**Motivation and Goals**

- Image Segmentation is the process of partitioning an image into several different segments that compose it.
- Our Mission: implement a scribble-based algorithm for extracting object from natural photos and pasting them seamlessly into a different background under the constraints of a mobile device’s computational power.

**The Main Idea**

- The user provides us with two scribbles
  - The pixels in the *inner* scribble belong to the object.
  - The pixels in the *outer* scribble belong to the background.
- Propagate that information to the rest of the image pixels using a designated weight distance function
- Define weights using the Probability Density Functions of both scribbles
- Define the object as the pixels that are closer to the *inner* scribble

**The Algorithm**

- The algorithm first calculates the designated weight functions, using the scribbles.
- Distances are then calculated on the entire image and used to derive the final result.

**Improving runtime**

- Running Dijkstra’s algorithm on a full-sized image can be computationally heavy.
- Solution: run the main algorithm on a resized image, add another refinement step for fixing the edges.
- Edges are fixed using both blurring and dedicated alpha calculation.

**The Application**

- OpenCV was used to implement the algorithm on a personal computer.
- C++ algorithm was ported to Android using the NDK.
- Android’s SDK was used to wrap the algorithm in a friendly user interface that anybody can use.

**References**

- "A Geodesic Framework for Fast Interactive Image and Video Segmentation and Matting" by Xue Bai and Guillermo Sapiro
- "Image Editing Using Level Set Trees", by Anastasia Dubrovina, Rom Hershkovitz and Ron Kimmel

**Matting Results**

**What users say**

- Works like magic! ★★★★★
- Molto bello ★★★
- Abracadabra, really works! Just what I needed! ★★★★★
- Solid App… The process is unique but effective Kudos to the Developer. ★★★★★