

# Final Presentation

## Task 4: Market-based task allocation with heterogeneous team of robots

**Groupe 8**

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1. Introduction
2. Centralized
3. Distributed
4. Conclusion

**Natural Disaster** with several victims :

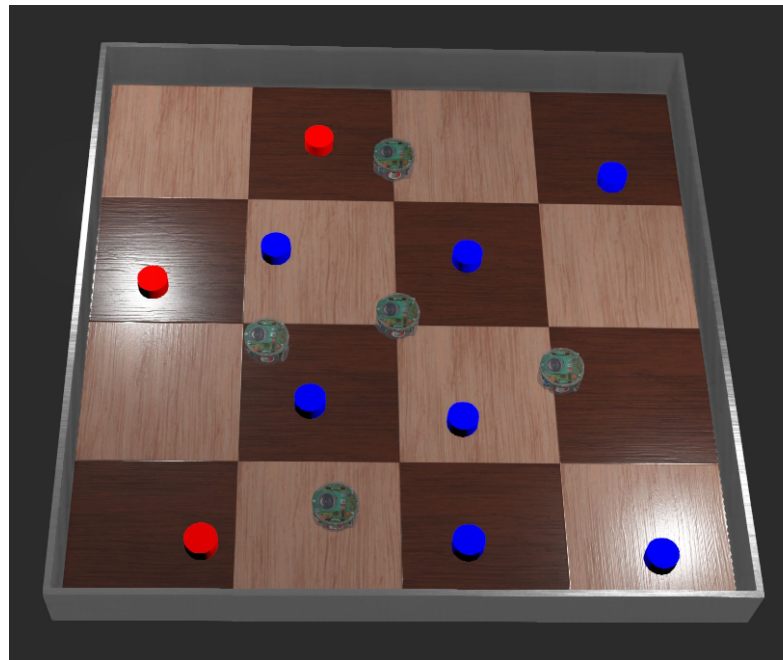
- Medical treatment  $\Rightarrow$  Task A: Red
- Psychological support  $\Rightarrow$  Task B: Bleu

