Modeling & Simulation

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Thoughts For The Future

Gerald Douglas
Lockheed Martin

Roger Chamberlain
Washington University

Layers Of Defense and Opportunities to Innovate

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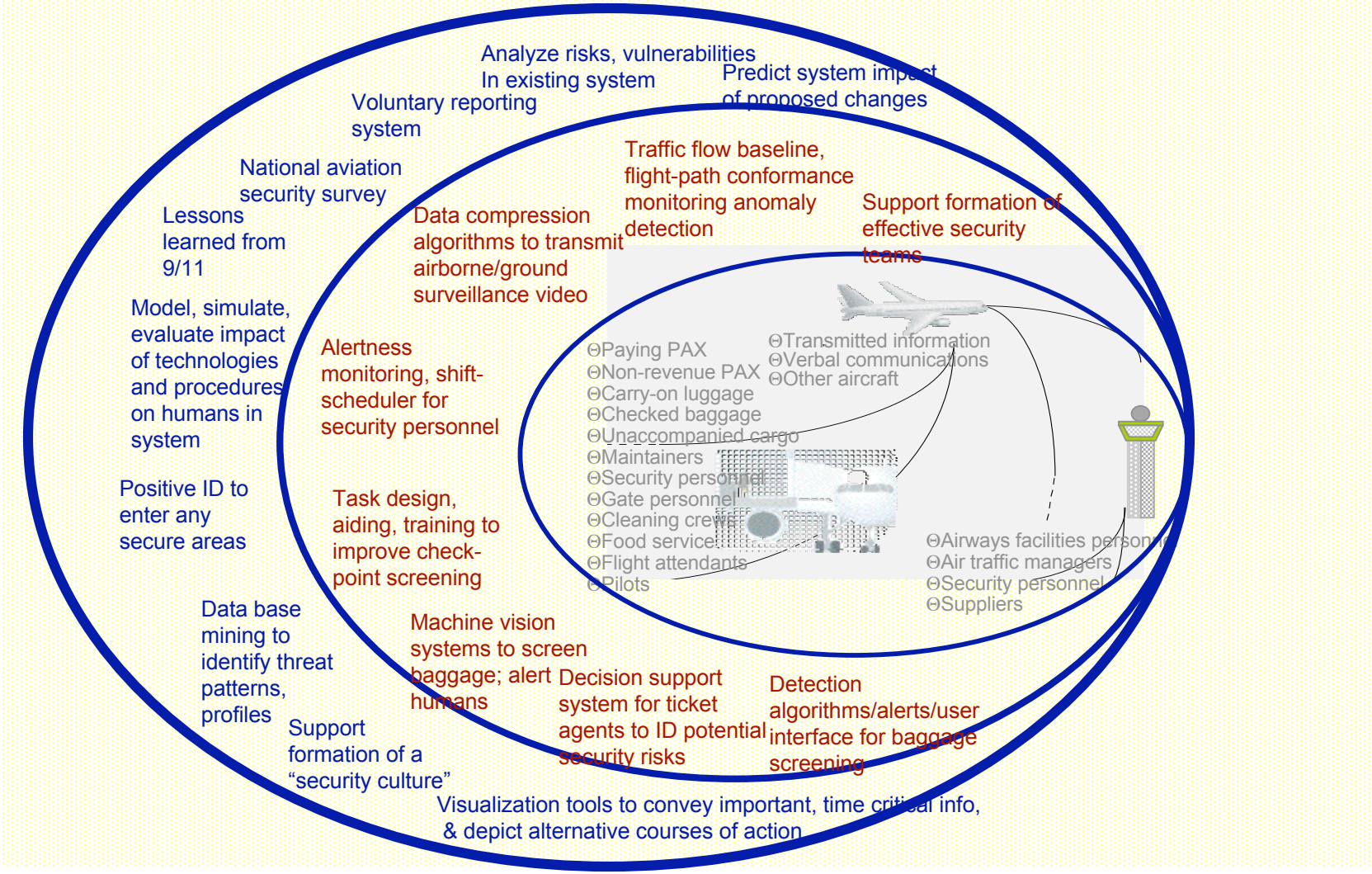

