What have we achieved?

MABS 2000

2nd International Workshop on Multi Agent Based Simulation

My issues for MABS-2000

- Problem-oriented approach
  - Techniques chosen or developed for aim of software system (e.g. social simulation model)

- Agent interaction in scalable, complex software systems

- Validation of representational models and applications

- Role of foundational ABSS

Your issues for MABS-2000: prediction

- Prediction validates simulation models as descriptions of social systems

- Predicting properties of systems with changing structures

- Expectancy of conditions that will (might?) emerge in real world

Validation

- Require validation methodology
- Complexity of agent specification
  - Complex agents identified with basis of agent design in cognitive science
- Complexity of agent design trades off explanation for prediction

Reported validation procedures

- Validation by appeal to domain experts and/or qualitative descriptions of observation
  - Retirement model (Rob Axtell)?
  - Archisim (presented by Alexis Drogoul)
  - Climate change models (Claudia Pahl-Worstl)
  - Shipping (Klaus Fischer)
  - Inter-sexual dominance (Charlotte Hemelrijk)
  - Common resource use (Olivier Barreteau)
- Validation by prediction
  - None in conventional sense of (*eg*) Popper

Problem-solving

- Small models to solve particular problems
  - Cognitive science *vs* engineering
  - "Any purposive behaviour modellable as utility formulation" – Axtell
- Impact of sociological models on technical systems
- Organizational analysis
  - New forms crossing computer-human boundaries
- Feedback to social scientists

Macro-micro issues

- Different perspectives rather than different simulation systems
  - Drogoul, Fischer, Barreteau, Pahl-Worstl
- Need model systems – different grain but mutually consistent

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Discussion of micro-macro issues

- Universality: given macro system properties sometimes follow from a range of alternative agent specifications.
    - Axtell: Makes agent specifications less important
    - Drogoul: Axtell view (representing SFI) incompatible with participatory modelling approaches
- When and why universality occurs is an important research issues

Foundational issues

- Formalisms & derivatives

  – Norling: extending BDI as programming paradigm

  – Teran: transforming agent models to constraint logic –
  facilitating theorem proving of MAS properties

  – David: extending use of logical formalisms to clarify
  core concepts and issues without loss of expressiveness

- Promise of link to representational simulations

  – Scale problem?

Lessons or results from papers

- Validation – which papers validated models
  - In practice, papers with validation entailed validation by description

- Feedback to social scientists?

- Impact of cognitive science?

- Contributions to software design/engineering
  - From use of or appeal to logical formalisms?
  - By analogy from social models?

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Final issues raised in discussion

- What kinds of systems are best approached using a MAS paradigm?

- Within MASs, what should be the most fine grained level of agent?

- How is the grain of the system to me justified?