Hello!

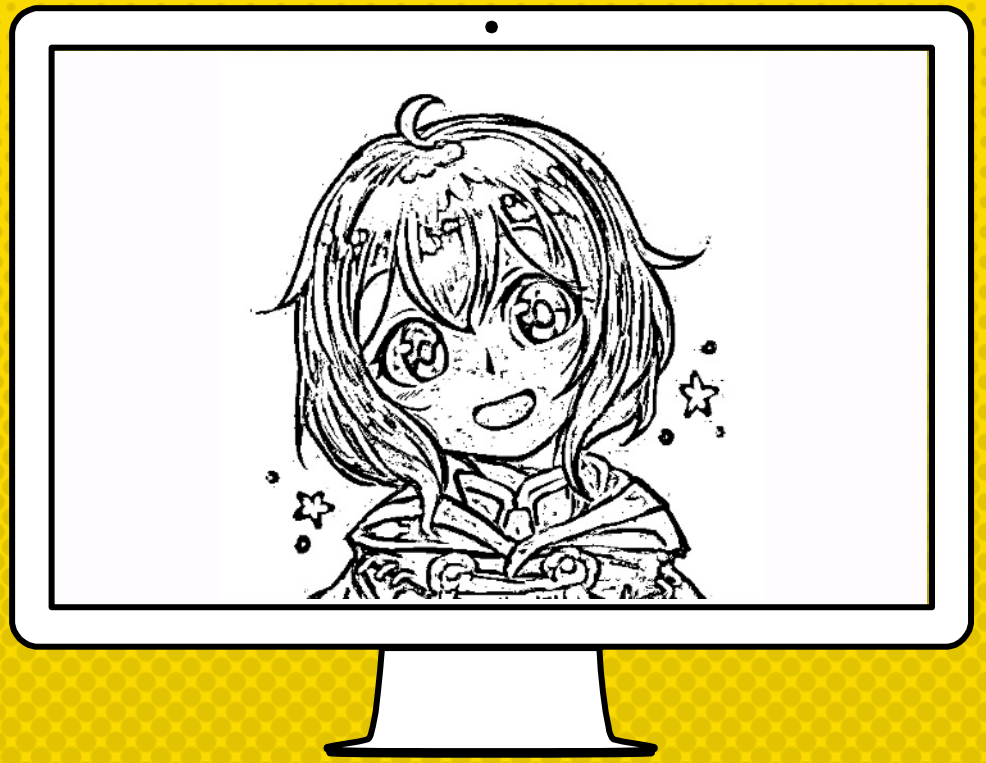
MANGAN

by Felipe Coelho
+ Paulo André
+ Hélio Ricardo
+ Ernesto Marujo

ITA

Itaú

COLORIZATION IS HARD



COLORIZATION IS HARD

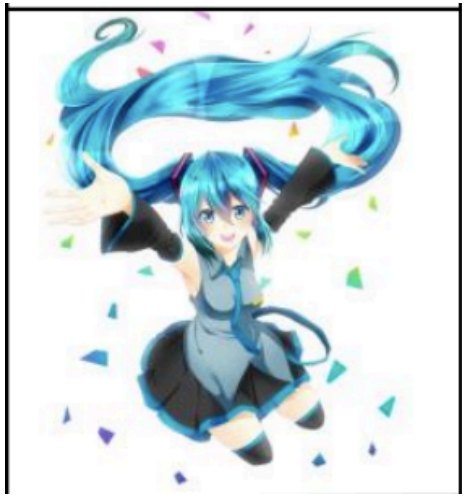
light

texture

details

STYLE TRANSFER!

+



=

NO PRIOR EXAMPLES!

AND WHEN DESIGNING FROM SCRATCH?

