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/**
 * @file init.c
 * @brief Perform initialization and start handler tasks
 * Copyright (C) 2017 Ethan Wells
 *
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 */

#include "../include/robot.h"

static inline float lMogoRecalc(int p) {
    return p * 1.1;
} /* lMogoRecalc */

static inline float lineRecalc(int v) {
    return (float)(v > 10);
}

void initializeIO() {
    watchdogInit();
}

/**
 * Notify both through the terminal and an lcd
 *
 * @param buffer the text to display
 */
void notice(const char *buffer) {
    print(buffer);
    lcdSetText(uart1, 2, buffer);
    delay(5);
} /* notice */

void init() {
    // LCD initialization

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lcdInit(uart1);
lcdSetBacklight(uart1, true);

print("\nInitializing... ");
lcdSetText(uart1, 1, "Initializing...");

// Set up the analog sensors
gyro      = newGyro(1, true, 200);
gyro.child = new(Sensor);
*gyro.child = newGyro(2, true, 195);
notice("gyroscopes, ");
Sensor *mogoAngle = new(Sensor);
*mogoAngle      = newAnalog(3, true);
mogoAngle->child = new(Sensor);
*mogoAngle->child = newAnalog(4, true);
notice("mobile goal angle, ");
Sensor *clawAngle = new(Sensor);
*clawAngle      = newAnalog(5, true);
clawAngle->inverted = true;
notice("claw angle, ");
for (int i = 0; i < 3; i++) {
    line[i] = newAnalog(i + 6, false);
    line[i].inverted = true;
    line[i].recalc = &lineRecalc;
}
notice("line sensors");

// Set up the digital sensors
Sensor *armCoder = new(Sensor);
*armCoder = newQuad(1, 2, false);
notice("arm quad, ");
Sensor *driveCoder[2] = { new(Sensor), new(Sensor) };
*driveCoder[0] = newQuad(4, 5, true);
notice("left drive quad, ");
*driveCoder[1] = newQuad(8, 9, true);
notice("right drive quad, ");
armLimit[0] = newDigital(12, true);
armLimit[1] = newDigital(11, true);
notice("arm limit switches, ");
sonic = new(Sensor);
*sonic = newSonic(6,7);
notice("ultrasonic, ");

// Initialize and set up all of the motors, servos, etc
claw      = motorCreate(3, false);
claw.sensor = clawAngle;

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notice("claw motor, ");

arm                = motorCreate(5, false);
arm.child          = new(Motor);
*arm.child         = motorCreate(6, true);
arm.child->child    = new(Motor);
*arm.child->child   = motorCreate(8, false);
arm.sensor         = armCoder;
notice("arm motors, ");

mogo               = motorCreate(1, false);
mogo.recalc        = &lMogoRecalc;
mogo.deadband      = 6;
mogo.child         = new(Motor);
mogo.child->deadband = 6;
*mogo.child        = motorCreate(10, true);
mogo.sensor        = mogoAngle;
notice("mobile goal motors, ");

drive[0]           = motorCreate(2, true);
drive[0].child     = new(Motor);
*drive[0].child    = motorCreate(4, true);
drive[0].sensor    = driveCoder[0];

drive[1]           = motorCreate(9, false);
drive[1].child     = new(Motor);
*drive[1].child    = motorCreate(7, false);
drive[1].sensor    = driveCoder[1];
notice("drive motors, ");

lcdSetText(uart1, 1, "Ready!");
print("\n\n");
setTeamName("709S");
notice("done!");

// Start the LCD task
LCDHandle = GO(lcdTask, NULL);
} /* init */

```