



Visual Analytics for Requirements-driven Risk Assessment

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The Problem

- Certification and Accreditation (C&A)
 - **Certification**: Assess level of compliance with baseline security requirements (specified in regulatory documents)
 - **Accreditation**: Agree upon an “acceptable level of risk” for authorizing system operation
- Large information space exists for understanding “**RISK**”
 - Complex interdependencies of systems of systems
 - Diverse socio-technical environment
 - Numerous natural language C&A requirements

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2

Why Visual Analytics will help?

- Visual Analytics in the intelligence community
 - Combine human intuition and mathematically derived metaphors to highlight the obvious and discover the obscure
- Visual Analytics for Requirements:
 - Creation of abstract **visual metaphors** that help to systematically reason about the related software behavior in a large information space
 - Quantitative metrics
 - Compliance levels, Properties of analysis artifacts
 - Qualitative metrics
 - Criticality, Impact, Risk levels, Uncertainty, etc,...

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3

Users and their Uses?

- The dilemma of a **Certification Analyst**:
 - Collective adequacy of diverse security constraints
 - Potential security risks due to non-compliance
- Some **really** helpful answers!
 - Necessity and sufficiency of C&A requirements
 - Prioritize C&A requirements
 - Cascading/propagative impact on other requirements
 - Coverage of risk components
 - Identify the influence of C&A requirements on the effective implementation of each other



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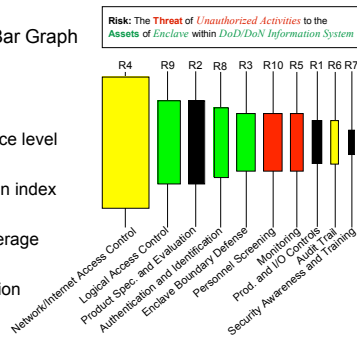


4

The Visual Metaphors

■ The Cohesive Bar Graph

- **Color**
 - Presence
 - Compliance level
- **Height**
 - Correlation index
- **Width**
 - Risk Coverage
- **Order**
 - Prioritization



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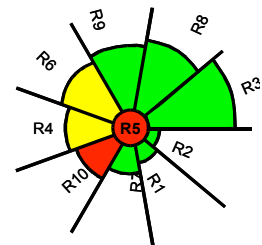


5

The Visual Metaphors

■ The Cohesive Arc Graph

- **Color**
 - Compliance Level
- **Arc Radius**
 - Requirement Influence Factor



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6