**Fleet of robot** to assist them:

- Specialized ( 2 task A, 3 task B)
- 2 min of energy

**Goal :**

- Maximize assistance delivered in 3 min
- Test multiple market based method

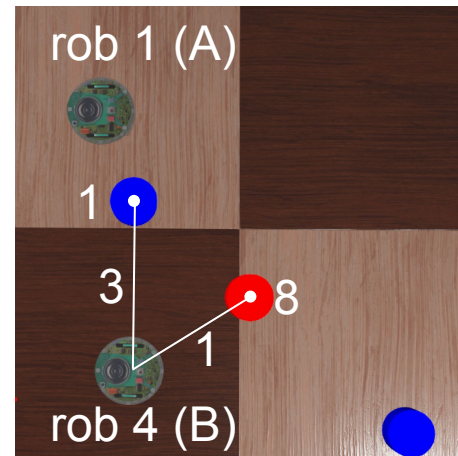


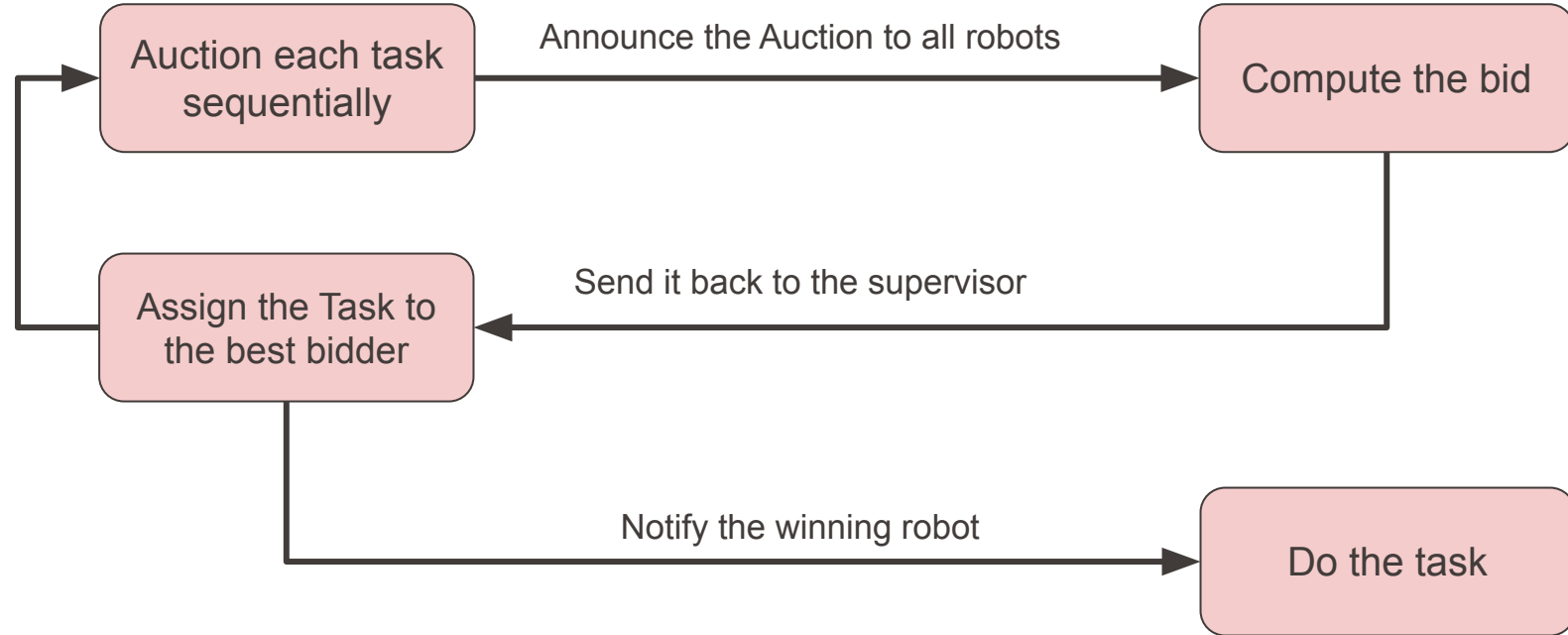
