AXON AI

Research Areas of Interest
Information flows among people, models, and data

Entailment (PGM)
Causal-Temporal (NSM)
Geospatial
Social Network
Task-Dependency (HTN)

## ABC Research, LLC

Superior solutions using
Agent-**B**ased and
Complex Systems

Physics
Biology
Linguistics
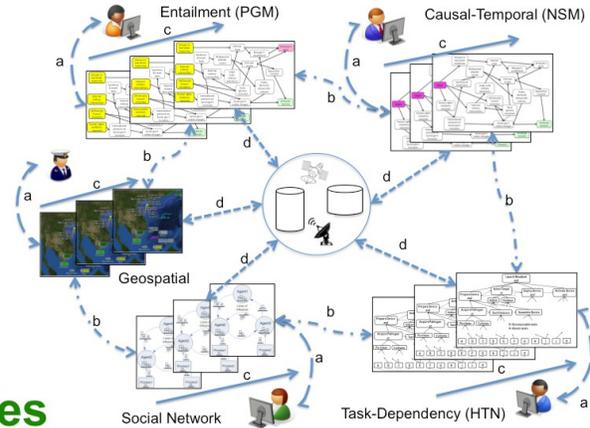
Qualifications and Capabilities
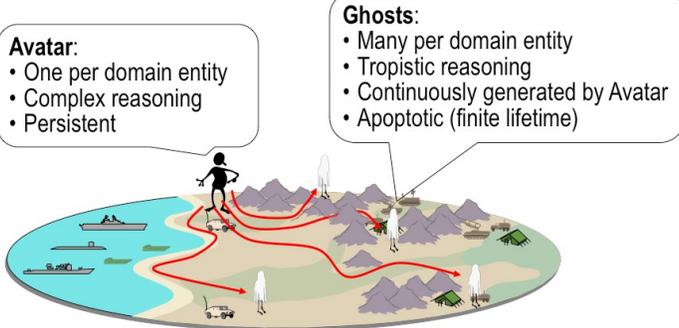(developed in multiple IARPA, DARPA, ONR, and NIST programs)

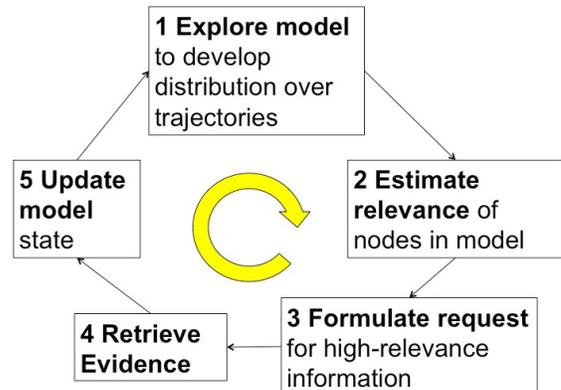**Representation**: GRAMAR (GRAphical Model of Argumentation) subsumes multiple widely used model types

Geospatial   Causal-Temporal (NSM)   Task-Dependency (HTN)   Social Network   Entailment (PGM)
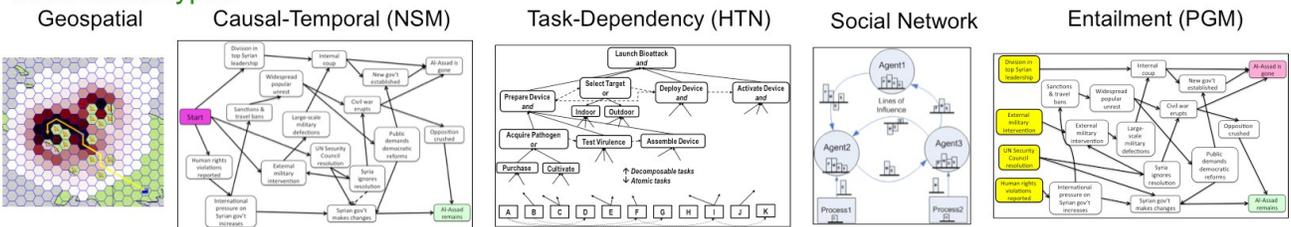
- Node = evidence-bearing statement
- Edge = inference
- Trajectory = hypothesis
- Argument = orthogonal Toulmin or gIBIS structure

Aggregation:
Polyagents perform stateful, context sensitive MCTS to develop distribution over alternative futures

Avatar:
- One per domain entity
- Complex reasoning
- Persistent

Ghosts:
- Many per domain entity
- Tropistic reasoning
- Continuously generated by Avatar
- Apoptotic (finite lifetime)

- Each ghost samples one possible trajectory of its avatar
- The set of ghosts builds a distribution over possible trajectories ($\sim 10^7$) *in a single run*.

Query:
D2REEM matches a graphical hypotheses against data in time linear in the size of the graph

1 Explore model to develop distribution over trajectories
2 Estimate relevance of nodes in model
3 Formulate request for high-relevance information
4 Retrieve Evidence
5 Update model state

Teaming
We bring
- expertise in multiple graphical representations, polyagent inference, and D2REEM
- engineering partners and engines

We seek partners with expertise in
- HCI, group psychology, collaboration theory
- Subject recruiting and management
- Experiment management

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