The Security "Net" Is Dynamic

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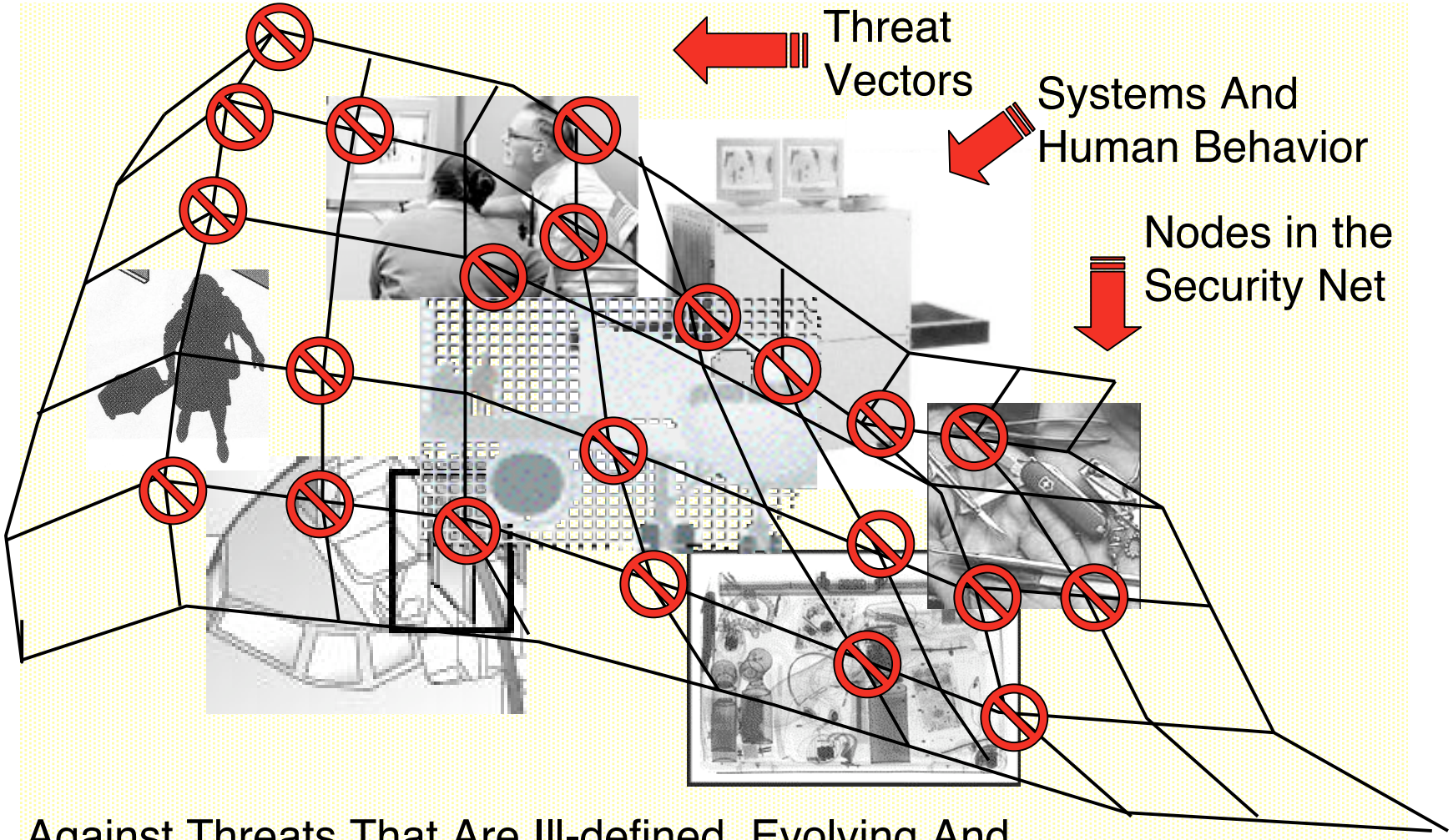

… Against Threats That Are Ill-defined, Evolving And The Result Of Deliberate And Intentional Actions

SG Hart, Ames Research

Layered Approach For Innovation

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Underlying Science	Security-Specific Applications	Focus
System Monitoring & Information Sharing	Analysis of risk, vulnerability	System vulnerabilities, patterns & trends Passenger profiles
	Voluntary reports of security issues	
	Data mining and visuali zation	
	Post hoc analyses	
Vision science	Automated pattern recognition devices	Baggage screening Personnel ID Remote monitoring
	Biological identification systems	
	Efficient transmission of visual data	
Perception, Attention & Cognition	Monitoring multiple auditory channels	Baggage screening Video surveillance Deviations in flight path
	Vigilance/Pattern recognition	
	Flight plan conformance monitoring	
Performance evaluation	Real-time alertness monitoring	Security personnel Aircraft crew coord ination Air/ground coordination
	Assess impact of procedures, technology, environment on operators	
Procedures & Policy	Distributed Teamwork	Aircraft crew coordination Air/ground coordination
	Transfer of control	
Task Analysis & Modeling	Computation al analysis of candidate solutions	Security personnel selection Security, ATC, pilot procedures Airspace operations
	Model-based exploration of procedures	
	Incorporate human factors into design	
Training	Effective teamwork	Security teams Flight crews Controllers & supervisors
	Use of virtual reality, intelligent tutoring	
	Reduce airport screener/monitors fatigue	

The March Of Modeling

- **2002/2003**
  - Modeling Was Done To Gauge The Effect Of The TSA Systems On PAX Queuing & Movement.
- **The Present**
  - Same Plus Equipment Suppliers Do Some Modeling To Provide Better Products.
- **The Future**
  - Today's Modeling Hardware & Software Will Enable Virtually Boundless Expansion Of The Modeling Experience

What Can Be Done?

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• Sensor Bit Streams Can Be Compared With Every Known Threat Bit Stream

•A Behavioral Analysis System Can Identify “Suspicious” Behavior

• Disparate “Intel/Data” Can Be Assembled And Analyzed To Determine Threat Risk Probabilities

More Intense Screening Of Specific Subjects
Faster Lane Throughput

What Can Be Done? Example

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Determine Optimum Conditions To Achieve Maximum Cognitive Results

The Challenges

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– Expand Multi-Discipline, Integrated Modeling

- Establish Integration With Systems Design And Integration Activities

- Assimilate Additional New Technologies And Capabilities.

Next Generation Technologies Are Ready To Respond.

Objective – Focus Security Resources

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- Expand Models To Provide Improved Security

- Expand Models To Support New Products, Systems Developments And Procedures

- Expand Models To Analyze Staff Workload In Multiple Scenarios

Establish New Plateaus of Security Excellence

Safe!! What Else Can Happen Now?

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Duh! Let's Be Prepared For Anything.

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Thank You For Your Time and Attention!

jerry.douglas@lmco.com