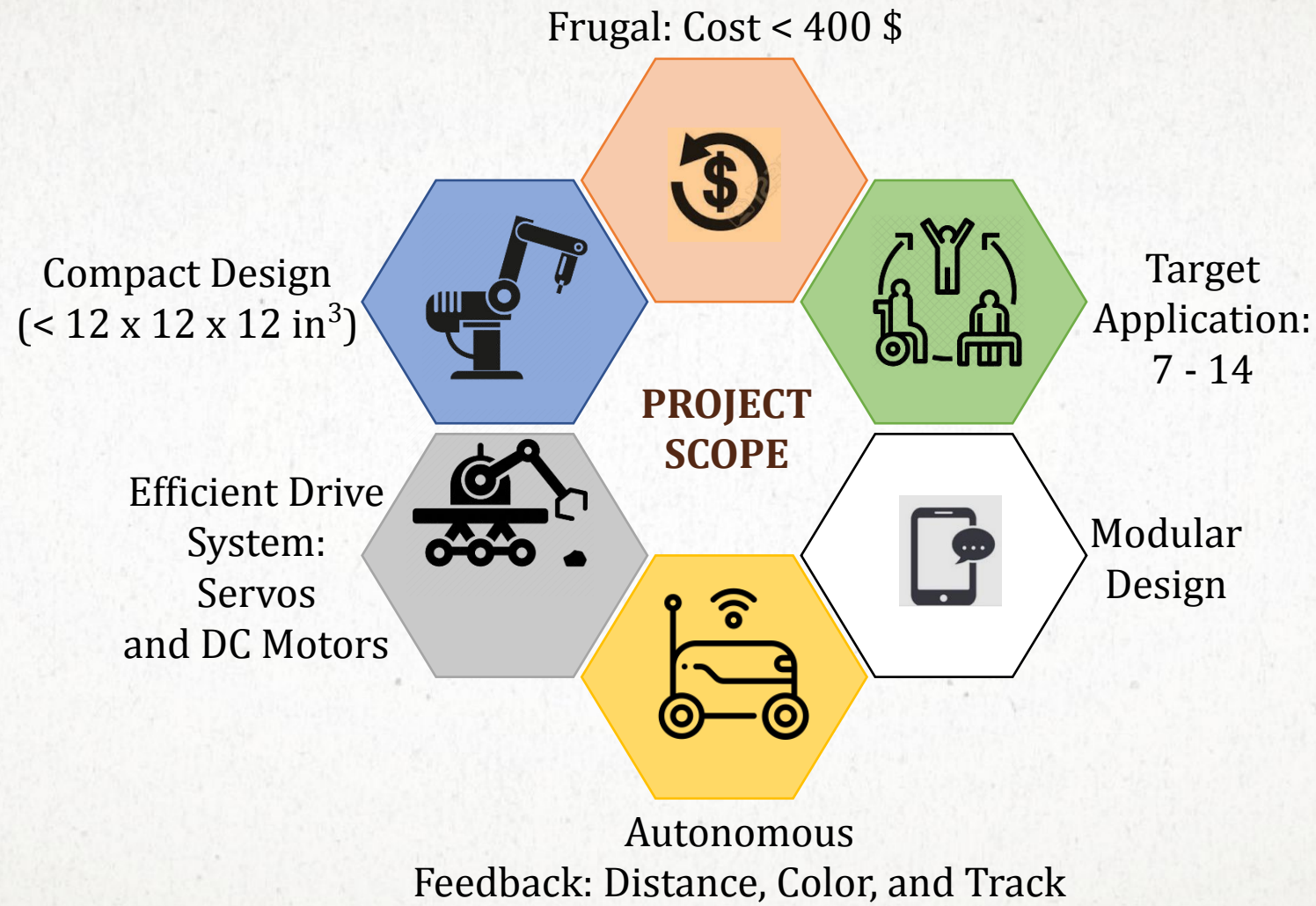