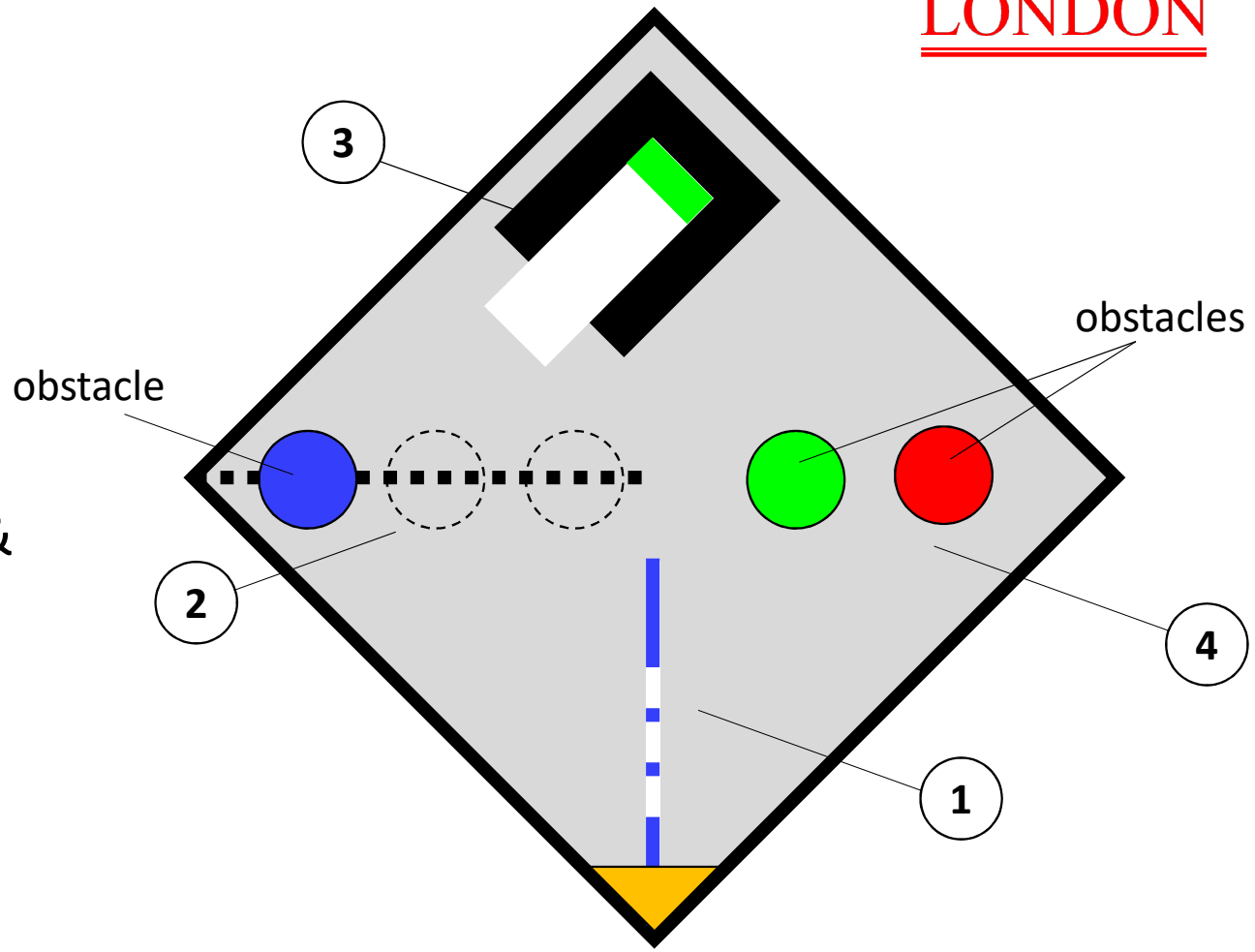
KING'S College LONDON

# Robotics Group Project

*- Term 2 Challenge (16/17)*

# Task outline

- Task 1: Self-localization
- Task 2: Path planning
- Task 3: Navigation
- Task 4: Colour detection & planning



