Lecture 5 - Evolutionary algorithms

Outline of the algorithm:

```
Initialize P(t) # Population at time t
Evaluate P(t)
while not stopping-condition:
        t = t + 1
        select P(t) from P(t-1)
        modify P(t)
        evaluate P(t)
```

Steady state vs Generational

- Generational algorithms replace entire population every generation, no individuals are alive more than one generation
- Steady state approach keeps some of the individuals, and only removes, or modifies a subset of the population
    - When we want to keep the population size constant, and we include the modified individuals, as well as their original versions in our population we also need to kill some of the solutions which is called negative selection. Positive selection is choosing which individuals to modify, and negative selection is choosing which individuals to kill.

Genetic Algorithms	Only deal with binary representations
Evolutionary Strategies	Only deal with continuous numerical optimization
Evolutionary Programming	Doesn’t put restrictions on representation
Genetic Programming	Tree structure represents solutions