

Le mini-projet compte pour 50% de la note

- **1 projet par personne**
- **Codez en Java (processing.org, real-time video)**
- **Esprit critique, travaillez des nouvelles extensions...
... plutôt qu'une finition**
- **Bien choisir ses jeux de données (mieux les créer)**
- **Présentation de 15 minutes**
- **2 pages de descriptif, et diapositives de soutenance**

P1

Homography from ellipses

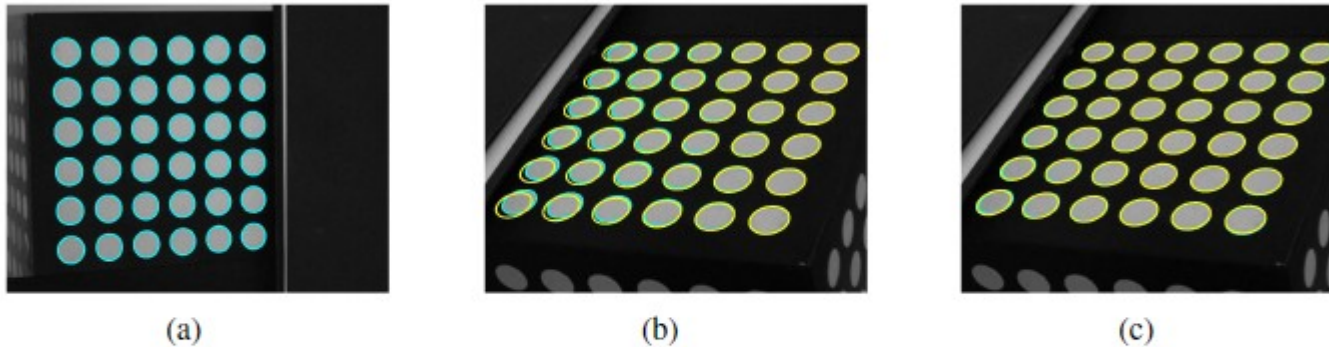


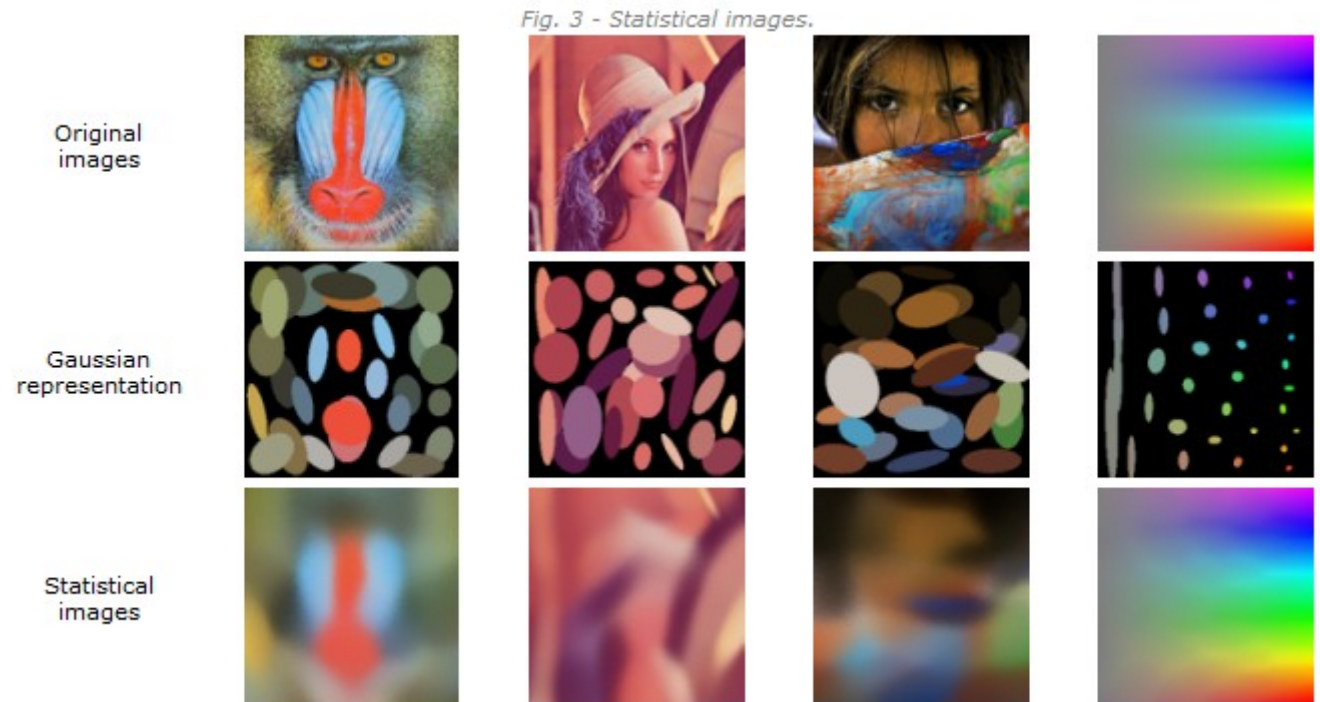
Figure 4: (a) Image of a plane containing white circles. The detected ellipses are in cyan. (b) Another view. The homography was estimated using the two ellipses in the right upper and lower corners. The ellipses transformed from the first view are in yellow. (c) The homography estimated using all the ellipses.

