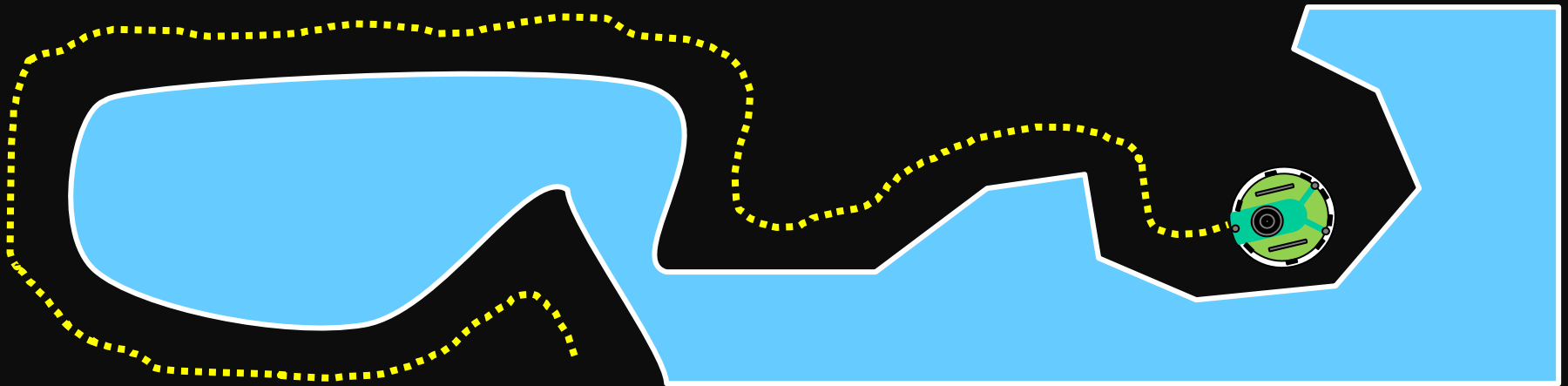


Wall-Following

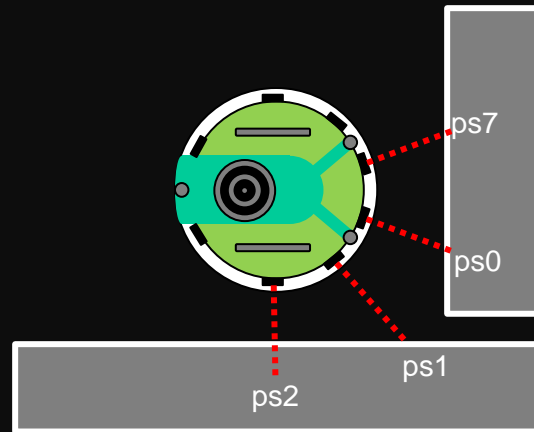
Wall Following

- Wall following behavior is useful for mapping, navigation, seeking wall outlets, performing cleaning tasks etc...
- Strategy varies depending on types of sensors.
- Robot usually follows wall by keeping itself aligned to the wall on its left or right side



