OPEN AI FAB

Artificial Intelligence Service Provider

如何利用開源程式碼進行髮絲去背

開源製造 OPEN AI FAB

蕭聖哲 (Jack)

2019/12/02

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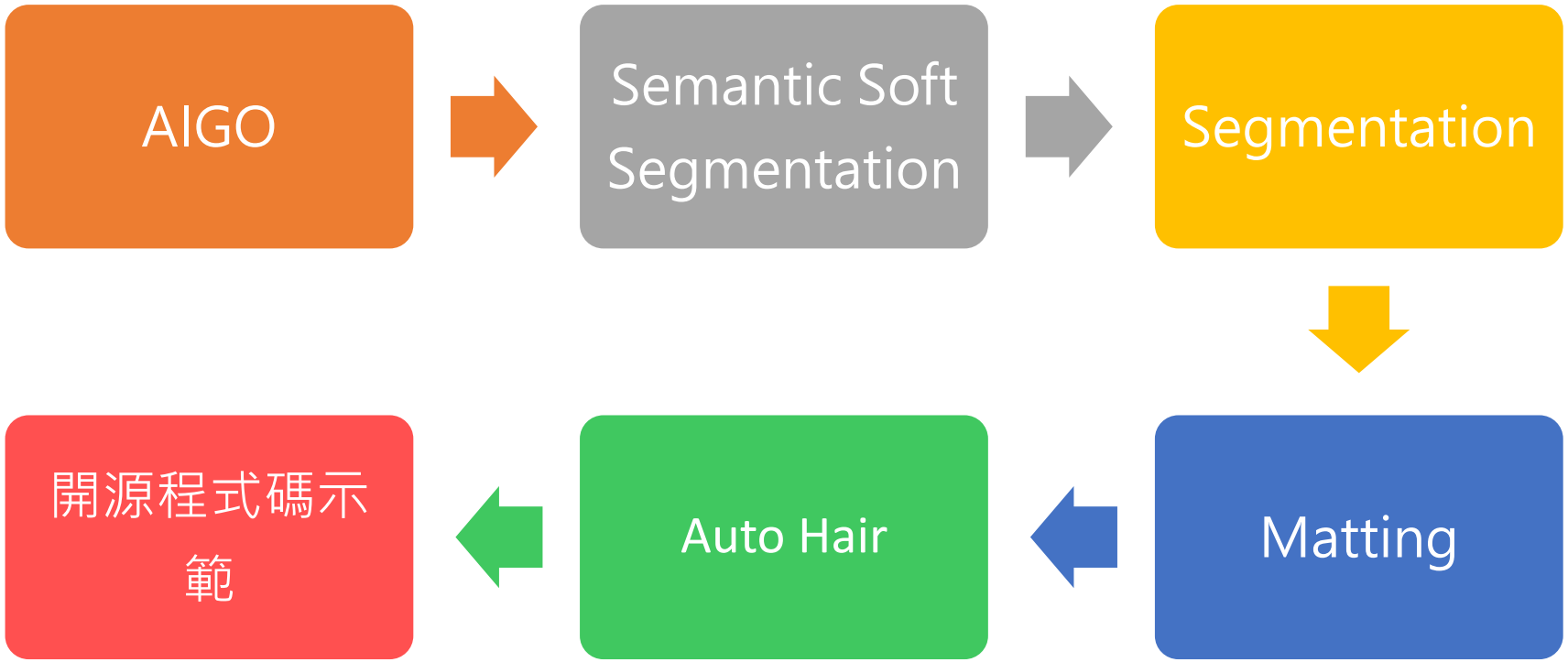