- Implement BMVC 2006
- Harris-Stephens feature detector (ellipses) and image stitching

P2

Statistical Generative Videos

- Learn a Gaussian mixture model from real-time image segmentation (SRM), then synthesize the video



<http://webcamxtra.sourceforge.net/> (using processing.org)

<http://www.lix.polytechnique.fr/~nielsen/MEF/>

<http://www.lix.polytechnique.fr/~nielsen/Srmjava.java>

P3 Structure tensor/edge detection

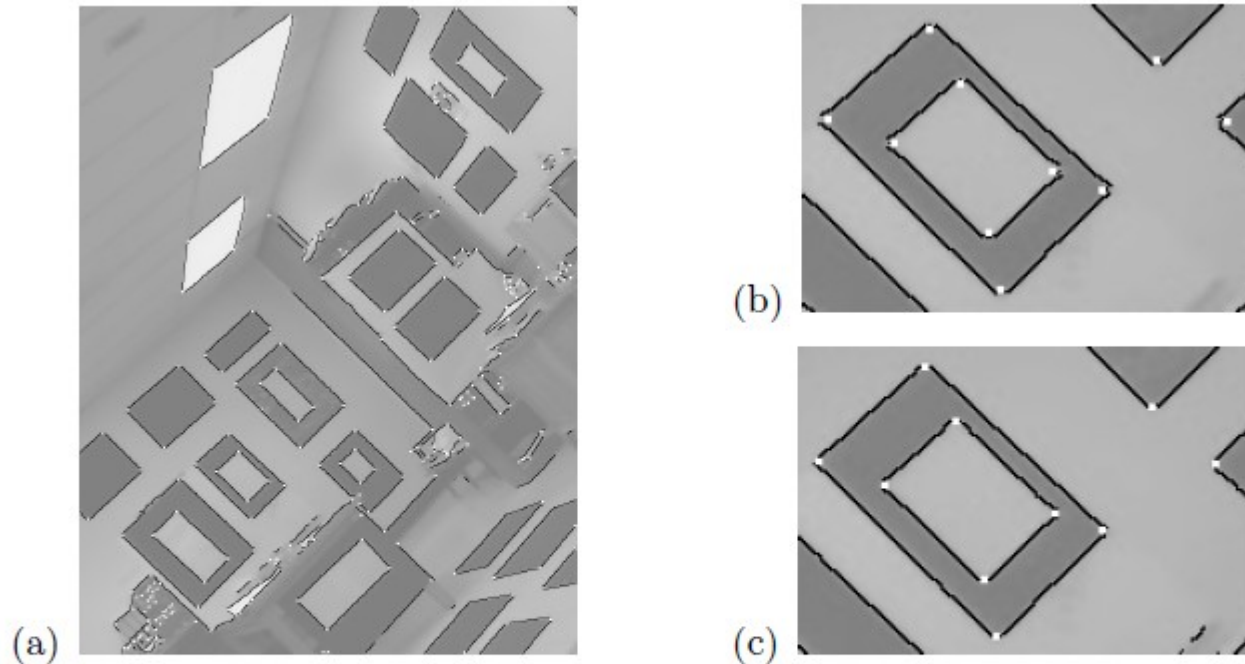


Fig. 5. (a) integrated edge and junction detection in a lab scene; (b) detail of (a) computed with linear tensor averaging; (c) the same region as (b) obtained with nonlinear averaging. Note the corner displacements in (b).

