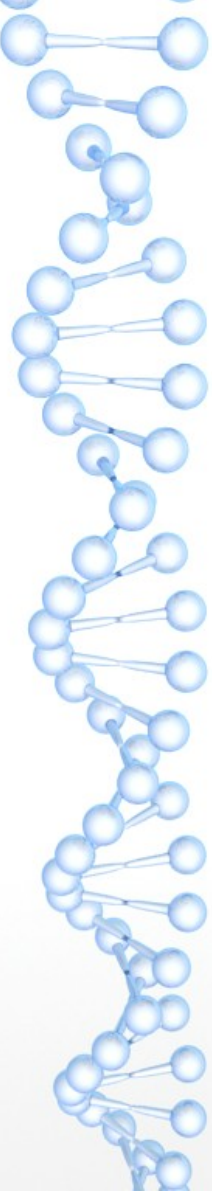


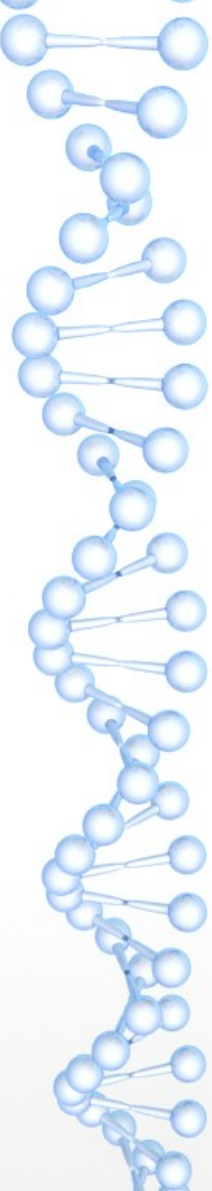
Workshop on Interoperability for Situation Management and Decision-Making

Ken Baclawski
22 May 2021



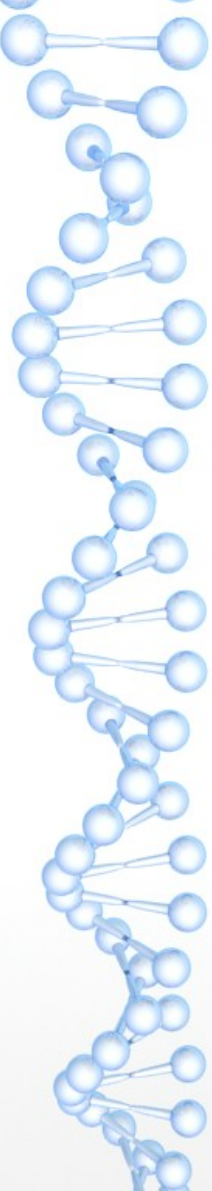
Agenda

- Lessons Learned from the first workshop
- Gamification by Alicia Ruvinsky
- Communiqué
 - Motivation for Interoperability
 - Survey of Situation Awareness Domains
 - Interoperability Issues
 - Future Prospects
 - References



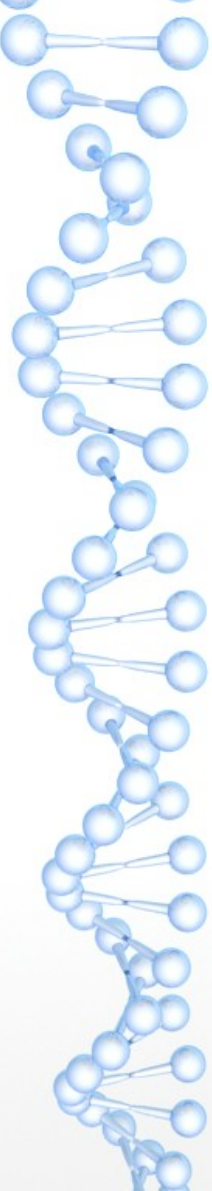
Role of Ontologies

- Ontologies are a powerful tool, but...
 - They do not solve interoperability by themselves
 - They could even make the problem worse
 - One can make progress on interoperability without ontologies or with simple ontologies and knowledge graphs
 - Nevertheless, there are examples of success stories of ontologies for interoperability such as the Gene Ontology, the Open Knowledge Network and many others.
- Lesson: Interoperability does not equal Ontology, but ontologies can be one of the key enablers of interoperability.



