

# Traitement d'Images Numériques – TD4

## *Projection et Recalage*

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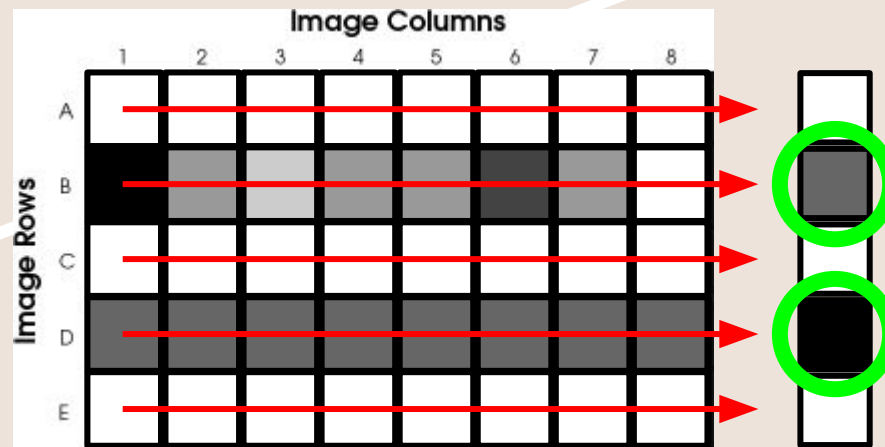
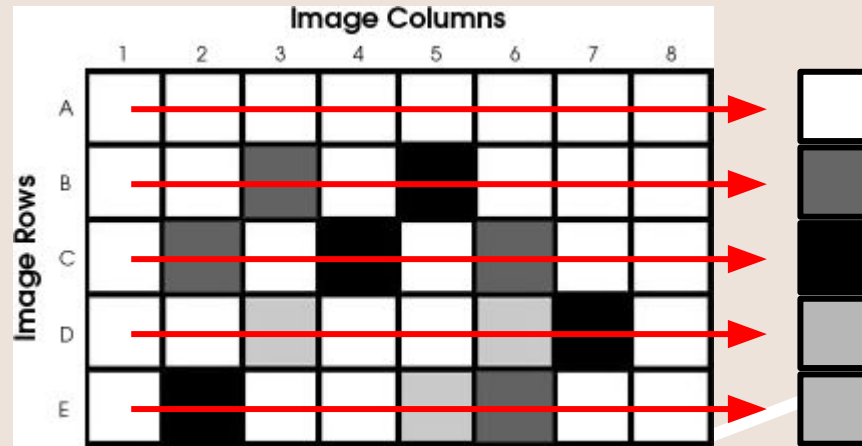
UNIVERSITÉ  
**PARIS**  
**DESCARTES**

Code pour le TP2

Code pour TP

[https://github.com/danyfel80/descartes-image-L](https://github.com/danyfel80/descartes-image-L3)  
[3](#)

# Projection



# Exercice 1 – Calculer la projection vertical et horizontale

Complétez le plugin ProjectImage dans le projet *projection* pour réaliser des projections sur des images en niveaux de gris.

Vous pouvez tester avec l'image *text1.jpg* et *text2.jpg* dans le répertoire *testImages*.

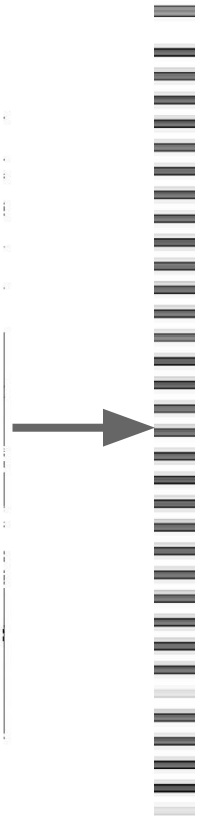
- Pourquoi cette méthode ne marche pas bien pour les images avec des rotations ?
- Existe-t-il une façon de résoudre cette limitation ?

