Multiagent and Agent Systems: Project

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Scenario

- We implement a mix/merge of the following competition scenarios
  - RoCKIn@Work
  - RoboCup@Work
  - RoboCup Logistics League
- The detailed layout of the environment
  - is not known yet
  - is not important for us
- The intention is to include elements of
  - planning
  - scheduling
  - contract net protocols
  - electronic markets
- Lectures on various of these issues will follow

Agent Types

- Customers
- Factory agent (most likely only one)
- Job agents
- Machine agents (fixed locations, fixed capabilities, can do manufacturing operations)
- FoFRs: Factory-of-the-Future Robots (mobile robots that can also manipulate objects)
- Stock agents (represent storage areas and maintain inventory)
- Optional extensions
  - Transporters (robots that can only move between places)
  - Manipulators (non-mobile robots that can only do manipulation, e.g. picking objects from transporter agents and placing them into bins or into machine fixtures)

First Stage

- First stage: implement a job acquisition facility for a factory
- A number of customers (between 3 and 300, typically 80, for MAAS 10)
  - Type 1: issuing repeated orders at a fixed, parameterizable schedule
  - Type 2: issuing randomised orders at randomised times
    - Orders consist of only a single item spec and a quantity, e.g. 10 items with item number #23.
    - Every item comes with a set of manufacturing operations (these will be detailed later) that need to be done to produce the item
- A single factory agent
  - Capabilities: the FA knows a list of manufacturing operations that can be performed in this factory
- Job agents

Proceedings

- Customer agents send order requests to the factory agent
- The factory agent checks whether the order can be accepted
  - Can all required manufacturing operations be done?
  - Later: Is enough capacity free to meet the order delivery date?
- If the check is positive, it accepts the order and creates a job agent for the order. (The job agent will be responsible for ensuring the job to be done)

- Design and implement this initial scenario.