MANGAN:

ASSISTING COLORIZATION OF MANGA CHARACTERS CONCEPT ART

using Conditional GAN

DATASET 30K -> 13K

Safebooru

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brown_hair

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Tags

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+ - black footwear 15113
+ - black neckwear 7121
+ - blonde hair 471058
+ - boots 134914
+ - bracelet 42391
+ - brown hair 443445
+ - brown wings 136
+ - cape 69323
+ - cosplay 42419
+ - costume switch 2622
+ - earphones 2972
+ - full body 102825
+ - gradient hair 19444
+ - grey background 28684
+ - hat 424221

LINE-ART EXTRACTION!

ADAPTIVE THRESHOLDING

LINE-ART EXTRACTION!

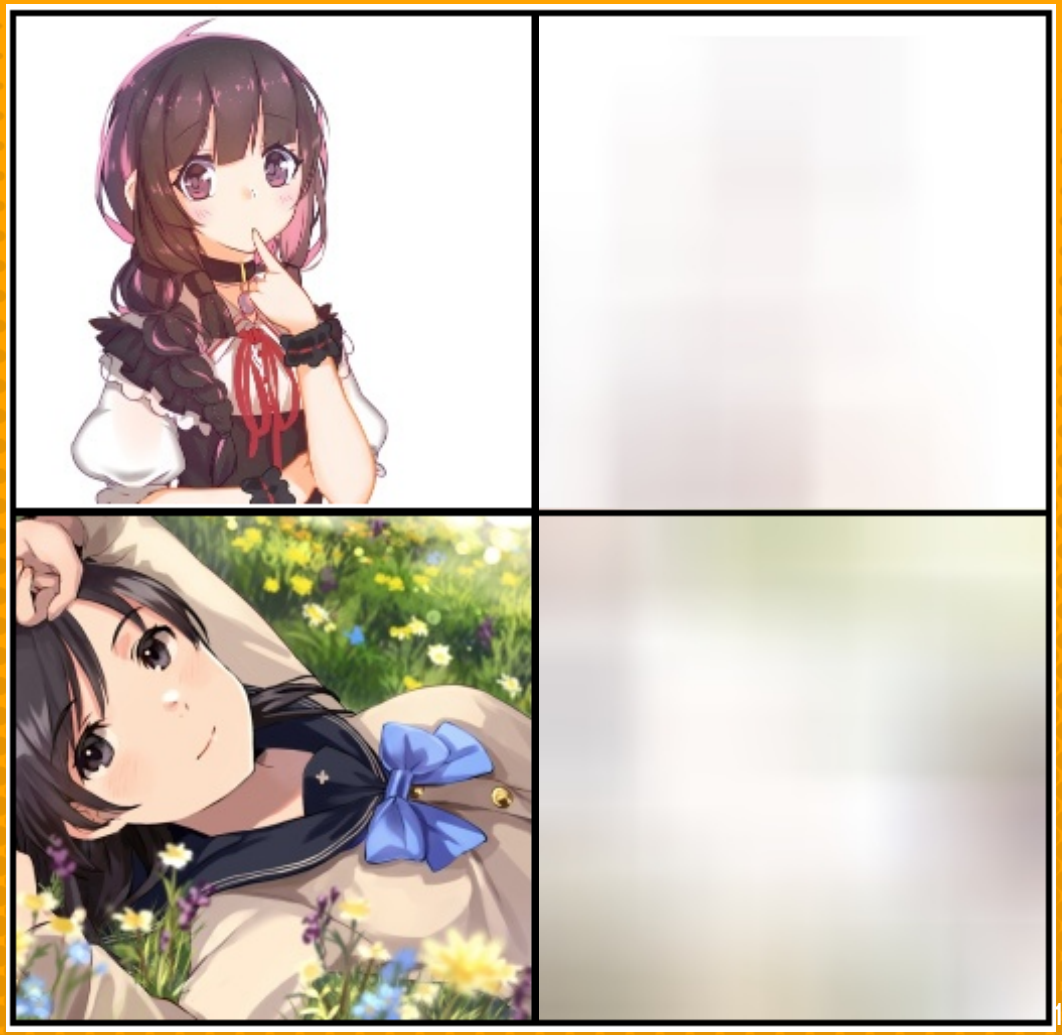
ADAPTIVE THRESHOLDING

COLOR-HINT!

