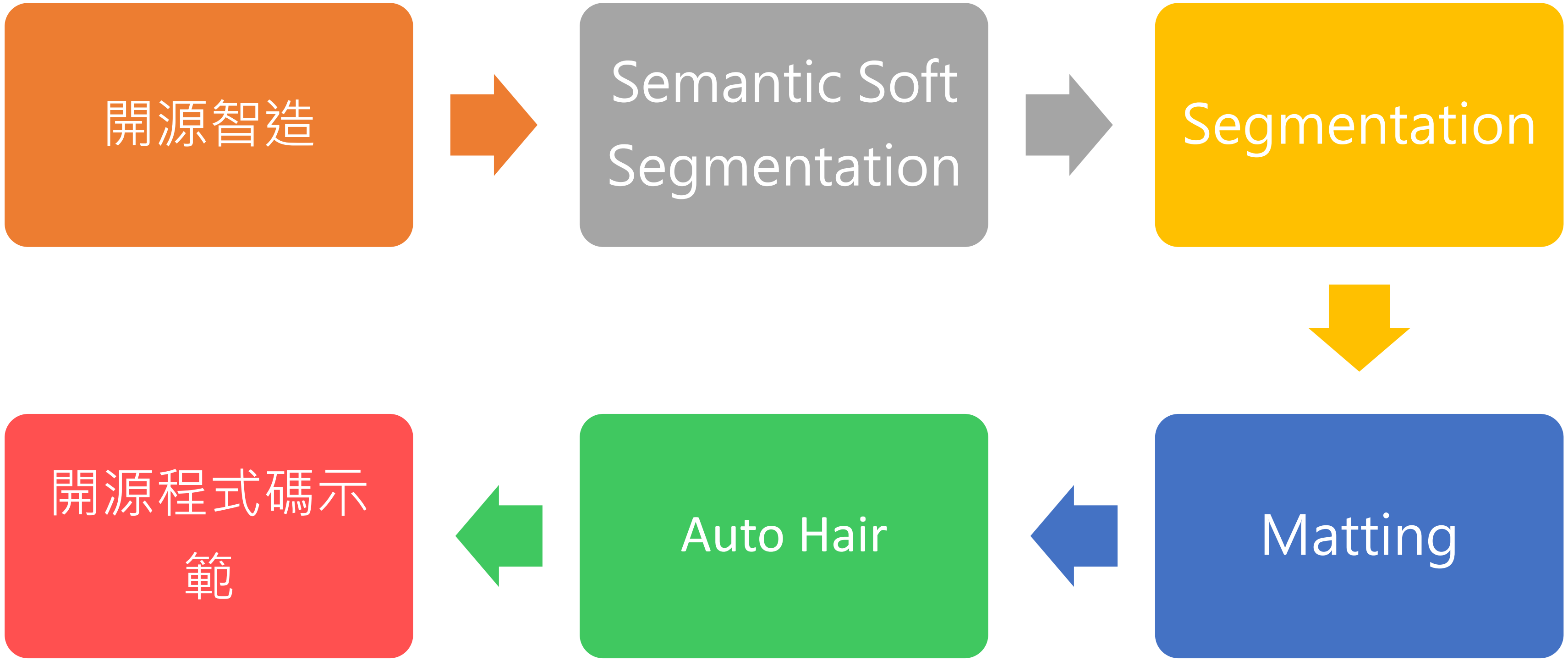
如何利用開源程式碼進行髮絲去背

開源智造 OPEN AI FAB


開源智造
Semantic Soft Segmentation
Segmentation
Matting
Auto Hair
開源程式碼示範

開源智造

Monthly AI Counseling

AI-as-a-service

- Empower customers to jumpstart AI
- Deep dive for customer requirements

AI Solutions

Develop AI models

- Domain expert + AI scientists
- After delivery service and optimization

Pricing

Based on model complexity

-
-
- Premium AI Model

開源智造

題目

- AI圖片去背功能

企業

- 高博思股份有限公司
- 台灣第一個針對Facebook社群進行行銷的團隊，經手超過200個企業粉絲團

痛點

- 當需要圖片的某個物件，都必須使用人工去背，非常耗費人力資源

目的

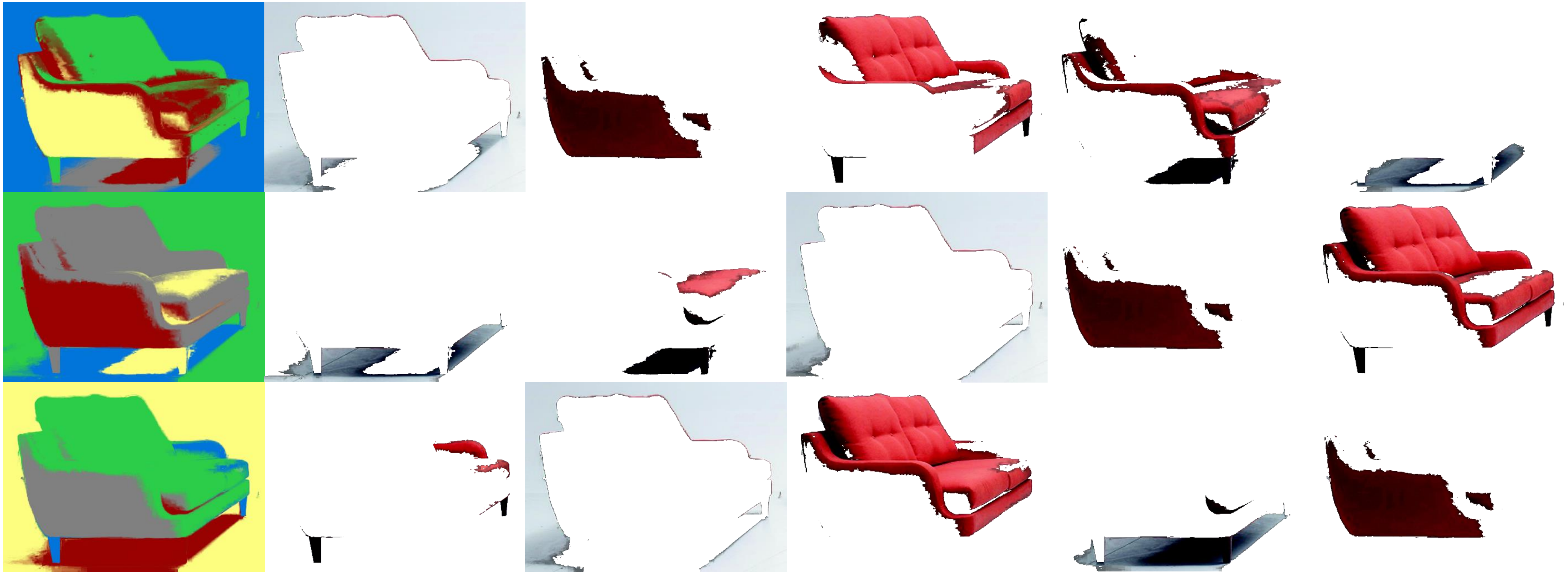
- 透過AI進行圖片背景的移除
- 可參考Semantic Soft Segmentation的作法

