Titre: Moving Gradients for Image Interpolation

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Durée: 2 à 3 mois

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Figure 1. Result of the Moving Gradient algorithm [1].

The goal of this internship is to implement and extend the *Moving Gradient* algorithm [1] for image interpolation. Given two images A and B, image interpolation [1,2] computes an intermediate image C as a mixture between A and B. Figure 1 illustrates the use of image interpolation to generate intermediate frames of a movie, resulting in a slow-motion effect. Image interpolation can also be used to generate novel views of a scene from a few photographs, as illustrated in Figure 2.

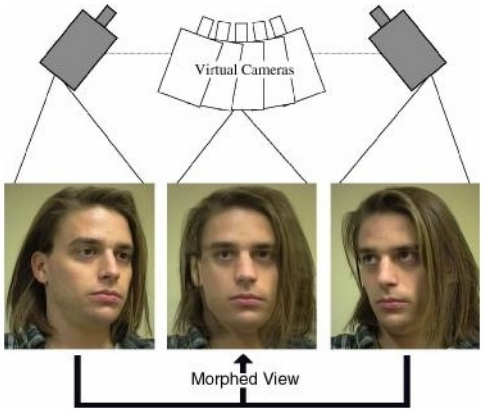

Figure 2. Result of the View Morphing algorithm [2].

The Moving Gradient algorithm interpolates pixels between two images along their motion path. However, while existing methods perform a simple linear interpolation of the pixel values, the Moving Gradient algorithm finds the optimal transition between the colors of each pixel in order to minimize unwanted artifacts such as blurring, ghosting or flickering.

The first step of this internship will be to implement the Moving Gradient algorithm as described in [1]. A second step will be to explore the extension of Moving Gradient to other application domain. We see several potential extensions. A first extension would be to compute interpolations between more than two images. A second extension would be to apply the algorithm to the interpolation of shadows in images under different lighting conditions.

References

[1] Mahajan. Moving Gradients: A Path-Based Method for Plausible Image Interpolation. SIGGRAPH 2009. http://people.csail.mit.edu/wojciech/MovingGradients/index.html

[2] Seitz and Dyer. View Morphing. SIGGRAPH 1996. http://www.cs.washington.edu/homes/seitz/vmorph/vmorph.htm