1) GENERIC
2) INCOMPLETE

- Remove Patches
- Blur

$$K = \frac{1}{9}\begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$$

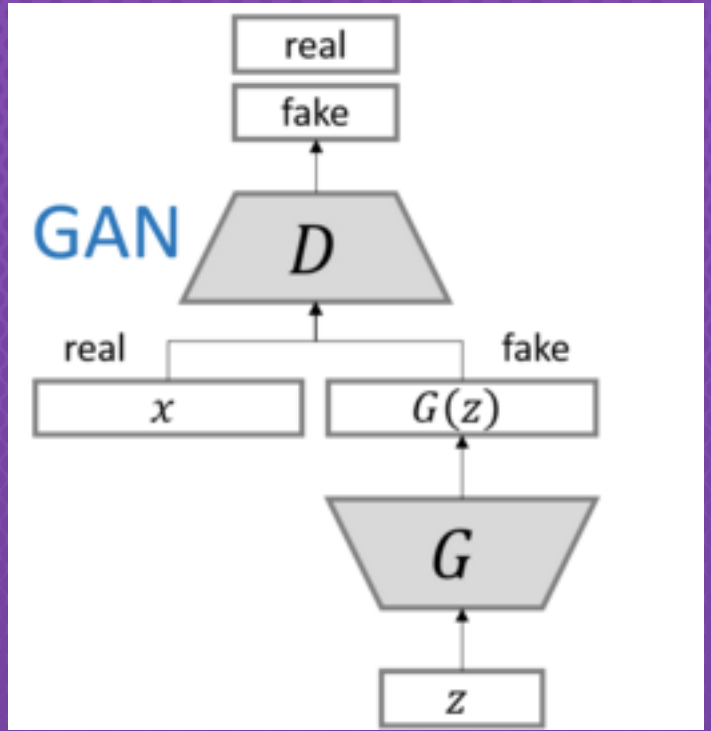


COLOR HINT FOR TEST-SET?

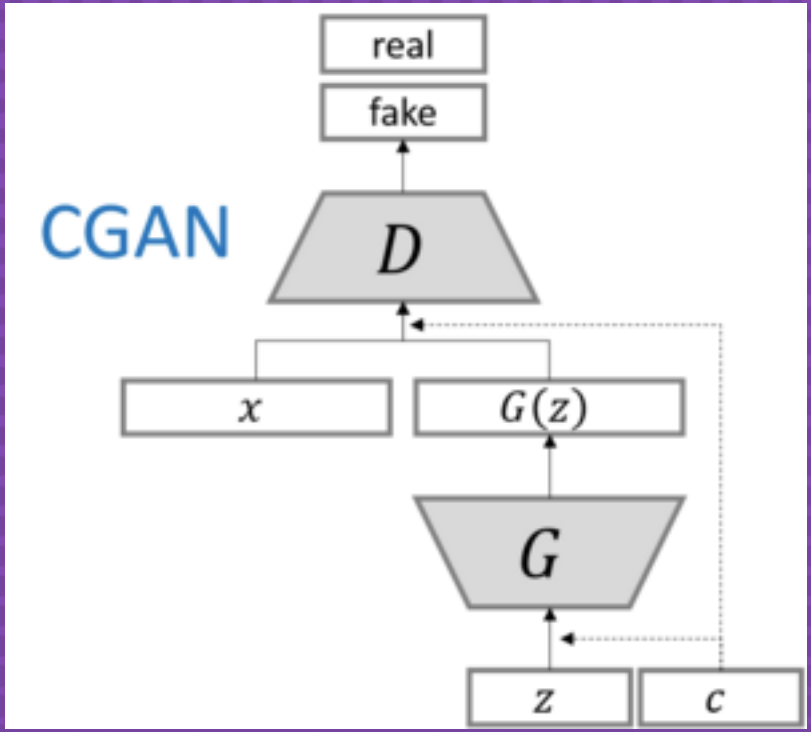
JUST BLUR IT.