**Auction** to find the best fit for a robot :

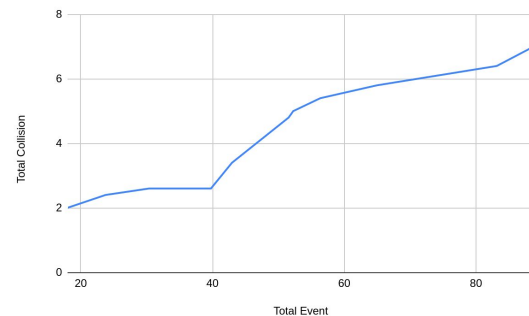
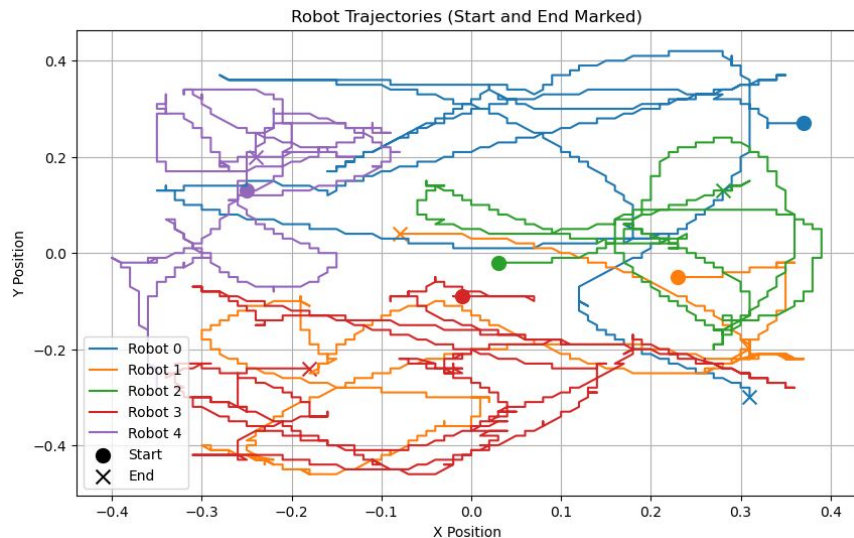
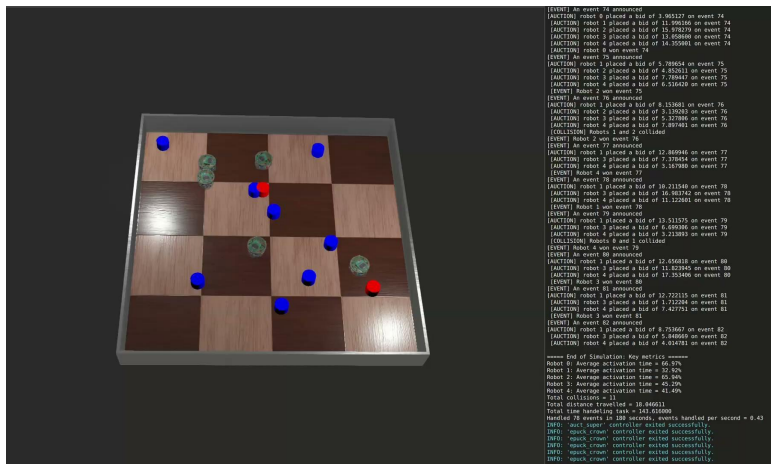
	Centralized	Distributed
Bid	Robots	Robots
Auction	Supervisor	Robots