Semantic Soft Segmentation

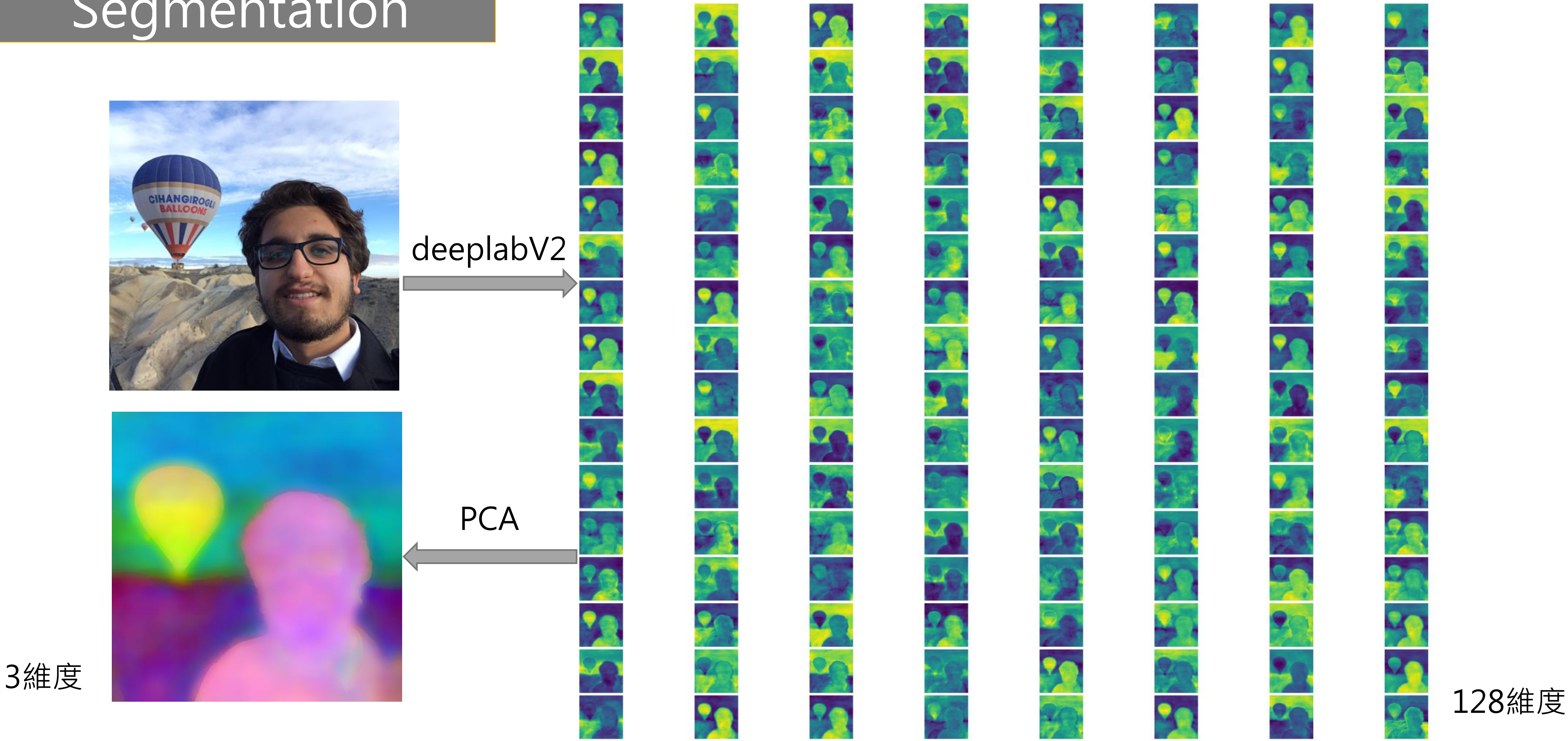
http://yaksoy.github.io/sss/

Semantic Soft Segmentation

Semantic Soft Segmentation



Semantic Soft Segmentation



Semantic Soft Segmentation

每次結果不同	目標物被拆解	效率低	使用不方便
• 使用群聚分析(K-means)將創建好的圖層分成5層，去背後目標物位於哪一層是隨機的	• 有時目標物被拆成多個物件	• 計算時間長	• 開源碼使用了python和matlab

圖片去背種類

Segmentation

- 對每個像素的語義理解，並得到該像素分類結果
- 較難滿足標的物邊緣高精度的切割效果

Matting

- 找出前景與背景的顏色，以及它們之間的融合程度，邊緣分割效果自然
- 人工耗時繪製「trimap」

Segmentation introduction

https://github.com/sadeepj/crfasrnn_keras

Original image (hover to highlight segmented parts)

Semantic segmentation

Objects appearing in the image:

Bicycle	Person

Objects not appearing in the image:

Aeroplane	Bird	Boat	Bottle	Bus	Car	Cat
Chair	Cow	Dining table	Dog	Horse	Motorbike	Potted plant
Sheep	Sofa	Train	TV/Monitor			

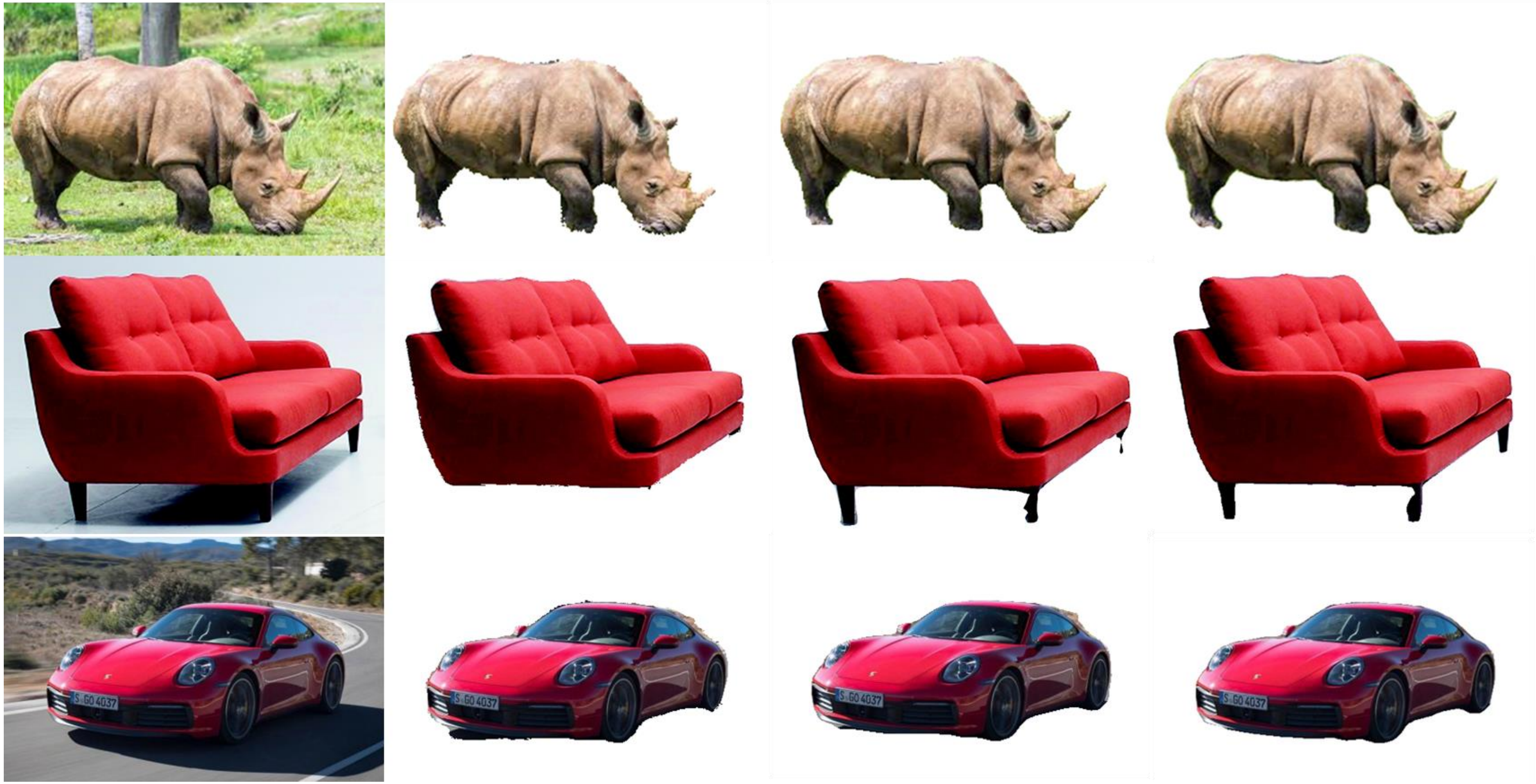
Segmentation method

http://host.robots.ox.ac.uk/leaderboard/displaylb_main.php?challengeid=11&compid=6

