Pseudo Code **for** Primary Microcontroller (STMF103RB)

**int** state = 1; //initialize state variable as 1

**if**(state==1) {

//Do nothing for 5 minutes

//turn off UVC light

HAL\_GPIO\_WritePin(PA\_8, RESET);

timeValue=0;

setTIMERVALUE(&tim4,0);

**while**(timeValue<300)//takes 300secs waiting

ticks= getTIMERVALUE(&tim4);

**if**(ticks>100) {

timerValue++;}

**if**(pinC\_9 is high) { //pinC\_9 flag showing if robot has finished operation

state=1;//stay in state 1

}

**else** {

state=2;

}

}

**if**(state==2) {

Motors\_stp();

timeValue=0;

setTIMERVALUE(&tim4,0);

**while**(timeValue<6) //takes 6secs checking the motion sensors

**if**(PB10|| PB15|| PA10||PB3) { //inputs from the motion sensors

state=1;

timerValue=7;

}

ticks= getTIMERVALUE(&tim4);

**if**(ticks>100) {

timerValue++;}

**if**(pinC\_4 is high) { //pinC\_4 flag showing robot mode forward movement or //backward

state=2;//stay in state 1

}

**else** {

state=2;}

}

}

If(state==3) {

Motors\_Fw();

timeValue=0;

setTIMERVALUE(&tim4,0);

**while**(timeValue<5) { //takes 5secs moving

**if**(timeValue==0|| timeValue==3) { //checks ultrasonic and ir sensors

frontDistance=ultraSonicF();//get distance from front ultrasonic

rightDistance=ultraSonicR();//get distance from right side ultrasonic

leftDistance=ultraSonicL();//get distance from left side ultrasonic

**if**(frontDistance<obstDistance) {

**if**(rightDistance<obstDistance)

{

state=5;

timeValue=6;

}

**if**(lefttDistance<obstDistance)

{

state=4;

timeValue=6;

}

}

}

**else** **if**(!PA0) //front right Infrared sensor

{

state=6;

timeValue=6

}

esle **if**(!PA1) //front right Infrared sensor

{

state=7;

timevalue=6;

}

ticks= getTIMERVALUE(&tim4);

**if**(ticks>100) {

timerValue++;}

}

**if** (state == 3) { // if there is no change in state move to state 2

state = 2;

}

}

**if** (state == 4) {

Motors\_Stp();

HAL\_Delay(2000); // delay of 2 secs

timeValue = 0;//reset counter used for timing

setTIMERVALUE(&tim4,0);//reset timer

**while** (timeValue <= 4) {

Turn\_R();

ticks = getTIMERVALUE(&tim4);

ticks= getTIMERVALUE(&tim4);

**if**(ticks>100) {

timerValue++;}

}

Motors\_Stp();

state = 2; //check motion sensors

}

}

**if** (state == 5) {

Motors\_Stp();

HAL\_Delay(2000); // delay of 2 secs

timeValue = 0;//reset counter used for timing

setTIMERVALUE(&tim4,0);//reset timer

**while** (timeValue <= 4) {

Turn\_l();

ticks = getTIMERVALUE(&tim4);

ticks= getTIMERVALUE(&tim4);

**if**(ticks>100) {

timerValue++;}

}

Motors\_Stp();

state = 2; //check motion sensors

}

}

**if** (state == 6) {

Motors\_Stp();

HAL\_Delay(2000); // delay of 2 secs

timeValue = 0;//reset counter used for timing

setTIMERVALUE(&tim4,0);//reset timer

**while** (timeValue <= 2) {

Turn\_L();

ticks = getTIMERVALUE(&tim4);

ticks= getTIMERVALUE(&tim4);

**if**(ticks>100) {

timerValue++;}

}

Motors\_Stp();

state = 2; //check motion sensors

}

}

**if** (state == 7) {

Motors\_Stp();

HAL\_Delay(2000); // delay of 2 secs

timeValue = 0;//reset counter used for timing

setTIMERVALUE(&tim4,0);//reset timer

**while** (timeValue <= 2) {

Turn\_R();

ticks = getTIMERVALUE(&tim4);

ticks= getTIMERVALUE(&tim4);

**if**(ticks>100) {

timerValue++;}

}

Motors\_Stp();

state = 2; //check motion sensors

}

}

If(state==3) {

Motors\_Rv();

timeValue=0;

setTIMERVALUE(&tim4,0);

**while**(timeValue<5) { //takes 5secs moving

**if**(timeValue==0|| timeValue==3) { //checks ultrasonic and ir sensors

backDistance=ultraSonicB();//get distance from back ultrasonic

rightDistance=ultraSonicR();//get distance from right side ultrasonic

leftDistance=ultraSonicL();//get distance from left side ultrasonic

**if**(backDistance<obstDistance) {

**if**(rightDistance<obstDistance)

{

state=5;

timeValue=6;

}

**if**(lefttDistance<obstDistance)

{

state=4;

timeValue=6;

}

}

}

**else** **if**(!PA4) //back right Infrared sensor

{

state=7;

timeValue=6

}

else **if**(!PB0) //back left Infrared sensor

{

state=6;

timevalue=6;

}

ticks= getTIMERVALUE(&tim4);

**if**(ticks>100) {

timerValue++;}

}

**if** (state == 8) { // if there is no change in state move to state 2

state = 2;

}

}