CS378
Autonomous Multiagent Systems
Spring 2004

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Week 5a: Tuesday, February 17th
Good Afternoon, Colleagues

Are there any questions?
Logistics

- Programming assignment 4 - any questions?
Logistics

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• A couple more talks:
  – Rob Holte: poker (Wed. @ 1:30, ACES 6.304)
  – Rosaline Picard: emotional intelligence
    (Thurs. @ 3:30, ACES aud)
Logistics

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- Next week’s readings posted
Joint Intentions – Setting

How agents **form and disband** teams
Joint Intentions – Setting

How agents form and disband teams

- Agents in dynamic multiagent world
- Neither complete nor correct beliefs
- Changeable goals, fallible actions
- Don’t know others’ beliefs/goals
Starting Point – Individuals

**Persistent goal:** relative to \( q \) to achieve \( p \)
Starting Point – Individuals

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- $p$ false, but desired true
- $p$ will keep being desired unless:
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**Intention:** persistent goal, belief throughout that it’s being done
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- What’s the role of $q$?
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**Intention:** persistent goal, belief throughout that it’s being done

- What’s the role of $q$?

- What’s the difference between goal, intention?
2 proposals for teams

Joint commitment not just intention where agent is team
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Joint commitment not just intention where agent is team

**Weak:** Joint intention $\equiv$ mutually known intention: each intend to do their part of collective action
2 proposals for teams

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Strong: Same, except mutual knowledge persists until mutually known that activity is over
2 proposals for teams

Joint commitment not just intention where agent is team

**Weak:** Joint intention ≡ mutually known intention: each intend to do their part of collective action

**Strong:** Same, except mutual knowledge persists until mutually known that activity is over

Why too weak and too strong?
Joint Commitment

Weak achievement goal (WAG): relative to $q$ with respect to a team to achieve $p$
Joint Commitment

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- Individually wants $p$
Joint Commitment

Weak achievement goal (WAG): relative to $q$ with respect to a team to achieve $p$

• Individually wants $p$
  OR
• Believes $p$ true, impossible, or irrelevant, AND has a goal of team knowing it.

4 cases
Joint Commitment

Joint Persistent Goal (JPG): relative to $q$ to achieve $p$

- mutually believe $p$ false, but mutually know all desire $p$ true
- mutually believe that each have WAG $p$ until
  - mutually believe $p$ true
  - mutually believe $p$ impossible
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Joint Commitment

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- Intend own action, committed to others’
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- Overhead: automatic goal to communicate status
Establishing JPGs

- Communication (basis for KQML)
- Observation (requires co-presence)
Establishing JPGs

- Communication (basis for KQML)
- Observation (requires co-presence)
- Any other way?
CYC – Doug Lenat

- Attempt to program common sense
CYC – Doug Lenat

• Attempt to program common sense

• > 1 million rules
  – “Trees are usually outdoors.”
  – “Once people die they stop buying things.”
  – “Glasses of liquid should be carried rightside-up.”
CYC – Doug Lenat

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- Ongoing effort since 1984
CYC – Doug Lenat

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• Potential applications?
• Attempt to program common sense

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• Ongoing effort since 1984

• Potential applications?
  – Some listed on their web site
  – Question answering, retrieval of captioned information, machine translation, speech recognition, semantic data mining, . . .
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• Agree or disagree?