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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 > 16);
} /* lineRecalc */

void initializeIO() {
    watchdogInit();
} /* initializeIO */

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

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void init() {
    // LCD initialization
    lcdInit(uart1);
    lcdSetBacklight(uart1, true);

    #ifdef DEBUG_MODE
        print("\nInitializing... ");
    #endif /* ifdef DEBUG_MODE */
    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 *liftPot = new(Sensor);
    *liftPot = newAnalog(5, false);
    sensorRefresh(liftPot);
    liftPot->zero = liftPot->value;
    notice("lift pot, ");

    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 *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, ");
    liftLimit[0] = newDigital(12, true);
    liftLimit[1] = newDigital(11, true);
    notice("lift limit switches, ");
    sonic = new(Sensor);
    *sonic = newSonic(6, 7);
    notice("ultrasonic, ");
}

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// The IMEs
if (imeInitializeAll() < 1) {
    print("\n\nexiting program...\n\n");
    exit(0);
}
Sensor *manipS = new(Sensor);
*manipS = newIME(0, false);
sensorReset(manipS);

// Initialize and set up all of the motors, servos, etc

// intake motor
intake = motorCreate(3, true);
notice("intake motor, ");

// intake manipulator motor
manip = motorCreate(4, true);
manip.child = new(Motor);
*manip.child = motorCreate(8, false);
manip.sensor = manipS;

// lift motors
lift = motorCreate(5, true); // bottom left
lift.child = new(Motor);
*lift.child = motorCreate(6, false); // top left
lift.child->child = new(Motor);
*lift.child->child = motorCreate(7, false); // bottom right
lift.sensor = liftPot;
notice("lift motors, ");

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

// left drive motors
drive[0] = motorCreate(2, true);
drive[0].sensor = driveCoder[0];

// right drive motors

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drive[1]          = motorCreate(9, false);
drive[1].sensor = driveCoder[1];
notice("drive motors, ");

lcdSetText(uart1, 1, "Ready!");
#ifdef DEBUG_MODE
    print("\n\n");
#endif /* ifdef DEBUG_MODE */
setTeamName("709S");
notice("done!");

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

```