Swarm Intelligence Course—H-414

Swarm robotics

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Collective decision making

- Process of selecting an option among a set of alternatives

Different types of collective decision
  - Consensus: all the individuals agree on the same option.
  - With quorum $Q$: a proportion $Q$ of the individuals select the same option.
Exercise: color selection

Goal:

All the robots must agree on one color among \{\text{red, blue, green}\}

Proceeding:

function \text{init}():
  ▶ select color randomly

function \text{step}():
  ▶ take decision

function \text{reset}():
  ▶ restore state of controller

Material:

http://iridia.ulb.ac.be/~lgarattoni/h-414/
Our solution(s)

**Sense:**
- Count number of individuals that chose red, blue, green.

**Think:**
- Select a color depending on the individuals’ choices:
  - majority (deterministic), or
  - probabilistically

**Act:**
- Display the color chosen.
- Move around.