# Recommended sensors

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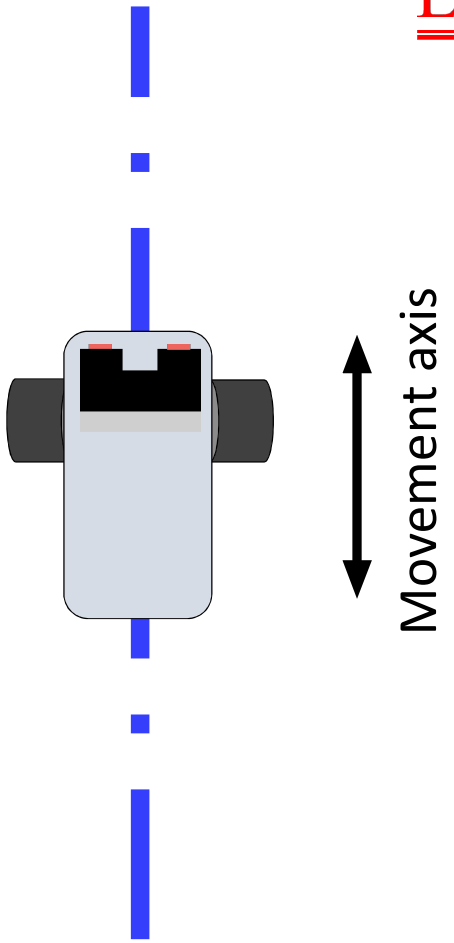
- Ultrasound sensor
- Light sensor
- Gyro sensor
- Touch sensor

