Genetic algorithms

Tomek Kwiecien

Mimicing nature

Genetic algorithms try to imitagte evolution on a very basic / naive level.

Type of problems

Genetic algorithms are used for **optimization** tasks. It means you already have solutions and a way to tell which ones are better.

Finding the best solution

- Brute force: generate all, pick best
- Genetic algorithms: change existing set of solutions until they evolve into the best one

Car problem

Create a car out of several parts.

- Brute force: a lot of solutions without wheels
- Genetic algorithms: we evolve only the best solutions, the rest die out

Structure

- feature
- individuals / solutions
- population
- generation

Operations

- fitness
- selection
- reproduction
- crossover
- mutation

Diversity

Fitness is not all you need for avoiding local maximum. You want both, fit and diverse individuals.

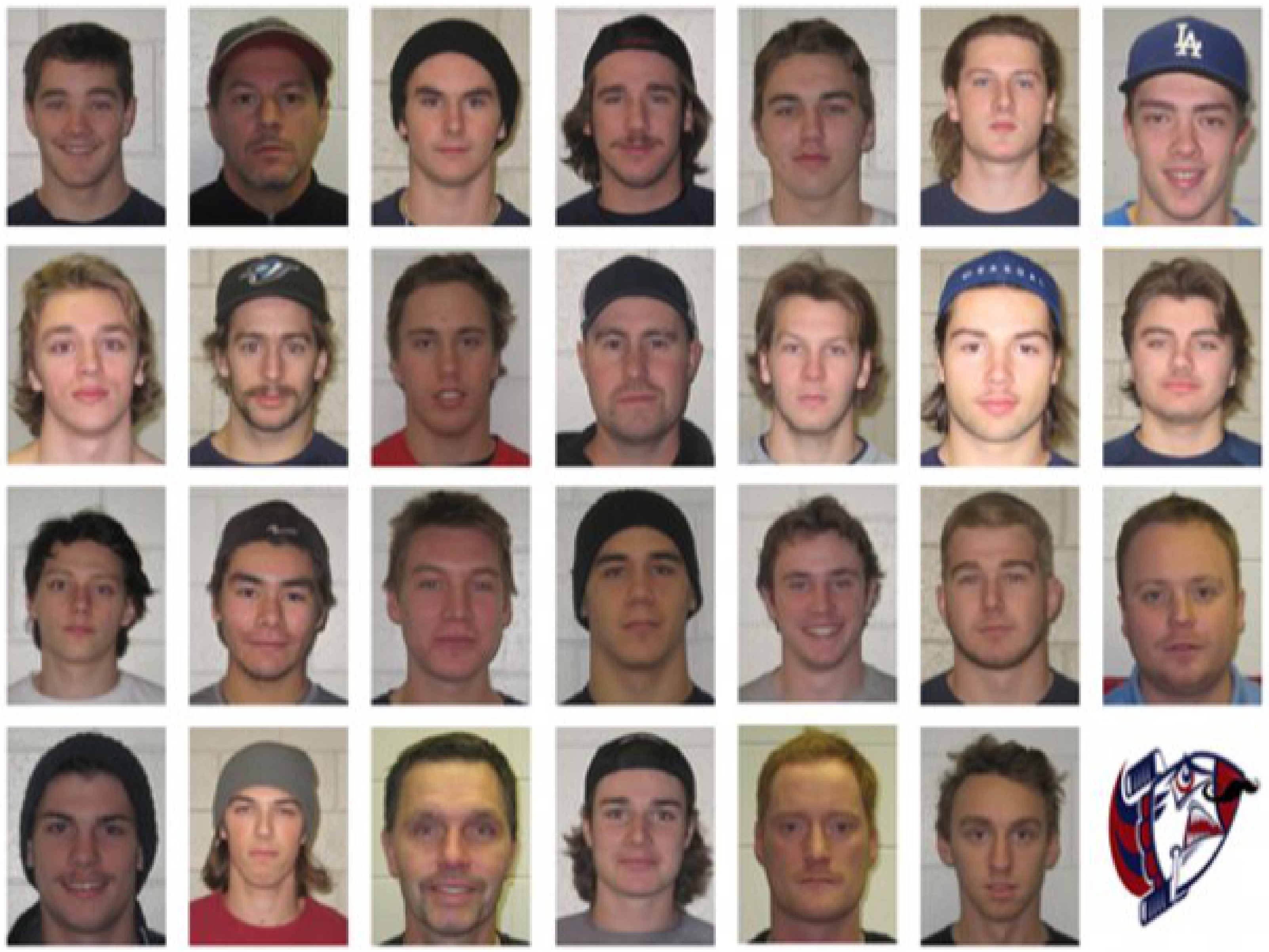
Gen-inder

Grow the best individual for a client.

Gosia

Gosia v2

Tofik



Features

- skin
- eyes
- hair
- nose

Process

1. We present the current population to Gosia
2. Gosia ranks the individuals
3. We generate new population based on Gosia's ranking
4. Repeast until we have a perfect fit

Gosia returns

Links

- Evolved Virtual Creatures - https://www.youtube.com/watch?v=JBgG_VSP7f8
- Genetic algorithms overview - https://www.youtube.com/watch?v=ziMHaGQJuSI
- Gen cars - http://rednuht.org/genetic_cars_2/