AIGO
Semantic Soft Segmentation
Segmentation
Matting
Auto Hair
開源程式碼示範

AIGO

AI智慧應用新世代人才培育
AI New Generation Talent Training Program

解決企業痛點

由企業直接出題，AI技術團隊申請解題。透過解題團隊與出題企業攜手合作，共同解決企業與產業痛點。

充實AI技術

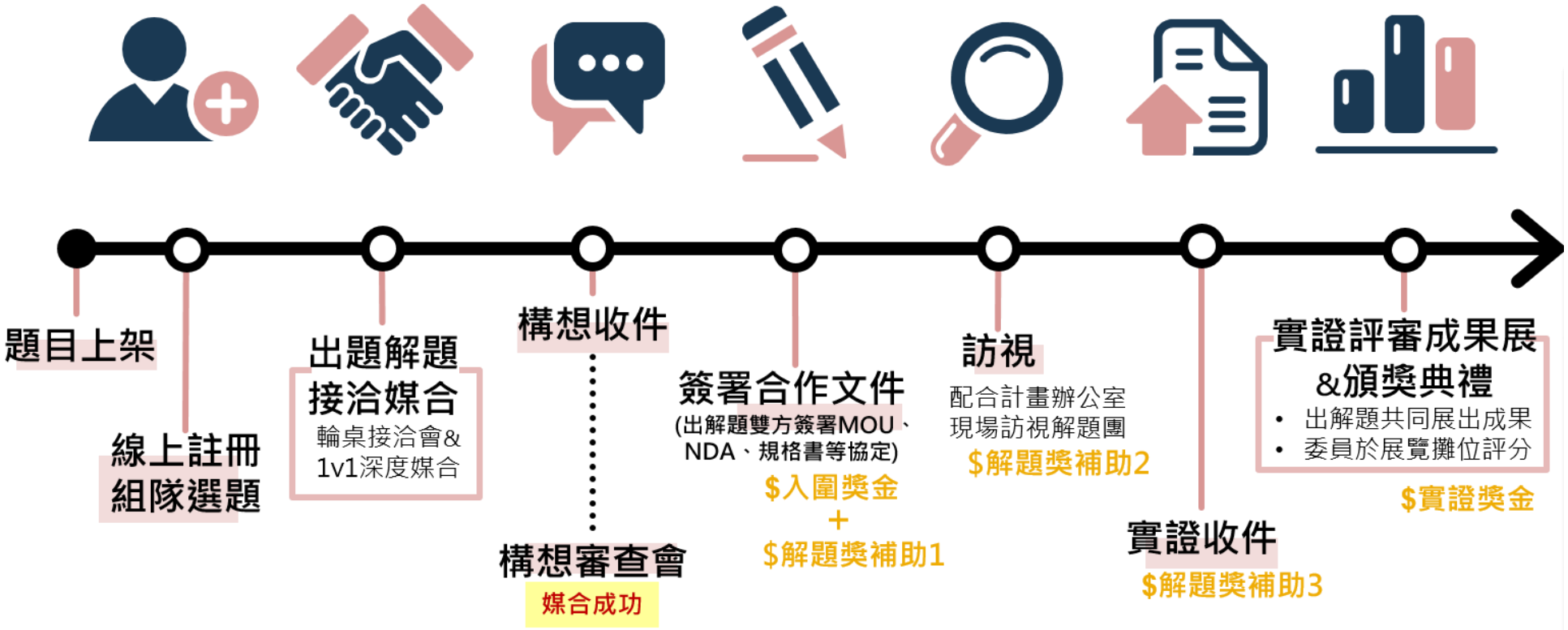
多元主題的線下補助課程與線上免費學習資源，讓你無論在任何時間地點，都能學習最佳新知。

AI人才交流

結合線上與實體互動，在網路社群之外另不定時舉辦線下小聚，促進人才交流、共創AI動能。

https://aigo.org.tw

AIGO



https://aigo.org.tw

AIGO

題目一覽 | 競賽時程 | 申請資格 | 競賽規則 | 獎勵辦法 | 我要出題

篩選

技術領域

- 電腦視覺
- 數據分析
- 自然語言

產業類別

- 工程技術顧問業
- 媒體業
- 網路廣告業
- 社會福利
- 公協會
- 電子業
- 運輸業
- 服務業
- 醫療業
- 教育業
- 製造業
- 物流業
- 零售業

全部出題企業 ▾

Search for... 搜尋

找到 65 個結果

圖片個資偵測系統

國發會於5月24日行政院院會報告因應GDPR施行之相關作為後，賴院長即責成國發會成立「個人資料保護專案辦公室」，行政院已指示未來個人資料保護法制之主政機關與跨部會協調工作也將由「個人資料保護專案辦公室」承接。 請查找圖片(先以JPG和PDF檔為主)內容可辨識個資...

鈊保資訊

(產業)資訊業 (技術)電腦視覺 576 隊伍申請：0-3 歡迎投件

2019-04-01-2019-10-31

以關聯資源和題目的資料結構基礎，建立可自主的適應性深度教學和學習框架

本案主要以老師和學生為主，期望以AI和大數據為基礎，改變教學與學習的機制，以自動化程序協助老師有效率地使用資源庫和題目庫的資料，需對資料賦予定義、程度、範圍、關係等的設

https://aigo.org.tw

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使用影像辨識判斷貨物材積

減少使用人工方式量測貨物材積(目的) 背景：因人工量測很浪費時間，為加速進行批量小貨量測時間，希望能夠使用人工智慧技術來協助此作業。

開始組隊
2019-04-01

報名截止
2019-05-31

競賽結束
2019-10-31

競賽結束

競賽細節　討論區

資料型態

貨物影像與材積資料

額外獎勵誘因

其他：商業合作

出題單位

台灣利威國際物流

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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Facebook社群內容行銷團隊，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

