

Colourly

Barvičky

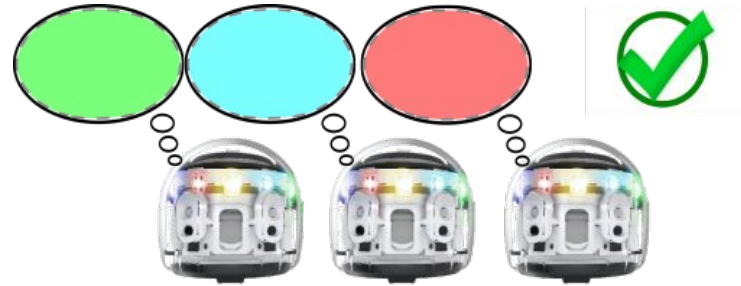
Progress

Topic review

- Multi-agents path finding
- Color searching and distribution: 1 Color -> 1 Ozobot
- Distributed & online

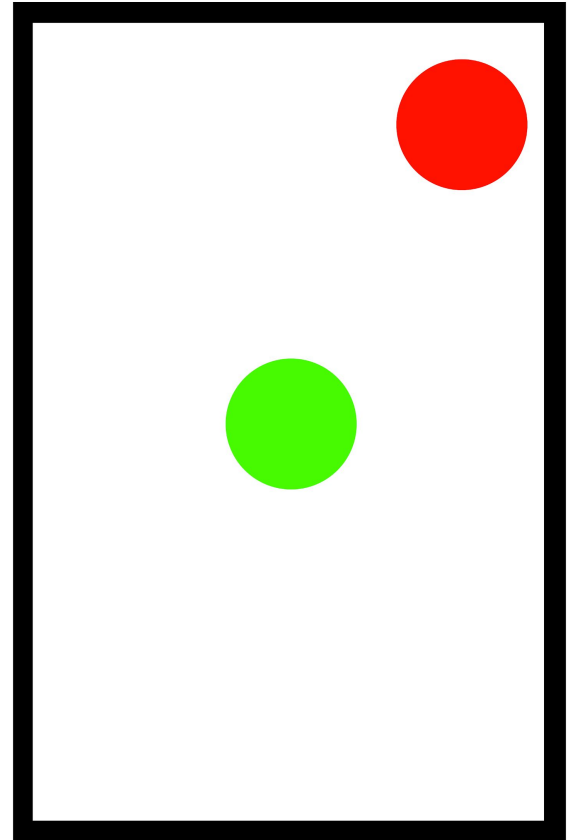
Reminder of stage 1

- Robots vs Circles N : N
- Goals:
 - Every area is occupied by single robot
- Tasks:
 - Movement inside the map
 - Searching all over the map
 - Occupation of the area
 - Distribution of occupied colors
 - Prevent DeadLocks



Map properties

- Rectangular shape
- Black wide border
- White background
- Coloured fulfilled circles
- No color occurs twice



What did we achieve?

- Each robot...
 - moves inside the map borders.
 - shows current procedure and the occupied color (as LED lights)
 - goes over the entire map
 - If it reaches the color circle, it would defend it
 - rolls over its color
- Ozoblockly
 - blocks everywhere
 - huge code

What's currently buggy?

- Ozobot wheels
 - worn out one of the wheels →
- Communication protocol
 - All message enqueued
 - Absence of documentation
 - Distance of broadcasting robots
 - Rotation of transmitter
- Collision of robots
 - Problems with rotated robots
 - Too fast sometimes



What are we working on?

- Precision of Ozobot's movement and turning
 - Searching the whole map - no unexplored zones
 - Algorithms for substitution of absence of odometry
- Extended communication between Ozobots
 - Simple error-resistant communication protocol
 - Find a way how to use limited Swarm module
- Clever occupation of color shape
 - For more complex shapes Ozobot needs smart searching strategy
- Finding achievable sequence of colors
 - Prevent deadlocks

