COS 426 Lecture Notes #5
Supplemental: halftoning, cont.

Color dithering

Color dithering

- Two cases: monitor and printing
- Monitor
  - Some monitors display a limited number of colors with a color table.
  - Choosing color tables. Suppose we have only 256 possible colors.
  - fixed:
    - option: 2 bits for each channel R,G,B
      - 4x4x4 = 64 possible colors; use other 192 colors however
    - option: 3 bits for R & G, 2 bits for B
      - 8x8x4 = 256 possible colors; less resolution in blue

Color dithering

- adaptive:
  - popularity algorithm: histogram of colors, use 256 most frequent
    - quick and easy
  - median cut algorithm: Heckbert '82.
    - Fit a box around colors used.
    - Split in longest dimension at the median.
    - Recurse until there are 256 boxes.
    - Use middle of each box as representative color.
- After you're done, use halftoning in each color channel.
- Ordered dither is okay if your colors are evenly spaced; otherwise, use error diffusion.

Color dithering

- Printing
  - Switch to CMY:
    - C = 1 - R
    - M = 1 - G
    - Y = 1 - B
  - Undercolor removal: darker black, faster drying, cheaper ink
    - K = min(C,M,Y);
    - C -= K;
    - M -= K;
    - Y -= K;
  - See Foley, Color plate II.15.
- Photomosaics: Marisa Range's poster.