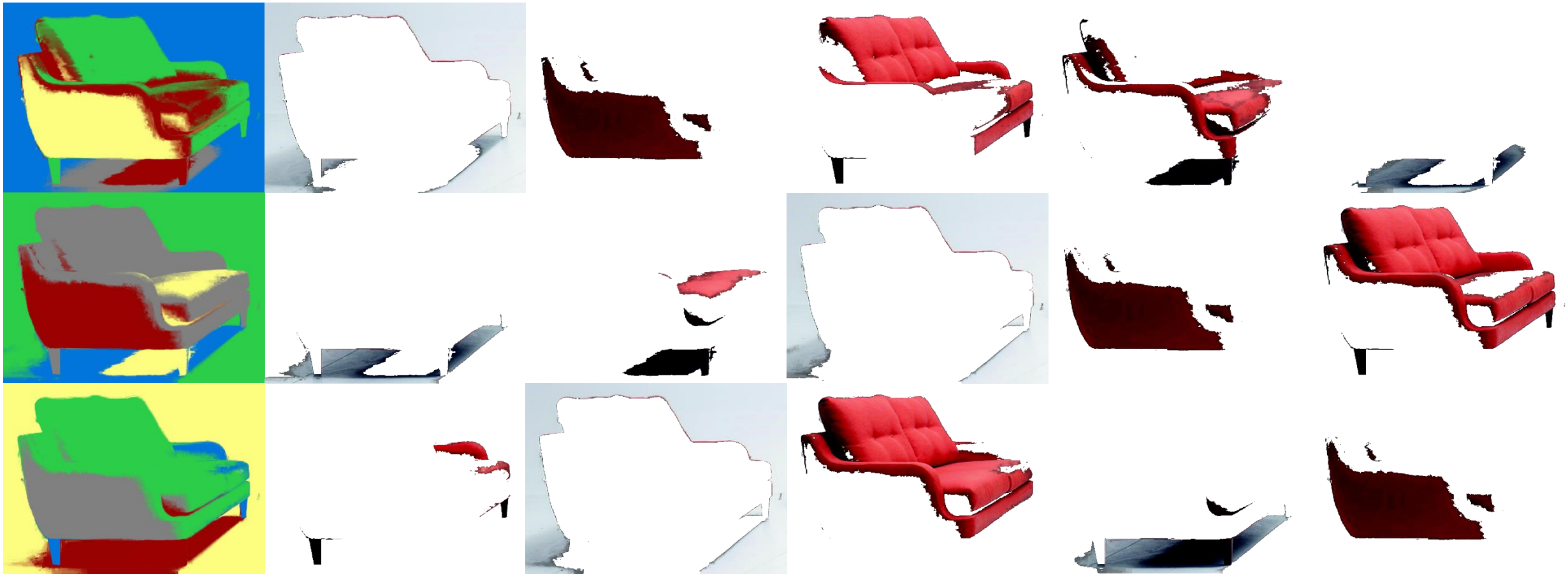
Semantic Soft Segmentation

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

Semantic Soft Segmentation

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

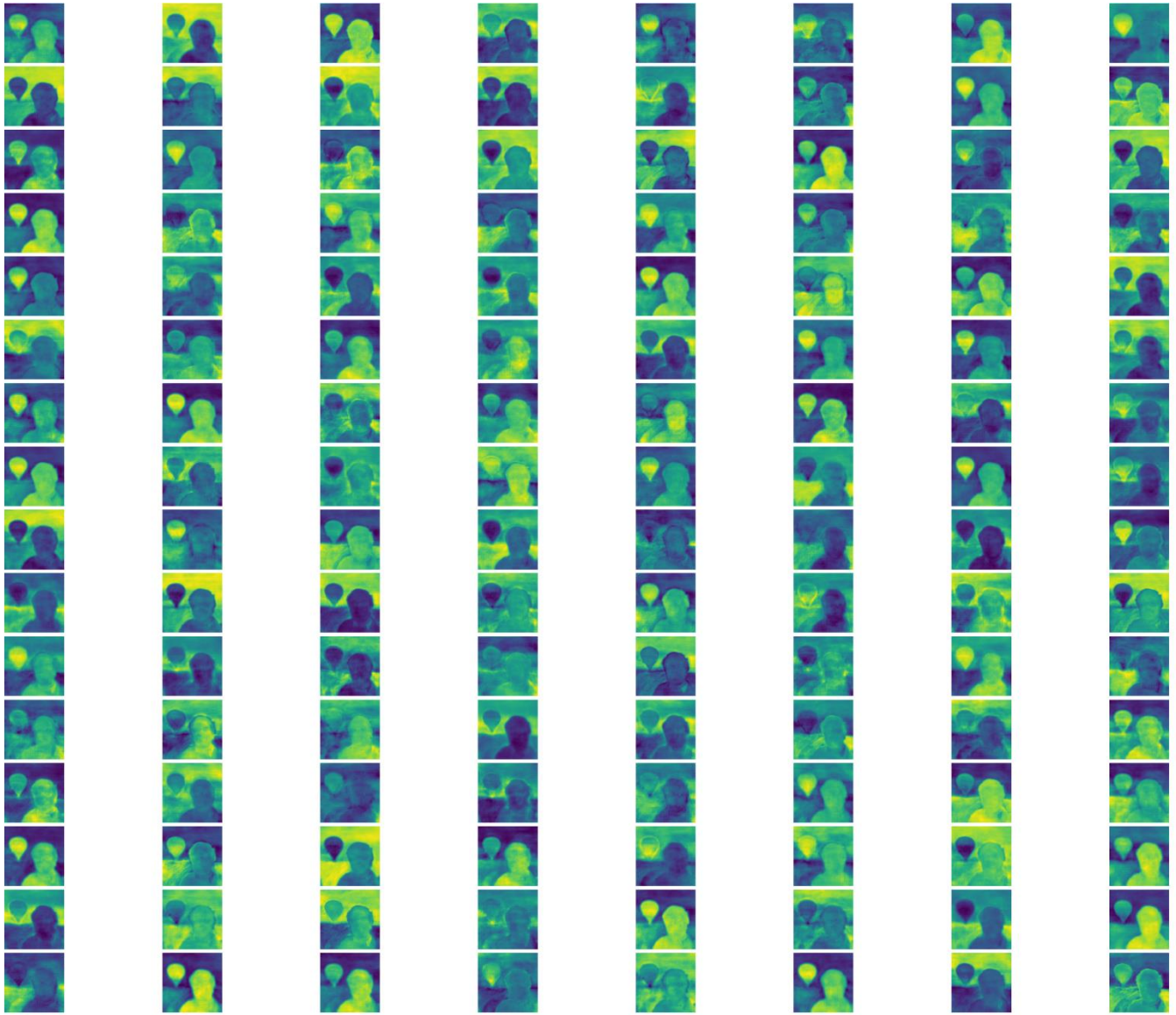
Semantic Soft Segmentation



有時目標物被拆成多個物件

Semantic Soft Segmentation

計算時間長



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

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			

https://github.com/sadeepj/crfasrnn_keras

Segmentation method