	mean	aero plane	bicycle	bird	boat	bottle	bus	car	cat	chair	cow	dining table	dog	horse	motor bike	person	potted plant	sheep	sofa	train	tv/ monitor	submission date
RecoNet152_coco [?]	**89.0**	97.3	**80.4**	96.5	**83.8**	89.5	97.6	95.4	**97.7**	50.1	**96.8**	82.6	95.1	**97.7**	**95.1**	92.6	80.2	95.2	71.7	92.1	83.8	26-Oct-2019
DeepLabv3+_JFT [?]	**89.0**	**97.5**	77.9	96.2	80.4	**90.8**	**98.3**	**95.5**	97.6	58.8	96.1	79.2	95.0	97.3	94.1	**93.8**	78.5	95.5	74.4	93.8	81.6	09-Feb-2018
DeepLabv3+_AASPP [?]	88.5	97.4	80.3	**97.1**	80.1	89.3	97.4	94.1	96.9	**61.9**	95.1	77.2	94.2	97.5	94.4	93.0	72.4	93.8	72.6	93.3	83.3	22-May-2018
SRC-B-MachineLearningLab [?]	88.5	97.2	78.6	**97.1**	80.6	89.7	97.4	93.7	96.7	59.1	95.4	81.1	93.2	97.5	94.2	92.9	73.5	93.3	74.2	91.0	85.0	19-Apr-2018
SepaNet [?]	88.3	97.2	80.2	96.2	80.0	89.2	97.3	94.7	**97.7**	48.6	95.0	81.6	**95.2**	97.5	**95.1**	92.7	79.5	95.4	68.8	90.9	83.4	25-Oct-2019
EMANet152 [?]	88.2	96.8	79.4	96.0	83.6	88.1	97.1	95.0	96.6	49.4	95.4	77.8	94.8	96.8	**95.1**	92.0	79.3	**95.9**	68.5	91.7	**85.6**	15-Aug-2019
MSCI [?]	88.0	96.8	76.8	97.0	80.6	89.3	97.4	93.8	97.1	56.7	94.3	78.3	93.5	97.1	94.0	92.8	72.3	92.6	73.6	90.8	85.4	08-Jul-2018
ExFuse [?]	87.9	96.8	80.3	97.0	82.5	87.8	96.3	92.6	96.4	53.3	94.3	78.4	94.1	94.9	91.6	92.3	**81.7**	94.8	70.3	90.1	83.8	22-May-2018
KSAC [?]	87.9	96.8	79.9	96.3	76.5	86.5	97.5	94.5	96.9	54.8	91.6	81.4	93.8	97.2	94.0	92.3	77.3	93.1	73.5	91.1	83.4	03-Sep-2019
DeepLabv3+ [?]	87.8	97.0	77.1	**97.1**	79.3	89.3	97.4	93.2	96.6	56.9	95.0	79.2	93.1	97.0	94.0	92.8	71.3	92.9	72.4	91.0	84.9	09-Feb-2018
CFNet [?]	87.2	96.7	79.7	94.3	78.4	83.0	97.7	91.6	96.7	50.1	95.3	79.6	93.6	97.2	94.2	91.7	78.4	95.4	69.6	90.0	81.4	12-Jun-2019
DeepLabv3-JFT [?]	86.9	96.9	73.2	95.5	78.4	86.5	96.8	90.3	97.1	51.4	95.0	73.4	94.0	96.8	94.0	92.3	81.5	95.4	67.2	90.8	81.8	05-Aug-2017
DIS [?]	86.8	94.0	73.3	93.5	79.1	84.8	95.4	89.5	93.4	53.6	94.8	79.0	93.6	95.2	91.5	89.6	78.1	93.0	**79.4**	**94.3**	81.3	13-Sep-2017
Gluon DeepLabV3 152 [?]	86.7	96.5	74.3	96.1	80.2	85.2	97.0	93.8	96.4	49.7	93.6	77.6	95.1	95.3	93.9	89.6	75.8	94.4	70.8	89.7	78.7	03-Oct-2018
CASIA_IVA_SDN [?]	86.6	96.9	78.6	96.0	79.6	84.1	97.1	91.9	96.6	48.5	94.3	78.9	93.6	95.5	92.1	91.1	75.0	93.8	64.8	89.0	84.6	29-Jul-2017
APDN [?]	86.4	94.5	65.4	94.2	82.7	88.1	95.7	91.7	95.7	45.5	94.3	**82.8**	93.8	94.8	92.4	91.7	73.7	93.4	72.8	91.9	82.4	28-May-2019
IDW-CNN [?]	86.3	94.8	67.3	93.4	74.8	84.6	95.3	89.6	93.6	54.1	94.9	79.0	93.3	95.5	91.7	89.2	77.5	93.7	79.2	94.0	80.8	30-Jun-2017
GluonCV DeepLabV3 [?]	86.2	96.3	69.7	93.5	76.2	86.5	96.5	92.2	95.8	47.8	95.0	81.6	93.0	96.0	91.2	90.7	77.1	94.7	68.9	89.3	81.7	07-Sep-2018
DFN [?]	86.2	96.4	78.6	95.5	79.1	86.4	97.1	91.4	95.0	47.7	92.9	77.2	91.0	96.7	92.2	91.7	76.5	93.1	64.4	88.3	81.2	15-Jan-2018

Segmentation result

原圖 | crfasrnn | PSPNet | deeplabV3+



Segmentation result

Segmentation result

crfasrnn

PSPNet

Segmentation result

deeplabV3+

Segmentation result

- SSS使用DeepLab v2的架構

- 目前較為推崇的是DeepLab v3+
  - https://github.com/tensorflow/models/tree/master/research/deeplab

Model	DeepLab v3+	DeepLab v3	PSPNET	DeepLab v2	DeepLab	CRF-RNN
Submission date	2018/2/9	2017/6/20	2016/12/6	2016/6/6	2014/12/23	2015/2/10
mean	**87.8**	85.7	**85.4**	79.7	66.4	**65.2**
plane	97.0	96.4	95.8	92.6	78.4	80.9
bicycle	77.1	76.6	72.7	60.4	33.1	34.0
bird	97.1	92.7	95.0	91.6	78.2	72.9
boat	79.3	77.8	78.9	63.4	55.6	52.6
bottle	89.3	87.6	84.4	76.3	65.3	62.5
bus	97.4	96.7	94.7	95.0	81.3	79.8
car	93.2	90.2	92.0	88.4	75.5	76.3
cat	96.6	95.4	95.7	92.6	78.6	79.9
chair	56.9	47.5	43.1	32.7	25.3	23.6
cow	95.0	93.4	91.0	88.5	69.2	67.7
table	79.2	76.3	80.3	67.6	52.7	51.8
dog	93.1	91.4	91.3	89.6	75.2	74.8
horse	97.0	97.2	96.3	92.1	69.0	69.9
motor	94.0	91.0	92.3	87.0	79.1	76.9
person	92.8	92.1	90.1	87.4	77.6	76.9
potted	71.3	71.3	71.5	63.3	54.7	49.0
sheep	92.9	90.9	94.4	88.3	78.3	74.7
sofa	72.4	68.9	66.9	60.0	45.1	42.7

