

```

/**
 * @file auto.c
 * @brief The primary source for the autonomous operation period
 * Copyright (C) 2017 Ethan Wells
 *
 * This program is free software: you can redistribute it and/or modify it
 * under the terms of the GNU General Public License as published by the Free
 * Software Foundation, either version 3 of the License, or (at your option) any
 * later version.
 *
 * This program is distributed in the hope that it will be useful, but WITHOUT
 * ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS
 * FOR A PARTICULAR PURPOSE. See the GNU General Public License for more
 * details.
 *
 * You should have received a copy of the GNU General Public License along
 * with this program. If not, see <https://www.gnu.org/licenses/>
 */

#include "../include/auto.h"

bool isAuto = true;

void autonNone() {}
void autoHerbLeft();
void autoHerbRight();
void autoMeatLeft();
void autoMeatRight();

int    selectedAuton    = 4;
Auton autons[MAX_AUTON + 1] =
{ {
    // index 0
    .name      = "none",
    .sensorName = "lDrv",
    .sensor     = &drive[0].sensor,
    .execute    = &autonNone,
}, {
    // index 1
    .name      = "herb l",
    .sensorName = "rDrv",
    .sensor     = &drive[1].sensor,
    .execute    = &autoHerbLeft,
}, {
    // index 2
    .name      = "herb r",

```

```

        .sensorName = "lIntake",
        .sensor      = &intake[0].sensor,
        .execute     = &autoHerbRight,
    },{
        // index 3
        .name         = "meat l",
        .sensorName   = "rIntake",
        .sensor       = &intake[1].sensor,
        .execute      = &autoMeatLeft,
    },{
        // index 4
        .name         = "meat r",
        .sensorName   = "gyroC",
        .sensor       = &gyro.child,
        .execute      = &autoMeatRight,
    },
};

void driveToPosition(int l, int r, unsigned long until) {
    driveSettings[0].target = l;
    driveSettings[1].target = r;
    until += millis();

    do {
        PID(&driveSettings[0]);
        PID(&driveSettings[1]);

        motorUpdate(&lift);
        sensorRefresh(lift.sensor);
        sensorRefresh(&gyro);

        for (int i = 0; i < 2; i++) {
            motorUpdate(&drive[i]);
            sensorRefresh(drive[i].sensor);
        }

        delay(10);
    } while ((!driveSettings[0].isTargetReached ||
              !driveSettings[1].isTargetReached) &&
             millis() < until);

    drive[0].power = 0;
    drive[1].power = 0;
    update();
} /* driveToPosition */

```

```

void driveToPositionAngle(int l, int r, int a, unsigned long until) {
    int gError;
    driveSettings[0].target = l;
    driveSettings[1].target = r;
    until += millis();

    do {
        gError = (a - gyro.averageVal) * 1.5;
        PID(&driveSettings[0]);
        PID(&driveSettings[1]);
        drive[0].power += gError;
        drive[1].power -= gError;

        motorUpdate(&lift);
        sensorRefresh(lift.sensor);
        sensorRefresh(&gyro);

        for (int i = 0; i < 2; i++) {
            motorUpdate(&drive[i]);
            sensorRefresh(drive[i].sensor);
        }

        delay(10);
    } while ((!driveSettings[0].isTargetReached ||
              !driveSettings[1].isTargetReached) &&
             millis() < until);

    drive[0].power = 0;
    drive[1].power = 0;
    update();
} /* driveToPosition */

```

```

void turnTo(int angle, unsigned long until) {
    until += millis();

    gyroSettings[0].target = angle;
    gyroSettings[1].target = angle;

    do {
        PID(&gyroSettings[0]);
        PID(&gyroSettings[1]);

        update();
        delay(10);
    } while ((!gyroSettings[0].isTargetReached ||

```

```

        !gyroSettings[1].isTargetReached) &&
            millis() < until);

    driveSet(0, 0);
} /* turnTo */

void autonomous() {
    unsigned long startTime = millis();
    isAuto = true;
    reset();

    selectedAuton = clipNum(selectedAuton, MAX_AUTON, 0);
    if (autons[selectedAuton].execute != NULL)
        autons[selectedAuton].execute();

    #ifdef DEBUG_MODE
        printf("\n\n\rFinished autonomous in %ldms\n\n", millis() - startTime);
    #endif
    while (isAutonomous()) {
        update();
        delay(10);
    }
} /* autonomous */

Task driveToPositionAngleT(void *triple) {
    Triple *t = (Triple *)triple;

    driveSettings[0].target = t->a;
    driveSettings[1].target = t->b;

    do {
        PID(&driveSettings[0]);
        PID(&driveSettings[1]);
        drive[0].power += (t->c - gyro.averageVal) * 2.3;
        drive[1].power -= (t->c - gyro.averageVal) * 2.3;

        motorUpdate(&lift);
        sensorRefresh(lift.sensor);
        sensorRefresh(&gyro);

        for (int i = 0; i < 2; i++) {
            motorUpdate(&drive[i]);
            sensorRefresh(drive[i].sensor);
        }

        delay(10);
    }
}

```

```
    } while ((!driveSettings[0].isTargetReached ||
              !driveSettings[1].isTargetReached));

    drive[0].power = 0;
    drive[1].power = 0;
    delete(triple);
    taskDelete(NULL);
} /* driveToPositionAngleT */
```