FINAL09 – HIGH-PRIORITY ORDER (HPO)04

National Institute of Standards and Technology

ARIAC NIST
Agile Robotics for Industrial Automation Competition

Trial Description

- **Task**: Build **3** shipments from 2 orders. The initial order is interrupted at a convenient time by a second order, which is of higher priority (hpo). The robot must complete hpo as fast as possible and then must resume the completion of the initial order.
  - The conveyor belt is used.
  - There are faulty products in the environment.
  - 1 pulley must be flipped in both shipments of the initial order.
  - The gripper is faulty and drops products over both AGVs.

- **Orders**: 2 orders. order_0 consists of 2 shipments (order_0::shipment_0 and order_0::shipment_1). order_1 consists of 1 single shipment (order_1::shipment_0).
  - Both shipments in order_0 consist of 2 products in total:

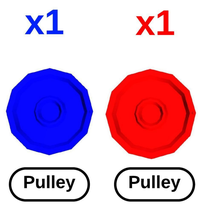

Fig. 1: Products used in order_0.

  - The shipment in order_1 consists of 2 products in total:

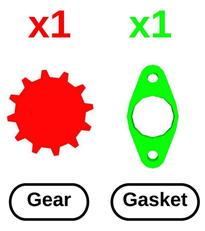

Fig. 2: Products used in order_1.

- **Maximum completion score**: 24 pts.
- **Agility challenges**:
  - Faulty products.
  - Flipped products.
  - Faulty grippers.
- **Product vessels**: bin × 0, shelf × 2, conveyor belt is used.
- **Shipment deliveries**:
  - order_0::shipment_0: AGV1.
  - order_0::shipment_1: AGV2.
  - order_1::shipment_0: AGV2.
- **Time limit**: 500 sim seconds.

Initial Product Placement

Fig. 3: Initial product placements.

- The conveyor belt will spawn a total of 20 blue pulleys.

Agility Challenges

- Faulty products: There are 2 faulty products in the environment.

Fig. 4: Faulty products in the environment.

- Flipped products: 1 blue pulley must be flipped for both shipments in order_0. Figure 5 highlights the flipped pulley in both shipments.
- Faulty grippers: A red pulley is expected to drop over AGV1. A red gear is expected to drop over AGV2.

Orders

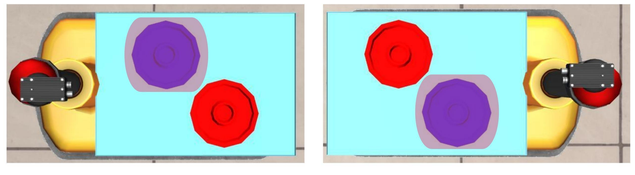

Fig. 5: order_0 shipment configurations on AGV1 and AGV2.

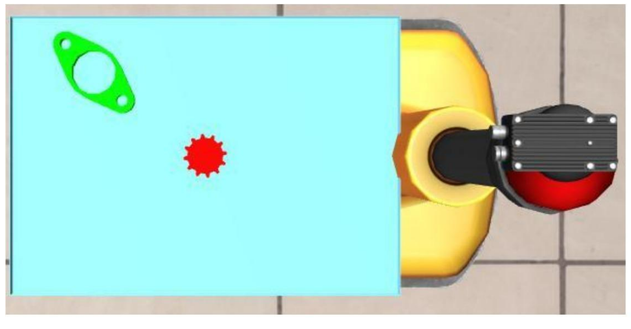

Fig. 6: order_1 shipment configuration on AGV2.