Edge and Junction Detection with an Improved Structure Tensor

U. Köthe:

Edge and Junction Detection with an Improved Structure Tensor,

in: B. Michaelis, G. Krell (Eds.): Pattern Recognition, Proc. of 25th DAGM Symposium, 2003, Lecture Notes in Computer Science 2781, pp. 25-32, Berlin: Springer, 2003.

<http://hci.iwr.uni-heidelberg.de/Staff/ukoethe/papers/structureTensor.pdf>

P4

Structure tensor & tracking



Figure 2. Object tracking using structure tensor as local descriptor. The tracker is manually initialized by drawing a bounding box over the object-of-interest in the first frame.

P5

Structure tensor & coloring

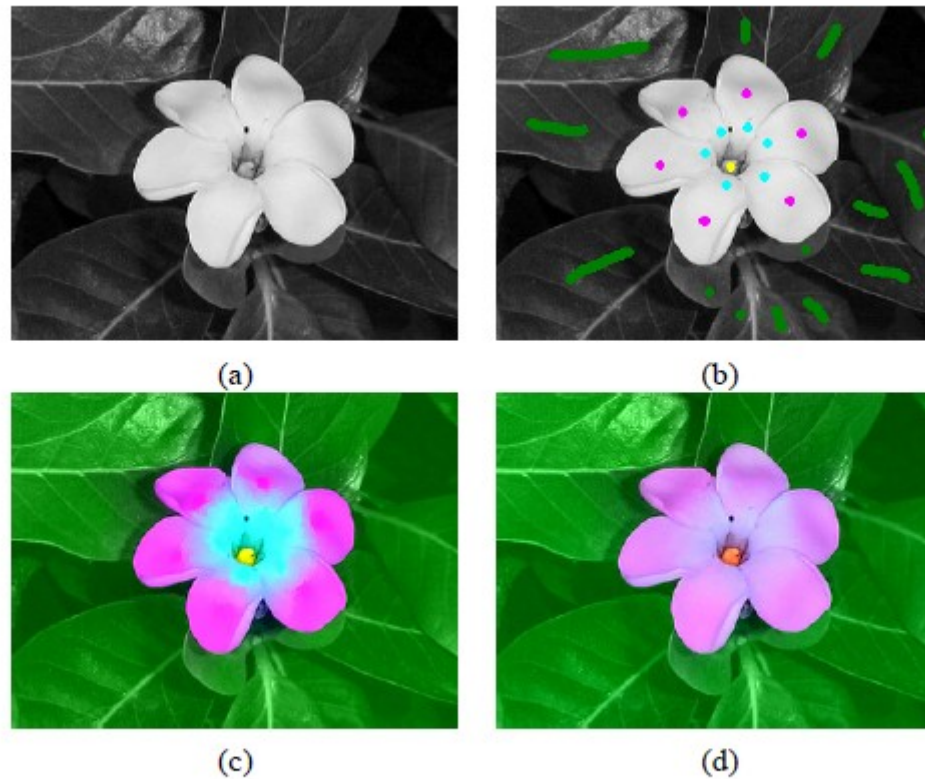
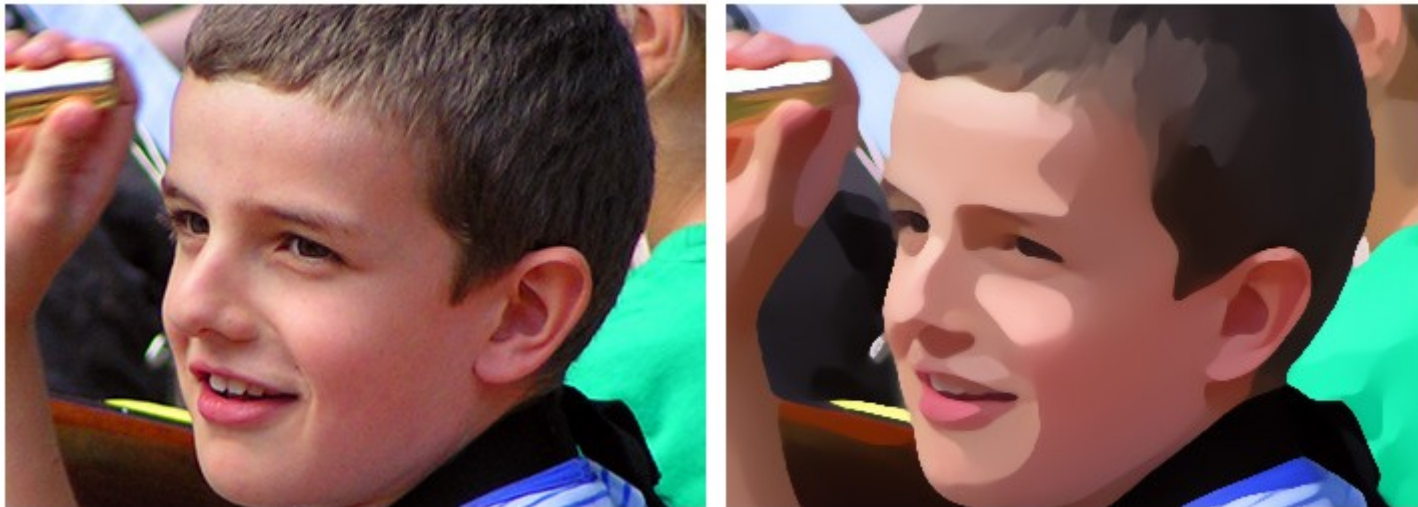