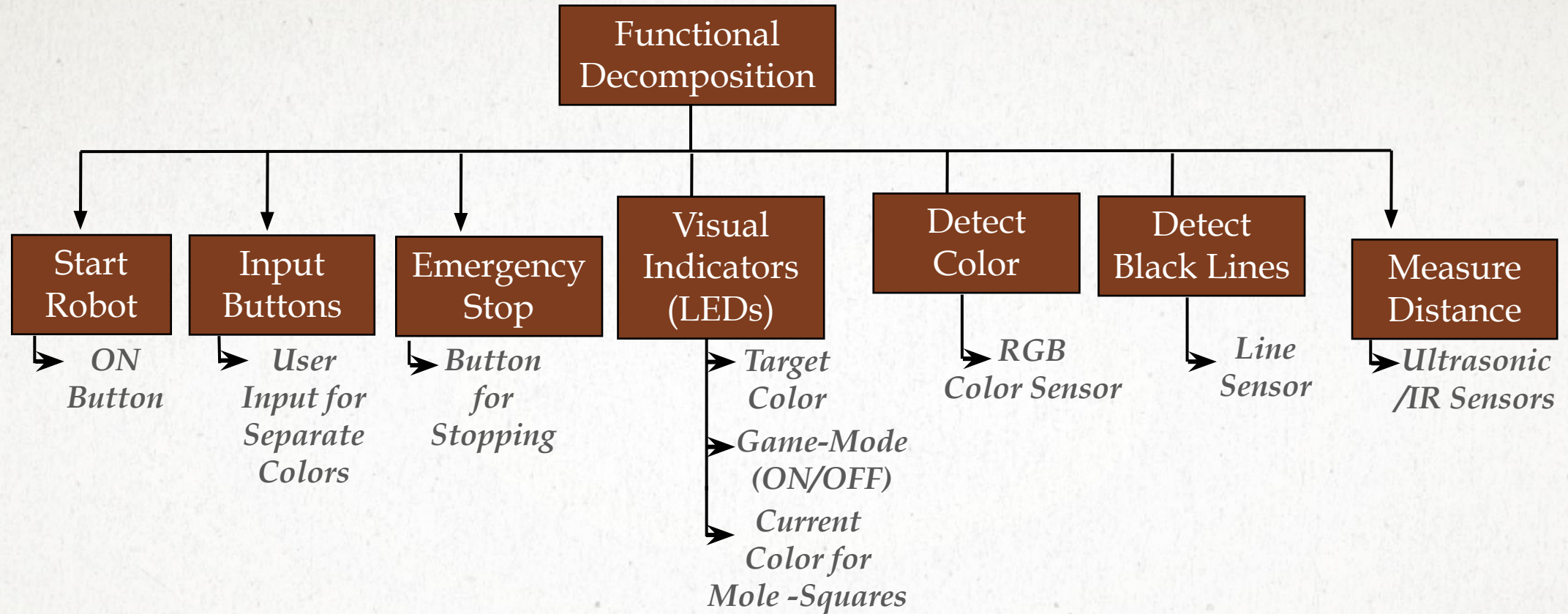# DESIGN REQUIREMENTS AND CONSTRAINTS