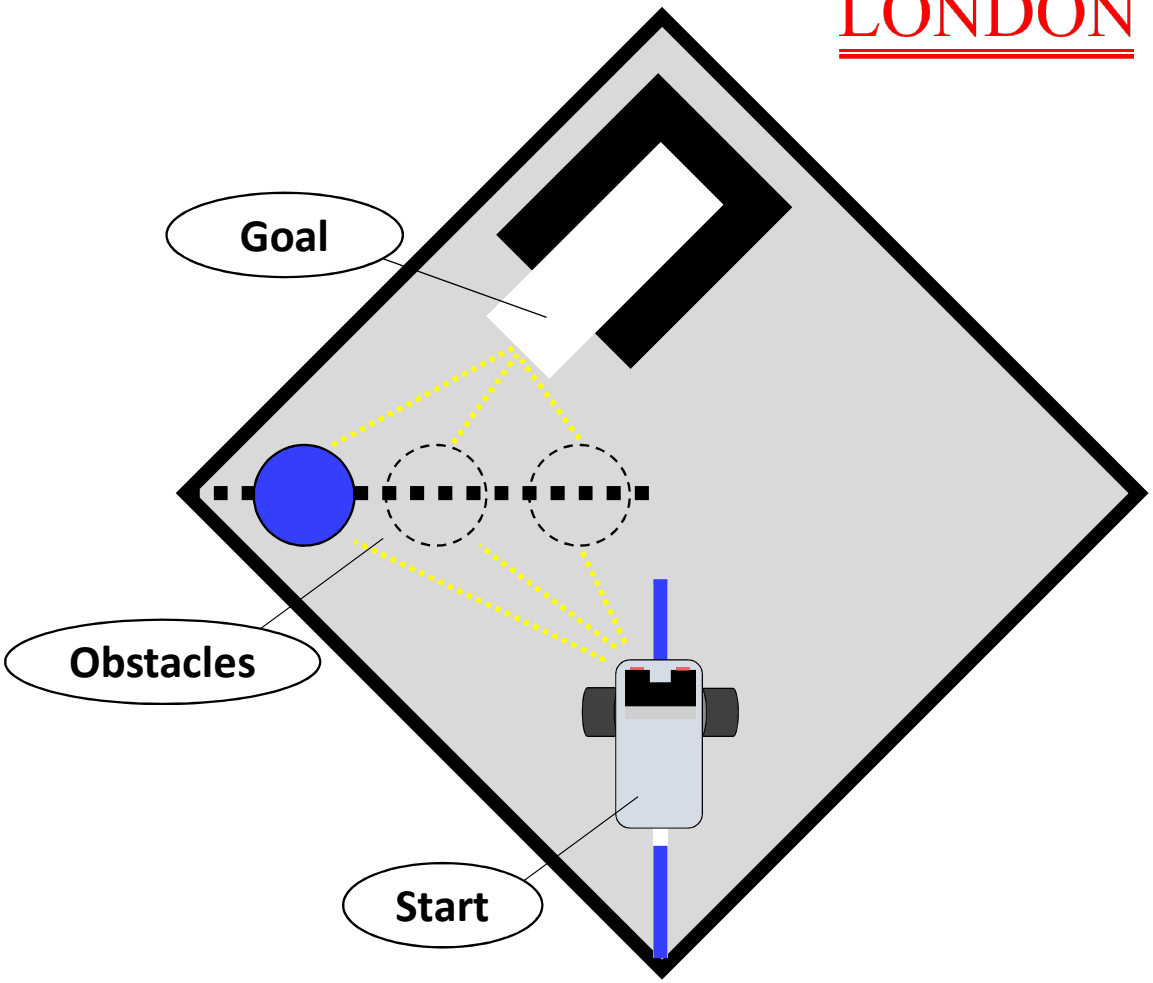
# Task 1

- Localize the robot with respect to a known line
- Robot will be assigned to random starting point
- Apply Bayesian localization to accurately determine robot location
- Pattern of the line as indicator



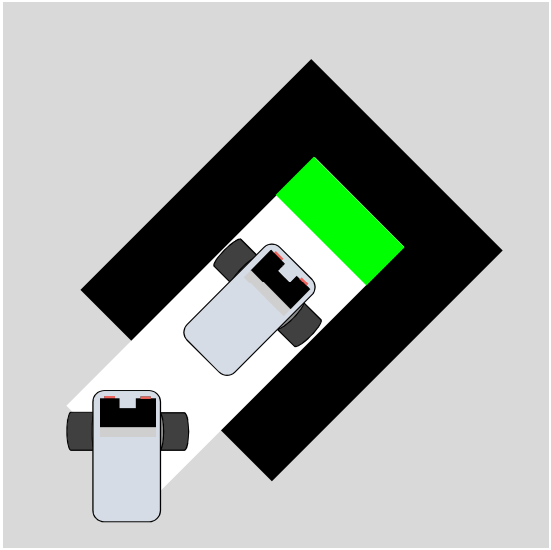
# Task 2

- After localizing robot, plan path from robot location to goal
- Location of the obstacle will be revealed shortly before challenge
- Find on-line shortest path to goal
- Reach goal location (pad before U-shaped box)



