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PICIT

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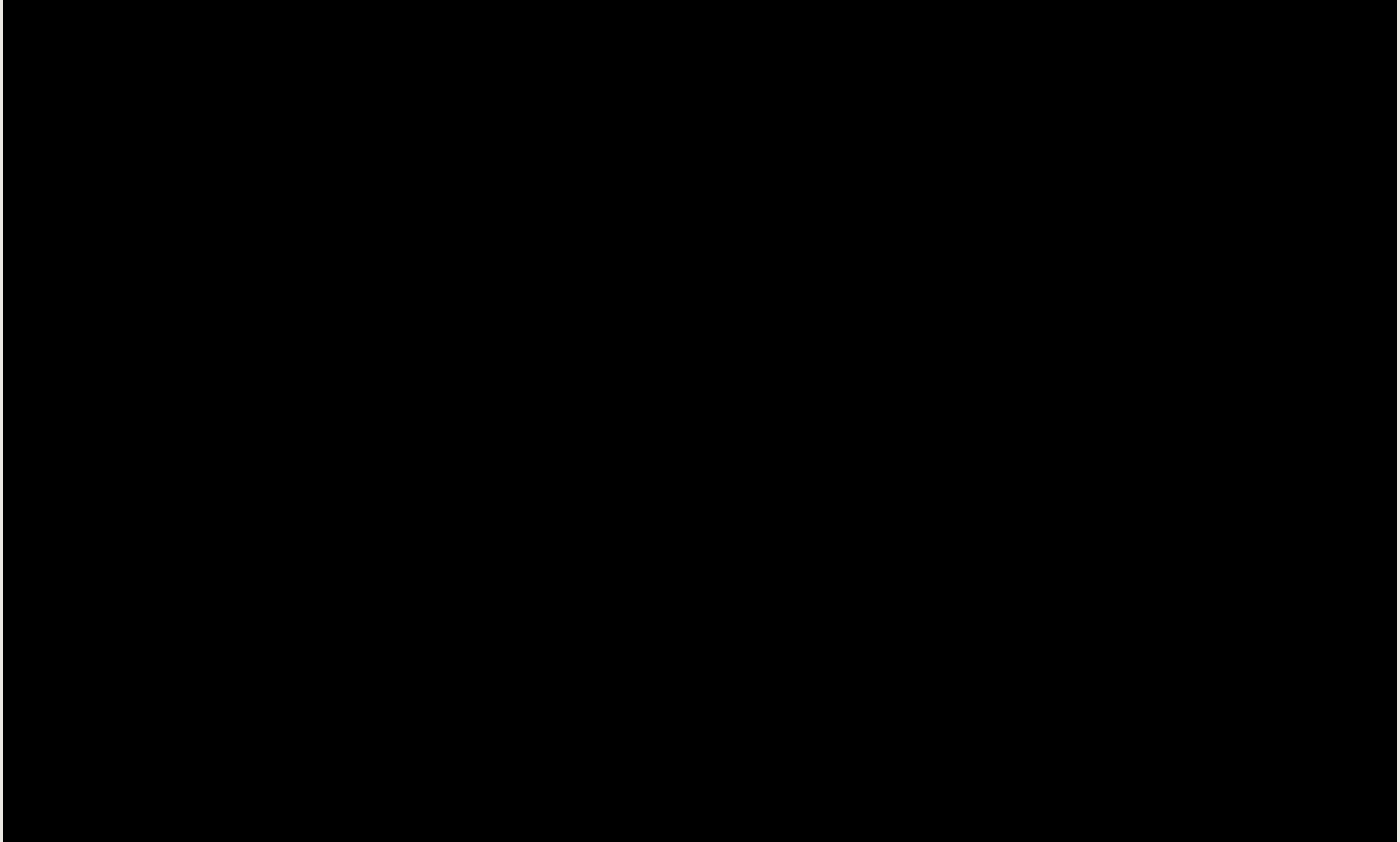
Group number 522

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Don't take a photograph, make it!

