Genetic Algorithms and Sorting Data

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Genetic Algorithms (GAs) are a recent and relatively unexplored form of basic artificial intelligence. Many applications still need development. This project is an attempt to determine the capability of these algorithms at sorting data. It was hypothesized that the GA would outperform sorting algorithms (selectionSort, bubbleSort, insertionSort, mergeSort, quickSort, and shellSort) because it has demonstrated problem solving abilities in the fields of bioinformation and antenna regression. All programs were created on the same computer using JavaScript. The various sorting algorithms were run with a random array which consisted of 10,000 random numbers from 0 to 1000. The GA was run for 20,000 generations with a Stochastic Universal Sampling fitness program, 1% mutation, 10% re-use, and 70% crossover rates, and the same array system as the sorting algorithms. selectionSort and bubbleSort ran around 1000 milliseconds, insertionSort around 500 ms, and quickSort and shellSort around 5 ms. The GA, even after the 20,000 generations, was still giving fitness scores that were comparable to random data. In other words, it did not improve its sorting whatsoever. GAs find good solutions, and not optimal solutions, and are therefore useless to any application of sorting algorithms where data must be sorted perfectly. A sorting algorithm that does work could be created by the GA, but is impossibly unlikely to develop compared to the vast majority of possibilities that do not work. This is applicable to machine learning, because, for some things, intelligent human programmers are still required.

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