REPORT ASSIGNEMNT 1

PETER LORENZ

1. Introduction

In the today's excercise lecture, the lecturer said that, the report is not important, so I keep it short.

In this report, I describe my approach to stitch image together as a panorama. Firstly, I explain my implementation of the backward mapping to compute the warped image. And secondly, I show up my version of stitching the images together.

2. Backward Mapping

It has already been provided the Homography matrix, [3x3] matrix. In order to calculate the Backward Mapping. I must iterate over all pixels of the destination image and calulate the corresponding points of the source image $p = H^{-1}p$.

$$\begin{bmatrix} \frac{x'}{\lambda} \\ \frac{y'}{\lambda} \\ \lambda \end{bmatrix} = \begin{bmatrix} h_{11} & h_{12} & h_{13} \\ h_{21} & h_{22} & h_{23} \\ h_{31} & h_{32} & h_{33} \end{bmatrix} \cdot \begin{bmatrix} x \\ y \\ 1 \end{bmatrix} \tag{2.1}$$

where H consists of

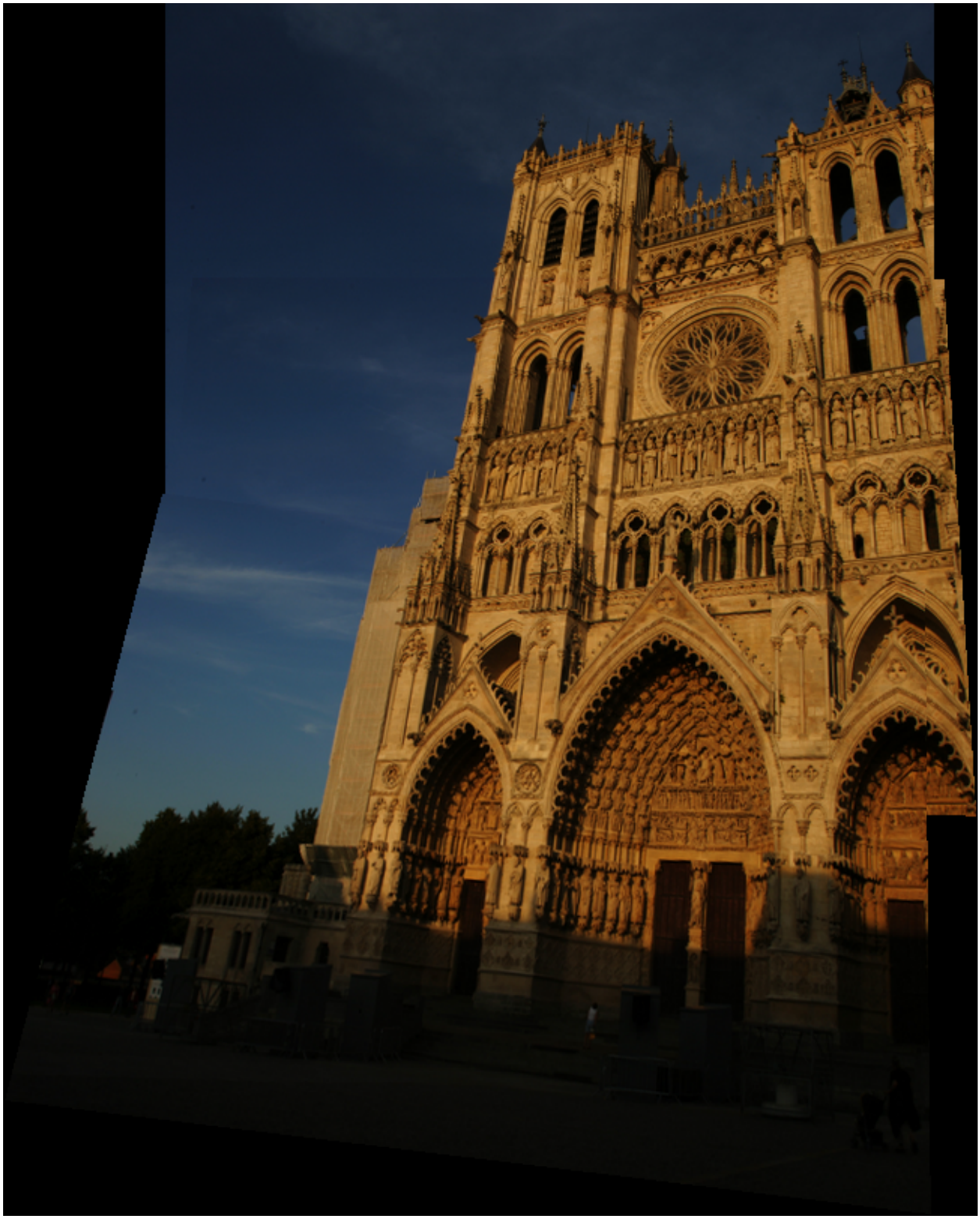
$$H = \begin{bmatrix} R & t \\ 0^T & 1 \end{bmatrix}$$

The equation 2.1 is implemented in the function backward_mapping. In the next step, there must be applied the scipy.ndimage.map_coordinates() function, which takes two parameters: input I^w and the new coordinates in the form [[x_1, ..., x_n][y_1, ..., y_n]]. It must be applied three times for each color. Because of the transformation the image could be rotation or in an other way distorted.

3. Stitch the image together to obtain the final Panorama

The procedure goes as follows: We are taking the top image and calculating the homography to the center image and then we take the result and stitch it together with the third picture.

4. Result



E-mail address: peter.lorenz@student.tugraz.at