



South Bohemian
Research Center
of Aquaculture
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of Hydrocenoses

Name of software (Czech): Expertomica Entropy calculator

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Description

The software was originally developed for microscopy phase-contrast images enhancement but it is usable for any kind of images where the background and objects are included. The image enhancement algorithm is based on the Renyi entropy. The intensity of each pixel is coded by the information contribution of the pixel to the information of whole image. Different kind of information can be highlighted in the image depending of the setting of the only one parameter of the program. Typically the edges of objects are highlighted and the background is suppressed in output image. No information is lost using this algorithm as usual in common image enhancement methods.

Input Data

The software processes the image or series of images in defined input directory.

Output: Enhanced images in defined directory.

Installation

You can download the last version of the software from [here](#).

Download and run ExpertomicaEntropyCalculator.exe and follow the instructions. The software will be installed into selected directory.

The installation contains:

ExpertomicaEntropyCalculator.exe - the software

dotNetFx35setup.exe - .Net Framework 3.5

vcredist_x86.exe - Visual C++ 2005 Redistributable Package

Help-ExpertomicaEntropyCalculator.pdf - help

VideoGuide.avi - video presentation of the functionality

Testing data - folder with testing data

Requirements

Operation system: Windows XP, Vista (32 bit) and 7(32 bit)

Software:

- .Net Framework 3.5 or higher (included in installation)
- Visual C++ 2005 Redistributable Package (included in installation)

Hardware

The software can use CPU or GPU (parallel calculation on graphic card) for calculation of image enhancement. Calculation on CPU is 50 - 150 slower than on GPU depending on the resolution. If there is no graphic card supporting CUDA the calculation will be done on CPU (the user is informed about this after the software run)

If there is the graphic card supporting CUDA (NVIDIA graphics cards) the calculation is done on GPU

CUDA drivers have to be installed - for more information on CUDA [click here](#)
Issue - in Windows the calculation on GPU can not be longer than 4 seconds. After that Windows kill the process and show error message. To avoid this problem (only for the processing of images with high resolution - more than 2000 X 2000) modify Windows registry: start 'regedit' from command-line go
to:HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\GraphicsDrivers
rightclick 'new' .. value .. enter name: "TdrLevel" ..doubleclick.. enter value: "TdrLevelOff"

Testing

There are several images for testing purposes in install folder in testing data. You can test the software on these datasets to see the enhancement of different kind of image data.

Cell cycle - example of HeLa cell cycle - highlighting of edge between cells

Gels - example of 2D electrophoresis - contrast enhancement

HeLa - example of HeLa cells - edges and inter objects highlighting