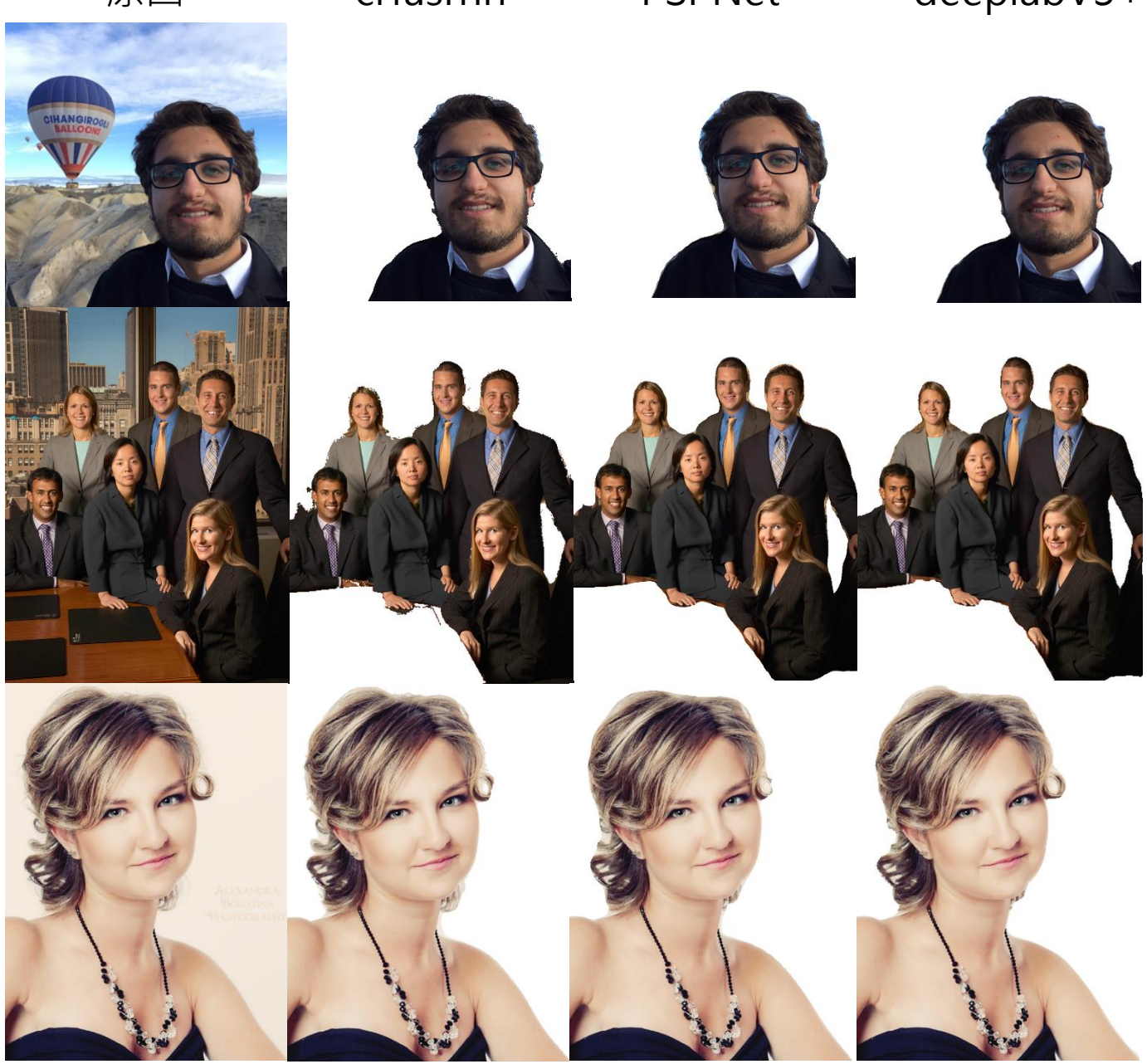
	mean	aero plane	bicycle	bird	boat	bottle	bus	car	cat	chair	cow	dining table	dog	horse	motor bike	person	potted plant	sheep	sofa	train	tv/ monitor	submission date
RecoNet152_coco [?]	**89.0**	97.3	**80.4**	96.5	**83.8**	89.5	97.6	95.4	**97.7**	50.1	**96.8**	82.6	95.1	**97.7**	**95.1**	92.6	80.2	95.2	71.7	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
EncNet [?]	85.9	95.3	76.9	94.2	80.2	85.3	96.5	90.8	96.3	47.9	93.9	80.0	92.4	96.6	90.5	91.5	70.9	93.6	66.5	87.7	80.8	15-Mar-2018

