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Object Detection Based on GPU Programming

Team Project Update 1

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Summary of Accomplishments

1. Since we determined the title of this project, we have conducted substantial amount of research in GPU programming and object detection. To realize GPU programming, we installed CUDA and OpenCV as development tools. Then, the initial idea of whole project came up based on some related works and papers.
2. We officially started the project and finished half of this week's tasks. However, we have not completed all three tasks of image preprocessing yet.
   1) Firstly, we successfully completed the conversion of color image to gray-scale image, which is the foundation step of the whole project. This step helps us get familiar with image processing. And the HDR tone mapping is being developed.
   2) At the same time, one of team members started to realize the seamless image composition part.

Challenges

1. Current challenges:
1) The seamless image composition part in image processing is not successfully developed.
2) The HDR tone mapping needs to be reimplemented due to current unsatisfactory result.
2. Ongoing challenges:
1) Determine the feature extraction algorithm.
2) Implement the algorithm in our project.

Scope change

When we wrote the proposal of this project, we divided the whole project into three phases. Firstly, conduct image pre-processing. Then, extract features using feature accelerated segment test algorithm and HOG descriptor. At last, realize object detection based on matching algorithm.

However, when we collected material, we planned to adopt the method of corner detection After doing research on more related papers, the edge detection may be more effective than corner detection in our project.

For current stage, this change will not affect the project's schedule. And we will try to realize the edge detection method and compare with the corner detection method next week if we have enough time.