¯_(ツ)_/¯

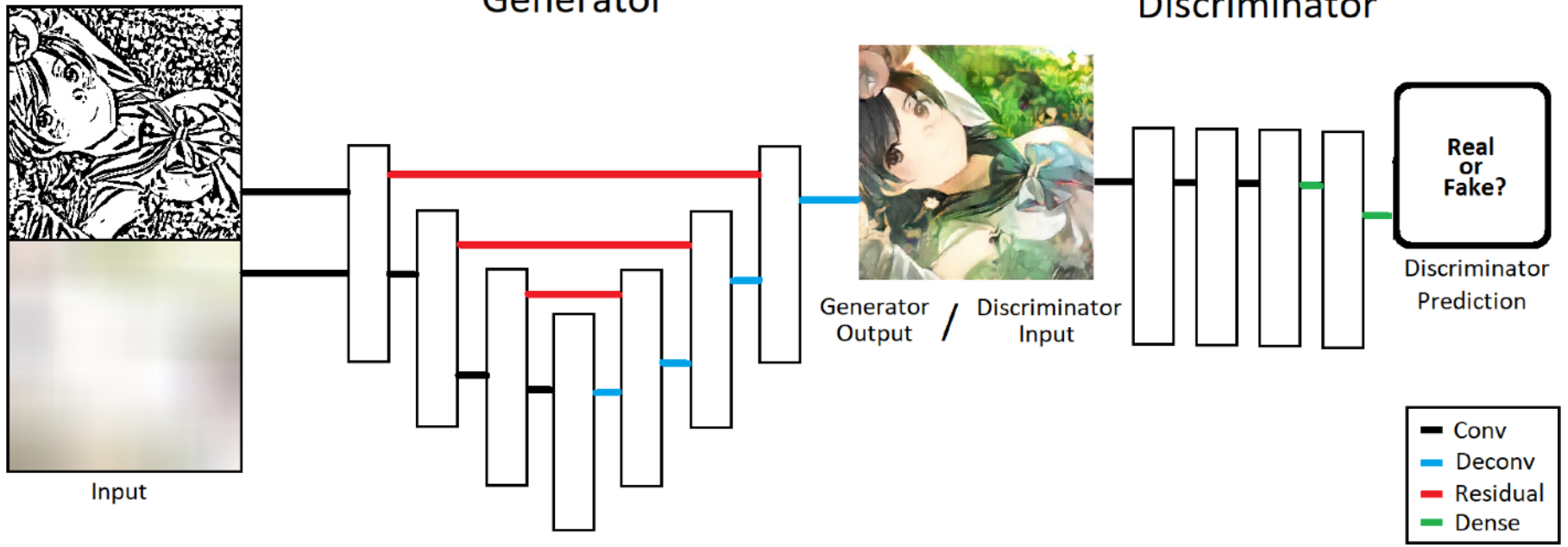
ARCHITECTURE: GAN



ARCHITECTURE: cGAN ?