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

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

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

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
train	91.0	90.8	88.8	86.8	73.3	72.1
tv/monitor	84.9	79.3	82.0	74.5	56.2	59.6

Matting introduction

Trimap

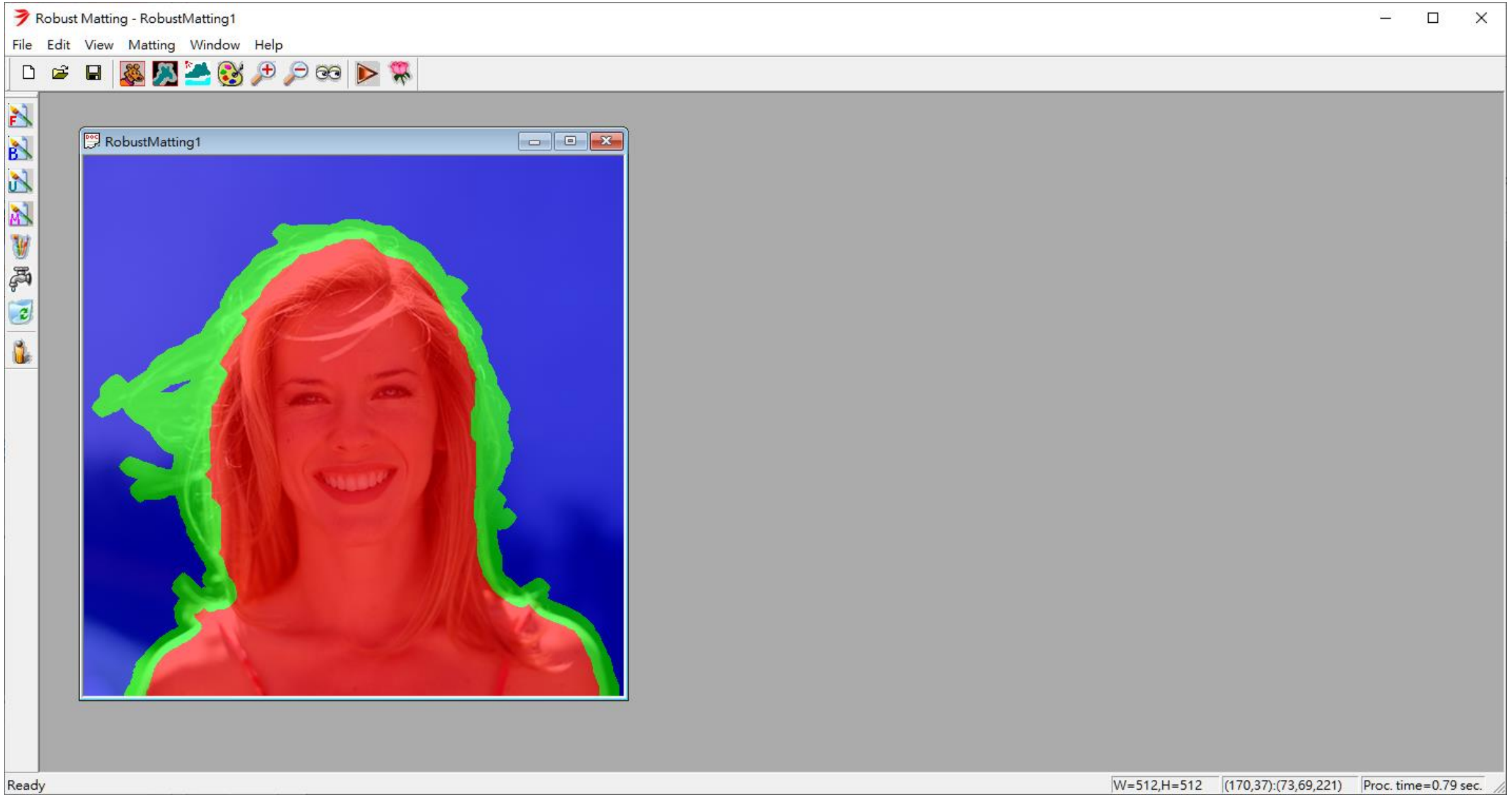
$$I = \alpha \times F + (1 - \alpha) \times B$$

