Smart Factory

Chaitanya Hebbal and José Mayoral

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Outline

- Project Specifications.
- Possible Architectures.
- Factory Agents.
- Coordination vs Cooperation
- Proposed Communication Diagram.
- JADE
- Questions Us2You
- Questions/Suggestions You2Us

Project Specifications

- Project Name: Smart Factory
- Objective: Deliver orders in an efficient way under a smart factory environment where several robots interacts in the same environment.
- Order Items: Bearing, Bearing Box, Assembled Bearing.
- Environment Description:
  - Robots.
  - Item Stocks.
  - Force Fitting Machine.
  - Deliver Place.

Possible Architectures

Centralized.

- A component organize all the activities of the other ones.
- Skip redundancy messages (i.e. are you available?).
- Main Disadvantage: Depending on the number of requests, communication may be slower resulting on a slower process. If center fails, systems breaks down.

Distributed.

- Each agent takes it's own decisions.
- Fault Tolerance due to it's redundancy.
- Main disadvantage: The data and resources sharing are complex (ie. every robot communicates with all the others when a order arrives or all the robots states should be append on a single message).

Mixed -> Very complex design.

Possible Architectures

Centralized:
- A component organize all the activities of the other ones.
- Skip redundancy messages (e.g. are you available?)
- Main Disadvantage: Depending on the number of requests, communication may be slower resulting on a slower process. If center fails, system totally down

Distributed:
- Each agent takes its own decisions
- N-1 Tolerance due to it's redundancy
- Main disadvantage: The data and resources sharing are complex (in every robot communicates with all the others) when a order arrives or all the robots states need to be agreed on a single message)

Mixed -> Very complex design.

Project Specifications

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- Coordination vs Cooperation
- Proposed Communication Diagram
- JADE
- Questions (JADE)
- Questions/Suggestions/Doubts

Proposed Communication Diagram

Proposed Communication Model

Coordination vs Cooperation

Coordination:
- Single Task , Single Agent.
- Traffic Control

Cooperation
- Single Task , Multiple Agents.
- No agent has sufficient information to solve entire problem (Tower of Hanoi Slides).

Factory Agents

-> We decide a centralized architecture.
1. Planner.
2. Robots.
3. Orders Service.
4. Stocks (state may result in a change in the environment).

Not Agents:
-> Customers.
-> Deliver Place.

Coordination vs Cooperation

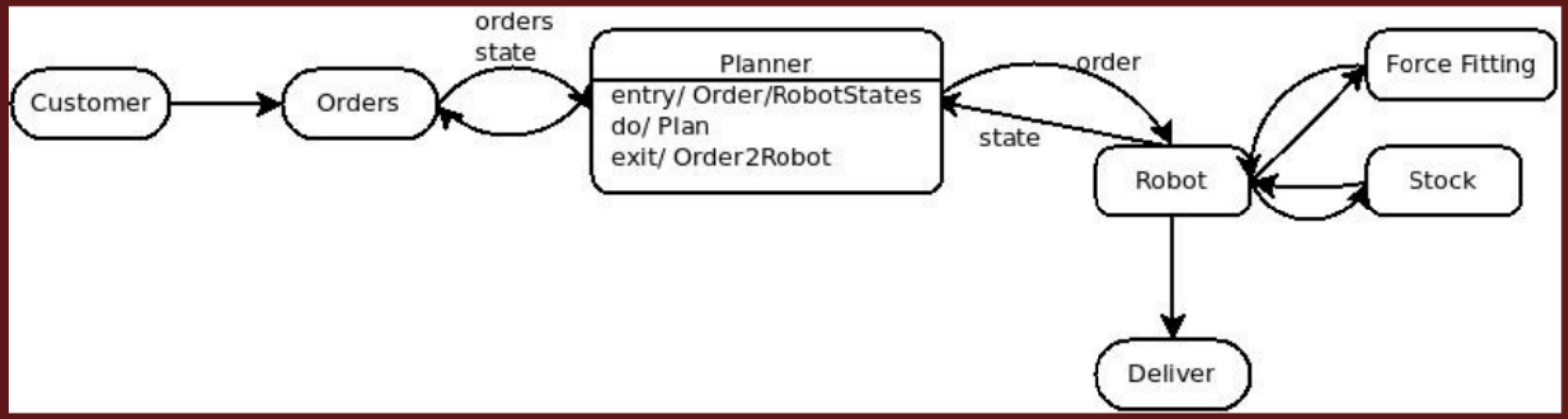
Coordination:

- Single Task... Single Agent.
- Traffic Control.

Cooperation:

- Single Task... Multiple Agents.
- No agent has sufficient information to solve entire problem [Rosenchein Slides].

Proposed Communication Diagram



Proposed Communication Model

ject Specifications

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Proposed Communication Diagram

Proposed Communication Model

Coordination vs Cooperation

Coordination
- Single Task - Single Agent
- Traffic Control

Cooperation
- Single Task - Multiple Agents.
- No agent has sufficient information to solve entire problem [Rosenschein Slides].

Factory Agents

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Not Agents.
- -> Customers.
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Questions/Suggestions You2Us

Questions Us2You

1. How does JADE represent the environment? Does it provides a standard represent
2. In the explanation at class, which is the difference between Assembly Aid and Fixe
Machine?

JADE

Best Youtube Tutorial

JADE

Best Youtube Tutorial.

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JADE

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Cooperation

Factory Agents

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