Instituto Superior de Engenharia de Lisboa

Licenciatura em Engenharia Informática e Multimédia

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Fundamentos de Sistemas Operativos

1º Trabalho Prático

Manual de funcionamento da Interface Gráfica do Robot Lego

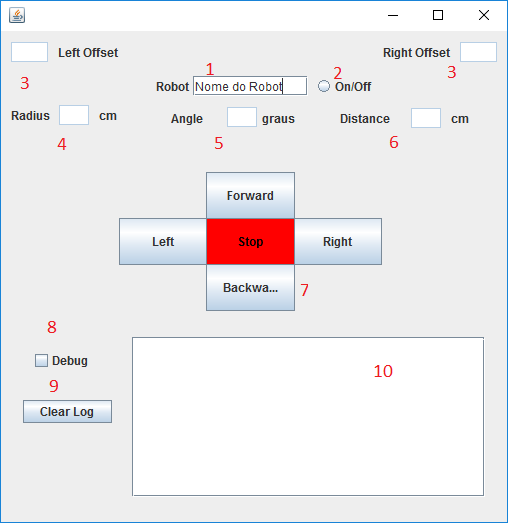
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# Interface Gráfica do Comando do Robot Lego



1 – Nome do Robot: Introduzir o nome do Robot que pretende utilizar.

2 – On/Off: Radiobutton, que caso o nome do robot esteja correto conecta o comando com o Robot.

**private** **void** **connectToRobot**(){

**if**(**this**.radioState==**false**){

**boolean** **auxEstado**;

auxEstado = **this**.robot.OpenNXT(**this**.robotName);

**if**(auxEstado == **false**){

**this**.rdbtnOnoff.setSelected(**false**);

showMessages("Erro ao abrir o Robot: " + **this**.robotName);

**this**.radioState = **false**;

robotON(**this**.radioState);

}**else**{

**this**.rdbtnOnoff.setSelected(**true**);

showMessages("Robot ligado : " + **this**.robotName);

**this**.radioState = **true**;

robotON(**this**.radioState);

}

}**else**{

**this**.robot.CloseNXT();

**this**.radioState = **false**;

**this**.rdbtnOnoff.setSelected(**false**);

robotON(**this**.radioState);

showMessages("Robot Desligado: " + **this**.robotName);

}

}3 – Steering Offset’s: Ajusta a rotação dos motores do robot.

**private** **void** **steeringLeft**(){

**this**.robot.AjustarVME(**this**.leftOffsetValue);

}

**private** **void** **steeringRight**(){

**this**.robot.AjustarVMD(**this**.rightOffsetValue);

}

4 – Radius: Determina um distancia em centímetros para o raio de circunferência que o robot descreve ao efetuar uma curva.

5 – Angle: Determina a amplitude a que o Robot efetua a curva com base no angulo em graus.

6 – Distance: Determina a distancia que o Robot percorre ao efetuar um movimento.

7 – Arrow Keys: Botões que determinam as ações do Robot (frente, trás, esquerda, direita e stop).

**private** **void** **actionForward**() {

// **TODO** Auto-generated method stub

**try** {

**this**.robot.Reta(**this**.distance);

**this**.robot.Parar(**false**);

} **catch** (**Exception** **e**) {

// **TODO** Auto-generated catch block

showMessages("Robot nao disponivel: " + e.getMessage());

}

}

**private** **void** **actionBackwards**() {

**try**{

**this**.robot.Reta(-**this**.distance);

**this**.robot.Parar(**false**);

}**catch**(**Exception** **e**){

showMessages("Robot nao disponivel: " + e.getMessage());

}

}

**private** **void** **actionRight**(){

**try**{

**this**.robot.CurvarDireita(**this**.radius, **this**.angle);

**this**.robot.Parar(**false**);

}**catch**(**Exception** **e**){

showMessages("Robot nao disponivel: " + e.getMessage());

}

}

**private** **void** **actionLeft**(){

**try** {

**this**.robot.CurvarEsquerda(**this**.radius, **this**.angle);

**this**.robot.Parar(**false**);

} **catch** (**Exception** **e**) {

showMessages("Robot nao disponivel: " + e.getMessage());

}

}

**private** **void** **actionStop**(){

**try** {

**this**.robot.Parar(**true**);

} **catch** (**Exception** **e**) {

// **TODO** Auto-generated catch block

showMessages("Robot nao disponivel: " + e.getMessage());

}

}

8 – Debug: Radiobutton que ativa a consola do comando do Robot.

