Seam Carving

Dana Silver
Seam Carving

Input image with one horizontal and one vertical seam

Top: Image resizing by seam carving
Bottom: Image resizing by scaling
Aspect Ratio Change

Input  Scale  Crop  Seam Carving
Dynamic Programming

Algorithm Direction

\[ M(i,j) = e(i,j) + \min(M(i-1, j-1), M(i-1, j), M(i-1, j+1)) \]

Source: https://en.wikipedia.org/wiki/Seam_carving
Expansion
Content Enhancement
Object Removal
Find the missing shoe in each image

Input
Retargeting and Object Removal

Input

Retargeted

Pigeon removed

Girl removed