

## Description of Additional Supplementary Files

**File name:** Supplementary Video 1

**Description:** v1-aggregation: This video presents details of the Aggregation mission and demonstrates collective behaviors with physical robots and in simulation for all methods under analysis.

**File name:** Supplementary Video 2

**Description:** v2-decision-making: This video presents details of the Decision-Making mission and demonstrates collective behaviors with physical robots and in simulation for all methods under analysis.

**File name:** Supplementary Video 3

**Description:** v3-rendezvous-point: This video presents details of the Rendezvous-Point mission and demonstrates collective behaviors with physical robots and in simulation for all methods under analysis.

**File name:** Supplementary Video 4

**Description:** v4-stop: This video presents details of the Stop mission and demonstrates collective behaviors with physical robots and in simulation for all methods under analysis.

**File name:** Supplementary Video 5

**Description:** v5-robot-view: The video presents an e-puck robot's view of laying and sensing the artificial pheromone.

**File name:** Supplementary Video 6

**Description:** v6-experiments: The video presents all real-robots experiment runs performed during this study.