

Evolutionary Computation

The first paragraph on EC in the textbook is rather confused.

“Evolutionary computation (EC) has as its objective to mimic processes from natural evolution, where the main concept is survival of the fittest: **the weak must die**. In natural evolution, **survival is achieved through reproduction**. Offspring, **reproduced from two parents (sometimes more than two)**, contain genetic material of both (or all) parents – hopefully the best characteristics of each parent. Those individuals that inherit bad characteristics are weak and **lose the battle to survive**. **This is nicely illustrated in some bird species where one hatchling manages to get more food, gets stronger, and at the end kicks out all its siblings from the nest to die.**” – p8

- ◆ First, there is an **odd conflation of survival and reproduction**.
 - An individual may survive for a very long time and not reproduce or it may survive for a very short time but still reproduce many times. So, for an individual, survival and reproduction are very different things.
 - From the standpoint of evolution, reproduction (not survival) is really what matters. If an individual reproduces many times, its genes will become widespread – this is success from an evolutionary perspective. If an individual never reproduces, its genes are much less likely to become widespread – if one's genes do not become widespread, this is failure from an evolutionary perspective.
 - However, note that an individual could help its genes to become widespread in other ways, such as helping a closely-related individual to reproduce. This is still success, from an evolutionary perspective.
 - Note the focus is on the genes, not the individuals!
- ◆ Second, **reproduction (in nature and in EC) does not require two parents**.
 - Clonal (or asexual) reproduction is possible in either.