The algorithm

based on the article
“Interactive Digital Photomontage“

We use graph-cut optimization to create a composite that satisfies the image and seam objectives specified by the user

Cost function

we define the cost function C of a pixel labeling L as the sum of two terms: a data penalty C_d over all pixels p and an interaction penalty C_i over all pairs of neighboring pixels p, q:

$$C(L) = \sum_{p} C_d(p, L(p)) + \sum_{p,q} C_i(p, q, L(p), L(q))$$

Cost function

$$C(L) = \sum_{p} C_d(p, L(p)) + \sum_{p,q} C_i(p, q, L(p), L(q))$$

Data Penalty

C_d: Designated image: **0** if L(p)=u, where Su is a user-specified source image, and a large penalty otherwise.

Interaction Penalty

C_i : We define the seam objective to be 0 if L(p)=L(q). Otherwise, we define the objective as:

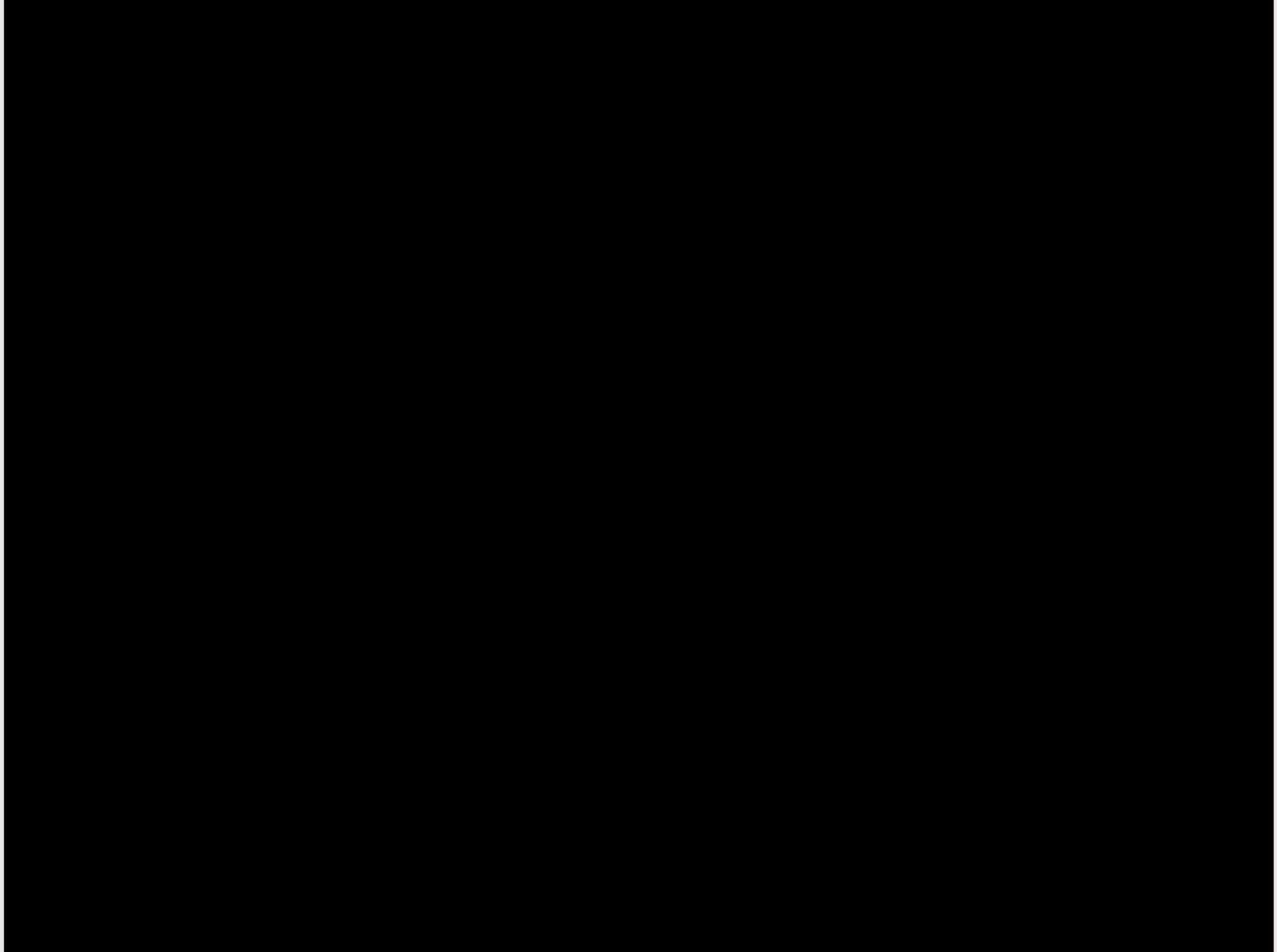
$$C_i(p, q, L(p), L(q)) = \begin{cases} X & \text{if matching “colors”} \\ Y & \text{if matching “gradients”} \\ X+Y & \text{if matching “colors \& gradients”} \end{cases}$$

