Image Retargeting on iOS Platform

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Outline

- Problem Definition
- Related Work
- Our Approach
  - Seam Carving
  - Retargeting via Axis-aligned Deformation
- Results and Evaluation
- Conclusion and Future Work
- Acknowledgement

Problem Definition — Image Retargeting

- Objective: Resize an image (without losing important information)
- Input: an image I of size $m \times n$, a new size $m' \times n'$
- Output: a new image I of size $m' \times n'$
- Requirement: I' should be a good representation of I
  - Important content should be reserved
  - Important structure should be reserved
  - New image should be free of *artifacts*

More about the Problem

- Aspect Ratio = Height / Width
- Two kinds of approaches
  - Content-independent approaches
    - Scaling, Cropping
  - Content-aware approaches
    - Our interests
- Demand for this technique
  - Fixed display regions, layout changes, etc.
  - Widescreen adjustment for movie scenes
  - Auto-fill to PC/Phone screens
- Fun to play with
  - Clean problem, Seeable results, Understandable data and techniques

Related Work

Our Approach 1: Seam Carving

Our Approach 2: Retargeting via Axis-aligned Deformation

- Basic idea
  - The source image is segmented into grids of the same size
  - Each grid is scaled into different sizes based on its importance
- Advantages
  - Robustness
  - No potential foldovers
  - Smoothness
  - Low computation complexity

Our Approach 2: Axis-aligned Retargeting (cont.)

- How to define importance?
  - An automatically-computed saliency map is used for retargeting
  - Similar to the intensity gradient used in seam carving
- How to formalize the problem?

Results and Evaluation

Conclusion

Road to Solution

Lessons Learned

References

- Daniel Vaquero, et al., 2010. A survey of image retargeting techniques.
- Shai Avidan and Ariel Shamir, 2007. ACM Trans. Graph.
- Daniele Panozzo, et al., 2012. Robust Image Retargeting via Axis-Aligned Deformation. Computer Graphics Forum (proceedings of EUROGRAPHICS).

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