https://github.com/99991/matting

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

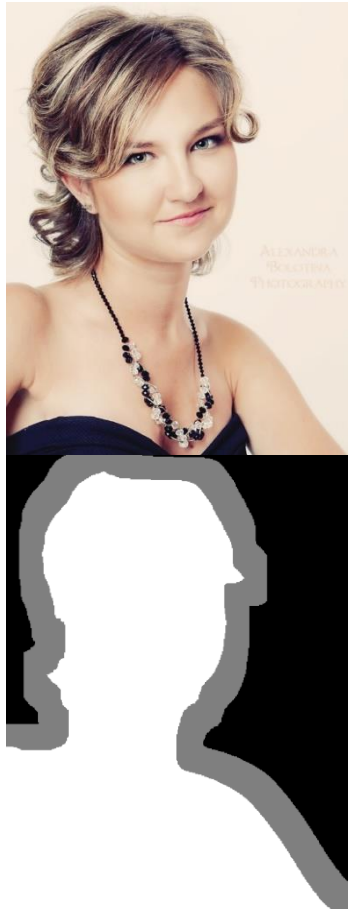
Sum of Absolute Differences	overall	avg. small	avg. large	avg. user	Troll (Strongly Transparent) Input			Doll (Strongly Transparent) Input			Donkey (Medium Transparent) Input			Elephant (Medium Transparent) Input			Plant (Little Transparent) Input			Pineapple (Little Transparent) Input			Plastic bag (Highly Transparent) Input			Net (Highly Transparent) Input		
	rank	rank	rank	rank	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
CCM	**27.3**	30.4	27.3	24.4	13.8 35	20.8 32	16.9 37	6.4 27	8.9 28	8.2 28	4.7 27	5.9 31	3.6 12	2.5 37	4.3 26	3 25	7 30	9 23	10.6 15	4.9 23	8.1 20	5.7 17	25.6 31	27.5 34	24.5 29	25.4 33	26.4 24	28.2 32

http://alphamatting.com/eval_25.php

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
- Lkm 、LFM
  - https://github.com/99991/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

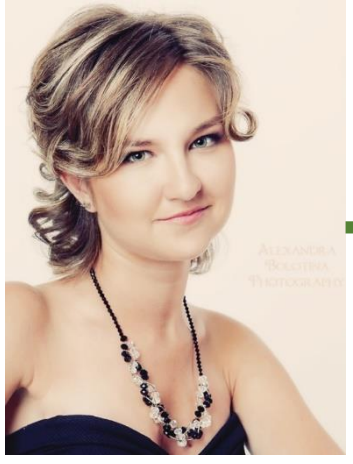
- 找出前景與背景的顏色，以及它們之間的融合程度，邊緣分割效果自然
- 人工耗時繪製「trimap」

