Review. Future

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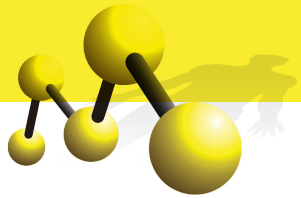
Programming for Scientists

October 22, 2012

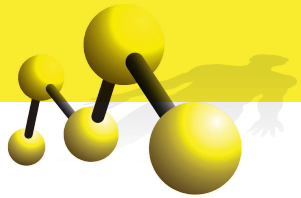
Case Study



Computer vision

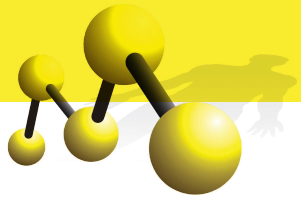
Analysis of fluorescent microgrpah

Libraries



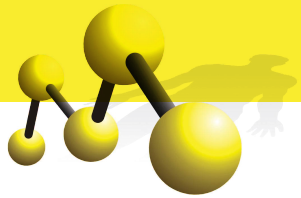
- Third-party libraries are hit & miss
- mahotas is good
- scikit-image is good
- imread is good

Task



Given an image which has a dna (Hoechst) and a protein (GFP tag) channel, can we determine "what fraction of protein is in nuclear region?"

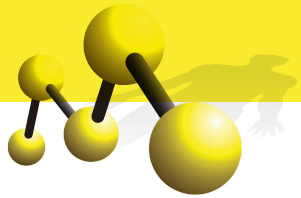
Loading images



```
from mahotas import imread
dna = imread('00-001-dna.tiff')
protein = imread('00-001-protein.tiff')
```

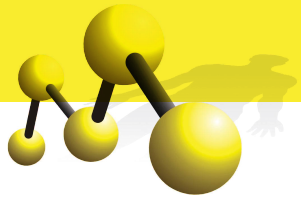
We now have arrays of small integers.

Visualising



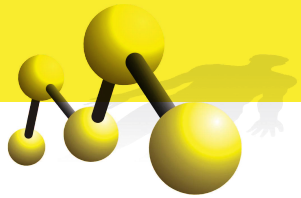
- Remember, all that we have are small numbers.
- We can show them in different ways for better visualization.

Thresholding



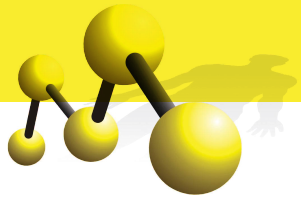
1. Gaussian filtering
2. Otsu thresholding

Protein Measurement



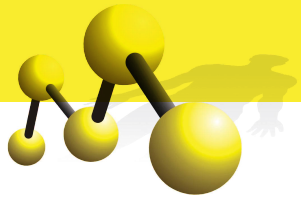
1. Subtract background
2. Sum up protein fluorescence inside valid region
3. Sum up protein fluorescence outside valid region

Links for Learning More



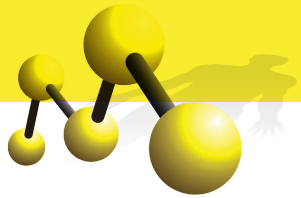
- How to Think Like a Computer Scientist http://interactivepython.org/courselib/static/thinkcspy/index.html
- Stack Overflow
  for asking questions
- Python.org & numpy.scipy.org
  for documentation

Shameless Plug



- I am giving an introductory/research talk on Bioimage Informatics
- October 31st 10am (room 057)

Any Other Questions...



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