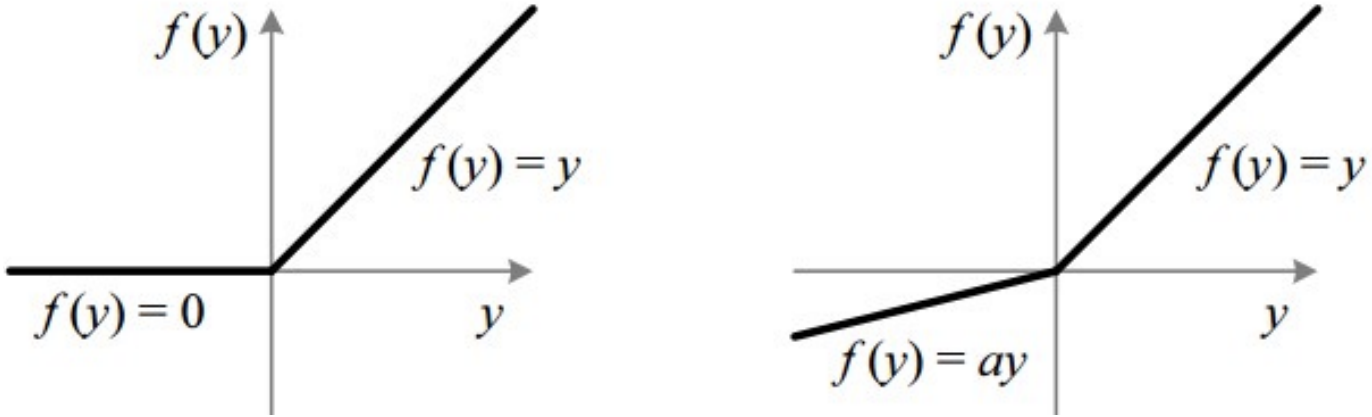


MY ARCHITECTURE (cGAN)



How to train your GAN

- Leaky ReLU



HOW TO TRAIN YOUR GAN 2

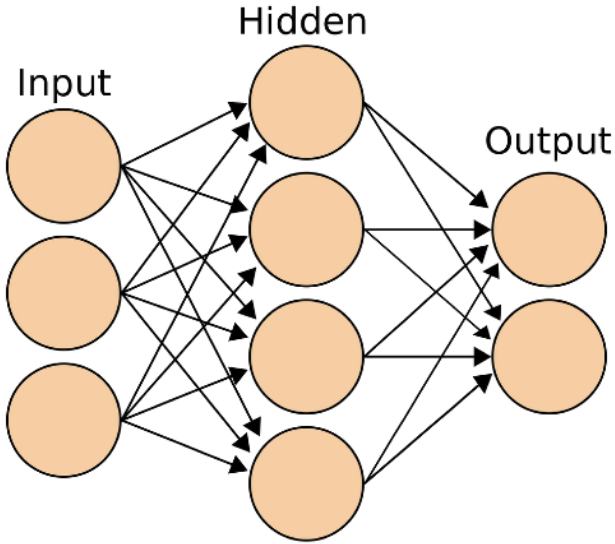
- ONE-SIDED LABEL SMOOTHING

PENALIZE
CONFIDENT
OUTPUT!

[1, 0, 0] -> [0.9, 0, 0]