Examples of code

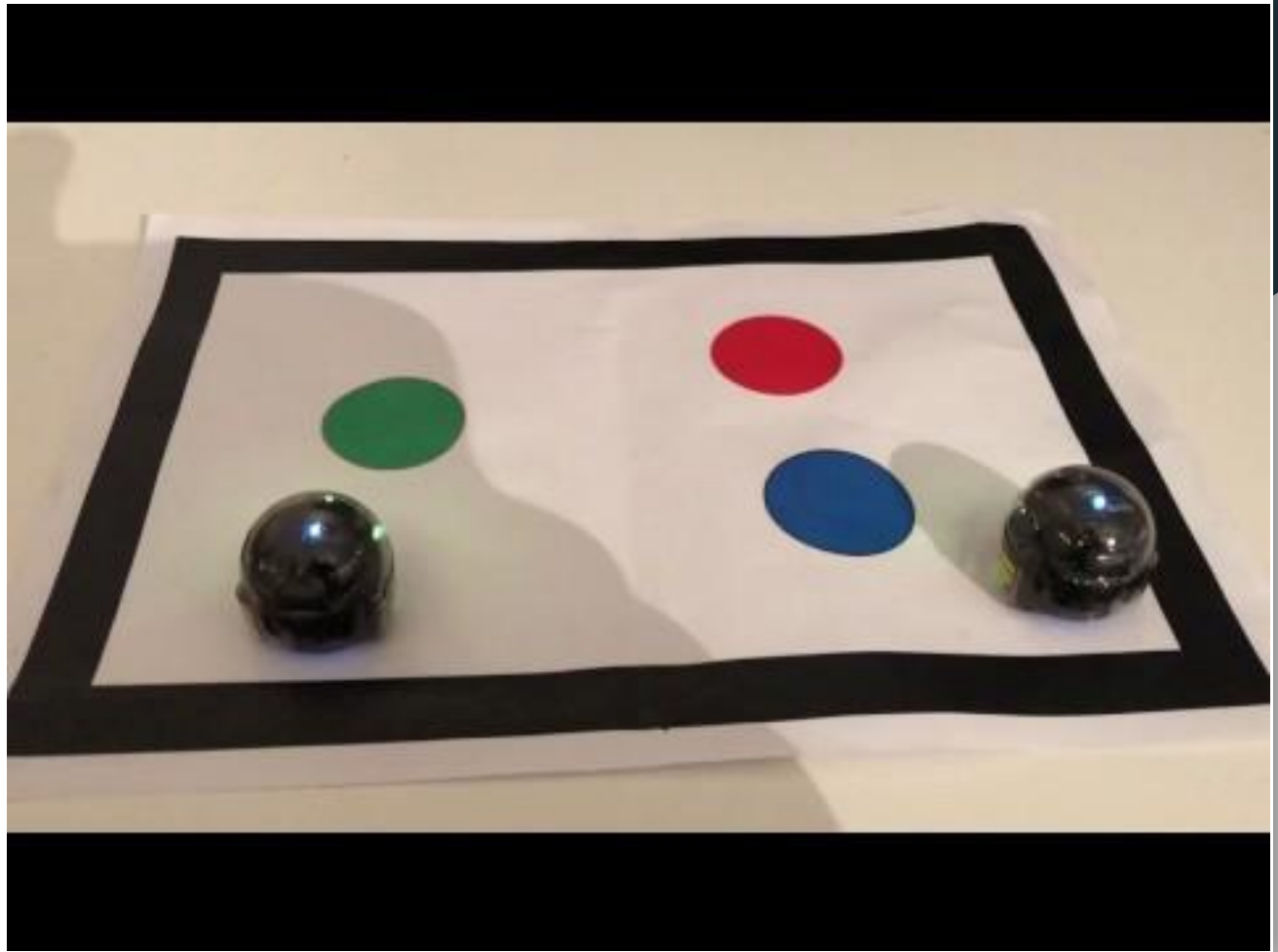
```
to dodge with: direction
  set lights with:
    top last visited color
    front surface color
  rotate angle: -90 deg speed: 30 mm/s
  set interrupted to go if can with:
    run time 1
    interrupting color surface color
  if interrupted
  do
    rotate angle: -90 deg speed: 30 mm/s
    if true return
  else
    rotate angle: 90 deg speed: 30 mm/s
  set interrupted to go if can with:
    run time 1
    interrupting color surface color
  if interrupted
  do
    set interrupted to turn with:
      direction direction
    if true return
  else
    rotate angle: 90 deg speed: 30 mm/s
  move 40 mm speed mm/s
  rotate angle: -90 deg speed: 30 mm/s
```

```
to sendMessage with: message
  set periodic message broadcast for emitter left front to value message
  set periodic message broadcast for emitter right front to value message
```

