

Database-assisted Interactive Mobile Image Completion

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It is often desirable to remove unwanted objects in an image. For example, when a photographer takes a picture of a popular tourist destination, he or she will often want to remove the unwanted tourists from the photo to obtain a cleaner image. Currently, such a capability does not exist on a mobile platform. Often times the pictures are left untreated until they are loaded to a computer software program such as Adobe Photoshop; as a result, the unwanted objects in the image is often left untreated, due to the painstaking procedure to perform such removal.

We propose to design and implement an image completion algorithm on the Motorola Droid mobile phone to provide a real-world application. We hope to investigate the effect of using information from both current image and other images. The information from the other images will be saved in a small database on the phone. Intuitively, if the region of removal is small, then it may suffice to use information from the existing image. However, if the region of removal becomes large, it may be necessary to examine other images. In order to examine other images, ideally, the algorithm first searches for a matching image in a database of images. Image registration is then performed on the database image to align it with the original image. The removed region in the original image is then replaced by the corresponding region in the matched image.

Some of the previous work include "Image Completion with Structure Propagation" and "Fragment-Based Image Completion." However, these paper does not utilize information from other images, which is a potential problem for images with nonuniform background and larger removal area. Moreover, these papers do not address the interactivity with the user. The user has to wait until the image is uploaded to a computer rather than being able to perform the task on the mobile platform. "Scene Completion using Millions of Photographs" searches over a large number of images but are limited to scenery pictures and completes images with arbitrary scenes, rather than identical ones.

Since our system will be a first iteration, the locations that users can take pictures from will be very limited and the database will be small and stored on the phone. Moreover, we will not focus on fast computation time as a requirement for the system. Our system will be a proof of concept implementation of image completion using a database of images on a mobile phone. This system could potentially open up a new area of database-assisted computational photography on mobile devices.

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