# Field Deployment Manual – Gesture Control:

### Gesture 1 (Zig Zag – Start Right):

Steps for performing this gesture:

1. Press the user button (blue button) on the Nucleo board to enter gesture mode.
2. Ensure no gesture is currently in the middle of detection. To check this, view the terminal output. If viewing the terminal is not valid, remove any object from the line of sight of the ultrasonic sensor for approximately 5s to reset the gesture detection.
3. Place hand at a distance of 15-30cm from the right ultrasonic sensor, and then quickly remove it.
4. Place hand at a distance of 15-30cm from the left ultrasonic sensor, and then quickly remove it.
5. Place hand at a distance of 15-30cm from the right ultrasonic sensor, and then quickly remove it.

NOTE: Do not hold hands at a fixed distance from the ultrasonic sensor in an attempt to circumvent performing the gesture. This will be detected and ignored.

Performing the above steps will make the TurtleBot move in the following fashion:

1. Move forward in current direction at 0.26m/s for 1s
2. Rotate approximately 40o to the right (this will take 0.3s)
3. Move forward in current direction at 0.26m/s for 1s
4. Rotate approximately 40o to the left (this will take 0.3s)
5. Move forward in current direction at 0.26m/s for 1s
6. Rotate approximately 40o to the right (this will take 0.3s)
7. Move forward in current direction at 0.26m/s for 1s
8. Complete stop.

### Gesture 2 (Zig Zag – Start Left):

Steps for performing this gesture:

1. Press the user button (blue button) on the Nucleo board to enter gesture mode.
2. Ensure no gesture is currently in the middle of detection. To check this, view the terminal output. If viewing the terminal is not valid, remove any object from the line of sight of the ultrasonic sensor for approximately 5s to reset the gesture detection.
3. Place hand at a distance of 15-30cm from the left ultrasonic sensor, and then quickly remove it.
4. Place hand at a distance of 15-30cm from the right ultrasonic sensor, and then quickly remove it.
5. Place hand at a distance of 15-30cm from the left ultrasonic sensor, and then quickly remove it.

NOTE: Do not hold hands at a fixed distance from the ultrasonic sensor in an attempt to circumvent performing the gesture. This will be detected and ignored.

Performing the above steps will make the TurtleBot move in the following fashion:

1. Move forward in current direction at 0.26m/s for 1s
2. Rotate approximately 40o to the left (this will take 0.3s)
3. Move forward in current direction at 0.26m/s for 1s
4. Rotate approximately 40o to the right (this will take 0.3s)
5. Move forward in current direction at 0.26m/s for 1s
6. Rotate approximately 40o to the left (this will take 0.3s)
7. Move forward in current direction at 0.26m/s for 1s
8. Complete stop.

### Gesture 3 (Clockwise Rotation):

Steps for performing this gesture:

1. Press the user button (blue button) on the Nucleo board to enter gesture mode.
2. Ensure no gesture is currently in the middle of detection. To check this, view the terminal output. If viewing the terminal is not valid, remove any object from the line of sight of the ultrasonic sensor for approximately 5s to reset the gesture detection.
3. Place hand at a distance of 40-60cm from the right ultrasonic sensor, and then quickly remove it.
4. Place hand at a distance of 10-30cm from the right ultrasonic sensor, and then quickly remove it.
5. Place hand at a distance of 40-60cm from the right ultrasonic sensor, and then quickly remove it.

NOTE: Do not hold hands at a fixed distance from the ultrasonic sensor in an attempt to circumvent performing the gesture. This will be detected and ignored.

Performing the above steps will make the TurtleBot spin in the following fashion:

1. Rotate with angular velocity of 1.82rad/s for 5s
2. Come to a complete stop.

### Gesture 4 (Anticlockwise Rotation):

Steps for performing this gesture:

1. Press the user button (blue button) on the Nucleo board to enter gesture mode.
2. Ensure no gesture is currently in the middle of detection. To check this, view the terminal output. If viewing the terminal is not valid, remove any object from the line of sight of the ultrasonic sensor for approximately 5s to reset the gesture detection.
3. Place hand at a distance of 40-60cm from the left ultrasonic sensor, and then quickly remove it.
4. Place hand at a distance of 10-30cm from the left ultrasonic sensor, and then quickly remove it.
5. Place hand at a distance of 40-60cm from the left ultrasonic sensor, and then quickly remove it.

NOTE: Do not hold hands at a fixed distance from the ultrasonic sensor in an attempt to circumvent performing the gesture. This will be detected and ignored.

Performing the above steps will make the TurtleBot spin in the following fashion:

1. Rotate with angular velocity of -1.82rad/s for 5s
2. Come to a complete stop.

### Gesture 5 (Stop):

Steps for performing this gesture:

1. Press the user button (blue button) on the Nucleo board to enter gesture mode.
2. Ensure no gesture is currently in the middle of detection. To check this, view the terminal output. If viewing the terminal is not valid, remove any object from the line of sight of the ultrasonic sensor for approximately 5s to reset the gesture detection.
3. Place both hands at a fixed distance of 1-5cm away from each sensor.

Performing the above steps will result in:

1. Come to a complete stop.