Fig. 1. (a): Input grey image; (b): Hints; (c): Colorized by method in [1]; (d): Colorized by proposed method.

P6

NPAR: Non-photorealistic rendering



<http://www.kyprianidis.com/p/npar2011/>

Image and Video Abstraction by Multi-scale Anisotropic Kuwahara Filtering

P7

Skin detection



Fig. 4. Skin color regions segmented using non-adaptive GMM (left), proposed method (middle), and the original image (right).

Real-time!

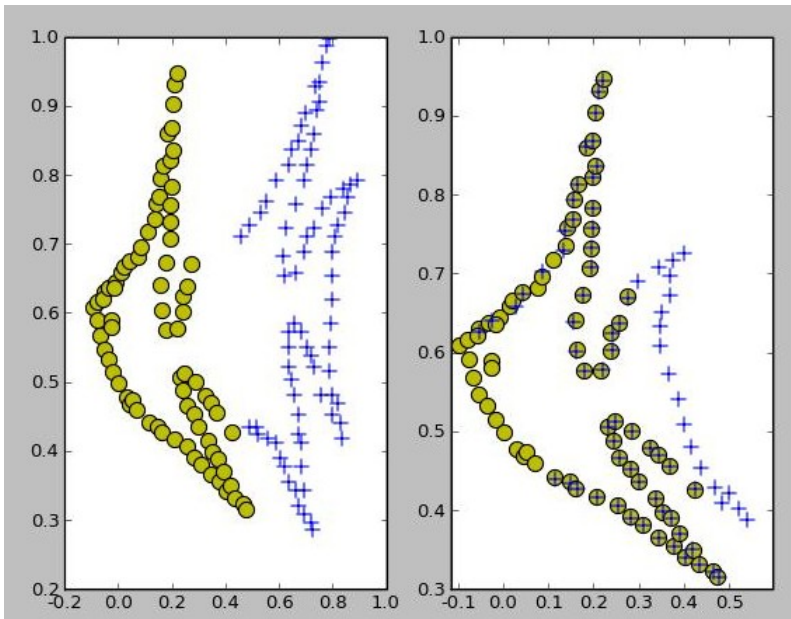
P8

Matching large zoom images (x16)

- Model each image by a GMM, then match the GMMs...