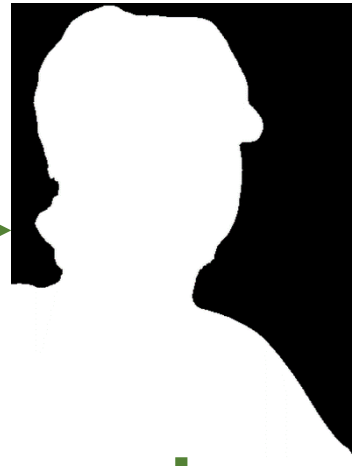
Auto Hair

- **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

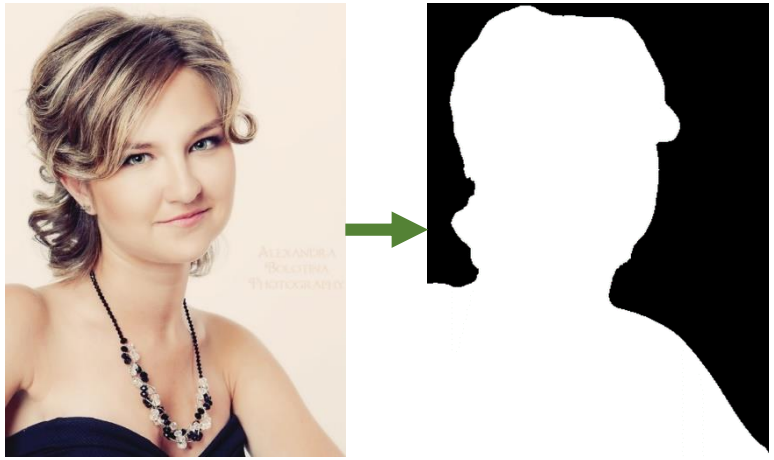


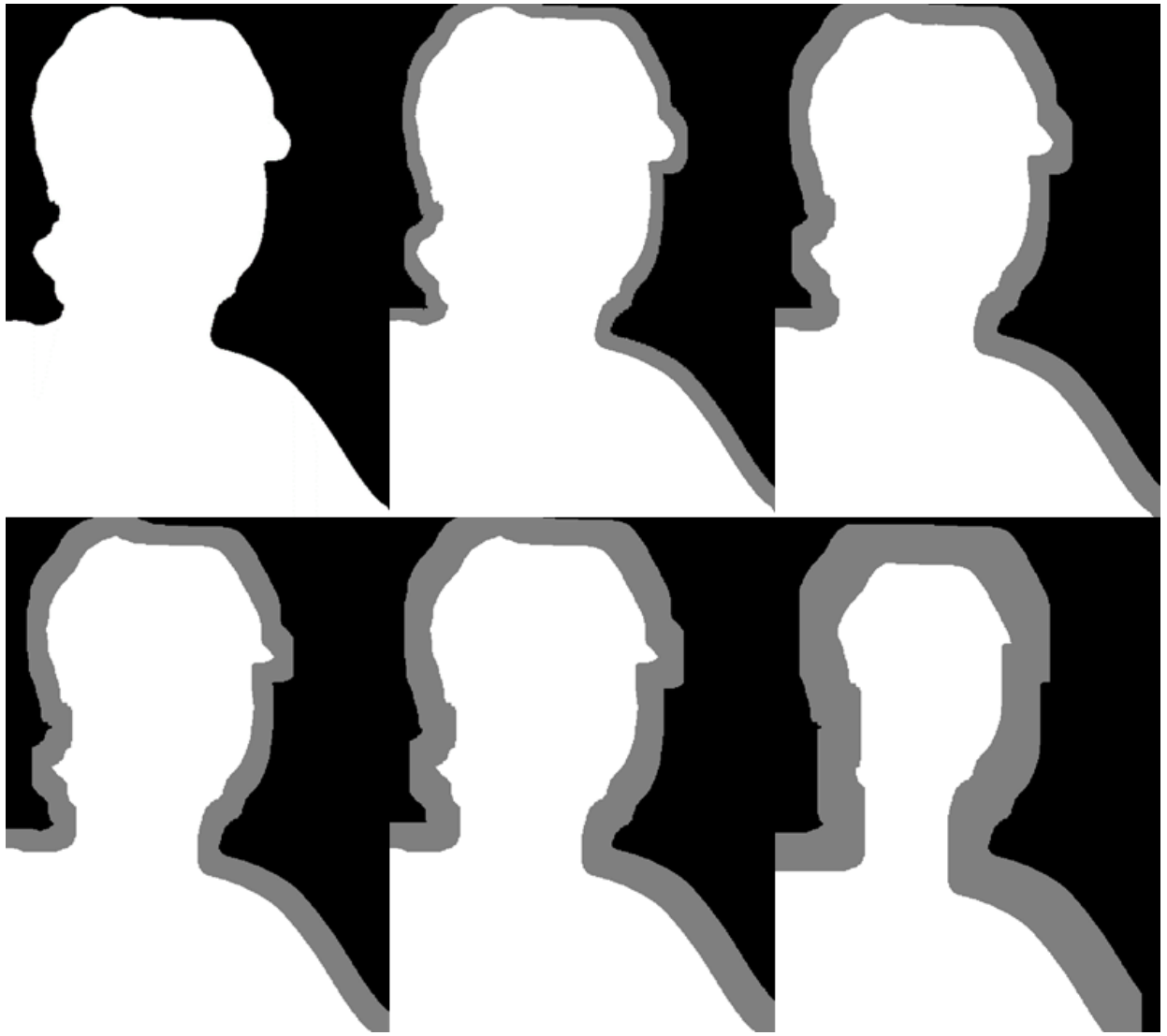


Auto Hair
Automatic Trimap

- 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

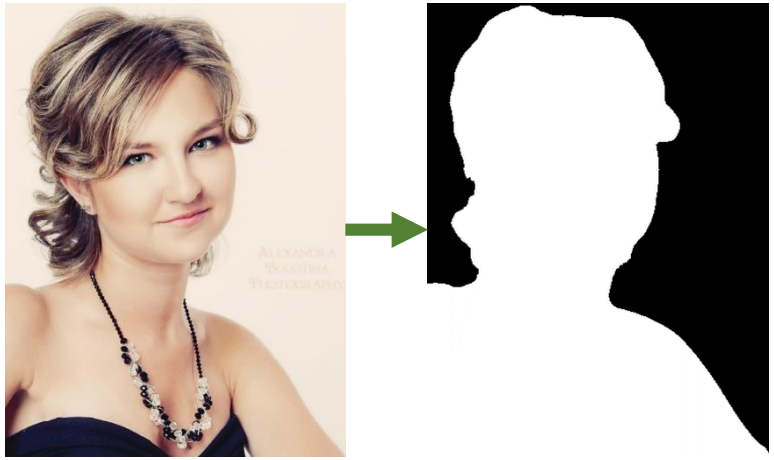
Auto Hair
Automatic Trimap





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



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Auto Hair
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Auto Hair

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- **Segmentation**：DeepLab V3+
- **Matting**：deep matting

開源程式碼
資料來源

- 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
- 整合
  - https://github.com/jack155861/segmentation_rladies_20191202

