Robin Lockyer
201148882

COMP390 Interim Project Report

Progress on my project has been slow, but steady. I have a working SNGP implementation based on my supervisors example code, implemented a function set as specified in my design doc, and manually created a sorting algorithm to ensure it is possible to generate a working sort using the function set. So far I have been unable evolve a sort. The main cause of this has been due to bugs that were not immediately apparent, but prevented useful results from occurring. I believe I have now tracked down and fixed these bugs, so I should have much more success in the future.

One of the problems I have been encountering is that many generated programmes do not manipulate arrays at all, resulting in multiple programmes with the same fitness score. This is because there is only one function in the set that can manipulate the array, SWAP(). I may have to reduce the number of functions in the set, or include SWAP() in the set multiple times to increase the proportion if SWAP()'s in the population, and therefore the number of programmes that are capable of manipulating the array.

Another problem I have come across is that some runs of SNGP can take much longer than others, sometimes taking over 10 minutes to complete 5000 successor mutate operations. Using visual studio to profile the code it seems that more than 80% of this time is spent executing the programme trees. From what I have observed, it seems that programme trees are more likely to take longer to execute the more ITERATE() functions are in the population. I suspect that this is due to nested ITERATE()'s forcing subtrees to be re-evaluated many times. My supervisor has suggested bounding the total number of iterations that can occur within a programme tree so that programmes that are making needless iterations are prevented from taking up all the processing time.

My supervisor has also advised me to start work on the standard GP implementation to see if I am able to replicate Kinnear's work on GP at all. I will start work on this after I have tried out the changes to my SNGP implementation.