



Tecnológico de Monterrey

Evidence 1. Integrative Activity

Santiago Alonzo Aguilar A01639373

Hannia Escamilla Pérez A01639113

Patricio Flores Reynoso A01645013

Erick Sinhué Sánchez Martínez A01640018

Cared Nicolle Castaños Manjarrez A01742620

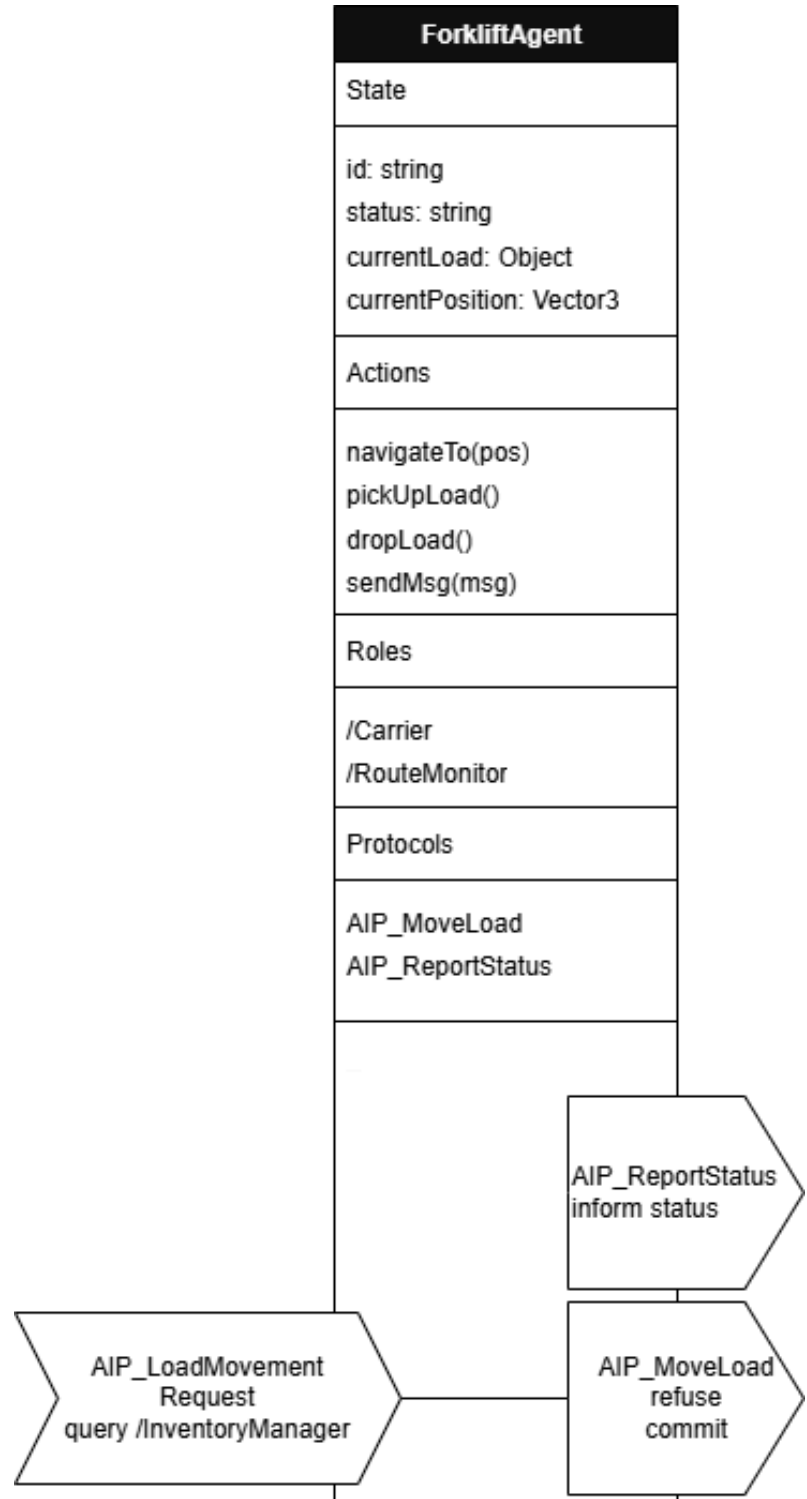
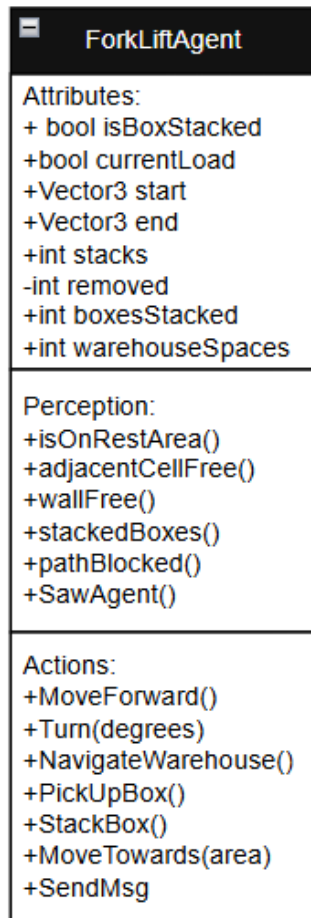
Team 2

Grp 301.