**Bid Calculation** (same for all methods) :

$$\text{Bid} = \text{Time to go to task} + \text{Time to do Task}$$

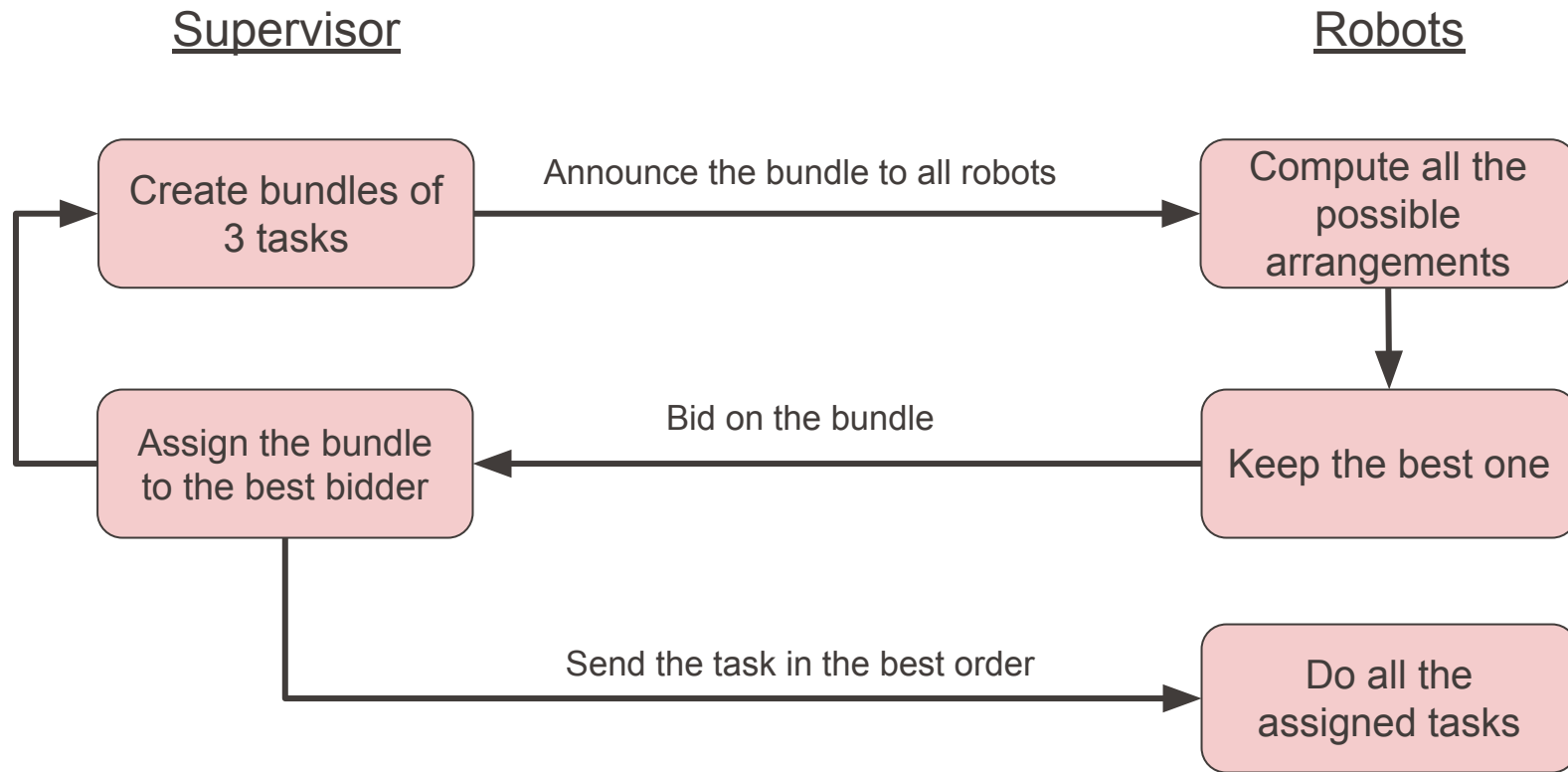


SupervisorRobots

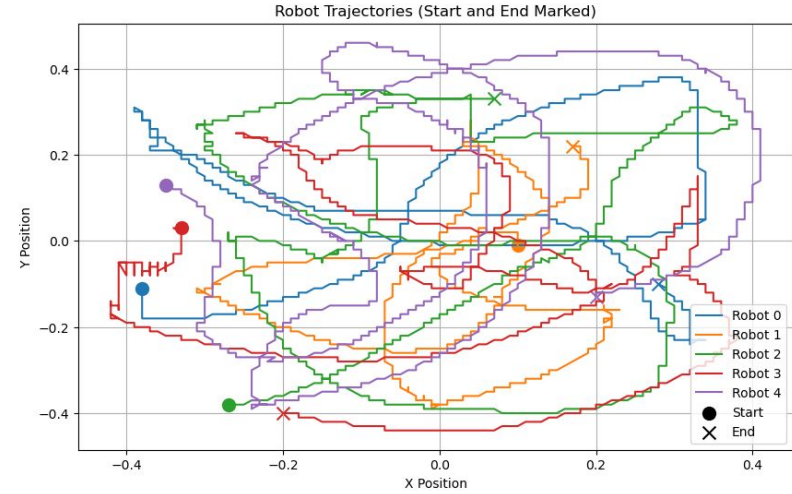
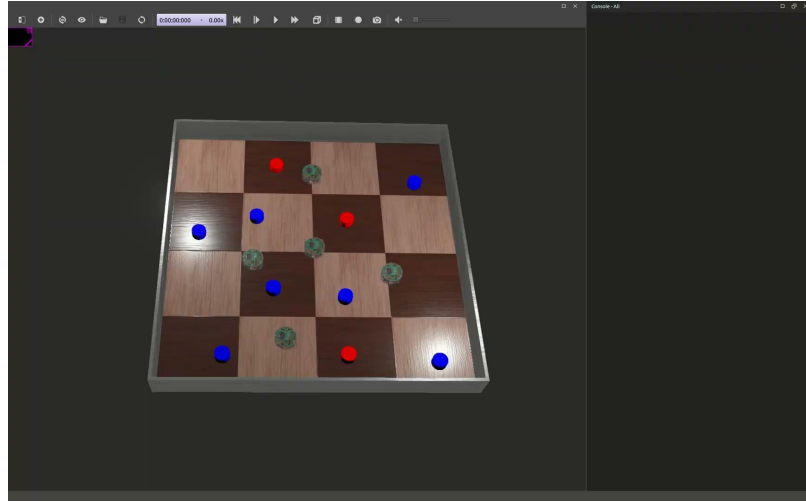


	Collision	Event Handled	Activation Time
Mean	7	88.8	55.53 %
Std	2.45	13.54	4.36 %

