

A8: Evolutionary Computation

This module introduces, first, the different models of symbolic and sub-symbolic intelligent systems, respectively: knowledge-based systems and artificial neural networks. Their characteristics, their constituent elements, advantages and disadvantages of each model and its application domain, are indicated for each of them. Special emphasis is placed on existing synergies with evolutionary computation to resolve the major difficulties that may be encountered in building such systems: knowledge extraction, selection of the best neural architecture and the process of training the system.

Subsequently, we will study evolutionary computation, mainly genetic algorithms and genetic programming, which provide mechanisms for automatic construction of intelligent self-adaptive systems or robust systems, both symbolic and sub-symbolic.

Finally, we will analyse the current trends in evolutionary computation and the most recent research results. The student will be provided with a promising line of research to follow in order to obtain the PhD degree.