DEMONSTRATION ABSTRACT: MOTION-CONSISTENT VIDEO INPAINTING

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ABSTRACT

This demonstration aims to show some resulting videos for our method presented in [1]. It is a fast and automatic inpainting technique for high-definition videos which works under many challenging conditions such as a moving camera, a dynamic background or a long-lasting occlusion. By incorporating optical flow in a global patch-based algorithm, our method provide improvements compared to the state-of-the-art, especially in motion preservation. The aim of the demonstration is to provide the audience with inpainted high resolution videos, in which some objects are removed with hardly any remaining trace of their former presence. As such, it provides an interesting complement to the conference paper.

1. INTRODUCTION

Video inpainting refers to the task of replacing corrupted parts in a video using the rest of that video to produce a "plausible" result. It is a very challenging task due to the difficulty of dealing with complex motions, the high sensitivity of our visual system to temporal inconsistencies, and the computational complexity. Given a video sequence and a hole to fill in, our method works by minimizing a global patch-based function embedded in a coarse-to-fine multilevel pyramid scheme. To obtain a good local optimum, a video stabilization preprocessing step and a well-design initialization solution are adopted. All the steps of the algorithm are designed in a GPU-friendly way to minimize the computational cost.

2. DEMONSTRATION DETAILS

Considering that, in video inpainting, there is no quantitative metric to measure the performance of the algorithm, the resulting video can mostly be evaluated based on human visual perception. Therefore, a demonstration would be a welcome complement to the conference paper. In this demonstration, a number of real, high resolution sequences taken by a handheld camera are shown. Our sequences face many challenging conditions. For example, the camera may be moving, the background can be dynamic, the foreground objects can have complex motions, and the region to be inpainted can be moving and possibly very large and long-lasting.

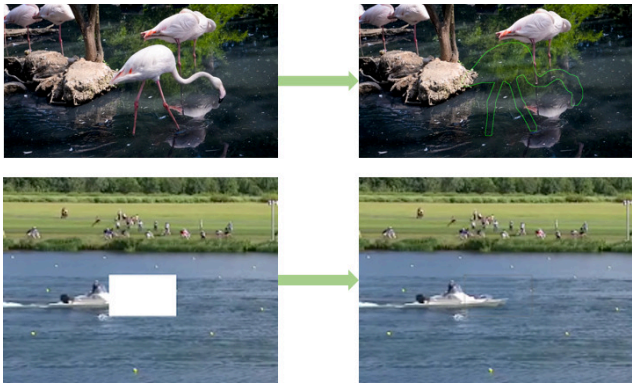

Fig. 1. Some sample frames of our videos in the demonstration. Top: objects removal, bottom: moving objects reconstruction

According to the purpose of video inpainting, our demonstration is divided into two parts.

In the first part, we will show videos in the context of objects removal. In this context, the undesired foreground objects are removed and the background is reconstructed with none or very little artifacts.

In the second part, some videos in the context of moving objects reconstruction are shown. The examples include some videos in which a moving object crosses a fixed or a moving occlusion. Such object can be partly or even completely occluded. This is challenging because the algorithm must reconstruct both background and foreground simultaneously.

3. REFERENCES

[1] Thuc Trinh Le, Andrés Almansa, Yann Gousseau, and Simon Masnou, "Motion-consistent video inpainting," in *IEEE International Conference on Image Processing (ICIP) (to appear)*, 2017.

This work was supported by the French Research Agency under Grant ANR-14-CE27-001 (MIRIAM)