Agent Communication

Speech Acts

- Declared in declarative form

    - Performative verbs

Informative - "Shipment will arrive on Wednesday"

Directive - "Send me the goods"

Commissive - "I will pay you £5"

Software Engineering Approaches:

- Sequence Diagrams

- State Transition Diagrams

Evaluation w.r.t multiagent systems:

- Low level abstractions

- Difficult to design and maintain

- Less flexibility at runtime

- Easy compliance checking at the cost of flexibility

Artificial Intelligence Approaches:

- Knowledge Query and Manipulation Language (KQML)

    - Agents maintain a knowledge base in terms of belief in assertions

    - Assumption: Agents are cooperative

- FIPA - Agent communication language

    - Specify a define syntax for interoperability

    - Specify the semantics of primitives

Evaluation w.r.t multiagent systems:

- High level of abstraction

- Curtailed flexibility

- Verifying agent compliance is impossible

Commitment Life Cycle:

Detached: $C(\text{BookCo, Alice, £25, Book}) \wedge £25 \implies C(\text{BookCo, Alice}, \top, \text{Book})$ Satisfy: $\text{Book} \implies \neg C(\text{Boo}$

Commitment Operations:

- CREATE(SBJ, OBJ, ant, con): Performed by SBJ; causes C(SBJ, OBJ, ant, con) to hold

- CANCEL(SBJ, OBJ, ant, con): Performed by SBJ; causes C(SBJ, OBJ, ant, con) to not hold

- RELEASE(SBJ, OBJ, ant, con): Performed by OBJ; causes C(SBJ, OBJ, ant, con) to not hold

- DELEGATE(SBJ1, OBJ, SBJ2, ant, con): Performed by SBJ1; causes C(SBJ2. OBJ, ant, con) to hold

- ASSIGN(SBJ, OBJ1, OBJ2, ant, con): Performed by OBJ1; causes C(SBJ, OBJ2, ant, con) to hold