where

$$X = \|S_{L(p)}(p) - S_{L(q)}(p)\| + \|S_{L(p)}(q) - S_{L(q)}(q)\|$$

$$Y = \|\nabla S_{L(p)}(p) - \nabla S_{L(q)}(p)\| + \|\nabla S_{L(p)}(q) - \nabla S_{L(q)}(q)\|$$

Max Flow
Min Cut

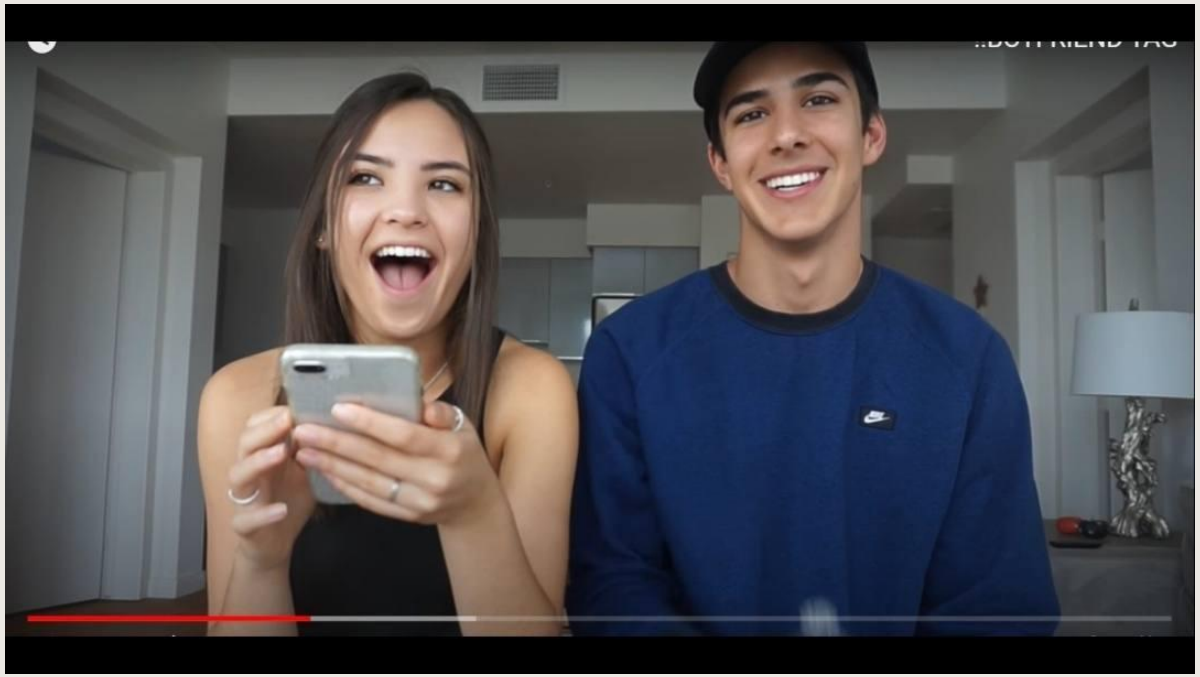


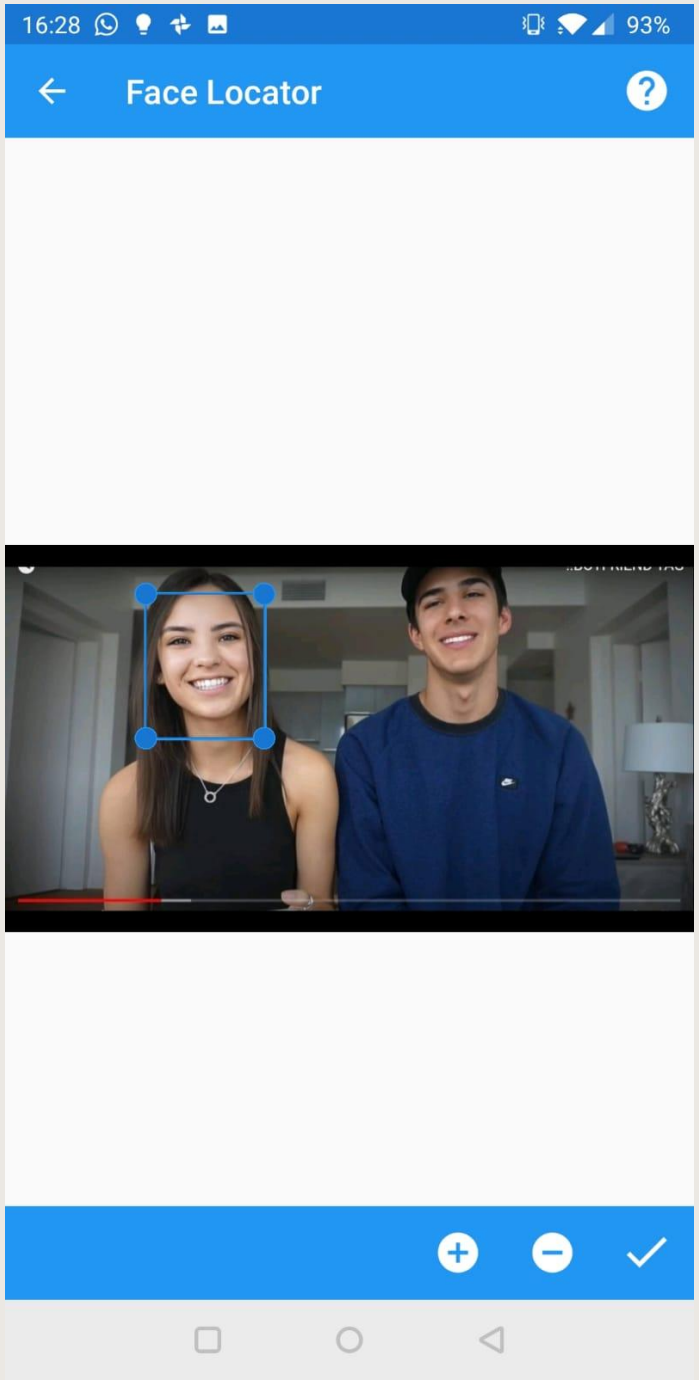