開源程式碼
常遇到的問題

- Linux 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
生態學的應用

- Artificial intelligence reveals environmental constraints on colour diversity in insects
  - 蛾類的色彩多樣性會隨著海拔下降而增加
  - 分析2萬筆的標本影像(蒐集了六年的蛾類標本)

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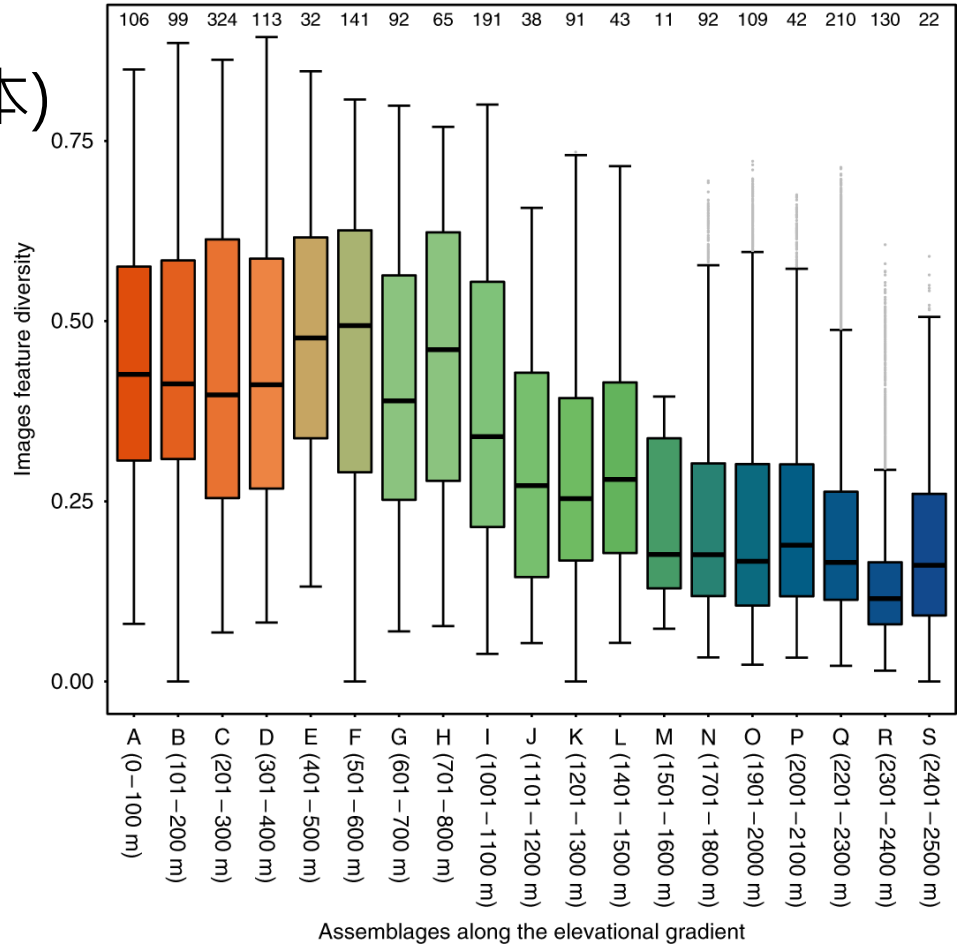

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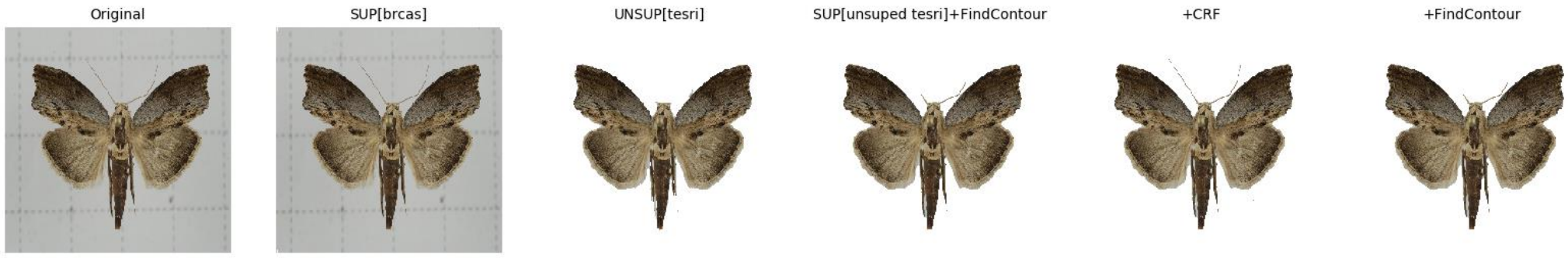
  - 低海拔溫度較高，沒有吸熱需求的限制，蛾的顏色傾向亮而多元
  - 高海拔溫度較低，較暗的體色更容易吸熱，有利在低溫中生存
  - 利用影像預測稀有種分布
- https://github.com/twcmchang/colorful-moth



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OPEN AI FAB

Artificial Intelligence Service Provider

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