1. Additional Examples

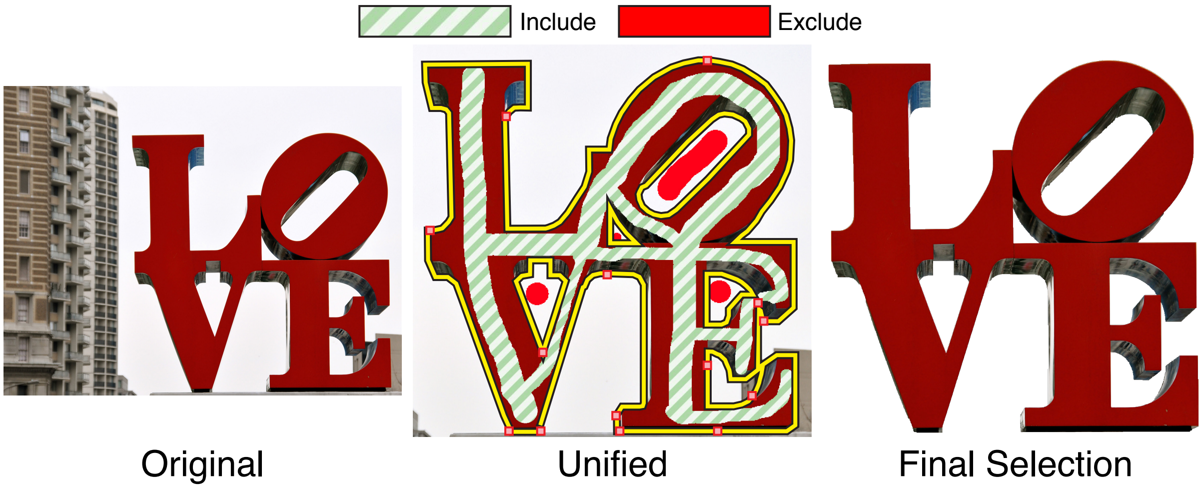

Figure A: *A coarse painting selects the statue and the boundary is fixed with constraints.*

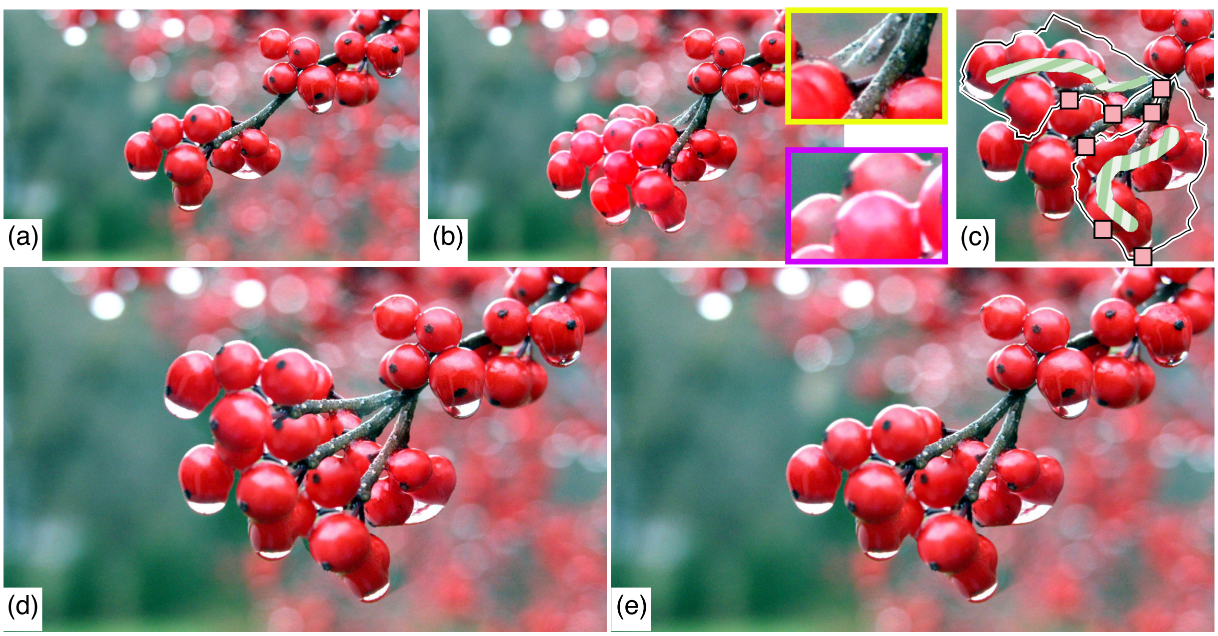

Figure B: *(a) An image of berries where the bottom branch will be cloned multiple times. (b) The result from Farbman et al. [FHL 09]. Even the most advanced color correction techniques can be limited by the chosen boundaries. Examples of problems include disappearing branches (inset yellow) and color inconsistencies due to inclusion of the background in the color solution (inset purple). (c) With our unified interactions, boundaries can be guided by the user to give the best color result. (d) The final image with two cloned branches. (e) An image with one cloned branch.*