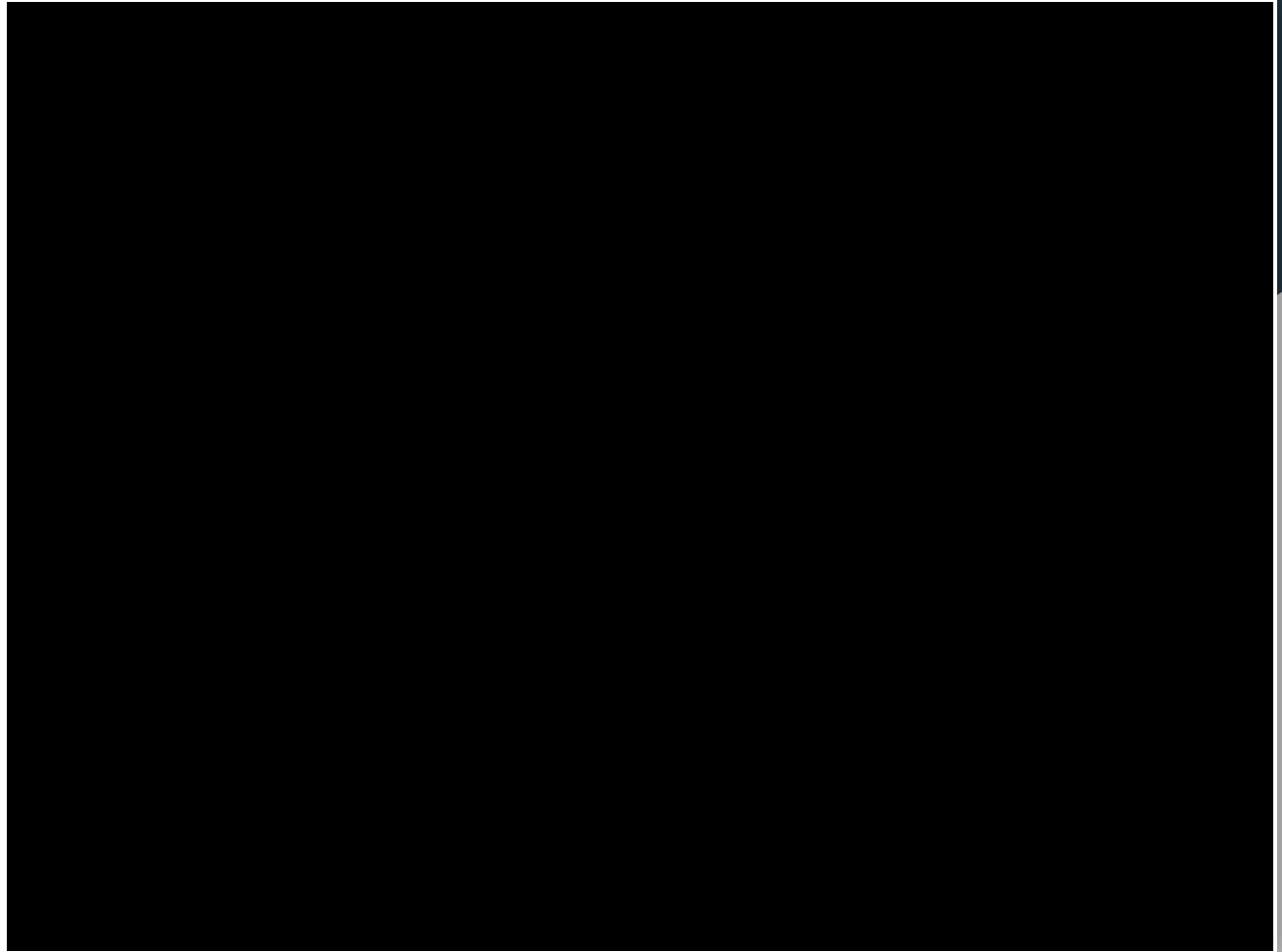
```
to turn with: direction
  set lights with:
    top last visited color
    front surface color
  rotate angle: direction * 90 deg speed: 20 mm/s
  set interrupted to go if can with:
    run time 1
    interrupting color surface color
  rotate angle: direction * 90 deg speed: 20 mm/s
  move 10 mm speed mm/s
  return interrupted
```

```
to occupy color with: timerTime
  set lights with:
    top last visited color
    front surface color
  repeat while true
  do
    set actualSurfaceColor to get surface color
    set wheel speeds:
      left (mm/s) speed
      right (mm/s) speed
  if object in front
  do
    if
    do
      dodge with:
        direction direction
      if true return false
    else
      rainbow
      stop motors
      5 . 0 second(s)
  if actualSurfaceColor = surface color
  do
    stop motors
    move -10 mm 30 mm/s
    rotate angle: 90 deg speed: 30 mm/s
    break out of loop
  return true
```

