xymosBot system User Guide

In the implementation of the AI system described in the Innovations Report there are several methods that allow control over the bots. These explained below.

Compiling

This code uses John Macey's Graphics Library, so if you wish to compile the code you must first install this set of libraries. You must copy the 'GraphicsLib' folder to your home directory and in a terminal 'cd' to this directory. Then all you need to do is type 'make' and his library will be compiled.

Once this is done you must go into the 'xymosBot Code' directory and type 'make'. This will generate a program file called 'xymosBot'.

All of this is fairly pointless, however, as a compiled version of the program is provided.

Startup Modes

There are two ways of opening the program. Both require the Linux operating system, and use the same program file.

In a terminal 'cd' to the directory of the program file 'xymosBot' and type in `./xymosBot`. If you wish to run the program in the **Flocking mode** simply hit enter and after a few moments it will start. If, however, you wish to enter the **Route Finding mode** you must specify the location of a map file before you hit enter, for example `./xymosBot ../maps/50by50.bmp`. The map files must be in '.bmp' format.

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Flocking Mode

This mode demonstrates the flocking thought modules of Separation, Cohesion and Alignment, and also the SeekPoint thought module.
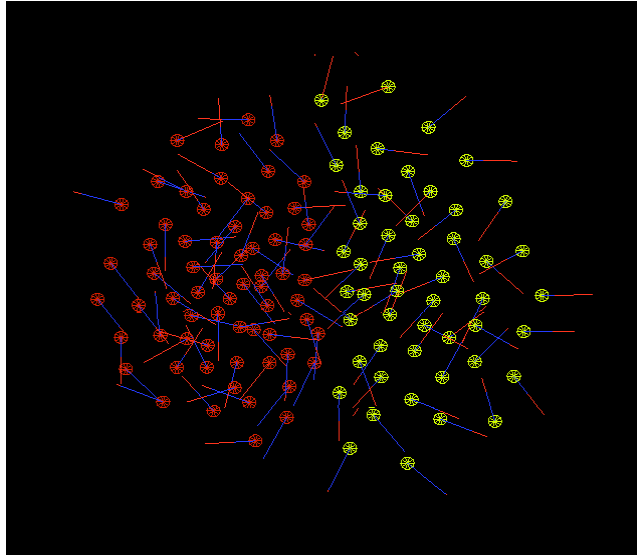

There are two teams, Group 0 (red) and Group 1 (green) which try to get to two different locations. Whilst doing so they flock together with members of the same group and avoid any bot in the environment regardless of group.

The attributes of the bots can be altered with the keyboard. An attribute mode is chosen and then the values of that attribute are changed with the '+' and '-' keys.

Some attributes affect all the bots on the screen. The type of attribute that you wish to change is chosen with the letter keys (make sure caps lock is turned off):

- **m** – Mass Mode
  - Changes the mass of the bots, altering their acceleration

- **r** – Radius Mode
  - Changes the radius of the bots. Does not effect their movement, just the way they are displayed.

- **f** – Max Force Mode
  - Changes the maximum force that a bot can apply to its velocity. Basically how quickly they can change direction and accelerate

- **v** – Max Velocity Mode
  - Changes the maximum velocity that a bot can achieve, so it is able to move around the world faster

- **n** – Neighbourhood Mode

Changes the radius of the neighbourhood that is used in the flocking algorithm. This is basically how close a bot has to be to other bots to consider them worth separating from and cohering to. The results are interesting, try a very low value, it does strange things.
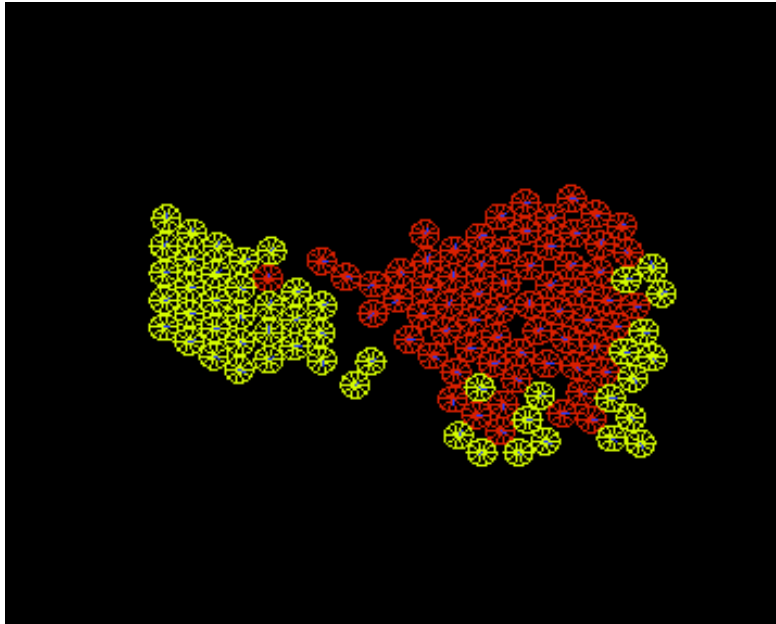
The next three attributes affect individual groups. You need to choose a group using the number of that group, e.g. for the reds hit 0 and for the greens hit 1.

