

Evolutionary Computation

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Overview

- ◉ Definition
- ◉ History
- ◉ Techniques
- ◉ Summary

Definition

- ◉ Subfield of artificial intelligence
- ◉ Uses iterative progress
- ◉ Processes are often inspired by biological mechanisms of evolution

History

- ◉ Idea of automated problem solving originated in the fifties
- ◉ In the sixties three distinct interpretations of the idea developed:
 - > Evolutionary Programming
 - > Genetic Algorithm
 - > Evolution Strategies

History Continued

- Early nineties they were unified as different representations of one technology-Evolutionary Computing

Techniques

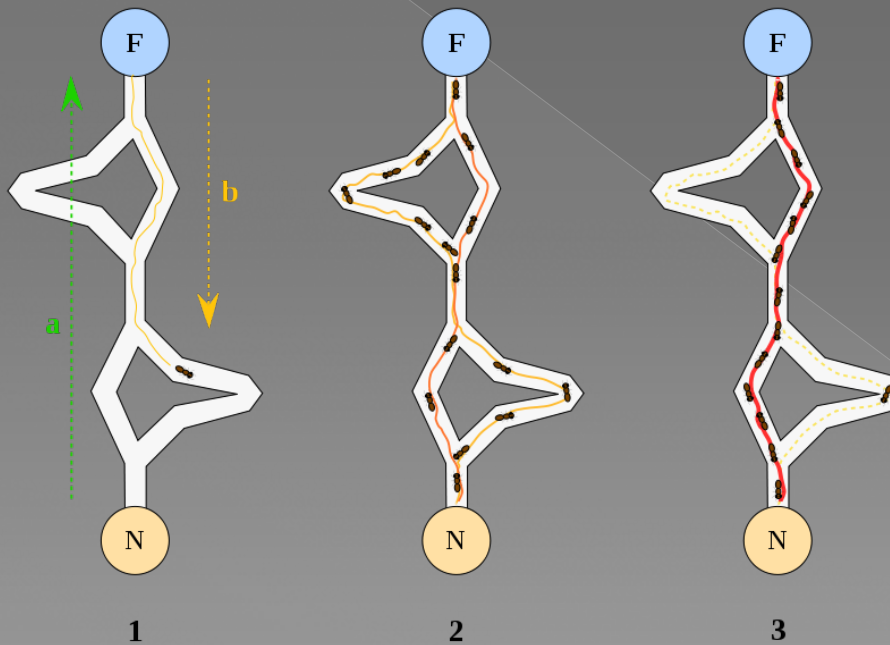
- ◉ Evolutionary Algorithms
- ◉ Swarm Intelligence
- ◉ Self-Organization
- ◉ Cultural Algorithms

Evolutionary Algorithms

- ◉ Genetic Algorithms
- ◉ Evolutionary Programming
- ◉ Evolution Strategy
- ◉ Genetic Programming

