**Blog 7**

Invented in 1970 to mimic the processes observed in a natural evolution process, Genetic Algorithms are optimisation methods inspired by Darwin’s evolution theory, according to which the nature preserves beneficial gene modifications and eliminates the species, that did not fully adapt to the prevailing conditions. Only the fittest individuals are selected for the reproduction process and thus giving the offspring of the next generations. Genetic Algorithms proved, that this notion can be applied for a search problem, such as finding hardware bugs and localizing weak links in approximate computing.

Genetic Algorithms gained popularity in 80’s, when they had finally been implemented in practice, solving a variety of optimization tasks more efficiently than standard optimization algorithms. The execution process begins with establishing the population (the genotype), that consists of a certain number of individuals characterized by a set of parameters (genes) in the form of variables. Genes are then joined into a string, forming a Chromosome – solution to a given problem. With the use of the fitness function system may determine the ability of the subject to compete with other individuals, returning the fitness score for each query. Based on that score, two pairs with the highest score are selected for the purposes of next stage – crossover. Here, each mated pair of parents generates the offspring, which is created by exchanging the parents’ genes among themselves. The main reasons to use GA are, among others, the ability of the system to process a large number of parameters, modularity and supporting multi-objective optimisation.

Moreover, regarding that the evolution is a parallel process, GA may implement parallel computing to improve the system even more.