# Centralized multi step planning



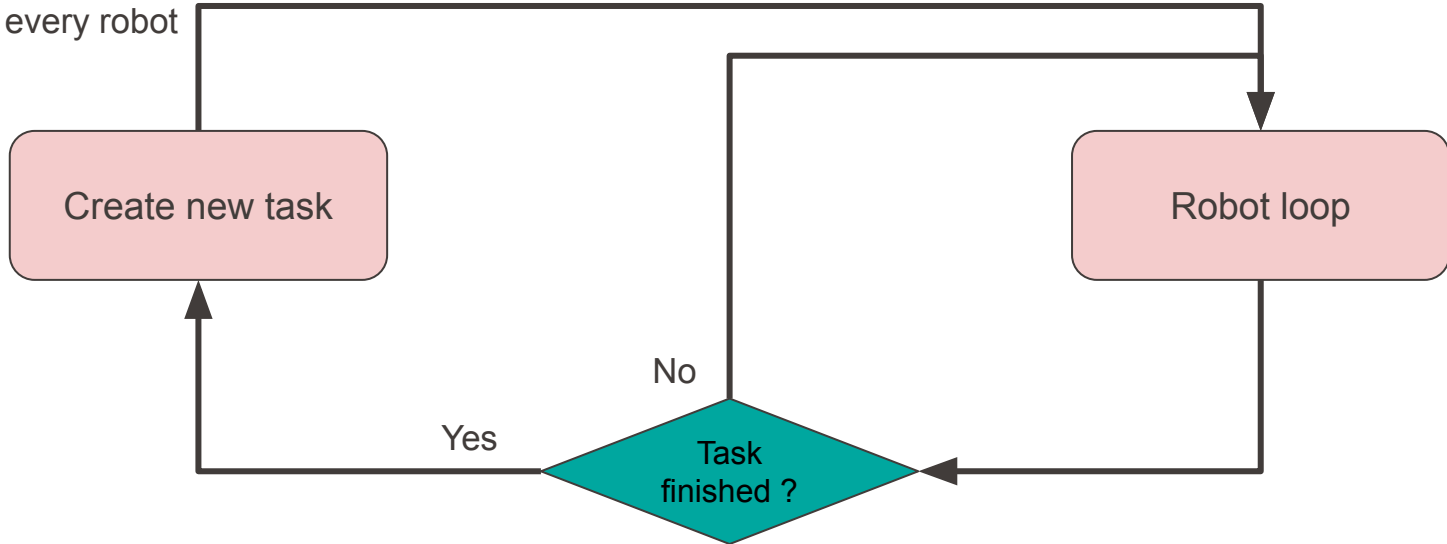
# Centralized multi step planning



	Collision	Event Handled	Activation Time
Mean	13	60.8	63.43 %
Std	2.73	7.05	3.67 %

