ABC Research, LLC
Superior solutions using Agent-Based and Complex Systems

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
  - Trospic 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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