

Google Summer of Code 2009

Proposal

KWarBots – A simple robot programmed game for KDE
Rodrigo Gonçalves de Oliveira - <mdkcore@gmail.com>

Proposal:

The proposal of this project is to develop a simple game based on *Robocode*[1], where computer programmed robots fight against themselves. More advanced robots can use statistical analysis and neural networks on their programming in order to have more chances of winning.

The Robocode game uses Java as the programming language for creating robots, but for this project I decided to use a language based version on *Logo*[2] scripting language to control the virtual agents of the game. This language is used as a support tool to the regular education and for beginners on computer programming; the typed commands are interpreted and the result is shown on the screen.

There is a development environment slightly based on Logo for the K Desktop Environment, the *KTurtle*[3]. This environment aims to teach a few simple mathematical and geometrical concepts and the initial steps of programming, using *TurtleScript*[4].

This makes it possible for the user to program little robots (in a form of a tank, for example) and play missions to complete specific objectives.

The main idea (inspired by a proposed game proposed for KDE, the *Robot Battle*[5]) differs from the original Robocode as follows:

- Integrating the TurtleScript system, already developed and consolidated;
- Creating 3 game modes:
 - Missions: simple tasks such as: get items, find resources, defend some strategical places and destroy the enemies;
 - Arena: Simply search and destroy the enemy, taking care of your own resources, energy and weapons;
 - Multiplayer: special mode to play through the internet against several enemies. The playing modes can be missions, arenas or group activities.
- The robot skills could increase as it gets points throughout the levels. New resource types could appear, as strength, weapons and energy.

However, through a scripting language, the user can create patterns and necessary actions to your robot fight and confront several situations so, when the robot enters some mission or level, he will battle by itself. The robot will act alone and will have only its weapons, energy meter and a radar to get its current position, find enemies, resources and/or specific objectives.

Its skills will increase when he finishes each level. By using the points earned, the robot can update the radar grasp, speed, armor, max energy level or the weapon power.

Project timeline:

The project will follow these steps, according to this timeline:

- Before 23rd May

Research and study on the necessary APIs and libraries, like *libkdegames* and TurtleScript. Also on this step, I must create the full specification on the game modes and graphics.

– 23rd May - 6th June

Develop the base graphical interface, with the game area, a test map and a robot graphic prototype.

– 7th June - 27th June

Integrate the TurtleScript in the project and implement the basic robot controls. Also the first mode of the game (missions) will be developed, containing the tasks that the virtual agent must do and the maps structure at all. At least 3 maps must be created on this step.

– 28th June - 25th July

Implement the arena mode, including the basic “search'n'destroy” task. After this (6th~13th July), the third and last game mode will be developed, adapting the other two modes (missions and arena) to run under a local network or over the internet. Here at least 3 maps must be designed for the arena mode.

– 26th July - 9th August

Finish the implementation. This task also includes testing, bugfixes and project documentation.

Between each step tests will be done to find possible errors and bugs in the program. Also, it's good to have basic documentation reviews.

Why develop this project?

With the increase adoption of KDE by many users and the popularization of open source, there is a great demand for high quality entertainment. The development of games to the KDE project contributes to suppress this demand and to motivate new projects to appear.

With this on mind, this project aims several goals with your development:

- reach people who are new in the programming world or enthusiasts, giving them an introduction of the logic of programming;
- encourage other similar projects, raising the range and variety of games to the KDE;
- encourage the creation of high quality games for the open source environment;
- create a community to exchange experience in the fields covered up by the project (games, artificial intelligence, scripts, etc);
- self learning;
- create a healthy competition environment and have fun, a lot of fun.

Why me?

I have experience in developing open source applications, affection with artificial intelligence and a great enthusiasm when it comes to compilers. Together with the other justificatives there is the desire to develop something useful, and the game development is my passion.

Details of my past experiences:

I worked in the research group on computer vision, image processing and computer graphics *IMAGO*[6], inside the *Federal University of Paraná (UFPR)*[7], where I'm an undergraduated student in *Computer Science*[8]. In *IMAGO* group, I helped in the development of some accessibility tools for the GNU/Linux system, like the *Mouse Loupe and Accessible Linux*[9]. Later I developed the *RedeIFES*[10], a system that connects the communication channels of several public universities in Brazil.

As my graduation work, I developed the vICon, a video conference system using cheaper webcams and human skin tracking.

Currently, I'm a trainee at Mandriva, doing QT/KDE development and bugfixing.

References:

- [1] Robocode - Open Source robot educational game
<http://robocode.sourceforge.net/>

- [2] Logo Programming Language - Computer programming language used for functional programming
http://en.wikipedia.org/wiki/Logo_programming_language

- [3] KTurtle - An educational programming environment for the KDE Desktop
<http://edu.kde.org/kturtle/>

- [4] TurtleScript Programming Reference - KTurtle Script Language
<http://docs.kde.org/development/en/kdeedu/kturtle/reference.html>

- [5] Robot Battle - Proposed Game in KDE Projects/Games
http://techbase.kde.org/Projects/Games/Proposed_Games#Robot_Battle_.28Programming_Game.29

- [6] The IMAGO Research Group
http://www.imago.ufpr.br/en_index.html

- [7] UFPR - Federal University of Paraná
<http://www.ufpr.br/>

- [8] Dinf - Department of informatics
<http://www.inf.ufpr.br/dinf/>

- [9] Accessible Linux - Open source accessibility tools for people with special needs
http://www.imago.ufpr.br/en_linuxaccessivel.html

- [10] RedeIFES - A media center for all Brazil Federal Institutions of High Education
<http://www.redeifes.ufpr.br/>