

CS 445 Final Project Proposal

Project Topic: Seam Carving

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Motivation

We are both fascinated by the basic applications of computational photography. We believe that a good understanding of fundamental algorithms such as graph cutting is essential for more complex start-of-the-art applications. We plan to follow Avidan and Shamir (2007) and implement the seam carving algorithm, the completion of which will provide us with a good practical knowledge of developing and applying graph techniques to images.

Milestones

- Read Avidan and Shamir (2007) and develop a comprehensive understanding of the seam carving algorithm. (4/10/2022)
- Develop the code skeleton, separate the code into various functional blocks, and assign tasks to team members. (4/17/2022)
- Implement the basic seam carving algorithm and test the algorithm with several images. (4/24/2022)
- Work on extensions such as object removal and test the applications on several images. (5/1/2022)
- Review and submit the final project report and code. (5/8/2022)

Evaluation

We plan to evaluate the project based on the following criteria:

- Can the basic seam carving algorithm edit images as expected? Does the edited image look natural? (70/100 points)
- Can the extension (e.g., object removal) work as expected? (20/100 points)
- Is the code well commented? Is the report clear and well-structured? (10/100 points)
- Note: The extension is intended to add complexity to this project for it to be at least “moderately complex” as defined in the project description.

Resources

- Access to Avidan and Shamir (2007) [Confirmed]
- Access to Python [Confirmed]
- Access to free suitable images [Confirmed]
- Note: We do not expect that this project will need significant computing power. If more computing power is needed, we might need access to some cloud computing environment.

Group

We plan to split the work 50/50 and each team member will complete 50% of each component.

- Zijian Jing: Code implementation (skeleton, basic algorithm components, extension) and documentation.
- Eric Liu: Code implementation (skeleton, basic algorithm components, extension) and documentation.