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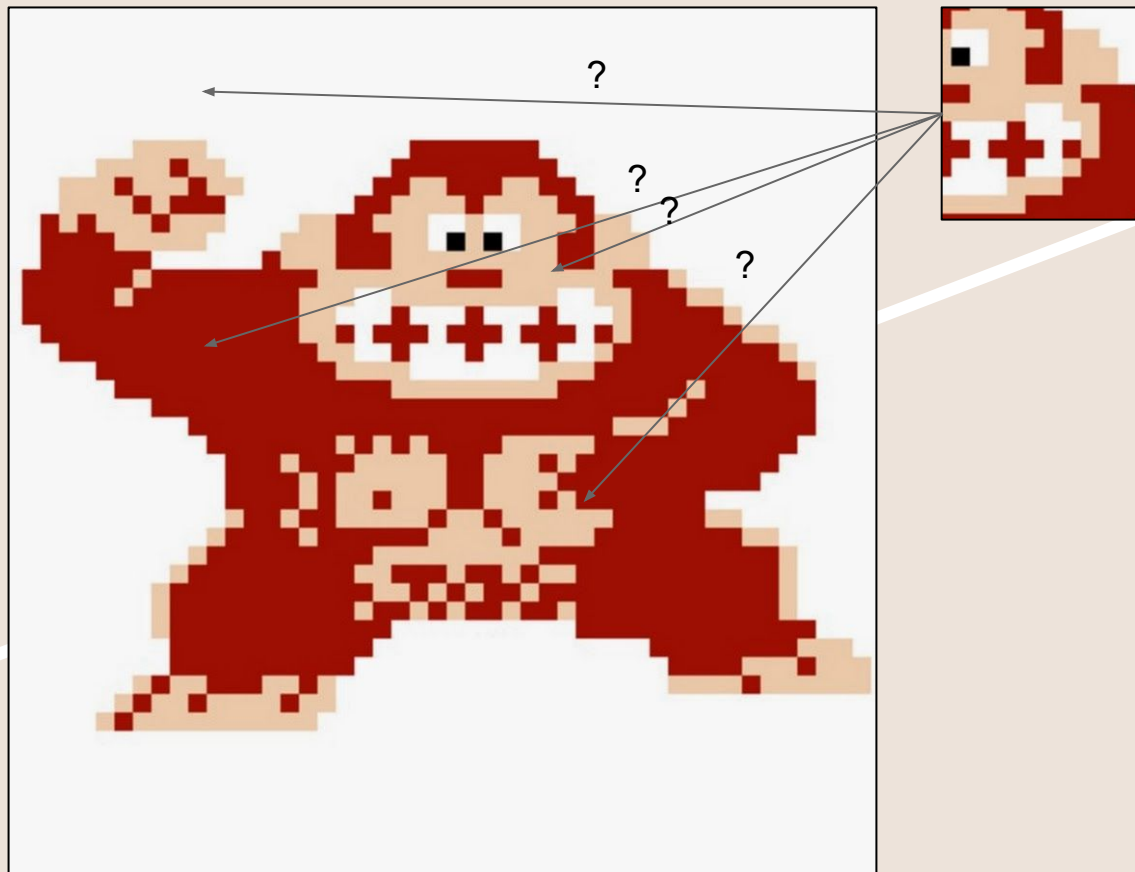
restrained enthusiasm catch from one bystander to another. They swing and bow to right and left, in slow time to the piercing treble of the Congo women. Some are responsive! others are competitive. Hear that bare foot slap the ground! one sudden stroke only, as it were the foot of a stag. The musicians warm up at the sound. A smiting of breasts with open hands begins very softly and becomes vigorous. The women's voices rise to a tremulous intensity. Among the chorus of Franc-Congo singing-girls is one of extra good voice, who thrusts in, now and again, an improvisation. This girl here, so tall and straight, is a Yaloff. You see it in her almost Hindu features, and hear it in the plaintive melody of her voice. Now the chorus is more piercing than ever. The women clap their hands in time, or standing with arms akimbo receive with faint courtesies and head-liftings the low bows of the men, who deliver them swinging this way and that.

See! Yonder brisk and sinewy fellow has taken one short, nervy step into the ring, chanting with rising energy. Now he takes another, and stands and sings and looks here and there, rising upon his broad toes and sinking and rising again, with what wonderful lightness! How tall and lithe he is. Notice his brawn shining through his rags. He too is a *candio*, and by the three long rays of tattooing on each side of his face, a Kiamba. The music has got into his feet. He moves off to the farther edge of the circle, still singing, takes the prompt hand of an unsmiling Congo girl, leads her into the ring, and, leaving the chant to the throng, stands her before him for the dance.