9 – Clear Log: Botão que limpa a consola do comando do Robot.

**private** **void** **clearLog**(){

**this**.debugText.setText("");

}

10 – Consola: Textfield onde todas as ações do robot são registadas.

# Anexos

Código Integral da interface do Robot:

import java.awt.Color;

import java.awt.EventQueue;

import java.awt.event.ActionEvent;

import java.awt.event.ActionListener;

import javax.swing.JButton;

import javax.swing.JCheckBox;

import javax.swing.JFrame;

import javax.swing.JLabel;

import javax.swing.JPanel;

import javax.swing.JRadioButton;

import javax.swing.JScrollPane;

import javax.swing.JTextArea;

import javax.swing.JTextField;

import javax.swing.border.EmptyBorder;

import RobotLego.RobotLego;

public class RobotInterface extends JFrame {

private static final long serialVersionUID = 1L;

private JPanel contentPane;

private JTextField robotNameText;

private JRadioButton rdbtnOnoff;

private JCheckBox chckbxDebug;

private JTextField leftOffset;

private JTextField radiusText;

private JTextField angleText;

private JTextField distanceText;

private JTextField rightOffset;

private JTextArea debugText;

private JButton btnClear;

private RobotLego robot;

private String robotName;

private boolean radioState;

private boolean debugOnOff;

private int rightOffsetValue;

private int leftOffsetValue;

private int radius;

private int angle;

private int distance;

private void myInit(){

this.radioState = false;

this.debugOnOff = false;

this.radius = 0;

this.angle = 0;

this.distance = 0;

this.rightOffsetValue = 0;

this.leftOffsetValue = 0;

this.robotName = "Nome do Robot";

this.robot = new RobotLego();

this.rdbtnOnoff.setSelected(this.radioState);

this.chckbxDebug.setSelected(this.debugOnOff);

this.rightOffset.setEnabled(false);

this.leftOffset.setEnabled(false);

this.distanceText.setEnabled(false);

this.angleText.setEnabled(false);

this.radiusText.setEnabled(false);

this.robotNameText.setText(robotName);

}

private void robotON(boolean condition){

if(condition){

this.rightOffset.setEnabled(true);

this.leftOffset.setEnabled(true);

this.distanceText.setEnabled(true);

this.angleText.setEnabled(true);

this.radiusText.setEnabled(true);

}else{

this.rightOffset.setEnabled(false);

this.leftOffset.setEnabled(false);

this.distanceText.setEnabled(false);

this.angleText.setEnabled(false);

this.radiusText.setEnabled(false);

}

}

private void connectToRobot(){

if(this.radioState==false){

boolean auxEstado;

auxEstado = this.robot.OpenNXT(this.robotName);

if(auxEstado == false){

this.rdbtnOnoff.setSelected(false);

showMessages("Erro ao abrir o Robot: " + this.robotName);

this.radioState = false;

robotON(this.radioState);

}else{

this.rdbtnOnoff.setSelected(true);

showMessages("Robot ligado : " + this.robotName);

this.radioState = true;

robotON(this.radioState);

}

}else{

this.robot.CloseNXT();

this.radioState = false;

this.rdbtnOnoff.setSelected(false);

robotON(this.radioState);

showMessages("Robot Desligado: " + this.robotName);

}

}

private void showMessages(String message){

if(this.debugOnOff){

this.debugText.append(message + "\n");

}else{

this.debugText.append("");

}

}

private void setDistance(String distance){

try{

this.distance = Integer.parseInt(distance);

}catch(Exception e){

showMessages("Erro seguinte: " + e.getMessage());

}

}

private void setRadius(String radius){

try{

this.radius = Integer.parseInt(radius);

}catch(Exception e){

showMessages("Erro seguinte: " + e.getMessage());

}

}

private void setRightOffset(String offset){

try{

this.rightOffsetValue = Integer.parseInt(offset);

}catch(Exception e){

showMessages("Erro seguinte: " + e.getMessage());

}

}

private void setLeftOffset(String offset){

try{

this.leftOffsetValue = Integer.parseInt(offset);

}catch(Exception e){

showMessages("Erro seguinte: " + e.getMessage());