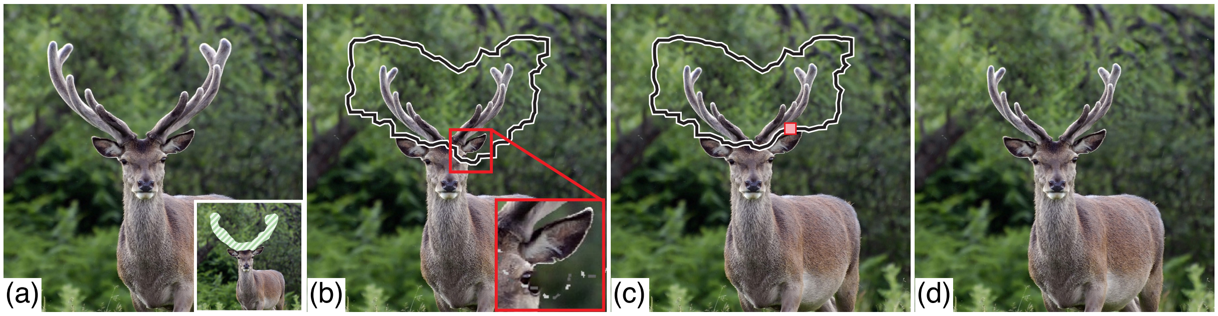

Figure C: *A user manipulates the deer's antlers. (a) The original image with the initial painting interaction to select and clone the antlers. (b) The scaled antlers are placed in a realistic location in the scene. Minimal boundaries are provided interactively which the user can use to detect unrealistic transitions in the composite. (c) A single constraint can fix the bad transition to give the final seamless image (d).*

Figure D: *A user manipulates the moose's antler and eyes. (a) The original image. (b) Eye size is increased and antler size decreased. Problems such as the purple inset are instantly detected by a user with our real-time boundaries. (c) Eye and antler size increased. Boundaries and interactions used to produce the seamless image are white inset.*

Figure E: *(a and b) Combining two images of motorcyclists to create more congested traffic. (c) The user paints the foreground motorcycle to composite into the other image. The initial solution has problems such as the passenger being excluded and unrealistic shadow transitions. (d and e) A user can simply add a few constraints to fix these issues.*

Figure F: *(top left) Several snapshots of a family composited into a single montage. Starting with a user-chosen background, pieces of three other images selected by the a painting annotation are composited into a seamless image. (top right) The initial boundaries have inconsistent transitions or undesirable areas included from an image, such as the child turning his head. With a few constraints (bottom left), all issues are resolved to produce a seamless image (bottom right).*

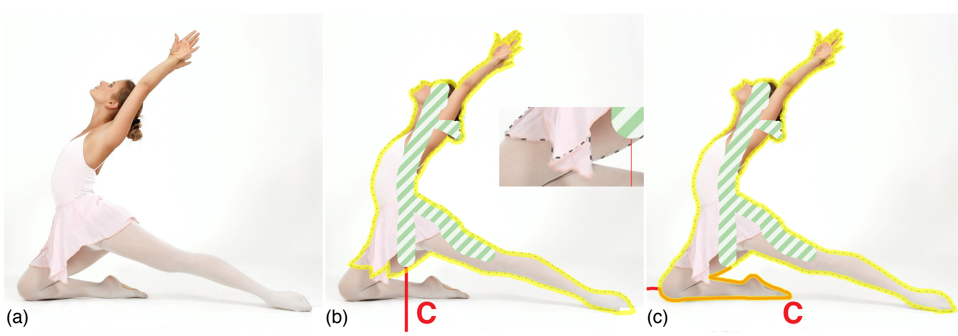

Figure G: *Alternative to Figure 2: (a) Input image. (b) Drag-and-Drop Pasting [JSTS06] provides a boundary solution that fails to properly find the dancer's left leg (inset), due to Jia et al.'s minimum distance separating cut of the domain (red). (c) Our new formulation using a minimum energy separating path (red) is guaranteed to find the minimum boundary.*

2. Performance

Figure	Size (Annulus)	Planar Graph Cuts	Our Method	Separating Path	Constraint Preprocess	Per Constraint
Beetle (Figure 1e)	715x1013 (490K)	0.66 s	0.67 s	368	2.1 s	158 ms
Eagle (Figure 9a)	1024x1024 (984K)	1.18 s	0.82 s	59	4.2 s	370 ms
Snowboarder (Figure 9b)	1900x1452 (2.5M)	2.44 s	2.52 s	68	8.8 s	798 ms
LOVE (Figure 9c)	1623x1259 (1.6M)	2.07 s	1.17 s	60	4.3 s	697 ms

Table A: *Object selection timings for Planar Graph Cuts[STC09] (P-GC) and our minimum cycle computation on a 4-core machine. Actual annulus pixels are provided. We additionally provide the separating path size and preprocessing time for a single constraint without subsampling approximation (Figure 6a of paper), along with average cost after movement for constraints (Figure 6f of paper).*