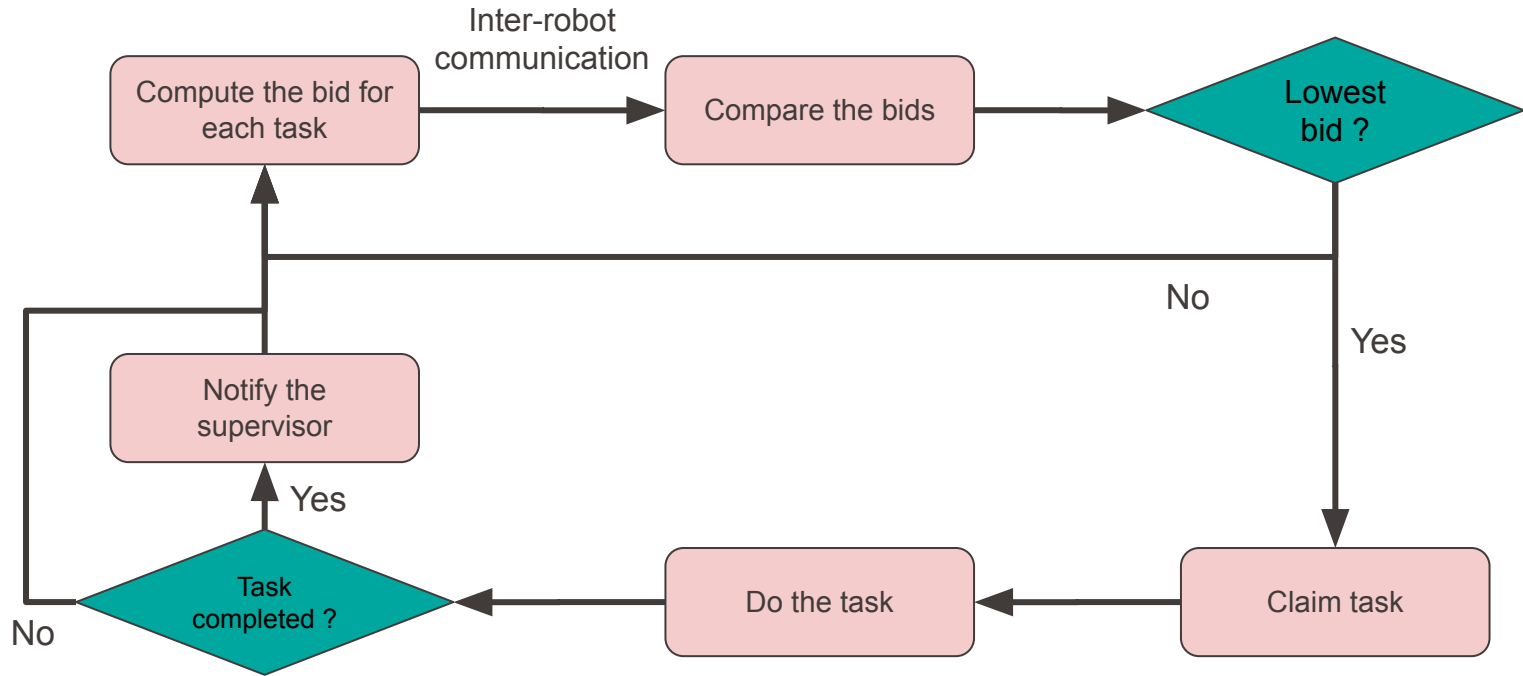
SupervisorRobots

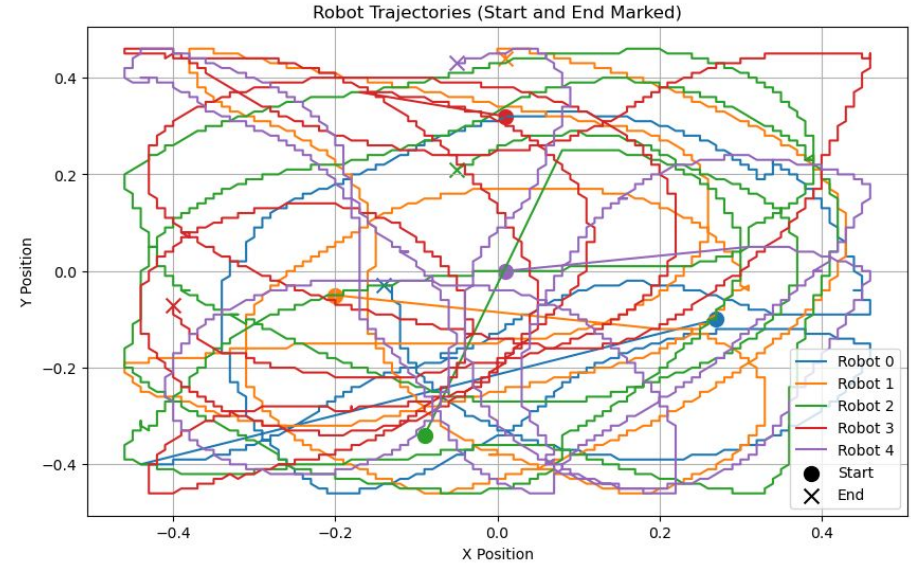
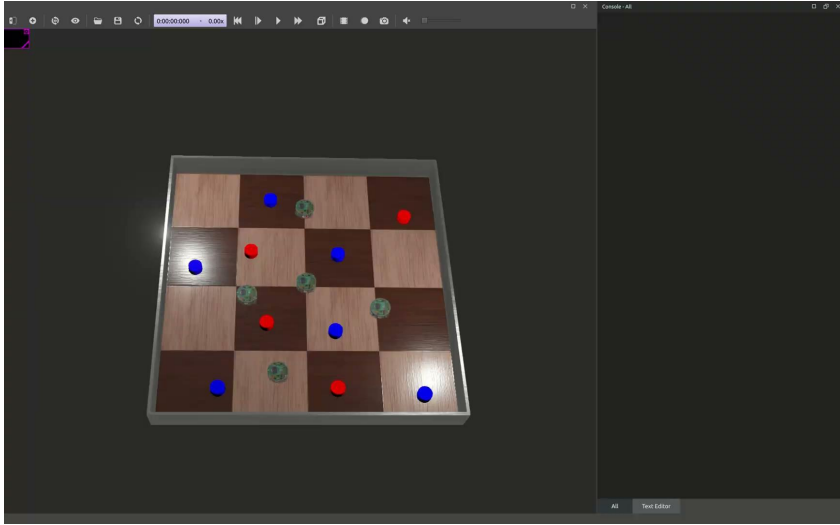
Send new task info to  
every robot