Matting introduction

https://github.com/99991/matting

Trimap

$$I = \alpha \times F + (1 - \alpha) \times B$$

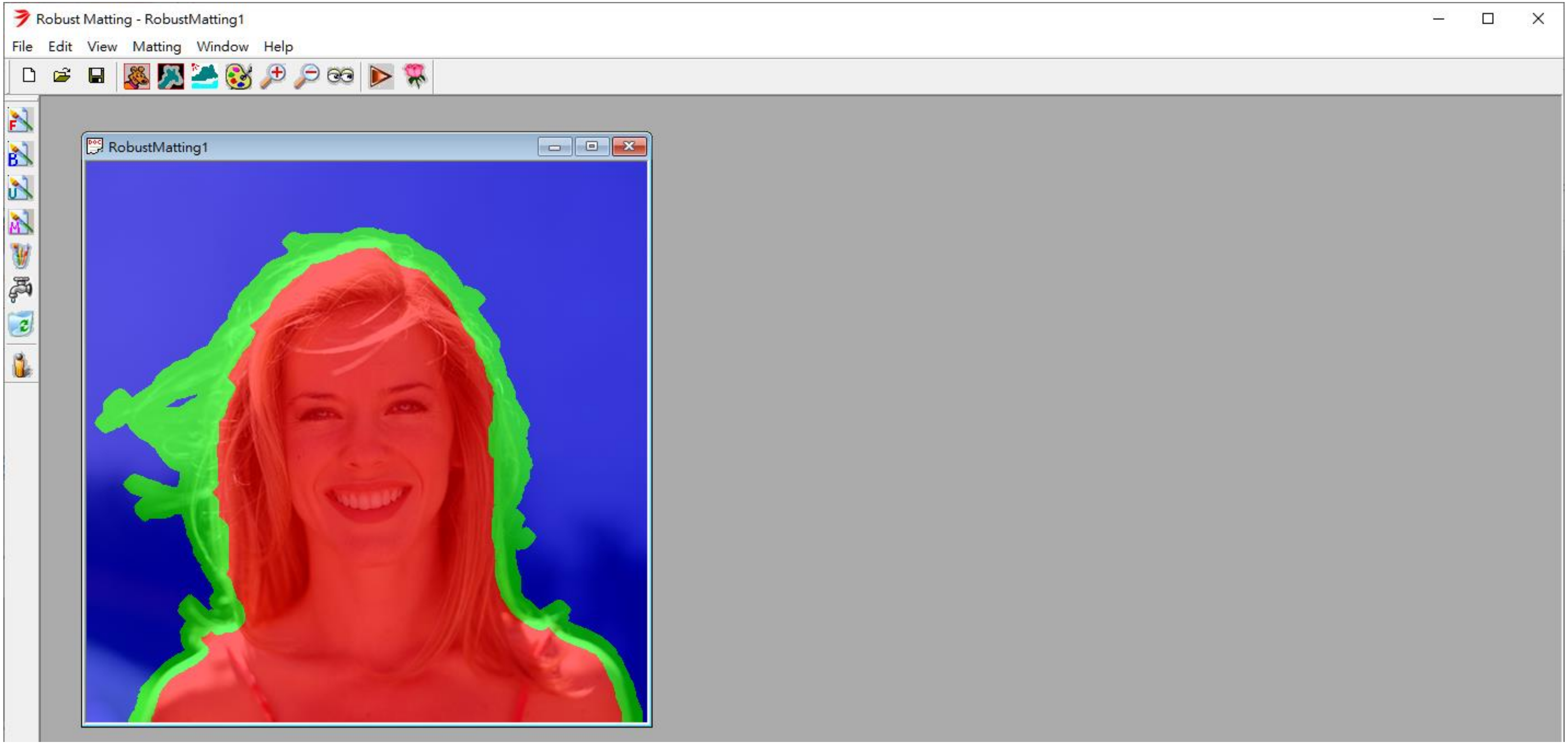
Matting

trimap

- Trimap製作困難且耗時，且品質不好衡量
- 製作方式
  - 目前無法全自動生成trimap
  - 小畫家
- RobustMatting
  - https://www.juew.org/projects/RobustMatting/index.html
  - https://github.com/foamliu/Deep-Image-Matting/files/2844890/RobustMatting_1.45.zip