Objective: Autonomously search the playing field for the Moles and place Mole—Whackers on those squares
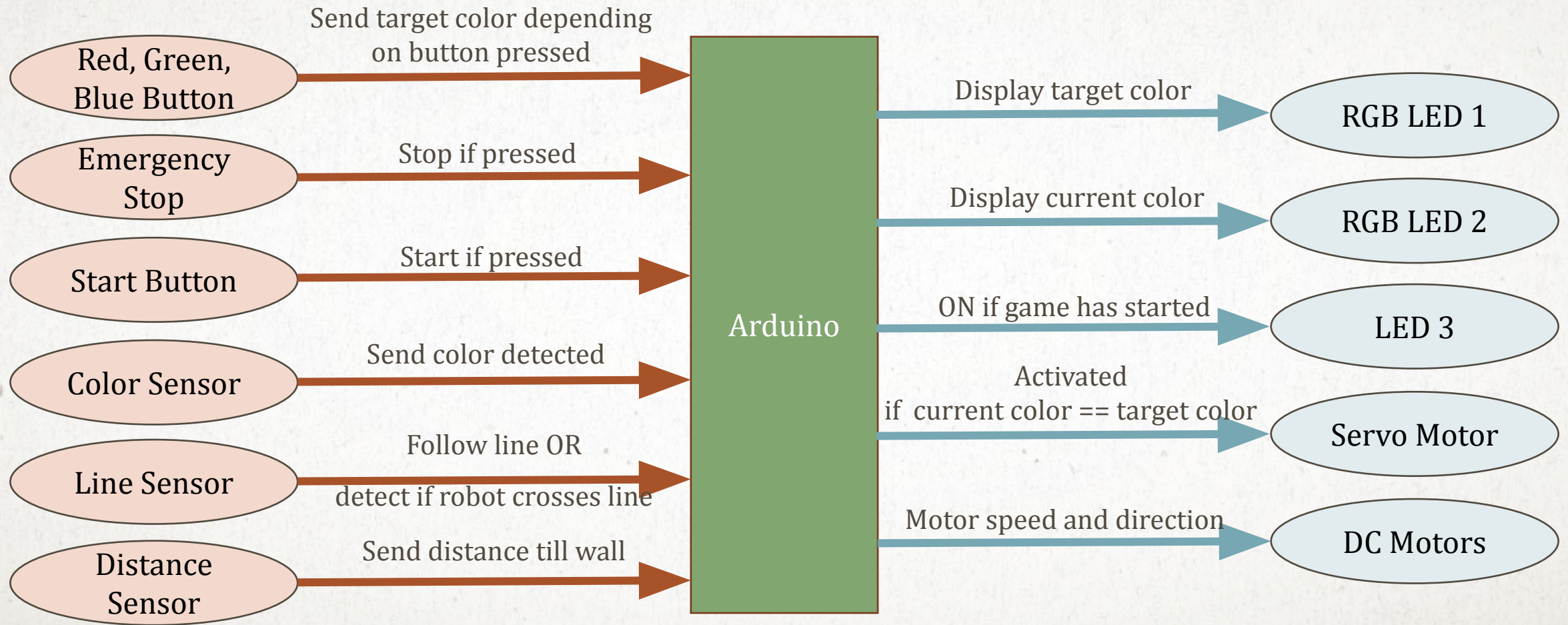
Frugal: Cost < 400 $
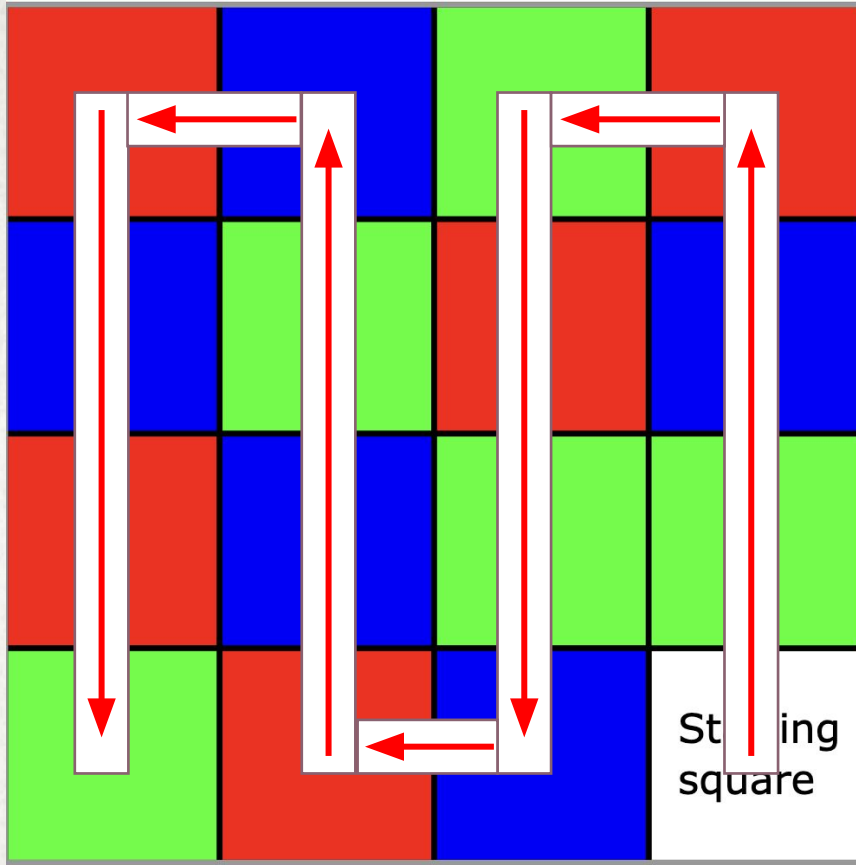
Compact Design
(< 12 x 12 x 12 in^3)