HOW TO TRAIN YOUR GAN 3

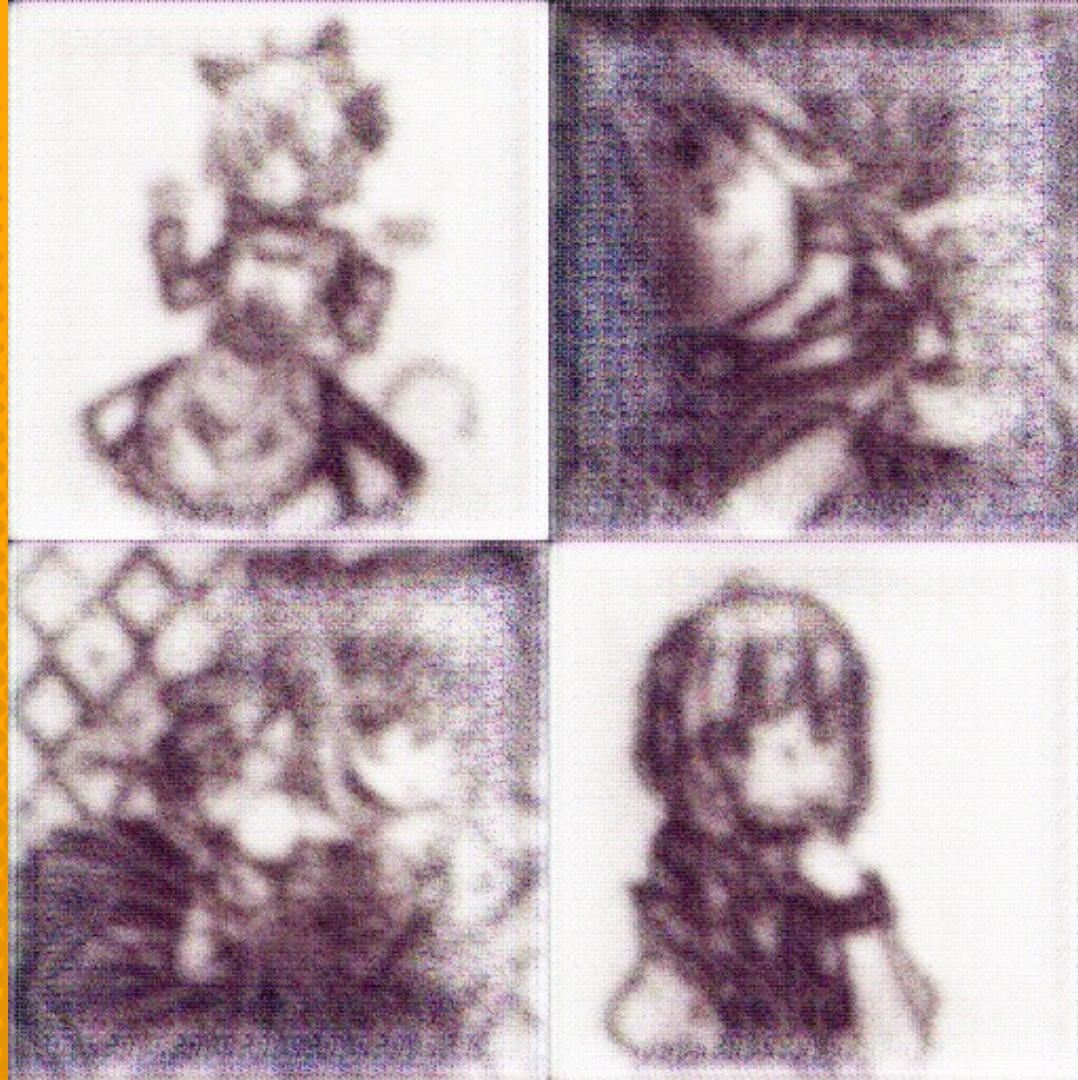
- BATCH NORMALIZATION



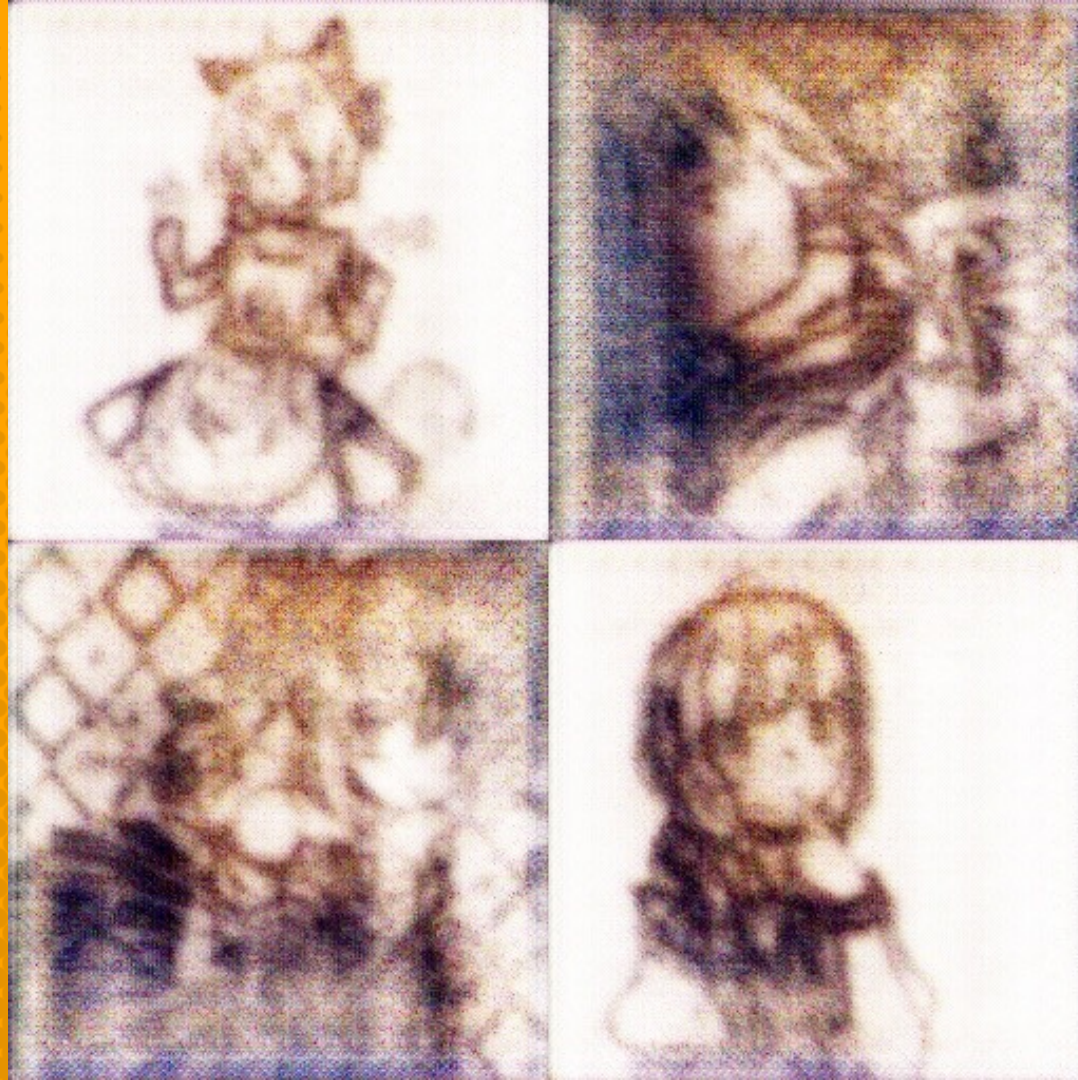
- AVOIDS GRADIENT EXPLOSION

TRAINING RESULTS!

TRAINING RESULTS!



TRAINING RESULTS!



TRAINING RESULTS!