Matting

trimap



Matting method

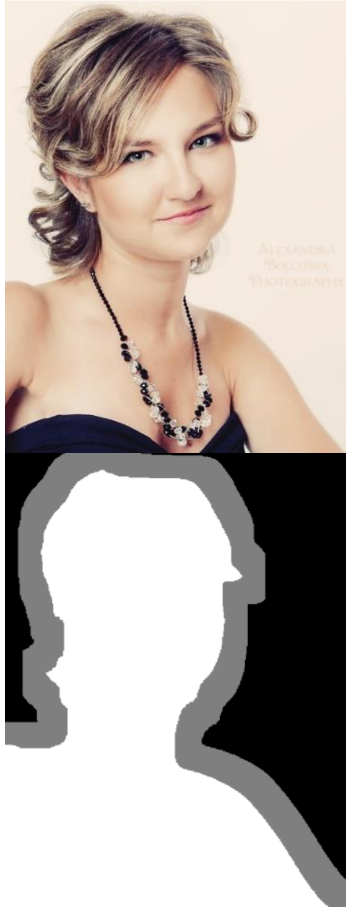
http://alphamatting.com/eval_25.php

Sum of Absolute Differences	overall rank	avg. small rank	avg. large rank	avg. user rank	Troll (Strongly Transparent) Input			Doll (Strongly Transparent) Input			Donkey (Medium Transparent) Input			Elephant (Medium Transparent) Input			Plant (Little Transparent) Input			Pineapple (Little Transparent) Input			Plastic bag (Highly Transparent) Input			Net (Highly Transparent) Input		
					small	large	user	small	large	user	small	large	user	small	large	user	small	large	user	small	large	user	small	large	user	small	large	user
AdaMatting	**4.9**	4.3	3.9	6.5	10.2 6	11.1 7	10.8 6	4.9 6	5.4 5	6.6 9	3.6 8	3.4 3	3.4 11	**0.9** 1	**0.9** 1	1.8 3	**4.7** 1	**6.8** 1	9.3 9	**2.2** 1	**2.6** 1	**3.3** 1	19.2 10	19.8 12	18.7 12	**17.8** 1	**19.1** 1	**18.6** 1
SampleNet Matting	**5.3**	4	4.5	7.4	9.1 3	9.7 3	9.8 3	**4.3** 1	**4.8** 1	**5.1** 1	3.4 7	3.7 7	3.2 8	0.9 2	1.1 3	2 6	5.1 2	6.8 2	9.7 12	2.5 3	4 7	3.7 3	18.6 9	19.3 9	19.1 15	20 5	21.6 4	23.2 11
GCA Matting	**5.8**	6.4	3.5	7.5	**8.8** 1	9.5 2	11.1 8	4.9 5	4.8 2	5.8 5	3.4 6	3.7 5	3.2 7	1.1 8	1.2 4	**1.3** 1	5.7 9	6.9 3	**7.6** 1	2.8 5	3.1 2	4.5 10	18.3 6	19.2 5	18.5 10	20.8 11	21.7 5	24.7 18
FE2E High-Quality Matting	**6.1**	5	6.5	6.8	10.1 5	11.1 5	9.3 2	5.5 11	6.4 9	6.9 11	3.4 5	3.7 6	3.2 6	1 4	1.7 7	1.9 4	5.7 8	7.8 11	11 17	2.5 2	3.8 5	3.8 4	17.3 2	18.4 3	17.4 8	19.6 3	21.8 6	20.2 2
VDRN Matting	**7**	8.5	6.4	6.1	8.9 2	**9.4** 1	**9.3** 1	5.2 8	5.6 7	6.6 8	2.8 2	3.3 2	**2.7** 1	1.8 20	1.9 9	2 5	5.7 7	7.1 5	8.3 2	3 6	3.5 4	3.6 2	17.6 3	18.3 2	16.9 5	23.2 20	25.9 21	26.5 25
Deep Matting	**7.3**	8.4	6.5	7	10.7 9	11.2 9	11 7	4.8 4	5.8 8	5.6 3	**2.8** 1	**2.9** 1	2.9 2	1.1 5	1.1 2	2 7	6 18	7.1 6	8.9 5	2.7 4	3.2 3	3.9 5	19.2 11	19.6 11	18.7 11	21.8 15	23.9 12	24.1 16
Information-flow matting	**8.8**	9.6	9	7.6	10.3 7	11.2 8	12.5 11	5.6 15	7.3 13	7.3 14	3.8 9	4.1 9	3 4	1.4 9	2.3 10	2 9	5.9 15	7.1 7	8.6 3	3.6 10	5.7 10	4.6 11	18.3 5	19.3 8	15.8 2	20.2 7	22.2 7	22.3 7
IndexNet Matting	**9.9**	12	8.3	9.4	12.6 25	13.4 11	11.4 9	4.8 3	4.9 3	5.7 4	3.3 4	4 8	3 3	1.1 6	1.5 6	1.6 2	6.4 22	7.5 10	8.9 6	3.4 7	4 6	4.1 6	18.6 8	19.1 4	18.5 9	23.4 21	25.1 18	29.3 36
DCNN Matting	**10.5**	12.3	8.6	10.8	12 19	14.1 13	14.5 17	5.3 9	6.4 10	6.8 10	3.9 11	4.5 11	3.4 10	1.6 15	2.5 11	2.2 12	6 17	6.9 4	9.1 7	4 13	6 11	5.3 13	19.9 12	19.2 7	19.1 14	19.4 2	20 2	21.2 3
AlphaGAN	**11.4**	12.1	11.4	10.8	9.6 4	10.7 4	10.4 5	4.7 2	5.3 4	5.4 2	3.1 3	3.7 4	3.1 5	1.1 7	1.3 5	2 8	6.4 24	8.3 19	9.3 10	3.6 9	5 8	4.3 8	20.8 13	21.5 14	20.6 20	25.7 35	28.7 33	26.7 28
Context-aware Matting	**13.5**	17.3	11.1	12.1	10.4 8	11.1 6	10.1 4	6.4 25	7.4 16	7.1 12	4.1 12	4.5 12	3.8 17	2.3 35	3.1 13	3 28	7.1 31	8.2 17	9.1 8	3.5 8	5.5 9	4.1 7	18.3 7	19.2 6	16.5 4	21.1 12	23.3 10	24.6 17
Three-layer graph matting	**15.5**	11.8	13	21.8	10.7 10	15.2 14	13.8 14	4.9 7	5.6 6	8.1 26	3.9 10	4.4 10	3.6 14	1 3	1.8 8	3 26	5.9 13	7.3 9	12.4 26	4.2 16	8 18	8.5 35	24.2 27	25.6 28	24.2 28	20.5 8	23.5 11	22.2 5
ATPM Matting	**18**	21.1	20	12.8	14 36	17.8 21	13.4 12	5.5 10	6.4 11	7.3 15	5.4 43	6.4 38	4.3 31	1.7 18	3.3 18	2.3 15	6.8 28	8 14	8.7 4	4.2 14	7.5 15	5.5 14	**17.2** 1	**17.6** 1	**15.7** 1	22.6 19	37.3 42	22.8 10
Three Stages Matting	**18.8**	18.3	18.9	19.1	11.7 18	13.9 12	13.9 15	5.6 12	7.4 15	7.9 20	4.6 24	5.5 25	4.2 26	2.2 31	4 25	3.1 31	6.5 25	11 36	11.9 21	4 11	6.5 12	4.5 9	23.3 21	23.2 23	22.3 23	19.6 4	20.8 3	22.4 8
CSC Matting	**20**	23.5	16.1	20.5	13.6 33	15.6 15	14.5 16	6.2 23	7.5 17	8.1 27	4.6 25	4.8 14	4.2 29	1.8 22	2.7 12	2.5 17	5.5 6	7.3 8	9.7 11	4.6 20	7.6 16	6.9 23	23.7 23	23 21	21 21	26.3 36	27.2 26	25.2 20
LNSP Matting	**20.3**	16.5	20.5	23.9	12.2 20	22.5 39	19.5 44	5.6 13	8.1 19	8.8 36	4.6 22	5.9 30	3.6 13	1.5 12	3.5 21	3.1 30	6.2 19	8.1 16	10.7 16	4 12	7.1 13	6.4 19	21.5 16	20.8 13	16.3 3	22.5 18	24.4 13	27.8 30
Graph-based sparse matting	**21.1**	21.6	21.8	19.9	12.6 26	20.5 31	14.8 21	5.7 17	7.3 12	6.4 7	4.5 20	5.3 21	3.7 15	1.4 11	3.3 19	2.3 14	6.3 21	7.9 12	11.1 18	4.2 15	8.3 21	6.4 18	28.7 40	31.3 41	27.1 37	23.6 23	25.1 17	27.3 29
Patch-based Matting	**21.4**	15.6	23.5	25	10.9 12	19 25	15.7 27	6 20	9.5 33	8.3 29	4.3 16	5.2 18	4.2 28	1.6 14	3.2 16	2.6 18	5.2 3	9 24	12.4 23	4.7 21	9.7 28	7 24	21.6 17	21.7 15	24.9 30	23.5 22	28.1 29	25.6 21
KL-Divergence Based Sparse Sampling	**21.5**	20	21.3	23.3	11.6 17	17.5 20	14.7 18	5.6 14	8.5 24	8 22	4.9 36	5.3 19	3.7 16	1.5 13	3.5 20	2.1 10	5.8 11	8.3 18	14.1 34	5.6 31	9.3 26	8 31	24.6 28	27.7 35	28.9 40	20.7 10	22.7 8	23.9 15
TSPS-RV Matting	**22.8**	21	22.5	24.9	11.3 16	16.4 18	13.7 13	6.1 21	8.1 21	8.6 33	4.5 18	5.4 23	4.1 25	1.4 10	3.3 17	3.5 40	7.9 39	8.9 22	12.4 25	6.2 35	9 24	8.7 37	22.8 20	23.5 24	21.4 22	20.7 9	28.5 31	22.2 4
Iterative Transductive Matting	**23.5**	24.5	23.5	22.4	13.1 30	17.2 19	15.6 26	5.7 16	8.6 26	7.8 19	5.1 39	5.5 24	3.9 18	1.9 23	5.8 36	2.6 19	6.6 26	8.5 20	13.8 33	5.4 26	10 29	7.4 28	25.5 30	24 25	23.8 27	20.1 6	22.7 9	22.7 9
Comprehensive sampling	**23.8**	20.6	24.3	26.6	11.2 15	18.5 24	14.8 19	6.5 29	9.5 32	8.9 38	4.5 19	4.9 15	4.1 24	1.7 17	3.1 15	2.3 16	5.4 5	9.8 28	13.4 31	5.5 29	11.5 35	7.4 30	23.9 25	22 17	22.8 24	23.8 26	28 28	28.1 31
SVR Matting	**24**	26.8	24.3	20.9	18.7 48	30.7 50	19.1 41	6.8 35	7.7 18	7.6 18	4.7 31	5 17	3.4 9	1.9 24	4.7 28	2.9 24	5.8 10	8.7 21	10.5 13	4.3 17	8 19	5.6 16	21.2 15	22.1 18	17.1 7	25.6 34	26.1 23	30.6 39
Comprehensive Weighted Color and Texture	**24.4**	23.9	25.6	23.8	14.6 37	16 16	15.7 28	6.8 34	10 36	7.9 21	4.3 15	5 16	4.1 22	1.7 16	3.5 22	2.2 11	5.4 4	9.9 30	12.8 29	4.3 18	7.4 14	5.2 12	28.3 39	28.1 36	25.4 33	24 28	30.2 35	28.7 34
Sparse coded matting	**24.8**	28	25.6	20.8	13.7 34	25.8 46	14.8 22	6.4 26	8.2 22	6.2 6	4.7 26	5.4 22	4 20	1.8 21	3.1 14	2.3 13	5.9 14	8 15	10.6 14	4.5 19	8 17	5.5 15	30.3 42	33.1 44	29.2 41	27.7 42	27.2 25	29 35
LocalSamplingAndKnnClassification	**26.4**	28.9	24.4	26	12.6 24	16 17	12.4 10	5.8 18	8.1 20	8 23	4.5 21	5.5 26	4.1 21	2.2 32	5.1 31	3.4 38	8.1 40	10.5 32	15.6 39	7.3 39	12.3 38	9.4 38	24.1 26	21.8 16	19.7 16	24.7 31	24.8 15	25.9 23
Weighted Color and Texture Matting	**27**	24.5	29.3	27.3	13.1 31	17.8 22	15.8 29	6.5 28	9.4 30	8.6 32	4.2 14	4.7 13	3.9 19	1.7 19	6 37	2.7 20	6.4 23	11 35	16.3 40	4.8 22	9.1 25	6.5 20	23.7 22	24.8 27	23.2 25	26.5 37	40.2 45	28.5 33

