Breakout Group #3 Outbrief

Participants

John Salerno (AFRL/IF)
John Tangney (AFOSR)
Ronald Yager (Iona College)
Neal Glassman (AFOSR)
Abbas Zaidi (George Mason University)
V.S. Subrahmanian (University of Maryland)
Hector Munoz-Avila (Lehigh University)
Sajjad Haider (George Mason University)
Subbarao Kambhampati (Arizona State University)
Eugene Santos (University of Connecticut)
Rick Warren (AFRL/HE)
Jean-Michel Pomarede (CIA/ATP)
Dick Deckro (AFIT)
Michael Dunaway (ONR)
Dana Nau (University of Maryland)
John Lemmer (AFRL/IF)

Topics Covered

- Modeling Culture and People
- Relation to Theoretical Modeling
- The Modeling Environment
  - Interdependency Between Cultures
  - Purpose (Model Use)

Modeling Culture and People

- Cultural Models require inputs
  - e.g. Economic, Religion, Language, Demographic, Geospatial, Transportation, Norms, Values, Beliefs (PMESI)
  - to correlate with events observed and learn these relationships
  - To determine what inputs are most useful
    - Feature vector to support model purpose and function, e.g.
      - » Guidebook v. computed action selection
      - » Interrogation
    - Target of comment and advice from social science community
  - cultural profiling may be useful guide
    - "Masks of War" analysis of MilDep Cultures (incl size, history, culture, PME, etc) its expressions and impacts on decision making,
    - so work from coarse to fine using molar measures, e.g. educational level of women
- Culture is more than input, it constrains understanding and explanation
  - Especially considering perturbations
- Does culture determine behavior?
  - Granularity issue: individual vs. group vs. society culture
  - Universals (e.g. value of human life)
- Issue: Cold war experience with modeling apply (50 years of continuous improvement)?
  - Adaptive models needed as, e.g., developed for counter cyber attack, and as appears necessary for e.g. new modes of attack
- Issue: Situation assessment requires estimates of human intent and capability for anticipation and intervention

The Modeling Environment

(Objective Functions in Cultures)

- Norms, values and beliefs affect perceived pay-offs and evaluation
  - E.g. value of mission success v collateral effects
  - Need for SMEs + Computational Models
  - Include strength of cultural influence in models
  - MAS approach shown flexible
  - DB integration shown useful (cult anthro provide schema) and, with rule based systems explanation is extractable and, if made feasible, valuable for users
    - But, models don't freely generate explanation or COAs
- Q: Could Cult Anthropologist analyze SIMs
- Model Points of Influence
- Issue: Models not end in themselves. Social scientists must define the context and the required data (CS is in support).
  - Related issue: other culture models not sufficient, need model of own culture and interaction
  - Related issue: culture varies between levels of hierarchical control and each level must be modeled to avoid mixed signals and associated (mis)actions

The Good

- Techniques to Build On
  - Success in Checkers, backgammon, poker
  - AI has considerably advanced
  - Human centered (can harvest human expertise)
- Available data essential to model improvement

The Bad

- Techniques need building on
  - Checkers of questionable applicability to cultural Adversarial Decision Modeling (ADM)
  - AI hobby shopping, unfocussed, narrow
  - Human explanation not possible
- Data not available for ADM
  - But.. avoid Data Base Management (DBM) and Information Management (IM) trap

Challenges

- Represent Culture in Models and AI Techniques
- Define a well-grounded computational challenge
  - Otherwise the development community will work on whatever's convenient
- Suggested approach: use analyst + scenarios in representative case studies

Summary

- Decision Making, own and adversary
- Models are Necessary to Support Analysis and Not Necessarily Action Selection
- Fidelity and Purpose of models are Co-Evolved
- Decision Makers will Lead the Way
  - Adversary decisions
  - Subject Matter Expertise (Social Scientists, CS, etc)
  - Ontologies
  - Model Validation
- Others, e.g. CS, will provide the tools
  - User friendly (e.g. provide explanation or pretty pictures, like Analysts Notebook or PowerPoint)

Additional Discussion Items

- Environment of ADM
  - Diplomatic, Information, Military and Economic (DIME) actions,
  - Political, Military, Economic, Society, Infrastructure and Information (PMESII) outcomes
  - Outcomes: predicting internal political stability; survey data
  - Adversary intent and capability are influenced by culture → anticipate and shape
  - Complexity:
    - Multiple scales
  - Data are fundamental to modeling;
- Constraints on Modeling
  - No adoptable rule book for adversarial games
  - No easy validation (use credibility of generated stories?) of models
  - Adversarial actions not always transparent; updating models difficult
- Advice to Modelers
  - Reduce complexity, model the 'clumps'
    - regional issues, e.g. factional competition
    - cultural entities, including own view, independent of region
  - Model the resources, growth, and evolution of adversaries
  - Model learning and adaptation required to gain rulebook (sometimes doctrine)
  - Gain knowledge from data and Subject Matter Experts (SMEs)
  - Build models that merge with use processes (to ensure effective use)

Additional Discussion Items (Cont'd)

- Challenges
  - Selecting the usefully modeled clumps (decomposition) to suit purpose
  - Players can tap unmodeled resources, e.g. recruits
  - Selecting a modeling approach and integrating them
  - Merging opponent model (and adaptations) with computational approaches
  - Adversary discovery, through data, context sharing, and inheritance
  - Determining adversary rules, objective functions, value functions
  - Generalizing models to new levels, groups