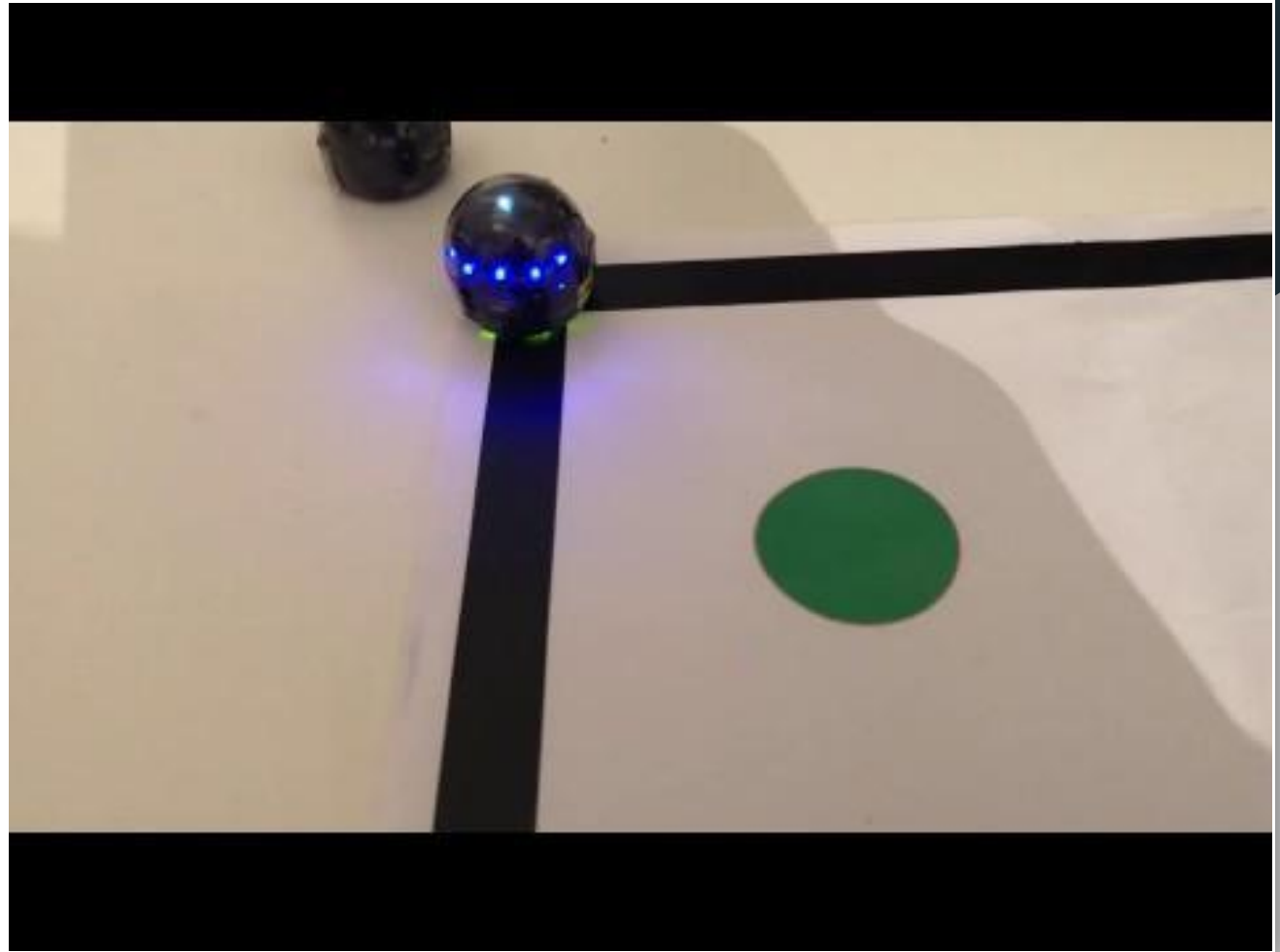

Awesome
video



Single
robot
video



Not
so
awesome
video



Thank you for your attention