Matting method

- Deep Image Matting
  - https://github.com/huochaitiantang/pytorch-deep-image-matting
- Indexnet matting
  - https://github.com/poppinace/indexnet_matting/
- Fusion Matting
  - https://github.com/yunkezhang/FusionMatting
- KNN-matting
  - https://github.com/MarcoForte/knn-matting
- bayesian-matting
  - https://github.com/MarcoForte/bayesian-matting/
- learning-based-matting
  - https://github.com/MarcoForte/learning-based-matting
- poisson-matting
  - https://github.com/MarcoForte/poisson-matting
- mishima-matting
  - https://github.com/MarcoForte/mishima-matting
- closed-form-matting
  - https://github.com/MarcoForte/closed-form-matting

Matting result



bayesian	closed form	deep matting	ifm	indexnet
knn	learning based	lkm	mishima	poisson

Matting
方法比較

deeplabV3+

deep matting

圖片去背種類

Segmentation

- 對每個像素的語義理解，並得到該像素分類結果
- 較難滿足標的物邊緣高精度的切割效果

Matting

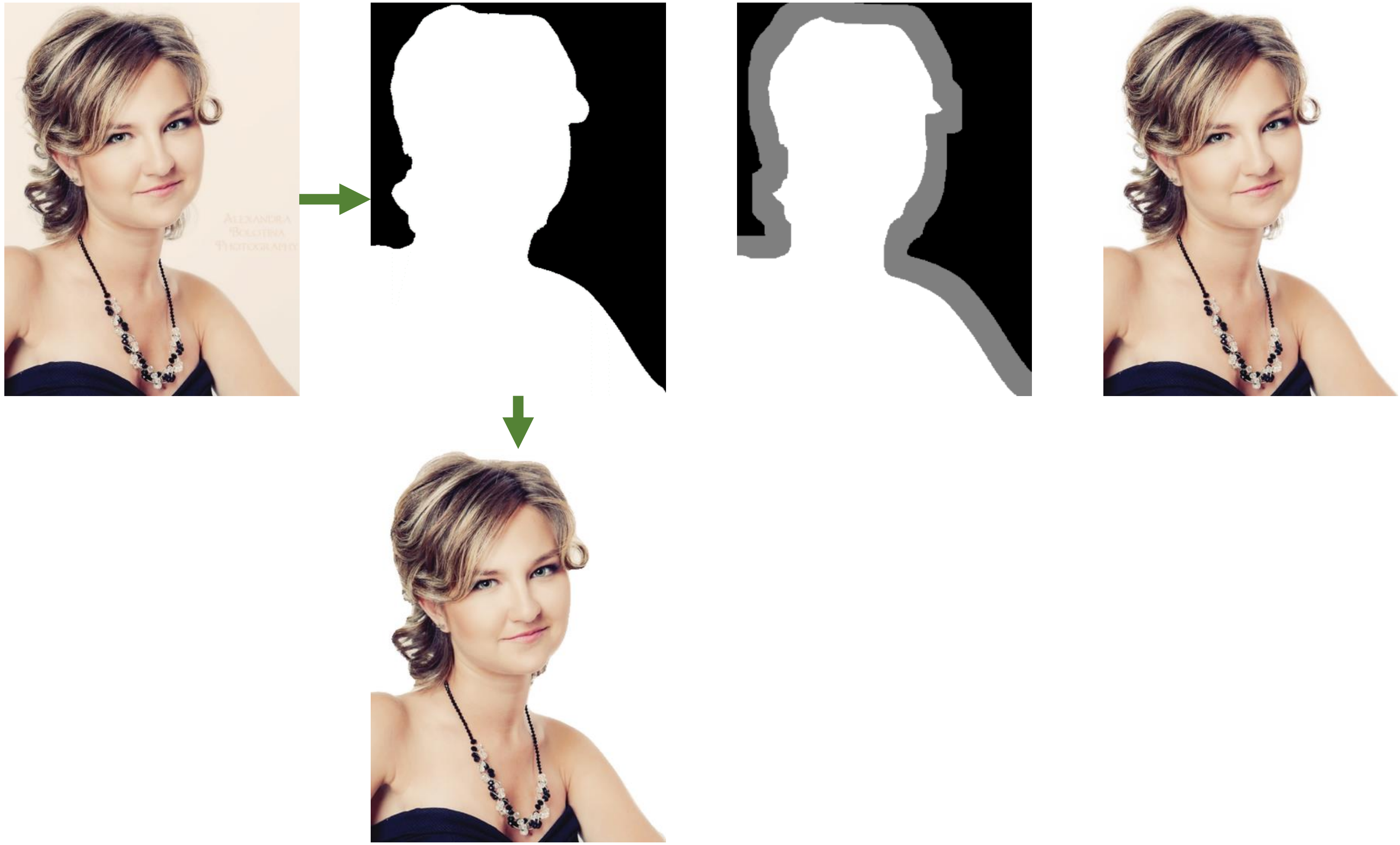
- 找出前景與背景的顏色，以及它們之間的融合程度，邊緣分割效果自然
- 人工耗時繪製「trimap」

