

Clustering colors

Stephen Boyd

EE103

Stanford University

September 7, 2025

Color compression

- ▶ 3-vectors x_1, \dots, x_N represent RGB values of each pixel in an image
- ▶ in 24-bit color representation $(x_i)_m \in \{1, 2, \dots, 256\}$
- ▶ total of $256^3 \approx 1.7 \times 10^7$ possible colors
- ▶ compress color vectors to k colors using k -means

Compressed image for various values of k

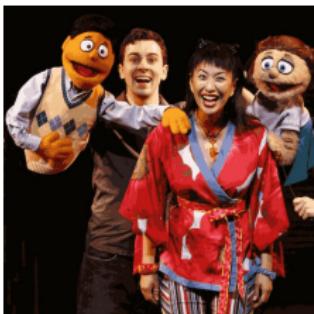
$k=4$



$k=8$



$k=64$



Original image