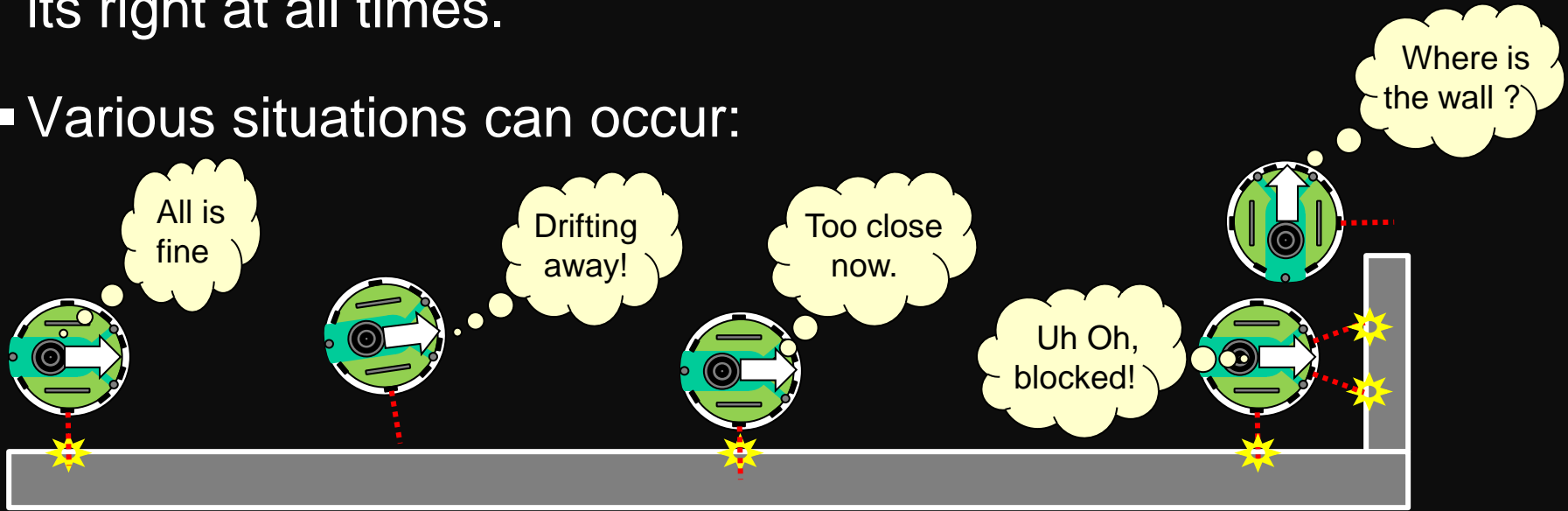
Wall Following

- At any time, robot simply moves forward or turns right or left depending on the shape of the contour that it is following.
- We will consider right-handed wall following only
- Consider the e-puck robot using 4 sensors as follows:



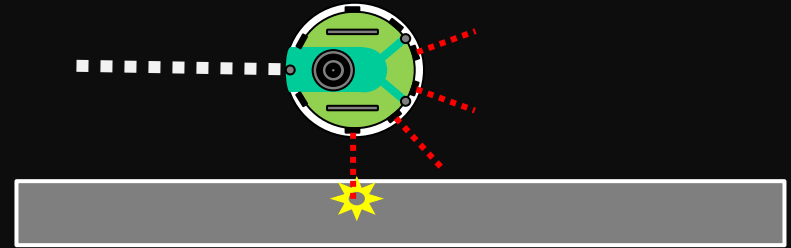
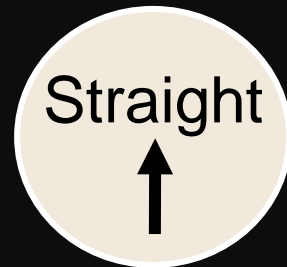
Wall Following

- Robot will try to maintain the same distance from the wall on its right at all times.
- Various situations can occur:

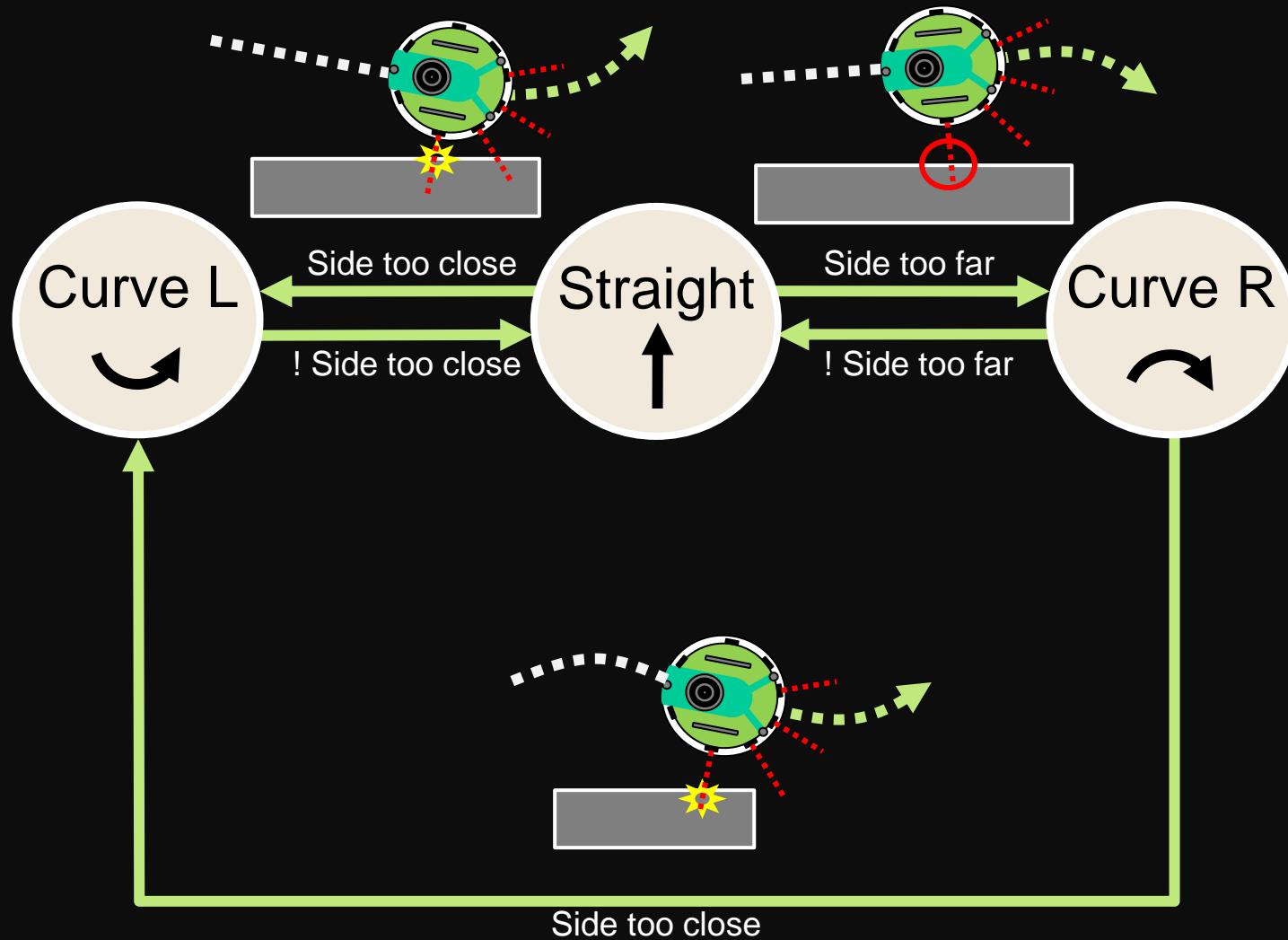


- Robot will thus be in certain *modes* to cause it to travel ahead or make appropriate turns to re-align with the wall or orient itself to a new edge.
- Can use a state machine to do this...