Auto Hair

- Segmentation與Matting的結合
- Segmentation：DeepLab V3+
- Matting：deep matting

Auto Hair
introduction

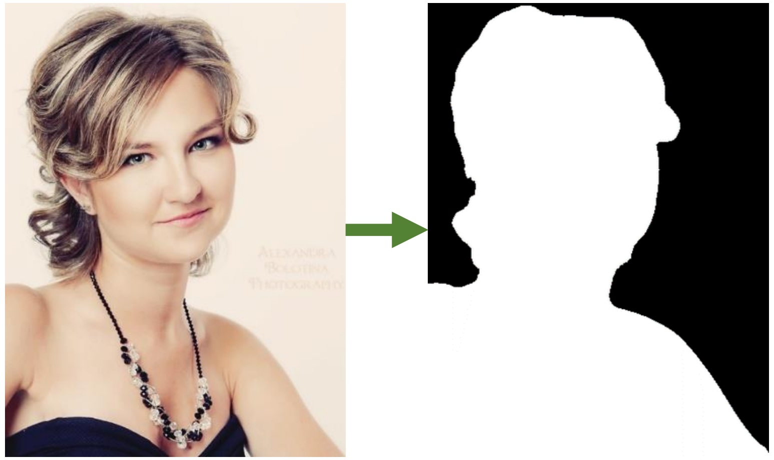
DeepLab v3+ → Extract Mask → Automatic Trimap Generator → Deep Image Matting

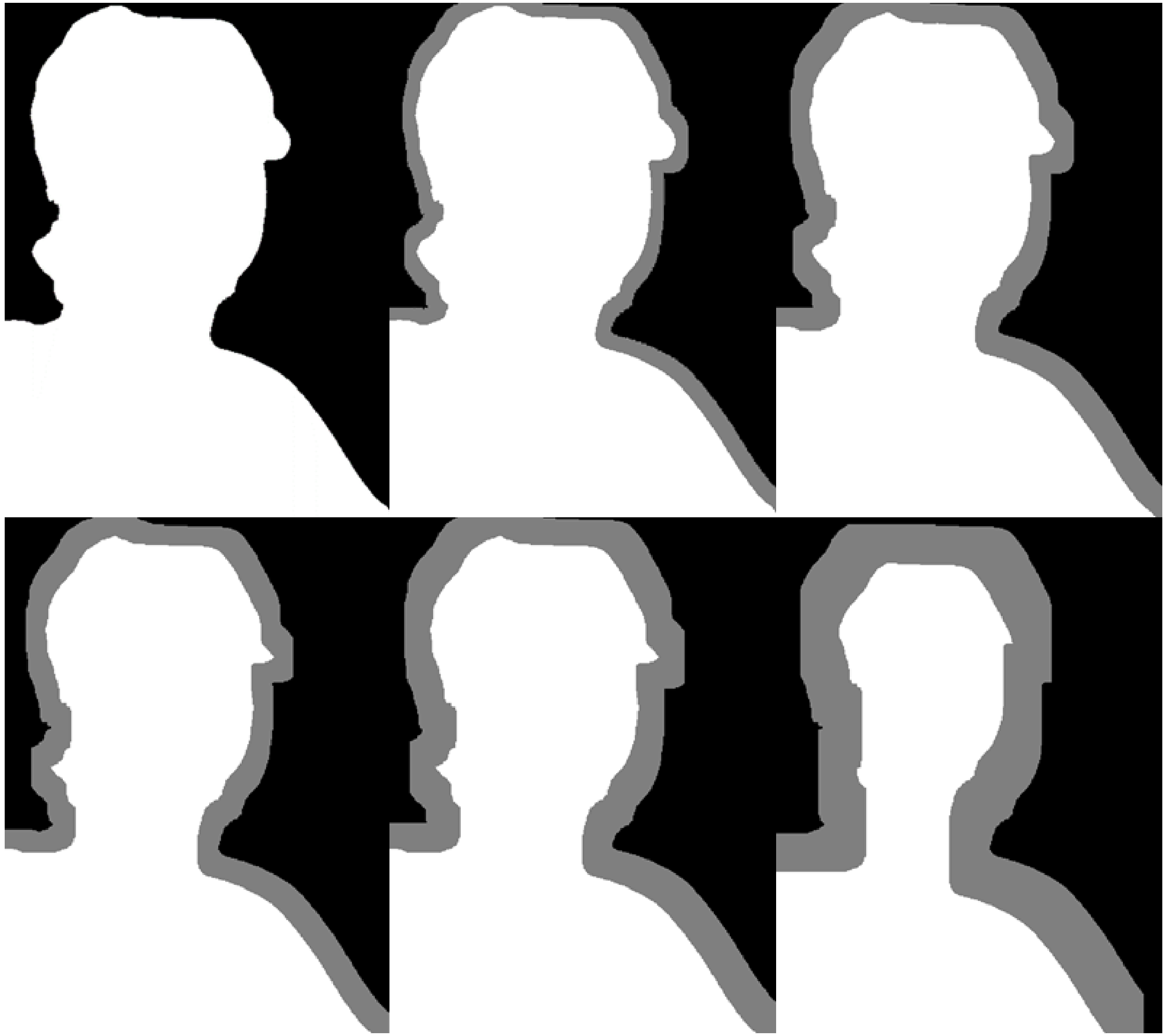


Automatic Trimap

- Automatic Trimap Generator
  - https://github.com/lnugraha/trimap_generator
  - trimap_module.py
- Deep-Image-Matting
  - https://github.com/foamliu/Deep-Image-Matting
  - data_generator.py
- unet-gan-matting
  - https://github.com/eti-p-doray/unet-gan-matting
  - combine.py
- Semantic Human Matting
  - https://github.com/lizhengwei1992/Semantic_Human_Matting
  - gen_trimap.py

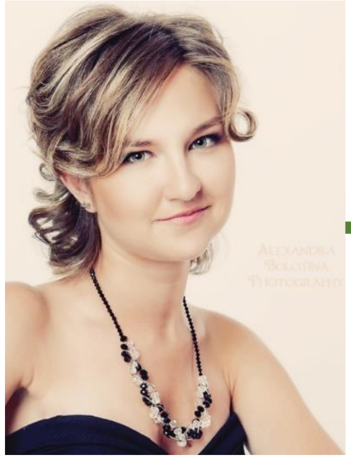
Auto Hair
Automatic Trimap

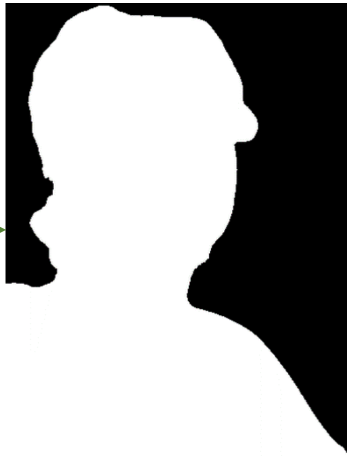




不內縮不外擴	不內縮外擴20	內縮10外擴30
內縮20外擴30	內縮20外擴40	內縮50外擴60

Auto Hair
Automatic Trimap





不內縮不外擴	不內縮外擴20	內縮10外擴30
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Auto Hair
方法比較