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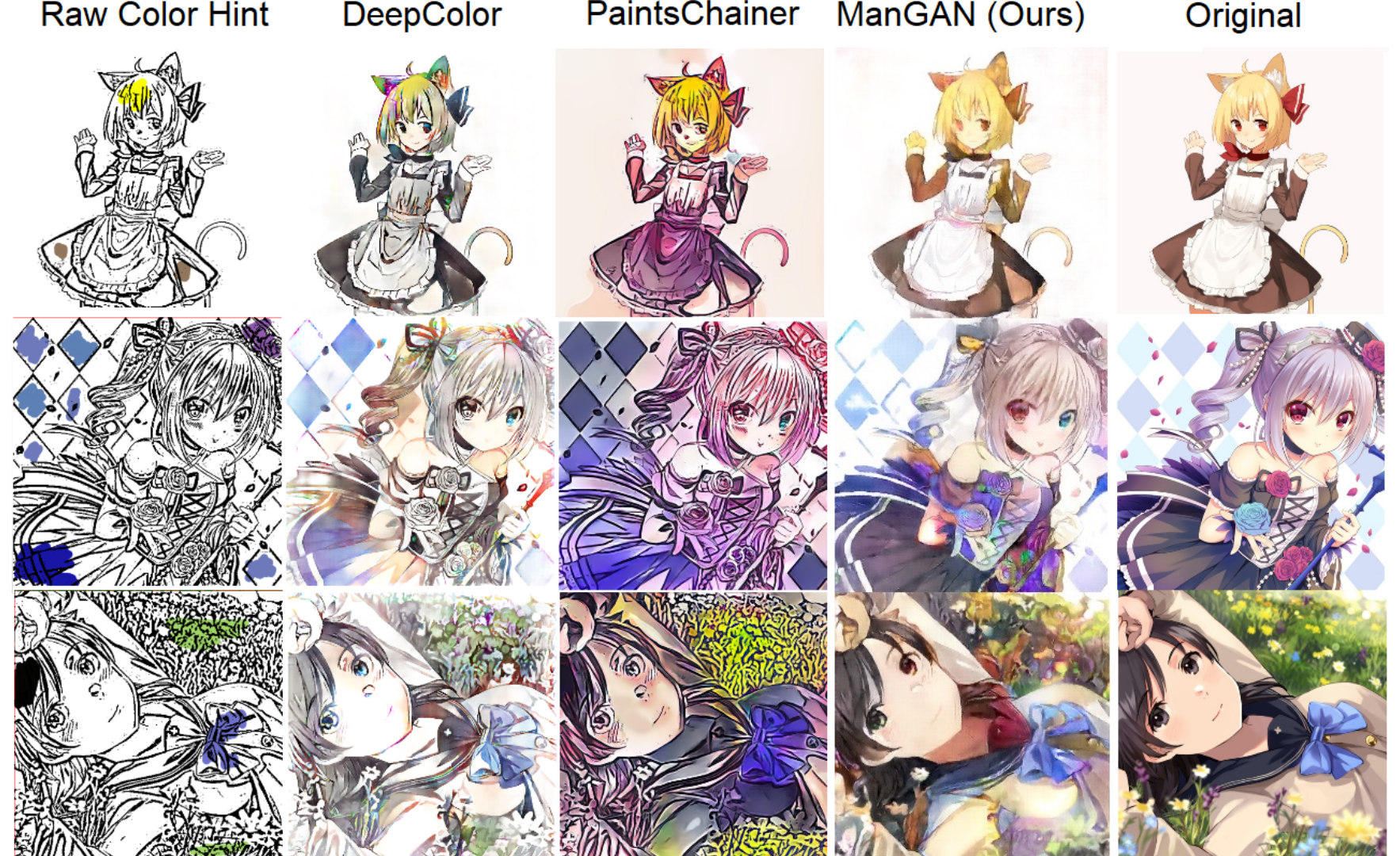

Raw Color Hint
DeepColor
PaintsChainer
ManGAN (Ours)
Original

SURVEY!

Image 1/8

1 2 3 4

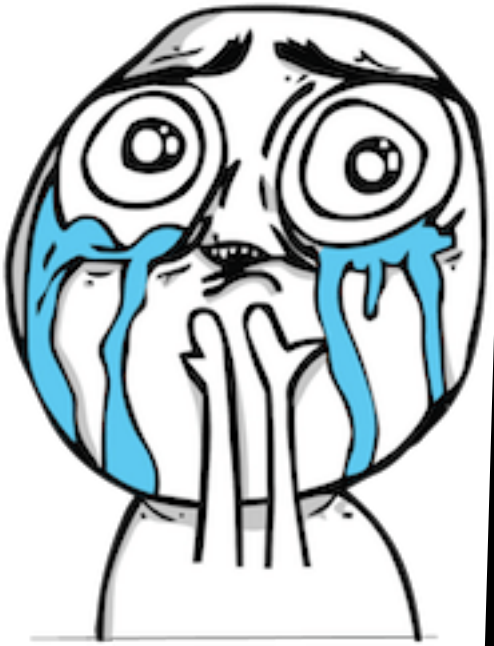
Please order the images according to the colorization quality, from best to worst. (example: 1, 3, 4, 2)

Short answer text

32 RESPOSTAS

RESULTS!

COMPARISON	MANGAN (OURS) PREFERED
ORIGINAL	8.98%
DEEPCOLOR	88.67%
PAINTSCHAINER	81.64%



CONCLUSIONS!

- GREAT FOR TESTING COLORS
- BETTER THAN OTHERS
- STILL MAKES MANY MISTAKES

FUTURE WORK!

- MULTI-STEP PROCESS
- ARCHITECTURES
- HYPERPARAMS TESTS

REFERENCES!

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THANK YOU ALL!!

QUESTIONS?

THANKS!

I AM FELIPE

Itaú

ITA

you can find me at

lodur.com.br