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Small Swarm Bot Project:

All robots in the swarm will have at least the following, specialized bots can have other things

USB Nano

2 gear motors

9v battery

L293 or L298 motor driver (maybe a alternative driver)

4 IR pairs for communications

2 IR drop sensors

1 ultrasonic sensor

2 Neopixel LEDs

Buzzer

push buttons (3 or 4)

blue/green led for rx/tx of IR communication (optional)

Swarm bots are small robots that have limited capabilities on their own.

But work in groups to complete a task, being able to use knowledge gained from other robots in the swarm, or relay information back to the hive controller.

Normally one bot is designated as the Hive controller (or just controller) - The Hive controller is given a task, and then asks the other bots in the swarm what they are capable of doing.

Using this knowledge the controller starts to assign tasks to each bot in the swarm to reach it’s goal.

In other situations, the Hive controller may just send all the bots out to gather information and relay that information back to the controller.

Situations like look for “food” or gather an item for instance

In either of these situations, a chain of bots would be made with one bot being an anchor point at the “food” source, and other bots passing the “food” to each other for the controller.

All swarm bots talk to each other, if they are in range of another bot, and bots try to stay with in range of each other. So every bot in the swarm ends up with the same information.

Bots will have unique destinations - set either by manual means or by the hive controller. Once set the destinations are what should be used to address individual bots in the swarm.

Information for a bot at the end of the chain, but not with-in range of the bot wanting to talk to it - can be relayed via the other bots in the chain. (Mesh-Networking style)

Each bot in the swarm will have at least 2 LEDs (RGB) to relay information to humans watching them.

Once one bot is designated as the hive controller - its LEDs change color to show it’s different.

All bots will have the basic functions of communication with other bots (IR style) via 4 directional IR pairs. Drop detection for self protection from falls, and Ultra Sonic sensor for distance detection in front of it. All bots will stay in communication with other bots, and will attempt to not get too far from being able to communicate with other bots. They can also be programmed to play short sounds for humans.

Bots can carry other sensors, or devices with them to reach a goal.

1. Temperature Sensor
2. Gas Sensor
3. Light Sensor
4. Sound Sensor
5. Video/Camera
6. Rain/Water Sensor
7. vibration sensor
8. compass/accelerometer
9. PIR Sensor
10. Push Bars (used to push an object somewhere)

Like in a beehive, or ant colony - different bots can and will do different things to reach the set goal of the swarm.

NOTES:

Wrobot 4 Directional Digital 38Khz IR Transmitter Sensor $3.22

<http://www.ebay.com/itm/Wrobot-4-Directional-Digital-38KHz-IR-Transmitter-Sensor-Arduino-Compatible-/181496266991?pt=LH_DefaultDomain_0&hash=item2a420540ef>

5pc digital 38Khz IR receiver $4.98 + $1.98 Shipping

<http://www.ebay.com/itm/5pcs-Digital-38KHz-IR-Receiver-For-Arduino-Compatible-NEW-/400947059610?hash=item5d5a4e9b9a>

One goal of this project is to make the bots as cheap as possible, under $20 per bot would be ideal. Under $15 would be fantastic, and Under $10 would be insane.

Keeping the cost low, will mean making many of the small parts myself (namely the IR receiver board)

A good swarm needs at least 15 bots. A small swarm of 5 bots could be used for demonstrations.

\*\*\* Here is another low cost swarmbot, not really the same as what I want to do, but some good information \*\*\*

<http://www.instructables.com/id/How-to-make-a-swarmbot/?ALLSTEPS>