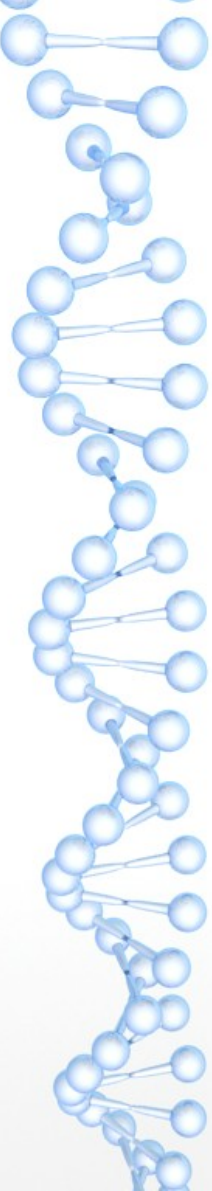
CogSIMA 2021 Presentations

- Interdependence and Vulnerability in Systems (William F. Lawless)
- Importance of Transparency (Mica Endsley)
- Computation as a Dynamical System (Susan Stepney)
- Psychological Dimensions of Cognitive Situation Management (Mare Teichmann)
- Gamification (Alicia Ruvinsky)
- Ethics (William D. Casebeer)
- Theory of Mind (Katia Sycara)
- Many more...



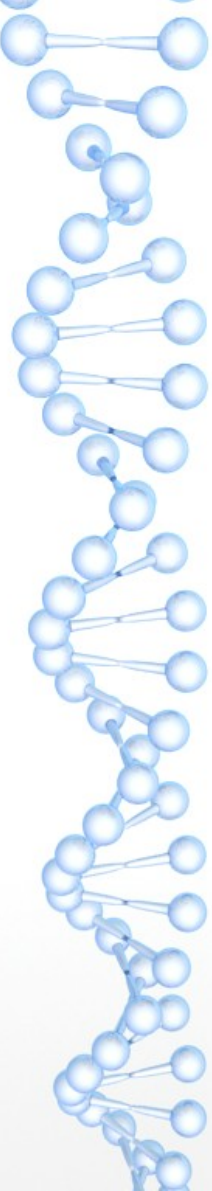
Work on the Communiqué

- With about 40 paragraphs, we can only spend around 4 or 5 minutes on each paragraph.
- If the 5 minute limit is exceeded, we will move on to the next paragraph.
 - If there is a consensus, the paragraph will be included with possibly minor changes.
 - If there is no consensus, the paragraph will either be deleted or be revised by a volunteer.
- Additional paragraphs can be added if there is consensus and volunteers who will add the additional material.
- A volunteer must be a member of the CogSIMA community.



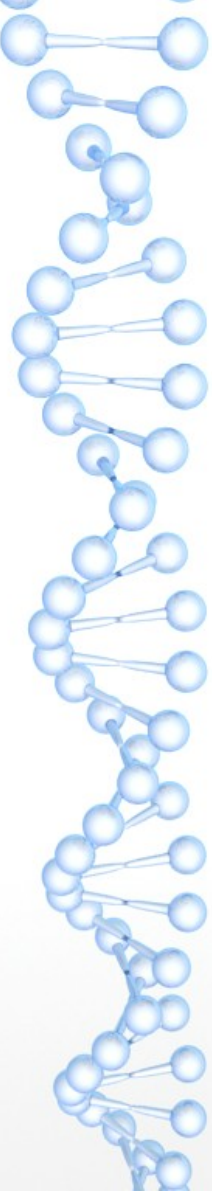
Motivation

- Introduction
- Shared Understanding
- Sharing Data
- Dealing with Complexity
- Experience with Bioinformatics



