1. System requirement

The program requires a PC with .NET framework installed.

2. Steps

a. To use image segmentation tool, click on the file "Video Segmentation.exe".

b. Load an image file (bmp/jpeg).

c. Draw the user input strokes. There are 4 kinds of user input:

_Foreground stroke (red color): to indicate a foreground region.

- To use: Click on **F** and draw a stroke on the foreground region.

_Background stroke (blue color): to indicate background region

- To use: Click on **B** and draw a stroke on the background region.

_Hard stroke (yellow color): to draw at the boundary to indicate where the boundary **must** pass through.

- To use: Click on **H** and draw a stroke on the boundary.

_Soft stroke (green color): to draw at the boundary to indicate where the boundary **possibly** pass through. **Note:** A soft stroke needs to be drawn in counter clockwise direction around the object boundary. That means when going from the beginning point to the end point of a soft stroke, the object would be in the left hand side of the stroke.

- To use: Click on **$** and draw a stroke on the boundary.

You can select Segment -> Options on the toolbar to change the stroke's size. You can use the Eraser ▢ to erase the wrongly drawn strokes.

Note: Normally we only need foreground and background strokes. Hard boundary and soft boundary strokes are only needed at the part of very unclear boundary. Hard boundary and soft boundary stroke work most effectively to refine small problem regions. For big problem region, the use of foreground and background strokes is more effective. Please see example 1 and example 2.

d. Choose segmentation mode.

 There are two available segmentation modes in this release, the fast mode and accurate mode. In the fast mode, the segmentation result is generated quickly. In accurate mode, the program takes more time to generate the segmentation result, but the result would be more accurate. You can choose either mode under category "Method" by select Segment -> Options on the toolbar. By default, fast mode is selected.

e. Click on ✂ to segment the image.

During the execution time, the symbol ✂ will be highlighted. When the execution finished, the symbol ✂ will be un-highlighted.

f. You can choose to view the foreground/background region under View on the toolbar.

g. If the result is not satisfactory, you can add more strokes at the problem area, or you can select other segmentation mode (step d) and then select ✂ to segment again.
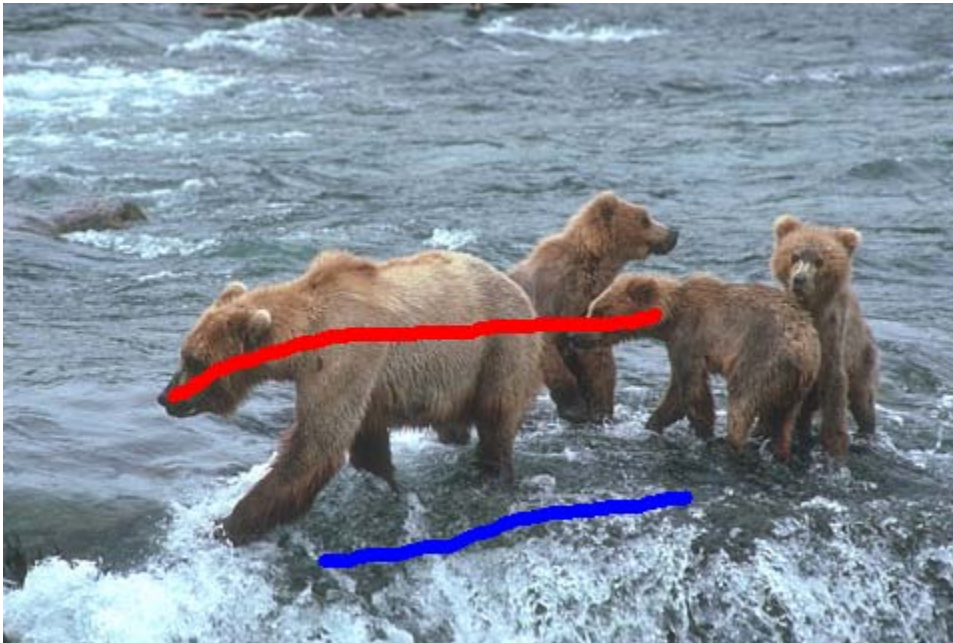
<u>**Example1:**</u>

Figure 1. Original image with foreground and background strokes
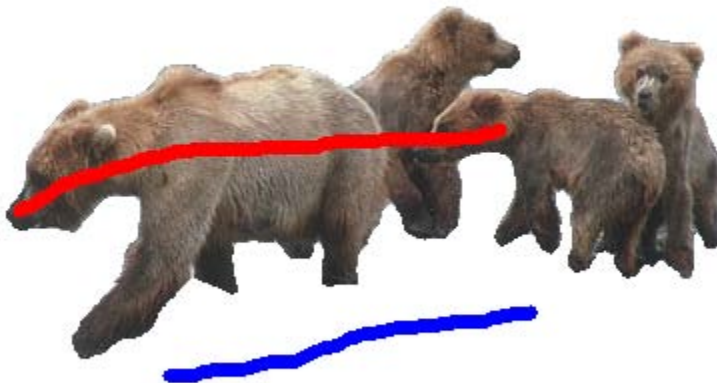

Figure 2. Original image with foreground and background strokes

(a) Original image   (b) Foreground   (c) Background

Figure 3. Round 1 with only foreground and background stroke. See the problem at the shoulder areas.

(d) Original image   (e) Foreground   (f) Background

Figure 4. Round 2 with added hard boundary and soft boundary stroke. The problem at the shoulder areas is solved.