Target Application:
7 - 14

PROJECT SCOPE

Efficient Drive System:
Servos and DC Motors

Modular Design

Autonomous
Feedback: Distance, Color, and Track

DESIGN FUNCTIONALITY

SYSTEMS ENGINEERING LAYOUT

Red, Green, Blue Button — Send target color depending on button pressed → Arduino

Emergency Stop — Stop if pressed → Arduino

Start Button — Start if pressed → Arduino

Color Sensor — Send color detected → Arduino

Line Sensor — Follow line OR detect if robot crosses line → Arduino

Distance Sensor — Send distance till wall → Arduino

Arduino — Display target color → RGB LED 1

Arduino — Display current color → RGB LED 2

Arduino — ON if game has started → LED 3

Arduino — Activated if current color == target color → Servo Motor

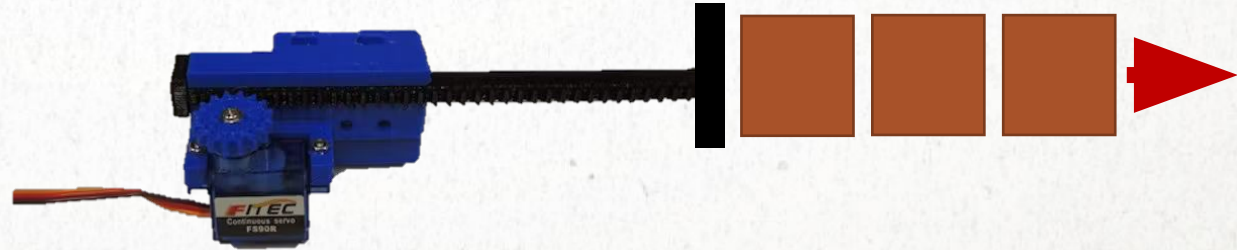Arduino — Motor speed and direction → DC Motors
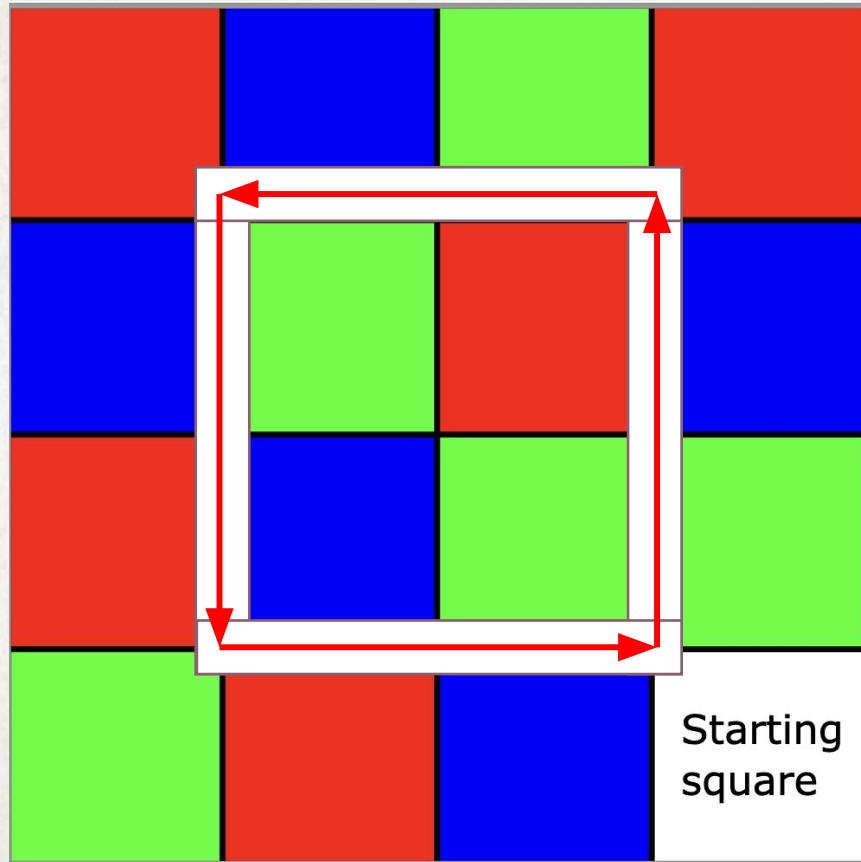
STRATEGY: EVERY SQUARE METHOD

Starting square

- Every Square Method
  - Robot follows the path given by the arrows to traverse every square
  - Based on the square under the robot: ball is dropped
  - This method might be the easiest to implement but could be slower

STRATEGY: LINE FOLLOWER METHOD

Starting square

- Line Follower Method
  - The robot only moves in the white boxes with red arrows
  - There are 2 color sensors to get the color of adjacent sides
  - Balls will be dropped on either side if follows the initial condition
  - This might be the fasted method of dropping the balls