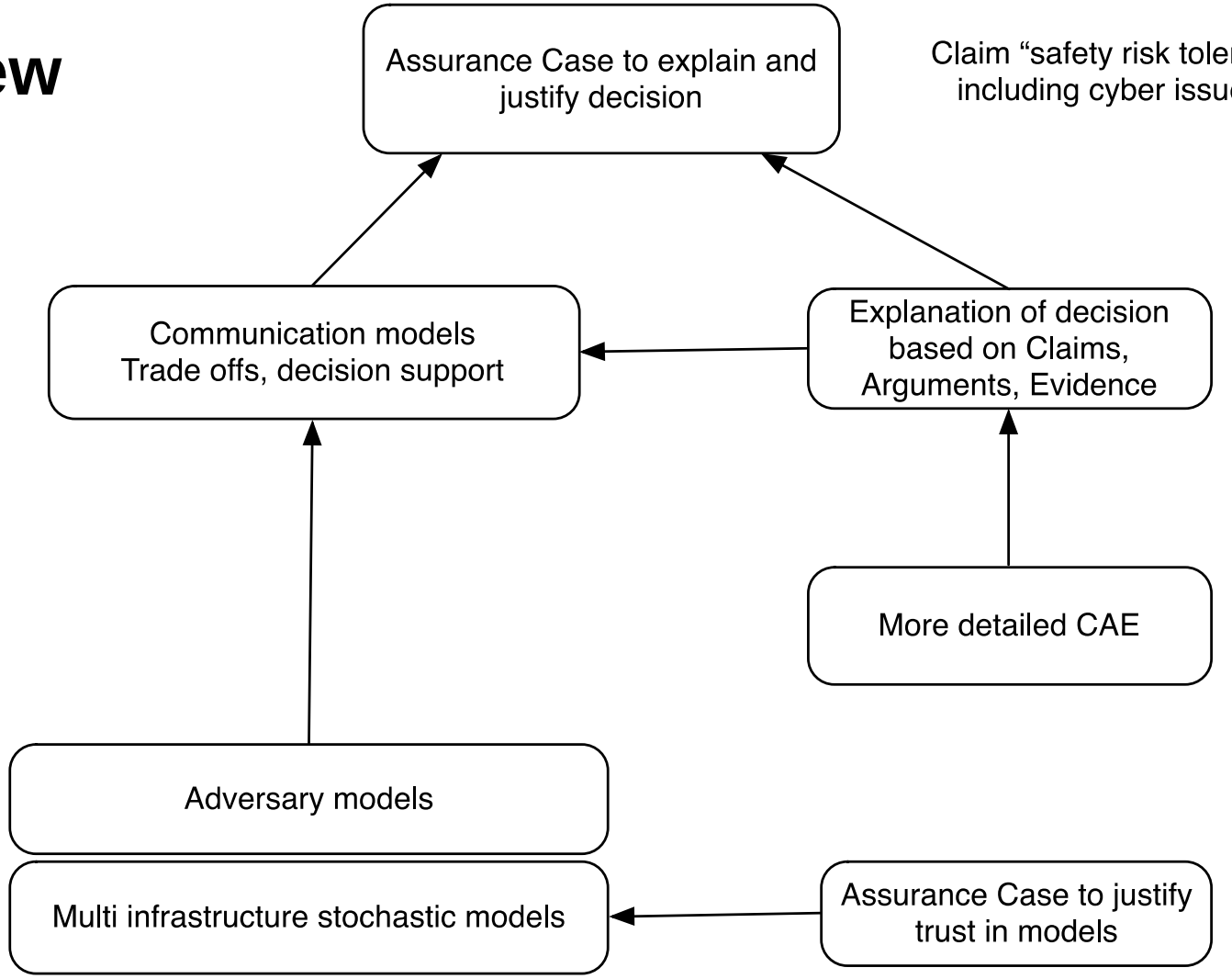
Overview



PIA FARA

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Safety and Security: trade-off analysis

- Trade-offs analysis between safety and security is often done qualitatively. The modelling approach to resilience improvement offers a quantitative alternative.
- Trade-offs between safety and security may be subject to review and change throughout the development process and after deployment
  - e.g. targets decided early may become infeasible or new threats may emerge
- We will scope tool support for quantitative trade-off analysis which covers the entire product life-cycle of safety-critical development: from feasibility to maintenance.

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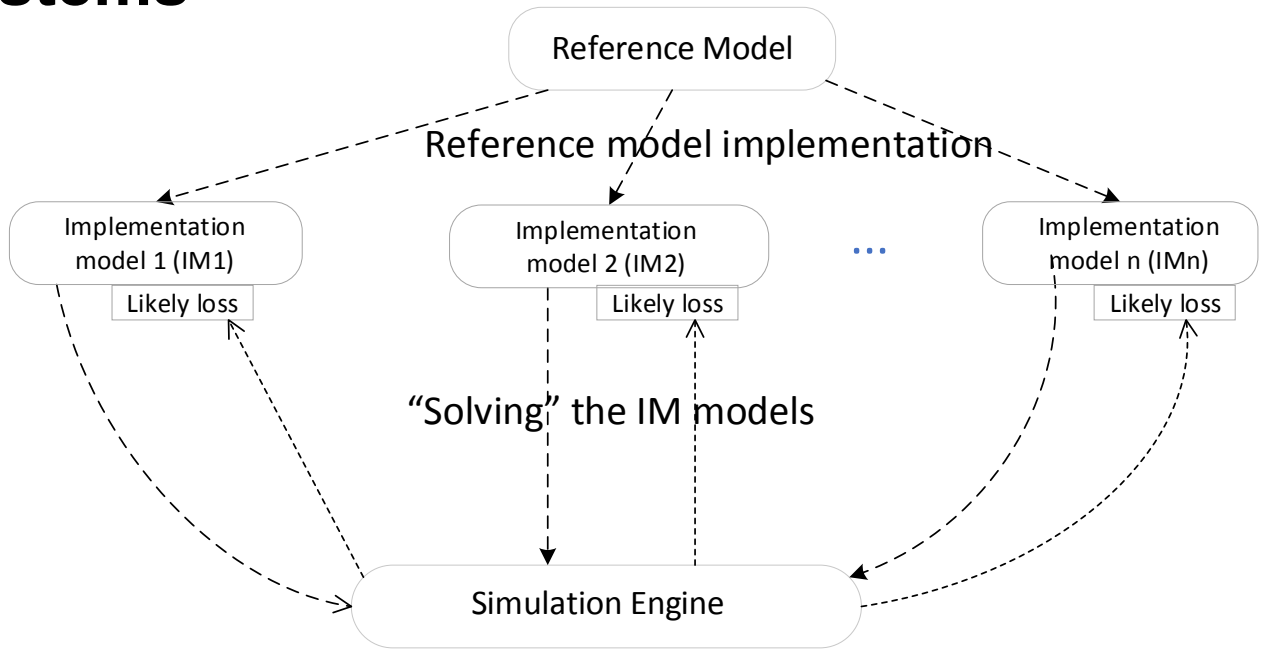
Model-driven approach to improving cyber- resilience of complex systems



- Explore role of ***reference model*** will assist decision makers to identify the space of credible alternatives.
- Compare using high-fidelity models, which will be derived for the specific "base-line" system and solved using PIA:FARA tools, designed to do that.

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Short term

- Landscape and road mapping
  - Identify issues with practitioners
    - Cross sector …Transport, Nuclear, Electricity ..
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