

COMPUTER SYSTEMS RESEARCH

Quarter 1 Version

2008-2009

1. Your name: Mary Linnell, Period: 1
2. Date of this version of your program: 10/28/08
3. Project title: Applications of Genetic Algorithms
4. Describe specifically what files are needed and the command(s) necessary to run your program

File needed: `plotsurfrotate.c`

How to run demo:
`./plotsurfrotate`

5. Your program is running, now what? List test input(s) for the user to interact with your program. Specifically what should the user expect to happen?

Input(s): Mouse, Page Down key

Rotate graph using mouse (to view it from different angles), and cycle through preliminary steps of a genetic algorithm using the "Page down" key.

Program's expected response(s):

The graph of $z = x^2 + y^2$ appears on the screen in a gradient of points. Eight randomly-generated yellow points appear on the screen. They consist of the population.

1. Page down is pressed. The four worst points (as determined by the fitness function) are highlighted in white and enlarged.
2. Page down is pressed again. Those four points have been deleted, because this is the selection process.
3. When page down is pressed the third time, new points appear (in this version of the program, they happen to be the points that were deleted, but in the future they will be new points chosen based upon a breeding algorithm).
4. The fourth time page down is pressed, the points stay the same but become the permanent new population.

When the page down button is continued to be pressed, the cycle repeats according to the steps above.

6. What about user input errors? Are there incorrect user input(s) that your program handles?

N/A.

7. What is the programming doing, demonstrating, or analyzing? What is the user looking for in order to understand what you've been studying and developing with this project?

The program is running a preliminary version of a genetic algorithm. We are looking at a three-dimensional graph with points that are randomly placed on the graph (random x and y coordinates, calculated z coordinates).

- ~~8. How has your program evolved during third quarter to now, the beginning of fourth quarter?~~

9. By the end of this school year, what do you hope to have as a final version of your program in relation to this current version? What will you demonstrate during your final presentation?

There are many improvements I will make to this program. The program will be functional and it will demonstrate the genetic algorithm both analytically and visually. It will run an entire trial in one press of a button (and I might even have two versions – one to show it step by step and another to show the entire trial). Additionally, I may implement other algorithms to solve this optimization problem.