

List of Course per Semester

Goal : Learning the basis of computer programming

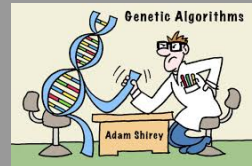
- 1 Basic Algorithms and Programming.
- 2 Data Managment and Web Design.
- 3 Introduction to Simulation of Dynamics Process.
- 4 Introduction to Image Processing.

Basic Algorithms and Programming

- Concepts and methods to write programs.
- Algorithm structures : boolean tests, loops, function calls ...
- Projects : to apply the theory and to practice in context of “real” cases.

Algorithm of Success

```
while(noSuccess)
{
    tryAgain();
    if(Dead)
        break;
}
```



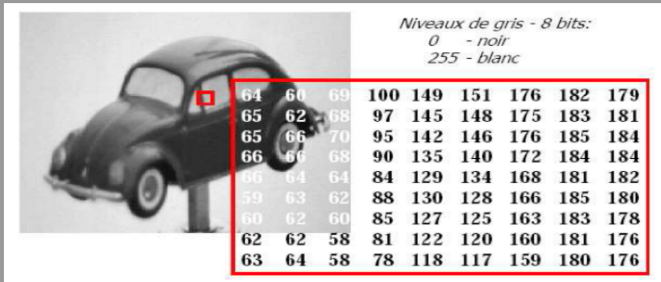
Basic Algorithms and Programming

- Invert one image.



Basic Algorithms and Programming

- In grey level - the values of pixel are :
 - 0 for black
 - 255 for white



Basic Algorithms and Programming

The algorithm is

```
InvertImage(myImage) :  
    newImage = []  
    i = 0  
    for pixel in myImage :  
        newpixel = 255 - pixel  
        newImage[i] = newpixel  
        i += 1  
    return newImage
```

Data Management and Web Design

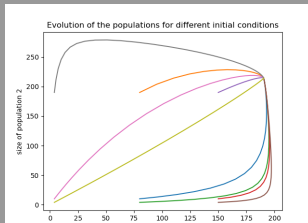
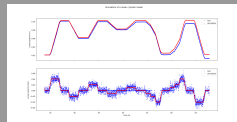
- Collection of data has to be store with formalism.
- Data structures for databases and languages to use them.
- XML format and tools will be also studied.
- Web Interface and applications.



Introduction to Simulation of Dynamics Process.

Simulate some continuous and discrete dynamic processes.

- We learn to handle samples from real experiments
- We learn to simulate dynamic processes
- We learn to identify some simple models
- We use scientific libraries in python (numpy, scipy)



Introduction to Image Processing

- Images are tables of pixels/numbers.
- Image processing is everywhere : robot vision, satellite images, medical or biological images.
- Goal : extract automatically most important information from images as shapes, region of interest....