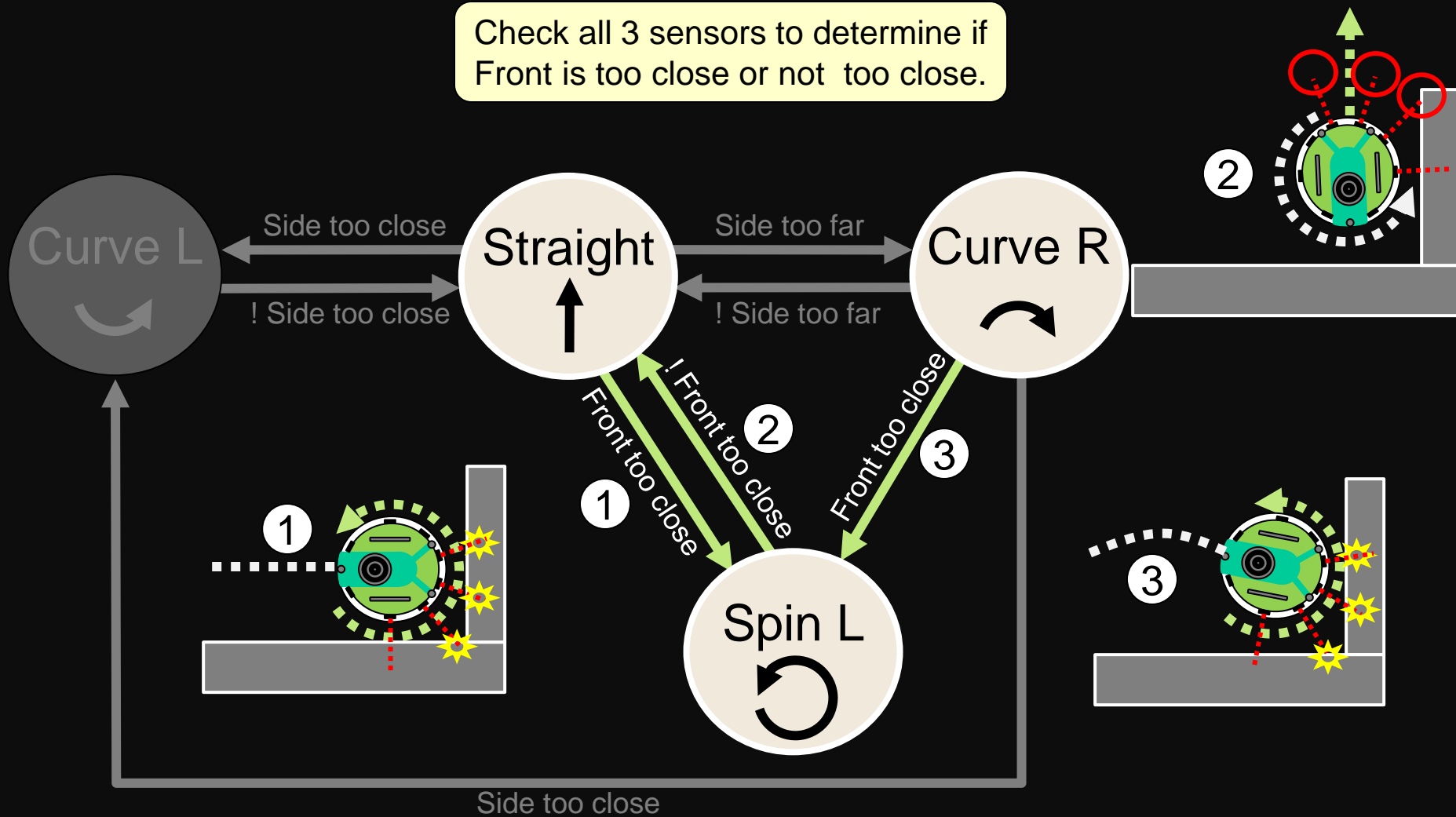
Wall Following – State Machine



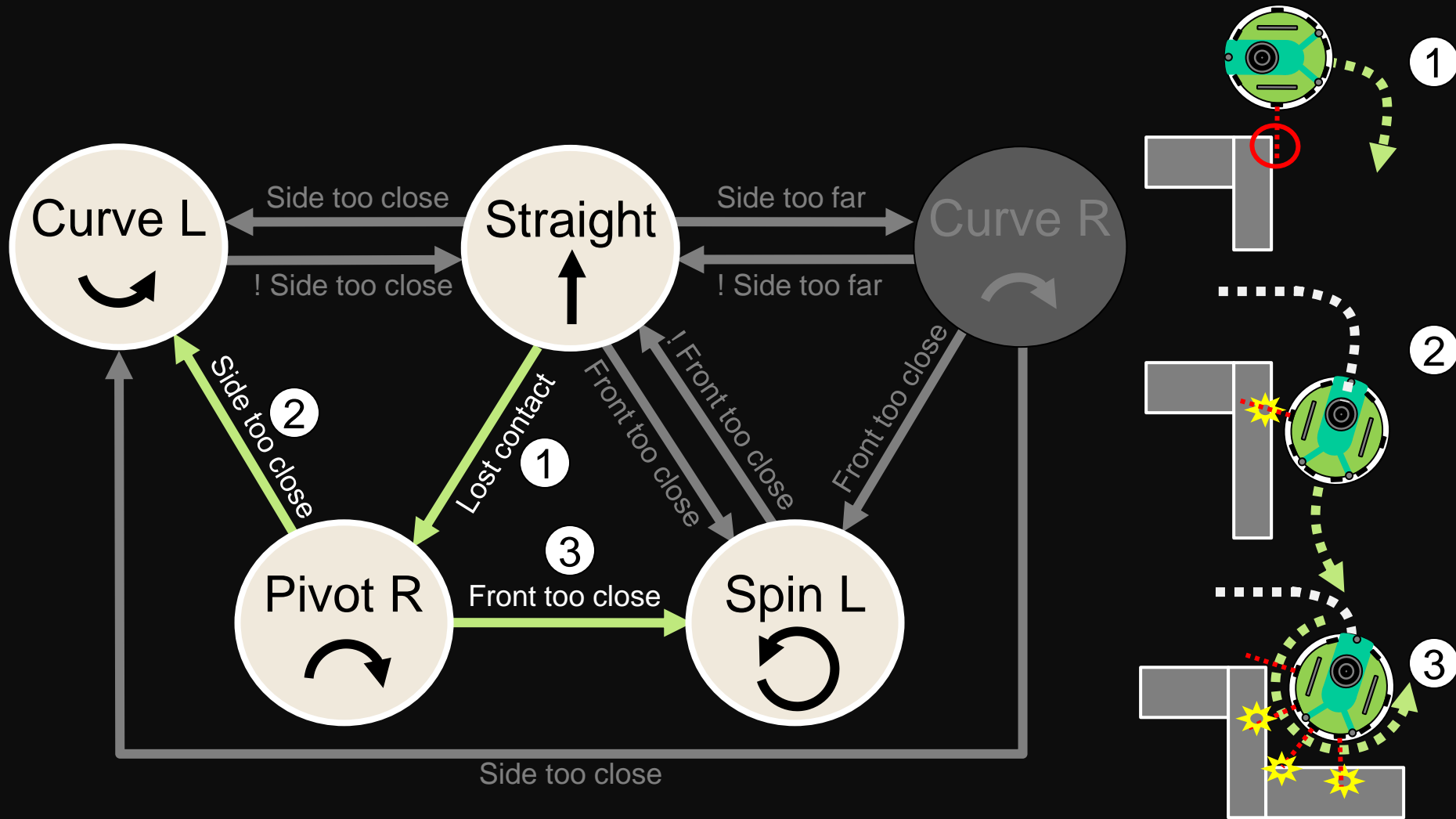
Wall Following – State Machine



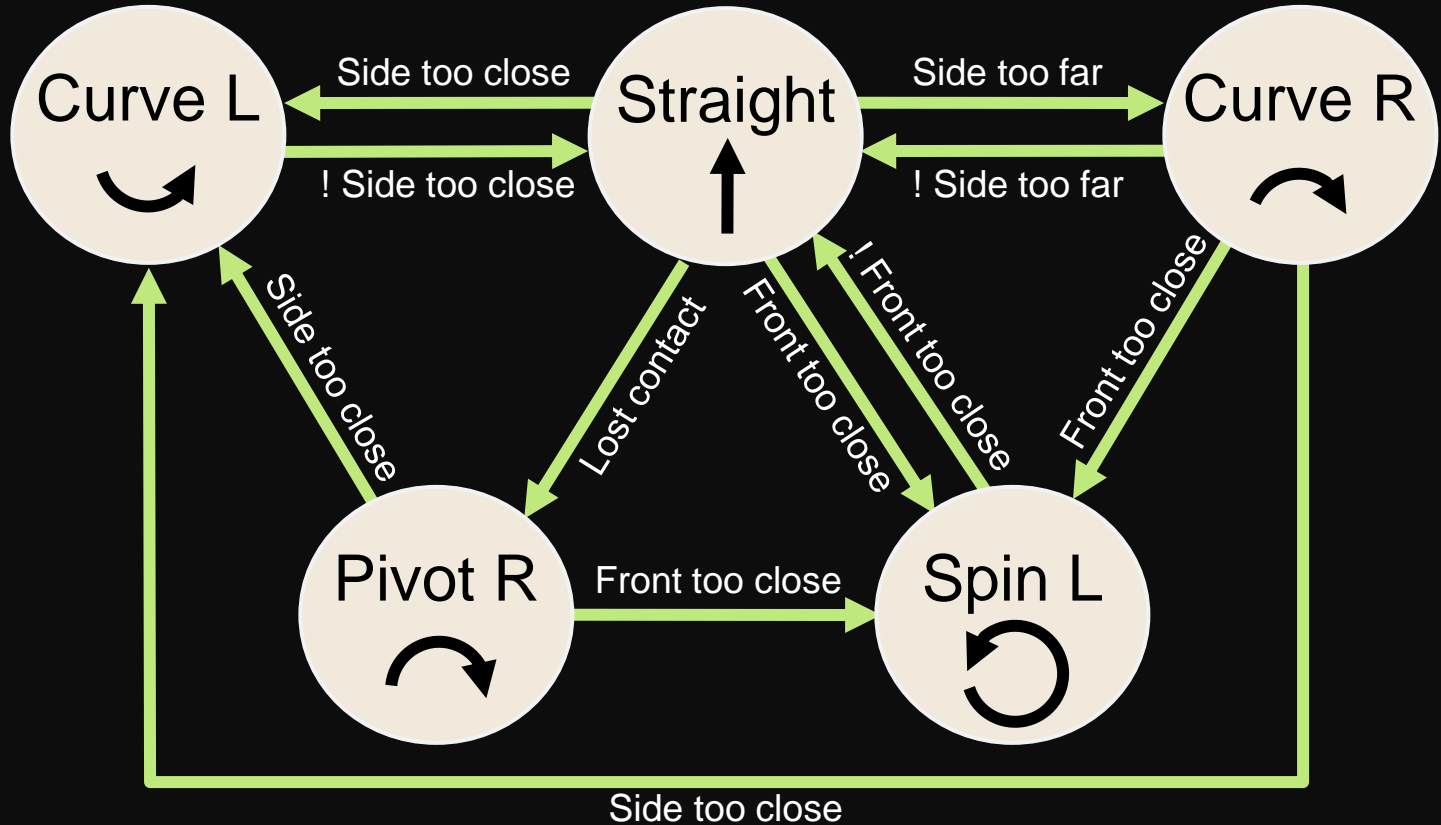
Wall Following – State Machine



Wall Following – State Machine



Wall Following – Completed



Wall Following – Code Structure

```
static final byte STRAIGHT = 0;
static final byte SPIN_LEFT = 1;
static final byte PIVOT_RIGHT = 2;
static final byte CURVE_LEFT = 3;
static final byte CURVE_RIGHT = 4;

byte currentMode = STRAIGHT;

while(robot.step(timeStep) != -1) {
    switch(currentMode) {
        case STRAIGHT:
            // ... check sensors and make decision to change mode, decide on move to make ...
            break;
        case CURVE_LEFT:
            // ... check sensors and make decision to change mode, decide on move to make ...
            break;
        .
        .
        .
        case PIVOT_RIGHT:
            // ... check sensors and make decision to change mode, decide on move to make ...
            break;
    }
    // ... move the motors right or left accordingly
}
```



**Start the
Lab ...**