Course: 02504 Computer Vision

Project Proposal: Image stitching with RANSAC

Group

Study number	Names
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Background

[Why is the project being undertaken? Describe an opportunity or problem that the project is to address. Remember, it does not have to be a novel solution.]

Image stitching has applications in many places, such as panoramic shooting in smartphone, high-precision map synthesis for aerial photography of drones, and medical image stitching. Image stitching with RANSAC has a wide range of applications in these areas. But in the process of implementing Image stitching, there will always be influenced by various factors, such as the presence of parallax, lens distortion, scene motion, and exposure differences. In order to better understand the principle and implementation of this method, and to provide a good foundation for advanced learning in future work learning, we will implement the Image stitching with RANSAC algorithm in this project.

Computer vision topic

[Which computer vision topic does this project introduce beyond the course curriculum? Where will you find information on this topic?]

The image stitching process includes three main components: image registration, calibration, and blending.

There are many online review papers, and articles that we will be using to find information on the topic. We will explore the current state of the algorithm used for image stitching, which is available as a research paper online that we will analyse. There is also open source code that is available.

Objectives

[Add specific & measurable objectives.]

- Stitching two pictures at first, then calibration it and reducing lens distortion.
- Try to stitching a sequences of picture in our algorithm.
- Comparing the result of stitching image with picture produced by PTGui. If the later one is much better, finding the reason of the difference and debug our algorithm.

Scope

[What will be the end result of the project? Describe here what phases of work will be undertaken.]

In the end, we can stitch a series of images to get a panoramic picture, and the stitching effect can be as good as PTGui.During the project, we will look for related papers and open source algorithms, and then we will rewrite the implementation. We will take multiple sets of photos of the teaching building and campus landscape at DTU, and then use them to stitch together. We will use the result to do controlled trials. By comparing with commercial software results, we debug out algorithm to robust it.

Timeframe

	Description of Work	Start and End Dates

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Phase One	Collect information about Image stitching with RANSAC to understand the principles of the algorithm and major issues in this area.	week 8
Phase Two	Rewrite the Image stitching with RANSAC algorithm to achieve the stitching of two and more consecutive photos.	week 9-11
Phase Three	Compare our algorithm with mature business software PTGui of image stitching. Find error and improve the robust of our algorithm.	week 12

Monitoring and Evaluation

[Describe how progress will be evaluated throughout and at the end of the project. Formulate clear indicators for objectives and result.]

Using the same set of photos in different scenarios, use PTGui and our image stitched algorithm to compare.

Currently temporarily scenarios planned to use: natural landscape, architecture.