Segmentation

Auto Hair

圖片去背種類

Segmentation

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- 較難滿足標的物邊緣高精度的切割效果

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- 找出前景與背景的顏色，以及它們之間的融合程度，邊緣分割效果自然
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Auto Hair

- Segmentation與Matting的結合
- Segmentation：DeepLab V3+
- Matting：deep matting

開源程式碼示範

資料來源

- Auto Hair
  - https://github.com/openaifab/Auto-Hair
- Segmentation
  - https://github.com/tensorflow/models/tree/master/research/deeplab
- Matting
  - https://github.com/huochaitiantang/pytorch-deep-image-matting
- Trimap
  - https://github.com/lnugraha/trimap_generator

開源程式碼示範

Auto Hair 教學

- Github
  - https://github.com/openaifab/Auto-Hair
- 步驟
  - 先於 Github 網址中下載 Auto Hair 原始碼
  - 下載其他開發者已訓練完成 deeplabV3+ 的模型
    - http://download.tensorflow.org/models/deeplabv3_pascal_trainval_2018_01_04.tar.gz
  - 下載其他開發者已訓練完成 deep matting 的模型
    - https://github.com/huochaitiantang/pytorch-deep-image-matting/releases/download/v1.4/stage1_sad_54.4.pth
  - 安裝所需套件：「tensorflow」、「torch」、「torchvision」與「opencv」

開源程式碼示範
Auto Hair 教學

- 開啟 jupyter notebook
- 打開 demo.ipynb

安裝套件

In [ ]:
```
#!pip install tensorflow==1.14
#!pip install torch
#!pip install torchvision
#!pip install opencv-python
```

匯入套件與函數

In [1]:
```
from matting import matting_result
from deeplabv3plus import deeplabv3plus
from trimap import trimap
import numpy as np
```

...

segmentation

In [2]:
```
result_segmentation = deeplabv3plus('06.jpg')
#result_segmentation = deeplabv3plus('04.jpg')
#result_segmentation = deeplabv3plus('http://i.epochtimes.com/assets/uploads/2016/06/PO_X5716_meitu_1-450x300.jpg',
#                                    website = True)
```

In [3]:
```
# 0:segmentation的結果
result_segmentation[0]
```

...

In [4]:
```
# 1:segmentation產生的mask
result_segmentation[1]
```

...

開源程式碼示範
Segmentation教學

- Github
  - https://github.com/tensorflow/models/tree/master/research/deeplab
- Model
  - https://github.com/tensorflow/models/blob/master/research/deeplab/g3doc/model_zoo.md
- Demo
  - https://github.com/tensorflow/models/blob/master/research/deeplab/deeplab_demo.ipynb

開源程式碼示範

Trimap 教學

- Github
  - https://github.com/huochaitiantang/pytorch-deep-image-matting
- Demo
  - https://github.com/lnugraha/trimap_generator/blob/master/trimap_module.py

開源程式碼示範
Matting 教學

- Github
  - https://github.com/huochaitiantang/pytorch-deep-image-matting
- Demo
  - https://github.com/huochaitiantang/pytorch-deep-image-matting/blob/master/core/demo.py
- Py file
  - https://github.com/huochaitiantang/pytorch-deep-image-matting/tree/master/core

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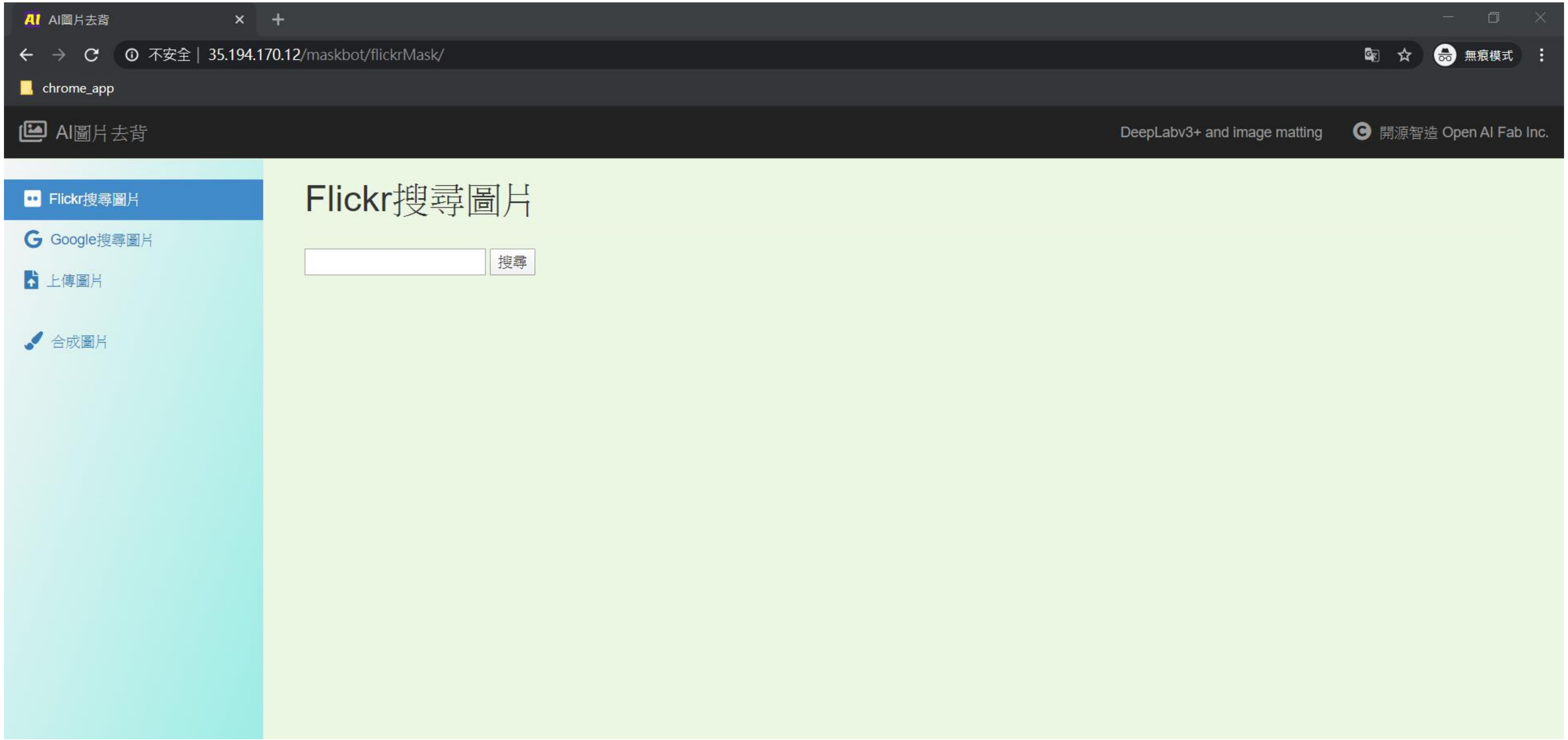
- Trimap
  - https://github.com/lnugraha/trimap_generator

開源程式碼
常遇到的問題

- 環境的架設、環境變數的路徑設定
- 可能沒有開放原始碼
- 有原始碼但沒有訓練好的模型
  - 使用CPU要訓練超級久
- 有原始碼、有訓練好的模型，但程式版本與自己的版本不合
  - Python2 VS. Python3
  - TF 1.14 VS. TF 2.0
  - scipy.misc.imread VS. imageio.imread
- 效果不佳

開源程式碼
前端介面應用

- http://openaifab.com/hair



Contact

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https://www.openaifab.com
https://www.facebook.com/openaifab