35x
Optical Zoom

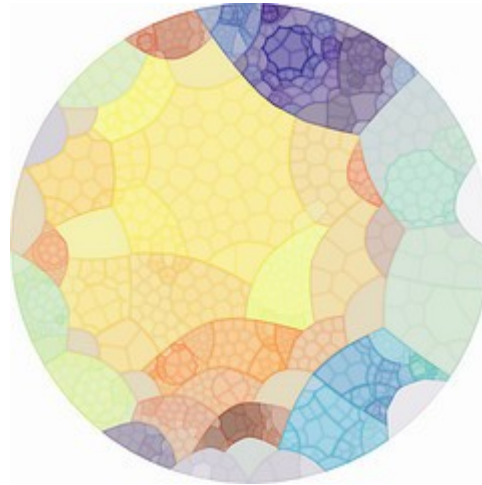
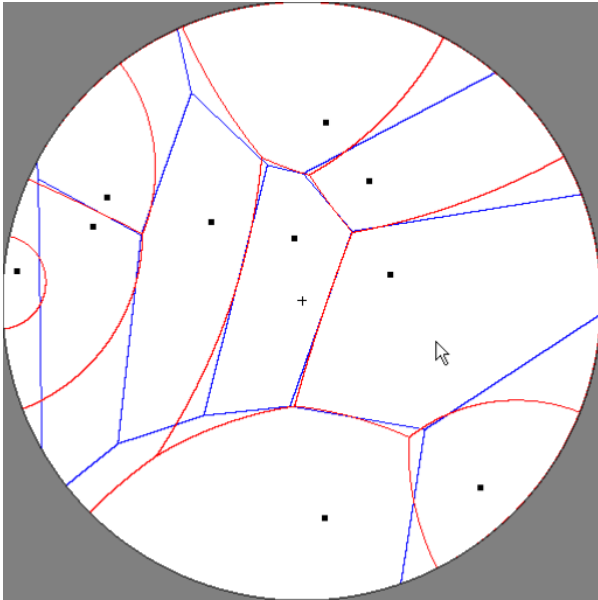


Match a cell-phone image in a panorama image (eg., Streetview image)

P9

2D/3D Hyperbolic Voronoi treemaps

→ Generalize treemaps to hyperbolic geometry



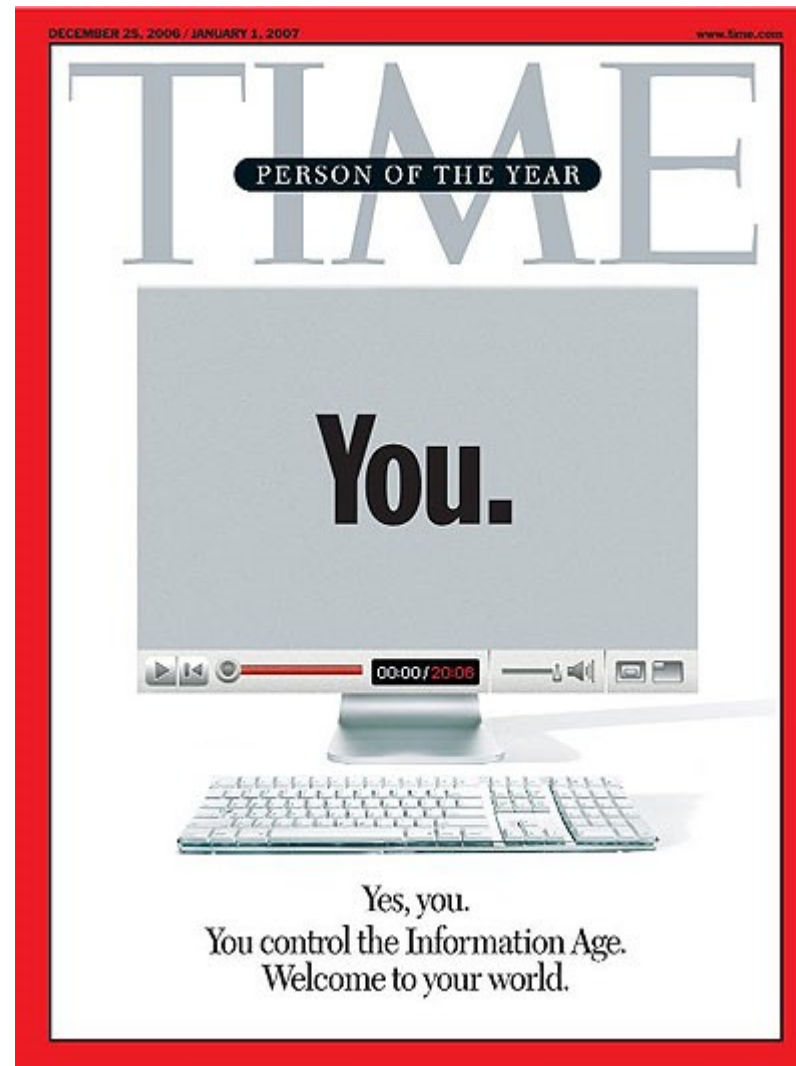
Animated, Dynamic Voronoi Treemaps, 2010

+ Dynamic viewing (using Moebius transformations)

[0903.3287] Hyperbolic Voronoi diagrams made easy

Make your own project!

P0



Définissons ensemble votre projet !