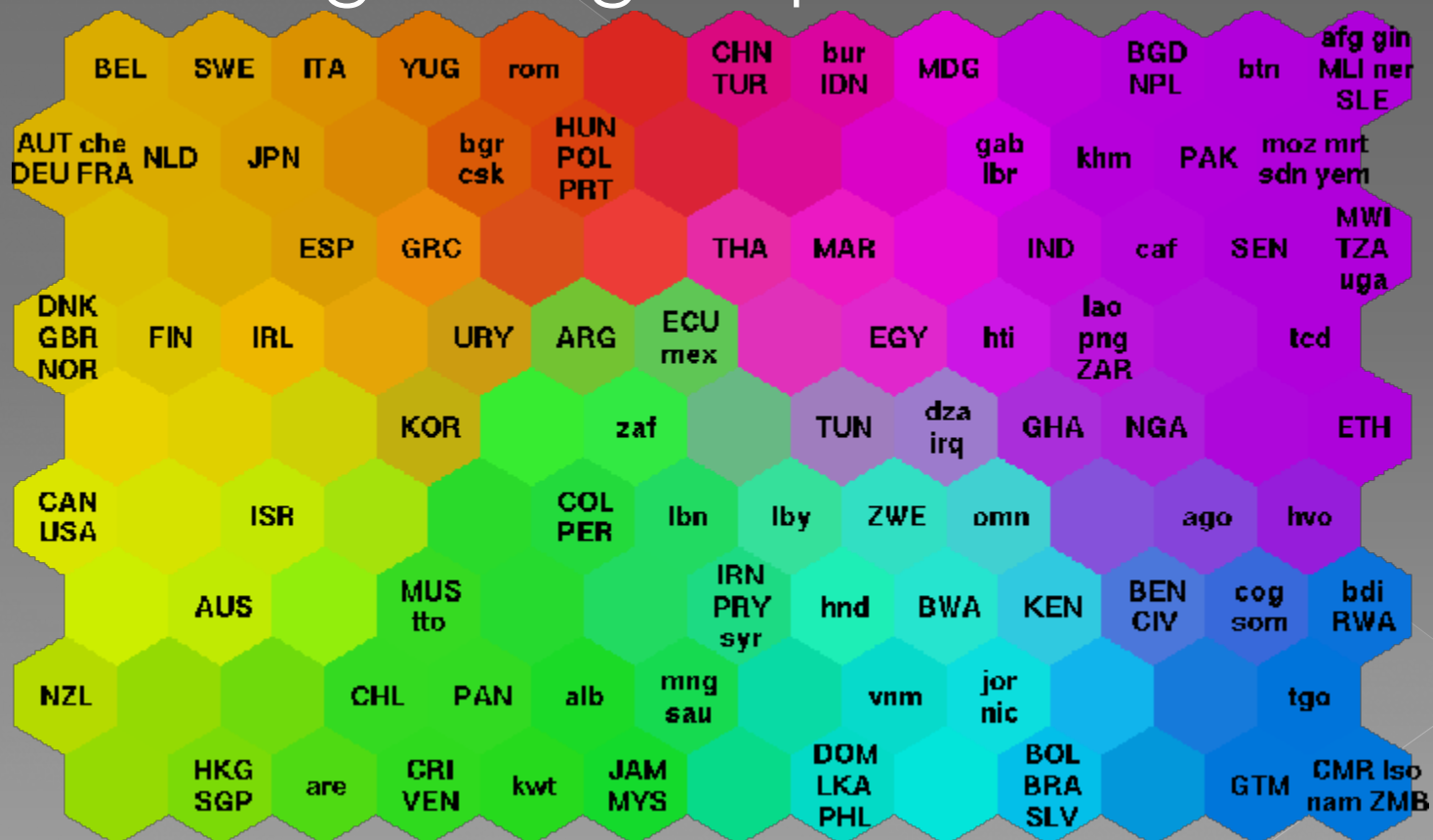
Swarm Intelligence

- Ant colony optimization

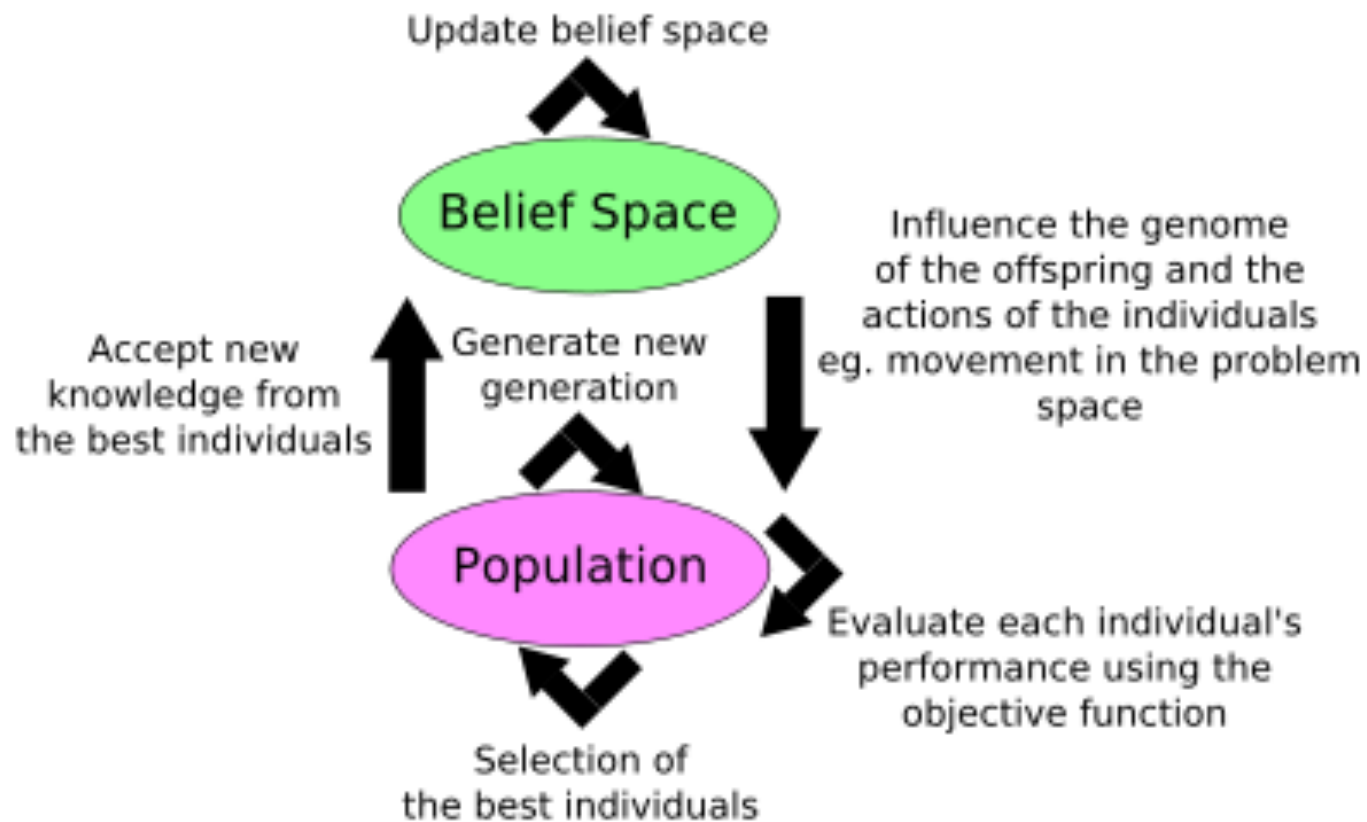


Self-Organizing

- Self-organizing maps



Cultural Algorithms



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Questions?



Resources

- Eiben, A., & Smith, J. (2003). *Introduction to Evolutionary Computing*. New York: Springer-Verlag Berlin Heidelberg.
- *Evolutionary computation*. (2010, September 27). Retrieved October 10, 2010, from Wikipedia: http://en.wikipedia.org/wiki/Evolutionary_computation