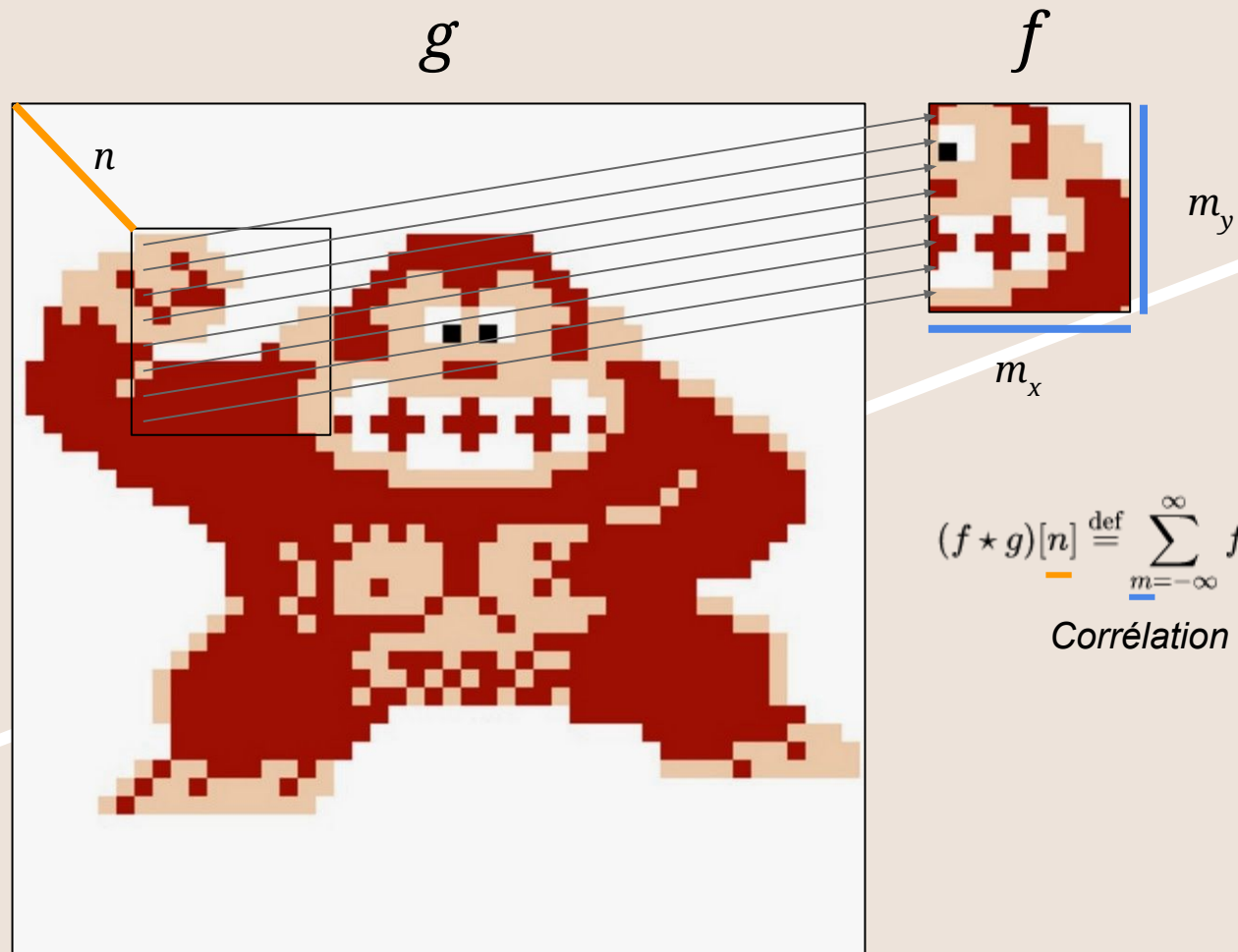
Will they dance to that measure? Wait! A sudden frenzy seizes the musicians. The measure quickens, the swaying, attitudinizing crowd starts into extra activity, the female voices grow sharp and staccato, and suddenly the dance is the furious Bamboula.



# Recalage



# Recalage



$$(f \star g)[n] \stackrel{\text{def}}{=} \sum_{m=-\infty}^{\infty} \underbrace{f^*}_{\text{blue}}[\underbrace{m}_{\text{blue}}] \underbrace{g}_{\text{blue}}[\underbrace{m+n}_{\text{orange}}].$$

Corrélation croisée

# Exercice 2 – Corrélation croisée

Complétez le plugin CrossCorrelation dans le projet *projection* pour calculer la corrélation entre deux image en niveaux de gris.

Vous pouvez tester avec l'image *veggies.jpg* et *someVeggies.jpg* dans le répertoire *testImages*.

- Comment peut-on trouver la position de recalage?
- Est-ce que l'image résultat prend en compte toutes les possibilités de recalage?

