

Figure 1: Optimal 2-operator regular paths using seam-carving and scaling. From left to right: the source image; the retargeted image; a plot of the BDW distance versus different transition points between seam-carving and scaling; the BDW alignment of the retargeted image to the source image; the BDW alignment of the source image to the retargeted image. For the latter visualizations, in case several pixels of one image are mapped to the same pixel in the other - their average value is taken.

































Figure 2: Optimal 2-operator mixed paths using the seam-carving and scaling operators, and BDW similarity. From left to right: the source image; the retargeted image; the dynamic programming table colored by the BDW distance (relative per image); the BDW alignment of the retargeted image to the source image. The table size corresponds to the amount of change and the rate at which the search space is sampled.

## Comparison to the User Study:

Image	Mean User Study	Optimal 3-operator regular path	Optimization search space
Car			Scale
eagle			
Foliage			
girls			
islands			÷
manga			
num			

Image	Mean User Study	Optimal 3-operator regular path	Optimization search space
orchid			+
mochizuki			
stairs			
sunglasses			
surfers			
venice			

Image	Mean User Study	Optimal 3-operator regular path	Optimization search space
liger			+
volleyball		C R R R R R R R R R R R R R R R R R R R	
osaka			
waterfall			+

Figure 3: Comparison between automatic (3-operator regular paths) and user study results. From left to right: the image used in the study; the mean user result, taken as the weighted center of mass of the user data; the optimal retargeted image; a visualization of the BDW distance throughout the search space as discussed in the paper and shown in the first (car) figure. The automatic and user results are marked on the search space with black and red markings respectively. Note that the distance was interpolated for visualization purposes.