Georges R. Harik, Fernando G. Lobo, David E. Goldberg, *The Compact Genetic Algorithm*, Report No. 97006, Illinois Genetic Algorithms Laboratory, IlliGAL, University of Illinois at Urbana-Champaign, 1997.

- d - długość chromosomu
- θ - parametr algorytmu, współczynnik uczenia
  zazwyczaj $\theta = 1/N$, gdzie N odpowiada wielkości populacji w SGA

```
COMPACT-GENETIC-ALGORITHM(F, θ)
 1  p ← INITIAL-PROBABILITY-VECTOR();
 2  x_1 = RANDOM-INDIVIDUAL(p);
 3  x_2 = RANDOM-INDIVIDUAL(p);
 4  INDIVIDUAL-EVALUATION(x_1, F);
 5  INDIVIDUAL-EVALUATION(x_2, F);
 6  while not TERMINATION-CONDITION(x_1, x_2)
 7      do
 8          x_i = BEST-INDIVIDUAL(x_1, x_2);
 9          x_j = WORST-INDIVIDUAL(x_1, x_2);
10          for k ← 1 to d
11              do
12                  if x_ik = 1 and x_jk = 0
13                    then p_k ← p_k + θ;
14                  if x_ik = 0 and x_jk = 1
15                    then p_k ← p_k − θ;
16          x_1 = RANDOM-INDIVIDUAL(p);
17          x_2 = RANDOM-INDIVIDUAL(p);
18          INDIVIDUAL-EVALUATION(x_1, F);
19          INDIVIDUAL-EVALUATION(x_2, F);
```

```
BINARY-RANDOM(p)
1  if UNIFORM-RANDOM(0, 1) < p
2    then z = 1;
3    else z = 0;
4  return z
```

```
INITIAL-PROBABILITY-VECTOR()
1  p = {p_1, p_2, ..., p_d}
2  for k ← 1 to d
3      do
4          p_k ← 0.5;
5  return p
```

```
RANDOM-INDIVIDUAL(p)
1  x = {x_1, x_2, ..., x_d}
2  for k ← 1 to d
3      do
4          x_k ← BINARY-RANDOM(p_k);
5  return x
```