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