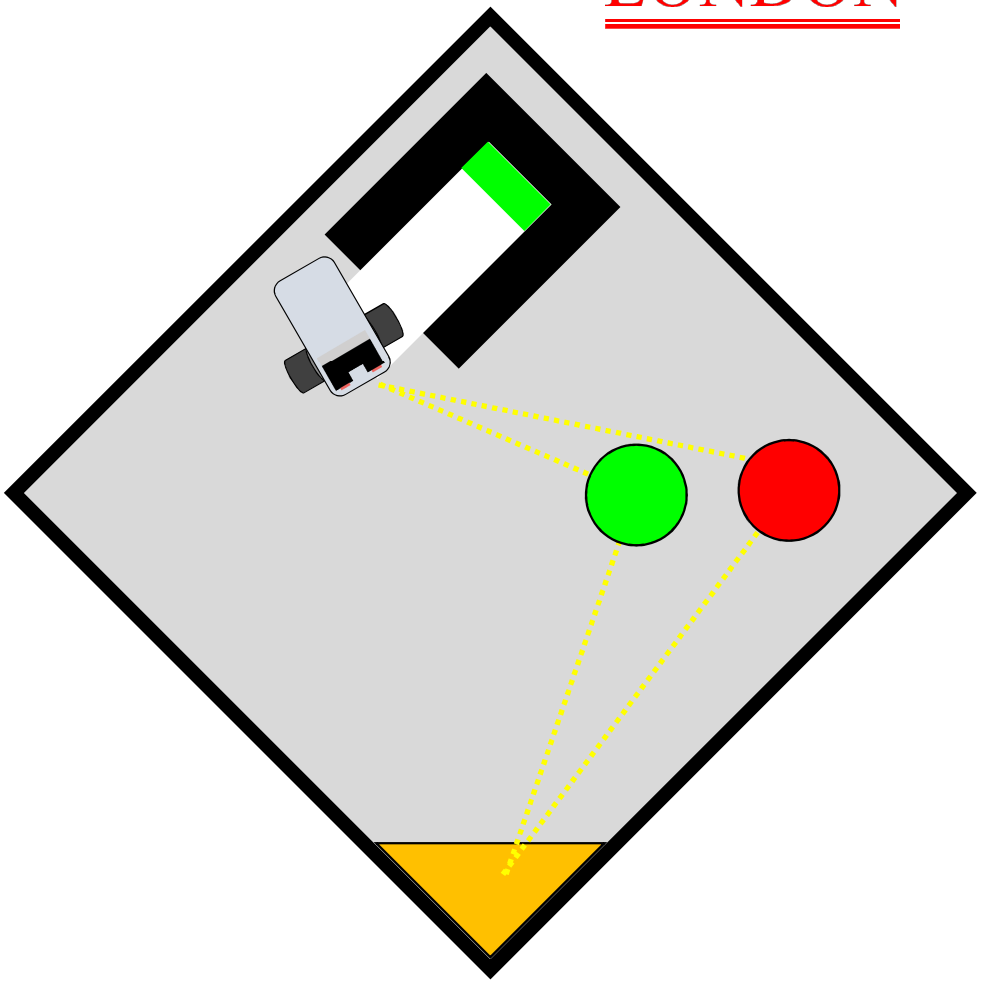
# Task 3

- Rotate towards the narrow path
- Move towards the end and read colour of colour pad
- Signal arrival by using a push button attached to robot; play beep-sound once activated
- Manoeuvre out of the obstacle



# Task 4

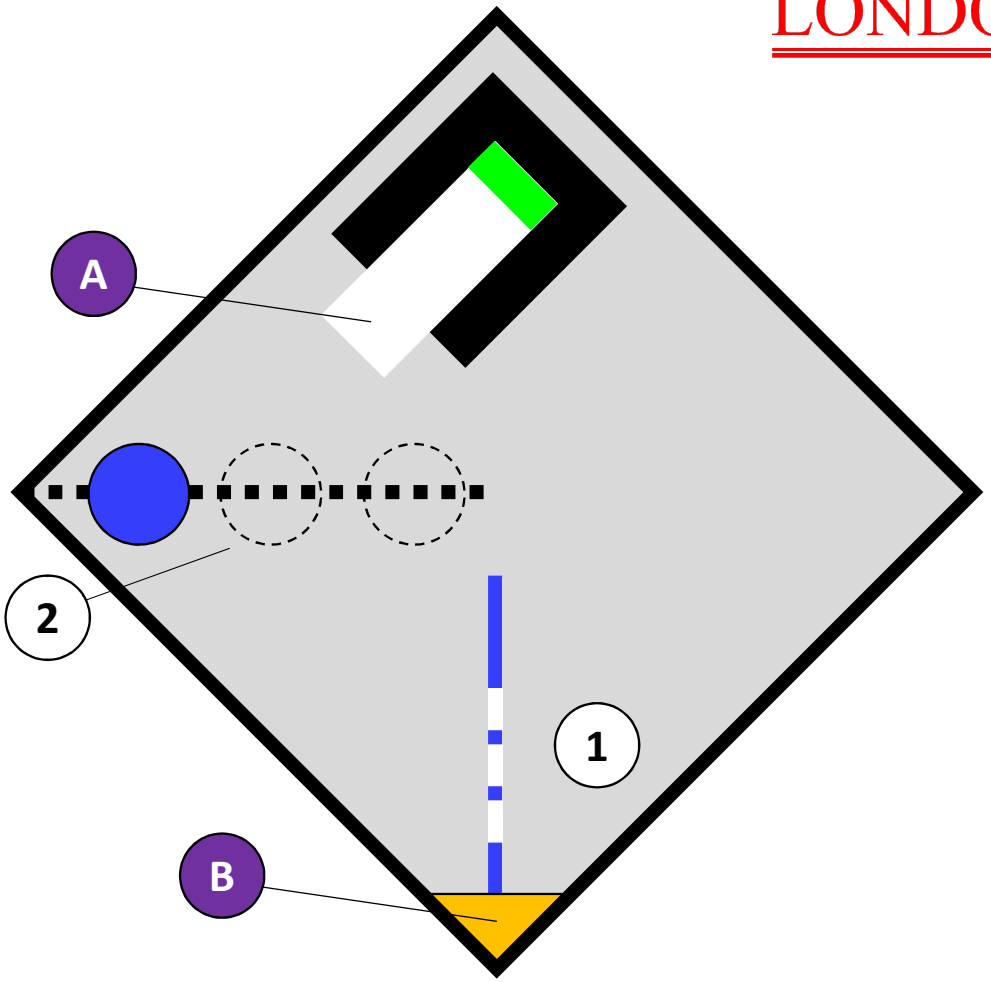
- Based on colour of previously scanned pad the 2nd obstacle position is known (red **OR** green)
- Plan a route back to the starting point using this information