solution evaluation

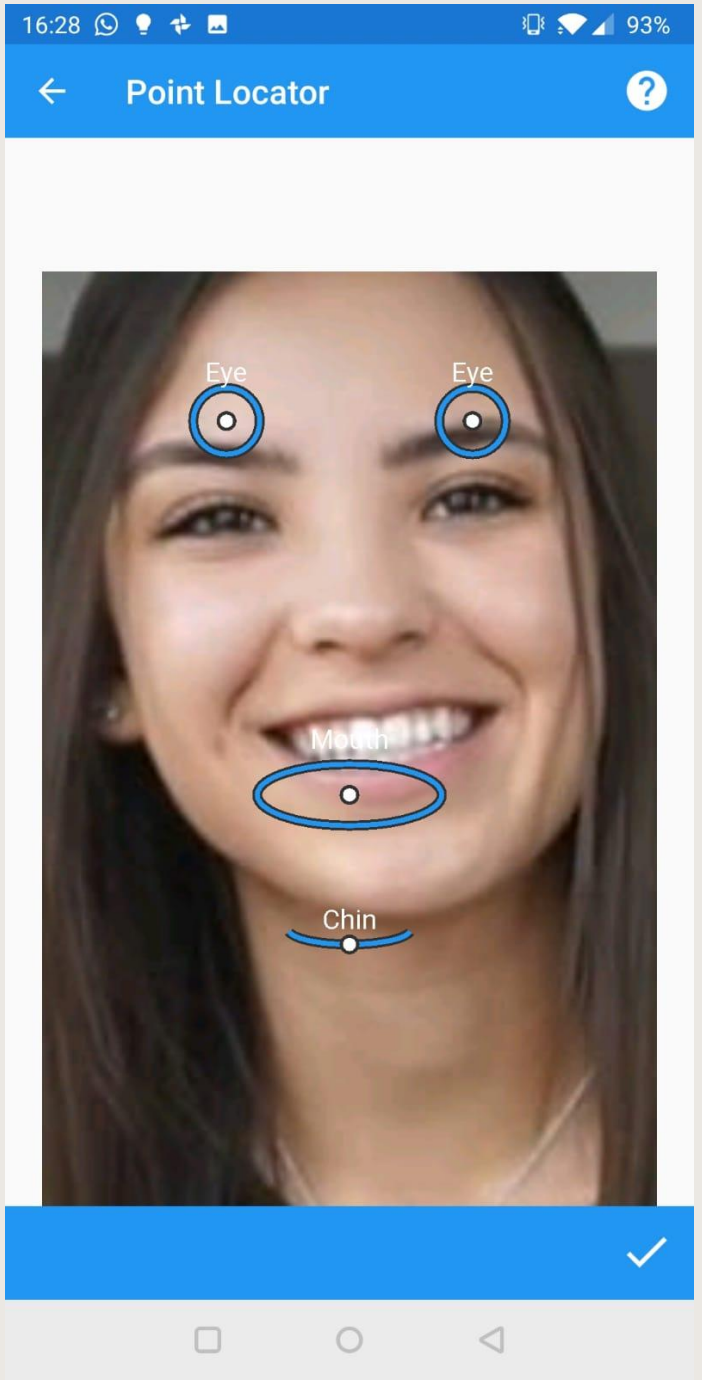
final image

compare to existing solution

source images:




16:28
93%
Face Locator


16:28
93%
Point Locator
Eye
Eye
Mouth
Chin

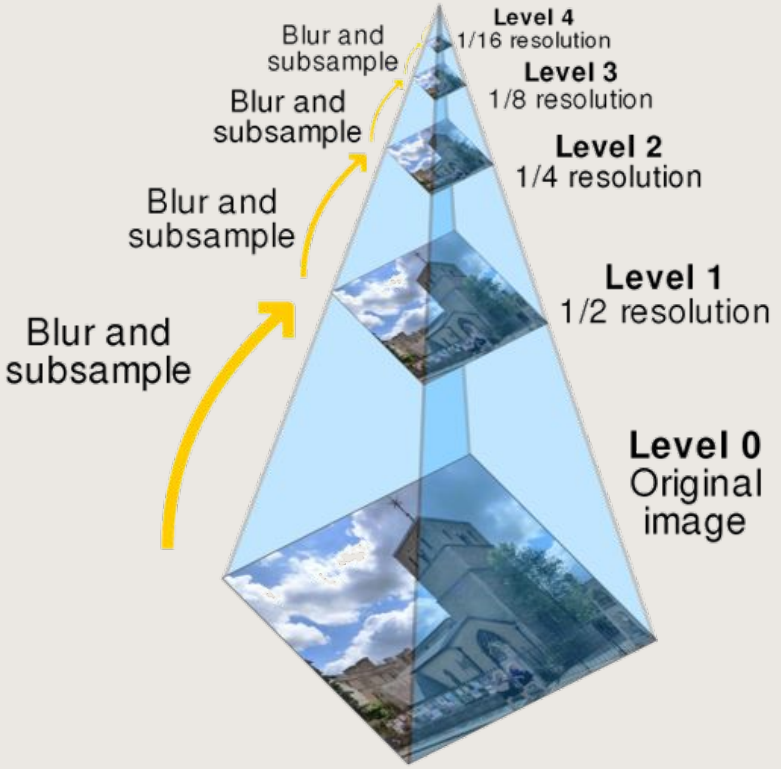
VS

other solution

our solution

Failures

$$R_x(\theta) = \begin{bmatrix} 1 & 0 & 0 \\ 0 & \cos\theta & -\sin\theta \\ 0 & \sin\theta & \cos\theta \end{bmatrix}$$



Summary

Exploration

Implementation

Improvement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