}

}

private void setAngle(String angle){

try{

this.angle = Integer.parseInt(angle);

}catch(Exception e){

showMessages("Erro seguinte: " + e.getMessage());

}

}

private void setRobotName(String name){

try{

this.robotName = name;

}catch(Exception e){

showMessages("Erro seguinte: " + e.getMessage());

}

}

private void clearLog(){

this.debugText.setText("");

}

private void actionForward() {

try {

this.robot.Reta(this.distance);

this.robot.Parar(false);

} catch (Exception e) {

showMessages("Robot nao disponivel: " + e.getMessage());

}

}

private void actionBackwards() {

try{

this.robot.Reta(-this.distance);

this.robot.Parar(false);

}catch(Exception e){

showMessages("Robot nao disponivel: " + e.getMessage());

}

}

private void actionRight(){

try{

this.robot.CurvarDireita(this.radius, this.angle);

this.robot.Parar(false);

}catch(Exception e){

showMessages("Robot nao disponivel: " + e.getMessage());

}

}

private void actionLeft(){

try {

this.robot.CurvarEsquerda(this.radius, this.angle);

this.robot.Parar(false);

} catch (Exception e) {

showMessages("Robot nao disponivel: " + e.getMessage());

}

}

private void actionStop(){

try {

this.robot.Parar(true);

} catch (Exception e) {

showMessages("Robot nao disponivel: " + e.getMessage());

}

}

private void steeringLeft(){

this.robot.AjustarVME(this.leftOffsetValue);

}

private void steeringRight(){

this.robot.AjustarVMD(this.rightOffsetValue);

}

public static void main(String[] args) {

EventQueue.invokeLater(new Runnable() {

public void run() {

try {

new RobotInterface();

} catch (Exception e) {

e.printStackTrace();

}

}

});

}

public RobotInterface() {

setDefaultCloseOperation(JFrame.EXIT\_ON\_CLOSE);

setBounds(100, 100, 522, 530);

contentPane = new JPanel();

contentPane.setBorder(new EmptyBorder(5, 5, 5, 5));

setContentPane(contentPane);

contentPane.setLayout(null);

rightOffset = new JTextField();

rightOffset.addActionListener(new ActionListener() {

public void actionPerformed(ActionEvent e) {

setRightOffset(rightOffset.getText());

showMessages("rightOffset -> " + rightOffsetValue);

}

});

rightOffset.setBounds(459, 11, 37, 20);

contentPane.add(rightOffset);

rightOffset.setColumns(10);

leftOffset = new JTextField();

leftOffset.addActionListener(new ActionListener() {

public void actionPerformed(ActionEvent e) {

setLeftOffset(leftOffset.getText());

showMessages("Left offset -> " + leftOffsetValue);

}

});

leftOffset.setColumns(10);

leftOffset.setBounds(10, 11, 37, 20);

contentPane.add(leftOffset);

JLabel lblLeftOffset = new JLabel("Left Offset");

lblLeftOffset.setBounds(57, 14, 70, 14);

contentPane.add(lblLeftOffset);

JLabel lblRightOffset = new JLabel("Right Offset");

lblRightOffset.setBounds(382, 14, 70, 14);

contentPane.add(lblRightOffset);

robotNameText = new JTextField();

robotNameText.addActionListener(new ActionListener() {

public void actionPerformed(ActionEvent e) {

setRobotName(robotNameText.getText());

showMessages("Nome do robot -> " + robotName);

}

});

robotNameText.setBounds(192, 45, 115, 20);

contentPane.add(robotNameText);

robotNameText.setColumns(10);

JLabel lblRobot = new JLabel("Robot");

lblRobot.setBounds(155, 48, 46, 14);

contentPane.add(lblRobot);

rdbtnOnoff = new JRadioButton("On/Off");

rdbtnOnoff.addActionListener(new ActionListener() {

public void actionPerformed(ActionEvent arg0) {

connectToRobot();

}

});

rdbtnOnoff.setBounds(313, 44, 109, 23);

contentPane.add(rdbtnOnoff);

JLabel lblRaio = new JLabel("Radius");

lblRaio.setBounds(10, 77, 46, 14);

contentPane.add(lblRaio);

radiusText = new JTextField();

radiusText.addActionListener(new ActionListener() {

public void actionPerformed(ActionEvent e) {

setRadius(radiusText.getText());

showMessages("Radius -> " + radius);