# Marking

Challenge 1

- To achieve 60% of the total marks:
  - Complete tasks 1 and 2
  - Reach location A
  - Return to the starting point B



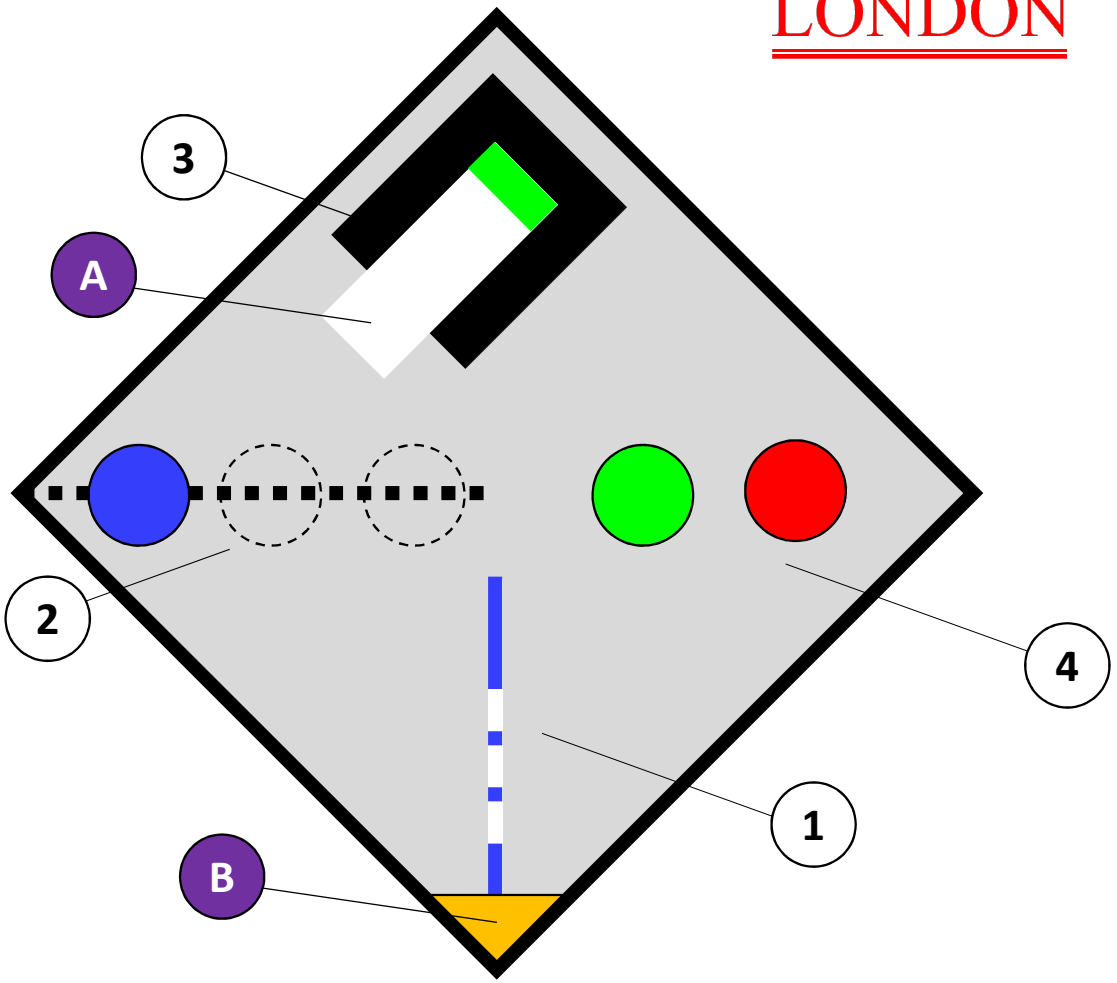
# Marking

Challenge 1

- To achieve 60% of the total marks:
  - Complete tasks 1 and 2
  - Reach location A
  - Return to the starting point B

Challenge 2

- To achieve additional 40% of the total marks:
  - Complete tasks 3 & 4
  - Return to the starting point B



# Marking

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- Marking criteria:
  - Robustness of the implementation
  - Speed of the execution

- Regularities:
  - Each challenge can be tried 3 times (failures are accounted for in the robustness marking)