Wikipedia Collage Project

IMAGE DOWNSCALING

Gavi Levy Haskell
Outline

- A Little History of Collage
- The Project Overall
- The Project at Hand
  - Previous Work
  - The Choices Made
  - What’s Being Tested
- A Few Results
- Further Possibilities
Image Downscaling
A HISTORY OF COLLAGE
A Little History of Collage

- High art—early 20th c.
  - Georges Braque
  - Pablo Picasso

http://facweb.cs.depaul.edu/sgrais/collage.htm
A Little History of Collage

- Scrapbooking—19th c.
  - Women and children

Kate Edith Gough—late 1870s
A Little History of Collage

- Paper cutting—18th c., earlier
  - Mary Delany

Mary Delany—Passiflora laurifolia: bay leaved—1777
Mary Delany—Physalis, Winter Cherry—1772–1788
http://www.britishmuseum.org/explore/highlights/highlights_search_results.aspx?RelatedId=11742
A Little History of Collage

- Collage as data visualization
  - 365 Days of Light in Norway

Steven Kay, based on video by Eirik Solheim
http://www.flickr.com/photos/stevefaembra/5349017221/
Image Downscaling

THE WIKIPEDIA PROJECT
The Project Overall

- Displaying lots of images
- Probably don’t just want to use the original sizes
- Opening and modifying images (even automatically) is slow
Image Downscaling
The Project at Hand
Downscaling Research

- Lots done on beautification
  - Samadani, et al., of HP labs
    - “Honest” thumbnails
  - Kopf, et al.
    - Content-based adaptive resizing
  - Suzuki, et al.
    - Thin line preservation
  - Avidan and Shamir
    - Content-aware resizing with seams
Downscaling Research

- Less done on speed
  - Parkinnen, et al.
    - Store some data to hasten calculations
The Choices Made

- Two algorithms
  - Nearest neighbor interpolation
  - Bilinear interpolation

- ImageMagick

- Parallel for multiple images
  - C application using MPI
  - Multithreaded Java
Testing

- Speed of each of the six implementations
  - Images resized by a variety of randomly-generated scalars

- Visual comparison of results of different algorithms
  - At several different sizes
Image Downscaling
THE RESULTS (FOR NOW)
Initial Results

- For one image, in Java, scaled by .6834:
  - Nearest Neighbor: 2.333 s.
  - ImageMagick: 2.429 s.
  - Bilinear: 3.110 s.

(average of three runs)
Initial Results

- May well be different in C
Initial Results

Bilinear

Nearest Neighbor
Image Downscaling

Further Possibilities
Further Possibilities

- Multi-image adaptive scaling
  - Smaller sizes need less quality

- Implementing a blur