- **c** – Cohesion Mode

  Changes the weight of the cohesion thought which forces bots of the same group together.

- **s** – Separation Mode

  Changes the weight of the separation thought which forces bots apart, regardless of their group.

- **a** – Alignment Mode

  Changes the weight of the alignment thought which forces bots of the same group into travelling the same direction.

Now that you can choose groups you can also choose where they are trying to get to. Using the mouse simply click where you wish the selected group to go, and they will flock towards that point.

This is more fun than it sounds, as you can start corralling the groups using different attributes in different ways. It is reminiscent of the classic game Liquid War (http://www.ufoot.org/liquidwar/).

Route Finding Mode

Unfortunately in this mode you do not have any control over the program, except for the map that it uses (which is not guaranteed to work properly I'm afraid). What it does show, however, is the ability to find the route of least cost between two points.
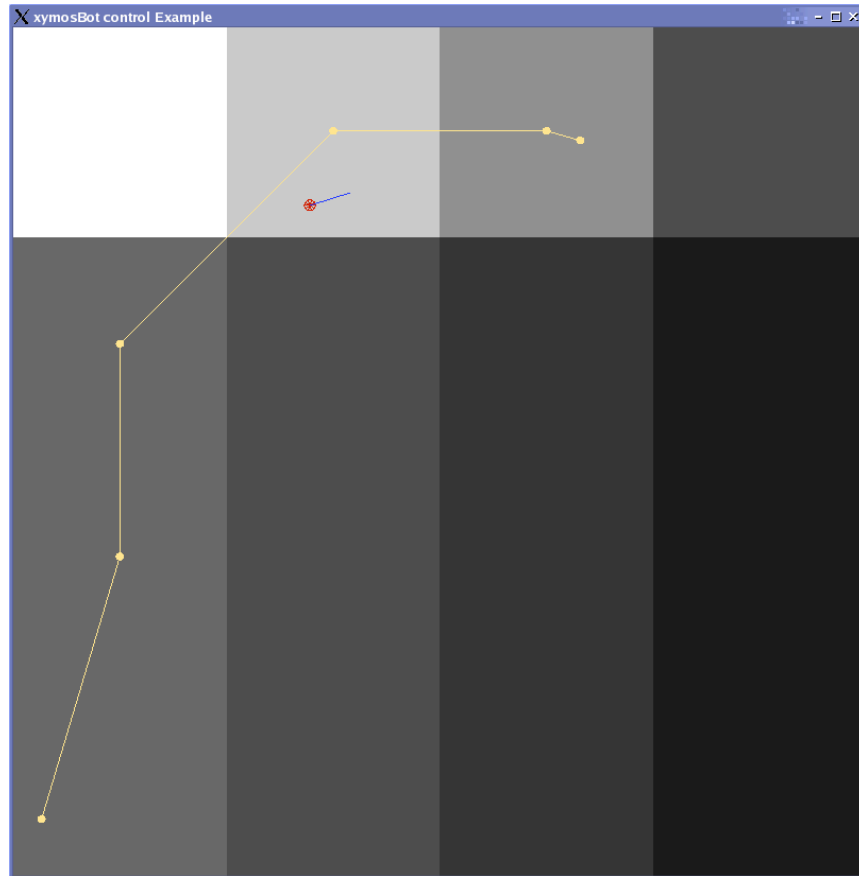
Once the route is found, which may take a few seconds (I recommend not using an image that is larger than 100 by 100), the bot begins patrolling the path, demonstrating the followPath thought. When it reaches the end of the path it turns itself around and heads on back the way it came. It does this forever.

Quiting

To quit all you need to do is hit the 'ESC' key.

Thanks for trying this program, I hope you enjoyed it. Although not a completed or fully functional (or even operational at times) piece of software, underneath the hood are concepts that are very open-ended and hopefully soon you will be playing against remarkably realistic, intelligent and robust enemies in best-selling games that use this engine.