}

});

radiusText.setBounds(58, 74, 30, 20);

contentPane.add(radiusText);

radiusText.setColumns(10);

JLabel lblCm = new JLabel("cm");

lblCm.setBounds(98, 77, 46, 14);

contentPane.add(lblCm);

JLabel lblAngulo = new JLabel("Angle");

lblAngulo.setBounds(170, 80, 46, 14);

contentPane.add(lblAngulo);

angleText = new JTextField();

angleText.addActionListener(new ActionListener() {

public void actionPerformed(ActionEvent e) {

setAngle(angleText.getText());

showMessages("Angle -> " + angle);

}

});

angleText.setColumns(10);

angleText.setBounds(226, 76, 30, 20);

contentPane.add(angleText);

JLabel lblGraus = new JLabel("graus");

lblGraus.setBounds(261, 80, 46, 14);

contentPane.add(lblGraus);

JLabel lblDistancia = new JLabel("Distance");

lblDistancia.setBounds(339, 80, 56, 14);

contentPane.add(lblDistancia);

distanceText = new JTextField();

distanceText.addActionListener(new ActionListener() {

public void actionPerformed(ActionEvent e) {

setDistance(distanceText.getText());

showMessages("Distance -> " + distance);

}

});

distanceText.setColumns(10);

distanceText.setBounds(410, 77, 30, 20);

contentPane.add(distanceText);

JLabel lblCm\_1 = new JLabel("cm");

lblCm\_1.setBounds(450, 80, 46, 14);

contentPane.add(lblCm\_1);

JButton btnNewButton = new JButton("Forward");

btnNewButton.addActionListener(new ActionListener() {

public void actionPerformed(ActionEvent e) {

steeringLeft();

steeringRight();

actionForward();

showMessages("Forward -> " + distance + "cm.");

}

});

btnNewButton.setBounds(205, 141, 89, 47);

contentPane.add(btnNewButton);

JButton btnStop = new JButton("Stop");

btnStop.addActionListener(new ActionListener() {

public void actionPerformed(ActionEvent e) {

actionStop();

showMessages("STOP!");

}

});

btnStop.setBackground(Color.RED);

btnStop.setForeground(Color.BLACK);

btnStop.setBounds(205, 187, 89, 47);

contentPane.add(btnStop);

JButton btnRight = new JButton("Right");

btnRight.addActionListener(new ActionListener() {

public void actionPerformed(ActionEvent arg0) {

steeringLeft();

steeringRight();

actionRight();

showMessages("Right -> " + distance + "cm.");

}

});

btnRight.setBounds(292, 187, 89, 47);

contentPane.add(btnRight);

JButton btnLeft = new JButton("Left");

btnLeft.addActionListener(new ActionListener() {

public void actionPerformed(ActionEvent arg0) {

steeringLeft();

steeringRight();

actionLeft();

showMessages("Left -> " + distance + "cm.");

}

});

btnLeft.setBounds(118, 187, 89, 47);

contentPane.add(btnLeft);

JButton btnBackwards = new JButton("Backwards");

btnBackwards.addActionListener(new ActionListener() {

public void actionPerformed(ActionEvent arg0) {

steeringLeft();

steeringRight();

actionBackwards();

showMessages("Backwards -> " + distance + "cm." );

}

});

btnBackwards.setBounds(205, 233, 89, 47);

contentPane.add(btnBackwards);

chckbxDebug = new JCheckBox("Debug");

chckbxDebug.addActionListener(new ActionListener() {

public void actionPerformed(ActionEvent arg0) {

debugOnOff = !debugOnOff;

if(debugOnOff){

showMessages("Debug Ativo!");

}

}

});

chckbxDebug.setBounds(30, 318, 81, 23);

contentPane.add(chckbxDebug);

JScrollPane scrollPane = new JScrollPane();

scrollPane.setBounds(131, 306, 353, 160);

contentPane.add(scrollPane);

debugText = new JTextArea();

debugText.setForeground(Color.BLACK);

scrollPane.setViewportView(debugText);

btnClear = new JButton("Clear Log");

btnClear.addActionListener(new ActionListener() {

public void actionPerformed(ActionEvent e) {

clearLog();

}

});

btnClear.setBounds(22, 369, 89, 23);

contentPane.add(btnClear);

this.setVisible(true);

myInit();

}

}