

## Genetic Programming

by Pete Nicholls  
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At first glance, you just might find the phrase "genetic programming" a bit confusing. From one point of view, it seems to suggest that human genes can be programmed like a computer. Perhaps this would be a way to get offspring of the gender you want or with the color hair you'd prefer. Of course, modern medicine is not quite to this point, not by a long shot. However, the true definition of the phrase "genetic programming" seems to tread on the same side of the science vs. fiction fence as the incorrect definition.

In a nutshell, genetic programming is programming on a computer that will mimic the evolutionary process. Put in a way that is a little more complicated, you develop a computer program by letting it evolve on its own. All you do is tell it what needs to be done, but you don't tell it how it should be done.

In very simple terms, a genetic program actually begins its "life" as a series of computer programs. Each computer program has a different function it can perform. The programs are then put through a sort of generational change by having them essentially "mate" with other programs in their groups based on the fitness of those programs.

You can see Darwin's theory in action, here. Computer programs are reproduced, combining the fittest elements of the previous programs to make better, more fit programs. Meanwhile the programs that had functions that were not needed are discarded and not brought forward into the next generation of computers.

### Genetic Programming and Its Potential

In its most ideal sense, genetic programming is lauded as a better way to program computers. Instead of "reverse engineering" a problem by starting from the problem itself and working towards making a computer program that will solve that problem, GP (genetic programming) does it backwards. Think of it as though the computer were you.

Say you need to vacuum your living room, but you have no idea what a vacuum is. Through trial and error, you have to figure out how to get the dust and debris in your carpet out of there. You try a number of ideas (programs) until you find one that works the best out of the others (the most fit program). You then use the one that is best and toss away the others. Also, you might keep some aspects of the failed programs because they worked well, but were dwarfed by other flaws.

Say you try to vacuum with a broom; obviously, that doesn't work. However, it works better than a pair of tweezers and a magnifying glass, right? So, you take the upright position from the broom and take it to the next level. You try a small, handheld vacuum. It works, but it hurts your back. You bring the "suction" part of the handheld vacuum forward and combine it with the upright aspect of using a broom. Then you've got your final program.

## More on Genetic Programming

The potential for genetic programming is impressive. Already, genetic programs have managed to create results that are seen as competitive with the results humans would create. In fact, there are more than 20 instances where genetic programs have come up with patents humans had already registered. Twice, a GP has conjured something patentable that no human had ever thought of.