

D5.3 Image inpainting methods and multi-view image processing

Public Executive Summary

We propose an image inpainting method adapted to artefact correction in the context of view synthesis. The algorithm proposed here addresses the case of static images. The case of video inpainting will be considered within this year and will be reported in a subsequent deliverable.. Image inpainting, also known as image completion or disocclusion, aims to obtain a visually plausible interpolation of an image in a region of its domain in which data is missing, due damage or occlusion. To this aim, the only data available is the image outside the inpainting region. This problem is relevant due to its applications to image and video editing and restoration. Inpainting methods found in the literature can be classified into two groups: **geometry-** and **texture-oriented** methods.

In all techniques, the inpainting region or mask is known in advance. In order to develop image inpainting techniques in the context of view synthesis we need to determine automatically the inpainting mask. For that we observe that artefacts in view synthesis usually happen around object's occlusion boundaries which may be identified in terms of discontinuities of the estimated depth. Thus, we first compute the depth associated to the virtual image and define the inpainting mask as the region around its discontinuities.

Then we develop some inpainting algorithms adapted to this situation. The most effective one is based on texture-synthesis techniques as proposed in (Efros et al., 1999) and (Criminisi et al., 2003) accelerated using fast searches in a database of patches organized as a tree structure.

We present a preliminary version of these techniques and further exploration is needed to improve them. We have used a set of simple images in order to validate our methods. This set of images represents a static scene with three persons that has been generated in order to start the experimentation and we dispose of the calibration parameters for the set of cameras. This enabled us to propose a methodology and have initial sets, preliminary at the moment. Our immediate purpose is to start experimentation with the set of images captured at the Berlin testbed. In this data set, there is an importance change of contrast that will imply the development of depth computation methods adapted to that case.

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