Genetic this procedure is inspired by the natural

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Genetic algorithms (GA) came into existence with the adaptation of developed biological processes to the computer environment (Kaya, 2010). A genetic algorithm is a high-level procedure used to generate quality solutions to optimization and search problems, this procedure is inspired by the natural process called natural selection. The basic elements of genetic algorithm were introduced in “ Machine Learning” by Holland (Holland, 1975). They were proved to be practical by one of his students, when he performed a study on gas pipes. GA studies in engineering are generally the optimizations of topology, shape, and dimension (Goldberg, 1989). Optimization problems will be faster solved with a computer and the genetic algorithm is faster than traditional optimization methods because the units in stored in the computer`s memory can behave in the same way as those in a natural population (Kaya, 2010).

Any genetic algorithm is influenced by their operators, such as crossover, selection and mutations. The performance is mainly affected by crossover and mutation, which makes them the most important part of the GA (Obtiko, 2017). Therefore, the effect of the crossover operator was investigated on the behaviour of genetic algorithms (S. Rajeev, 1992).

The crossover operator has several types such us: single point crossover, two-point crossover, uniform crossover and arithmetic crossover. In this paper the effect of crossover operators will be investigated on a genetic algorithm in order to find the set of values that optimises the performance measures. Genetic algorithms are very used for parametric optimisation problems and it can be explored how different operators of the genetic algorithm influences them. Description of the Genetic AlgorithmA genetic

algorithm procedure needs to be applicated to a population because is based on Charles Darwin's theory of natural evolution (Mallawaarachchi, 2017).

The natural selection process is the most similar procedure, where the fittest individuals are selected for reproduction, to produce the next generation. Genetic algorithms are often represented by strings of binary values like in the image above. Natural selection starts with the selection of individuals from a population, they will produce a new generation with inherited characteristics that can give them a better chance of survival. This procedure keeps repeating until the best set of individuals is found.

This process can be applied to optimize problem in order to produce a better solution. The genetic algorithm is going to have five different stages: initial population, fitness function, selection, crossover and mutation. The process starts with a set of solutions to a given problem, these solutions can be called individuals and the set of individuals a population. The fitness function will show if an individual is fit in comparation with other individuals. Each individual will have a fitness score, the one with highest score will be selected for reproduction. Selection is the phase where the fittest individuals are selected to pass their genes to the next generation.

Then crossover happens, for each pair of parents a crossover point is chosen randomly from their genes and the offspring is created by exchanging genes of parents until the crossover point is reached. After the new offspring is added to the set of individuals. Mutation appears only in some of the new offsprings because some of their genes can be the subject of a mutation, but this has a very low probability. This means that some bits in the bit string

can be changed. The algorithm terminates when the old population has been replaced by the new generation.

This means the algorithm has provided a new optimised set of solutions to our problem.