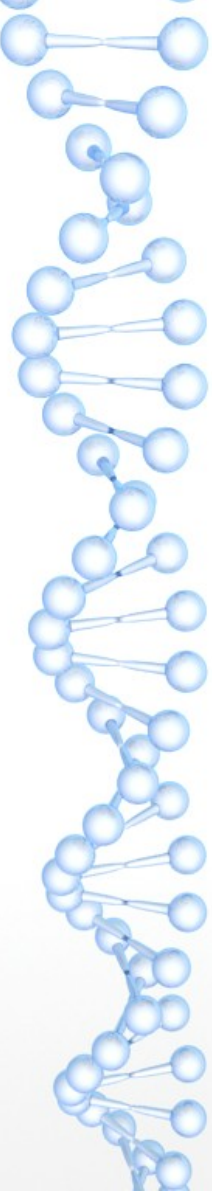
Survey of Situation Awareness Domains

- Healthcare
- Transportation
- Logistics
- Finance
- Government
- Self-Awareness



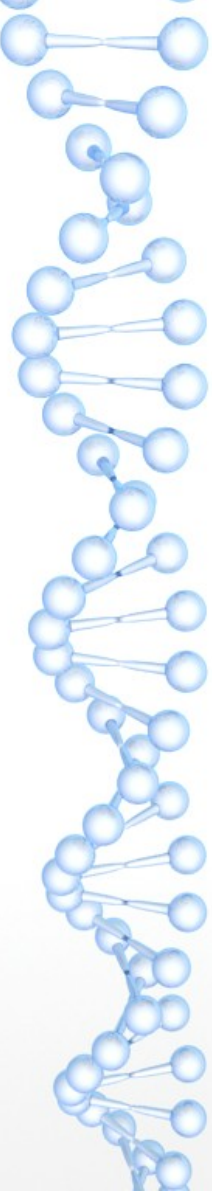
Interoperability Issues

- The Rule of Least Power
- Compliance Levels
- Benchmarks
- Evolution
- Uncertainty
- Context
- Reference Ontologies
- Process Modeling
- Decision Rationales



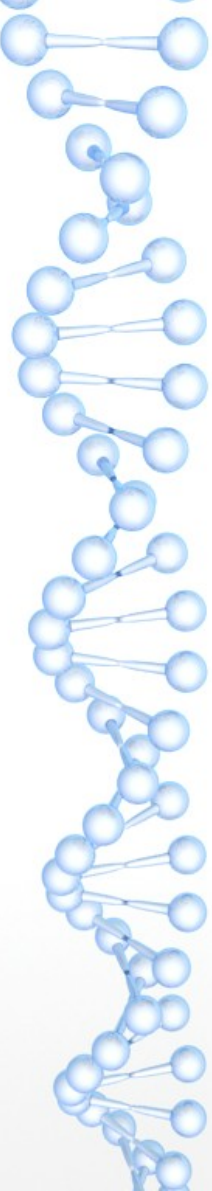
Future Prospects

- Identify a target domain for whom it is the right time for interoperability standardization.
- Develop an explicit statement of the scope and purpose of an effort.
- Propose challenge problems/benchmarks.
- Initial ontologies and other artifacts are developed.
- Determine the most appropriate foundation for interoperability.
- Provide ample documentation and user forums.
- Choose a standards development organization (SDO).



Other Issues

- Please send me references for the paragraphs.
 - Not just your own work
- Where should it be submitted?
- Is it too late to include a 2 or 3 page extended abstract in the CogSIMA proceedings?



Knowledge Graphs

- Very popular but there are problems with RDF and OWL
 - Fixed logic (Description Logic) that is difficult to use and understand
 - Annotations are awkward, and annotations of annotations are even worse
 - Reification is awkward and inefficient
 - Facts (triples) and their reifications are unrelated
 - In many cases, RDF is only used as a low-level representation.
- Why not develop a new KG language based on lessons learned?
 - Logic agnostic
 - Has a simple subgraph construct for specifying situations with their own logic and behavior
 - All triples are reified and can be easily annotated (and the annotations can be annotated...)
 - Ontology is separate from the graph.
- Disadvantage is lack of tools
 - But RDF tools could be adapted