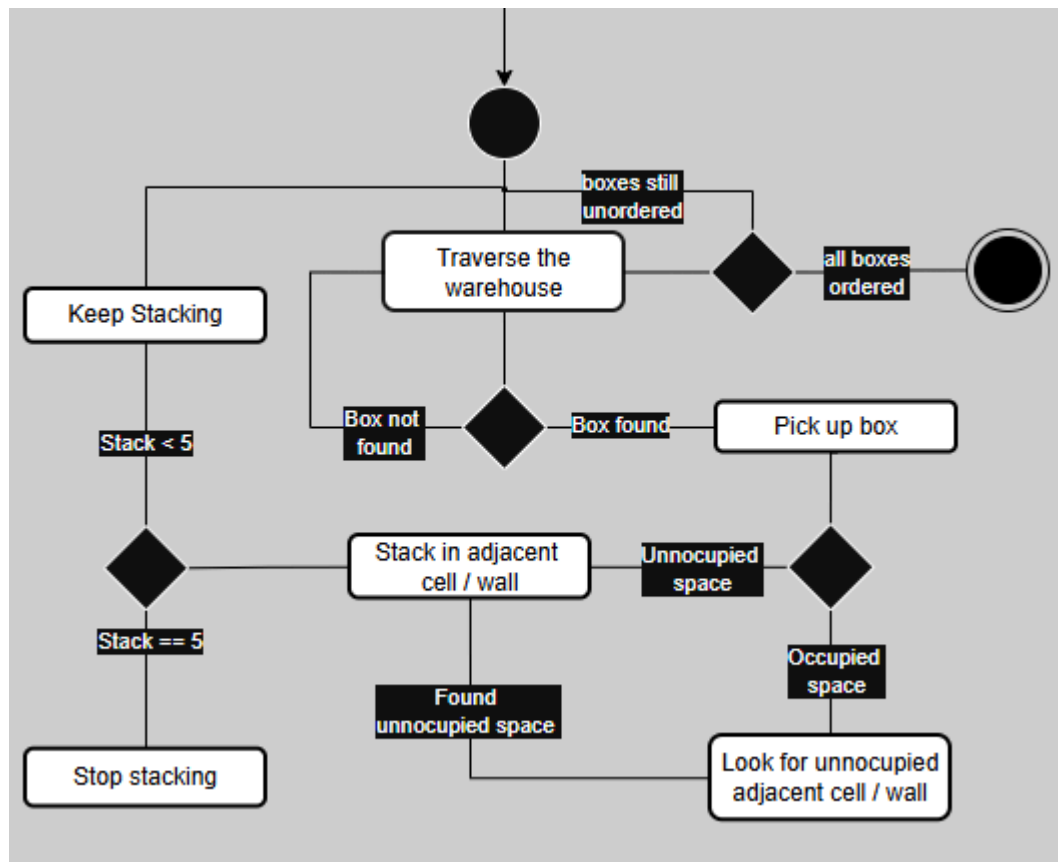
Modeling of Multi-Agent Systems with Computer Graphics

November 24 2025

- Agent Class Diagrams



- Activity or State Diagrams to describe the behavior of the agents' subsystems.



- Cooperative strategy for solving the problem:

Collision scenario:

Two agents are about to bump into each other

Negotiation:

Negotiation Set:

Possible offers:

- Agent A lets Agent B pass first
- Agent B lets Agent A pass first

Protocol:

Simple protocol: Alternating offers

1. Agent A makes a proposal x

2. Agent B can only Accept or Reject
3. If Agent B Accepts, Deal x closes. End.
4. If Agent B Rejects, Turn passes, Agent B makes a new proposal y
5. Agent A can only Accept or Reject
6. If no one accepts, randomness decides

Pseudocode:

```
None
FUNCTION solveCollision(agentA, agentB):
    // Agent A proposes first
    IF agentB.accepts() THEN
        agentA.passFirst()
    ELSE
        // Agente B propone
        IF agentA.accepts() THEN
            agentB.passFirst()
        ELSE
            // If no one accepts, randomness decides
            IF random() > 0.5 THEN
                agentA.passFirst()
            ELSE
                agentB.passFirst()
            END IF
        END IF
    END IF
END FUNCTION

FUNCTION accepts():
    RETURN random() > 0.5 // 50% probability of accepting
END FUNCTION
```

Two agents seeing the same box scenario:

Two agents see the same box and are about to reach for it

Negotiation:

Negotiation Set:

Possible offers:

- Agent A lets Agent B grab the box
- Agent B lets Agent A grab the box

Protocol:

Simple protocol: Alternating offers

1. Agent A makes a proposal x
2. Agent B can only Accept or Reject
3. If Agent B Accepts, Deal x closes. End.
4. If Agent B Rejects, Turn passes, Agent B makes a new proposal y
5. Agent A can only Accept or Reject
6. If no one accepts, randomness decides

Pseudocode:

```
None
FUNCTION solveBoxConflict(agentA, agentB, box):
    // Agent A makes first offer
    offerA = "A_TAKES_BOX"

    IF agentB.accepts(offerA) THEN
        agentA.takeBox(box)
        agentB.findOtherBox()
        RETURN
    END IF

    // Agent B makes counter-offer
    offerB = "B_TAKES_BOX"

    IF agentA.accepts(offerB) THEN
        agentB.takeBox(box)
        agentA.findOtherBox()
        RETURN
    END IF

    // If no agreement, random decision
    IF random() > 0.5 THEN
        agentA.takeBox(box)
        agentB.findOtherBox()
    ELSE
        agentB.takeBox(box)
        agentA.findOtherBox()
    END IF
END FUNCTION

FUNCTION accepts(offer):
    // 60% chance to accept an offer
    RETURN random() < 0.6
END FUNCTION
```