## Robot loop

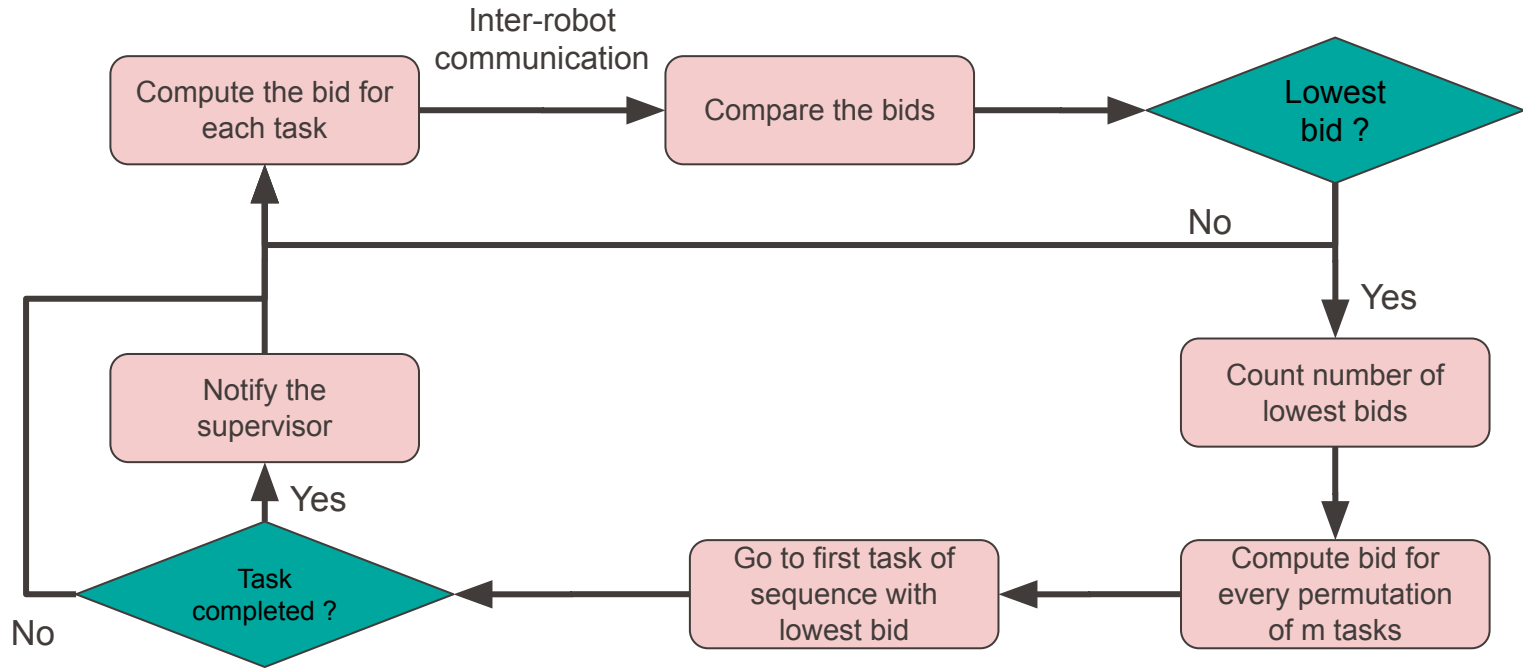




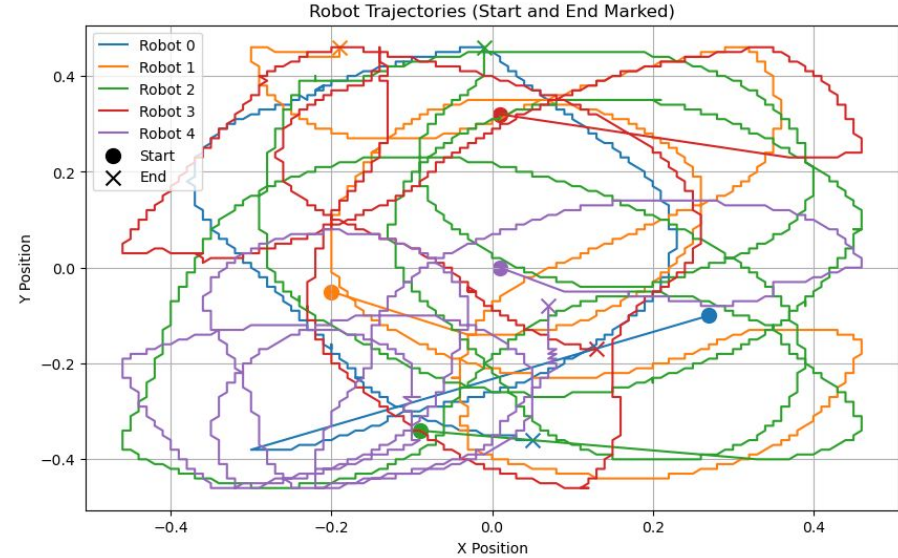
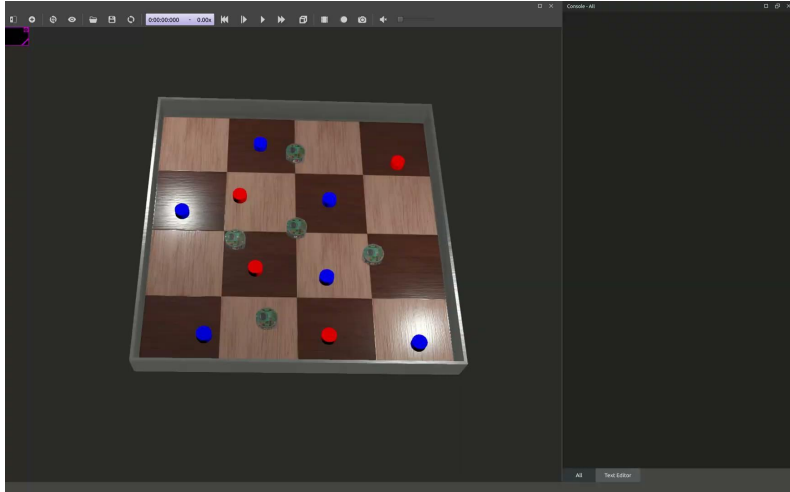
	Collision	Event Handled	Activation Time
Mean	14.4	71.8	62.68 %
Std	2.06	6.68	4.10 %

# Distributed multi step planning

## Robot loop

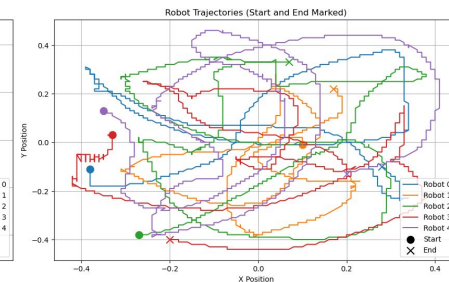
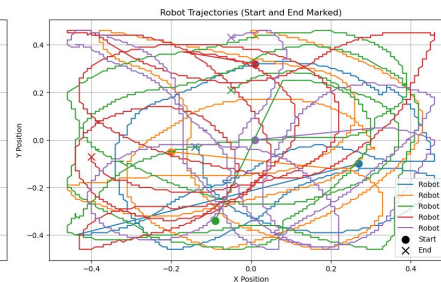
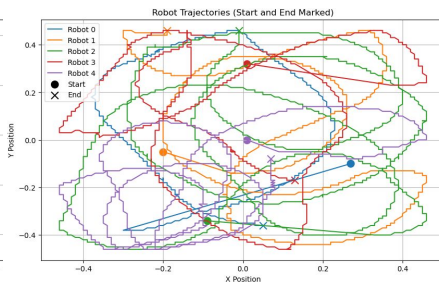
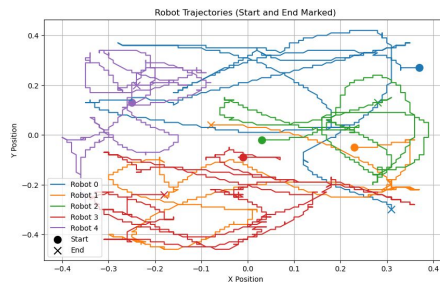


# Distributed multi step planning



	Collision	Event Handled	Activation Time
Mean	18.8	80.60	64.61 %
Std	4.26	5.50	4.67 %

	Centralized	Centralized planned	Distributed	Distributed planned
Collision	7	13	14.4	18.8
Event Handled	88.8	60.8	71.8	80.6
Activation time	55.53 %	63.43 %	62.68 %	64.61 %



# Thank you for your attention !