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AI 在視覺環境分析之運用

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何立智 2024.3.20

Scene Understanding

- 電腦視覺、心理學中的一個研究次領域。
- 使用電腦，了解環境中的內容（物件辨識）、感受、意義...
- 最顯著的應用在自動駕駛。
- 將環境置換為景觀就是我目前正在做的事情

傳統AI可以給出穩定的答案，我認為
可以跟生成式AI互為補充。

從Deep Learning開始

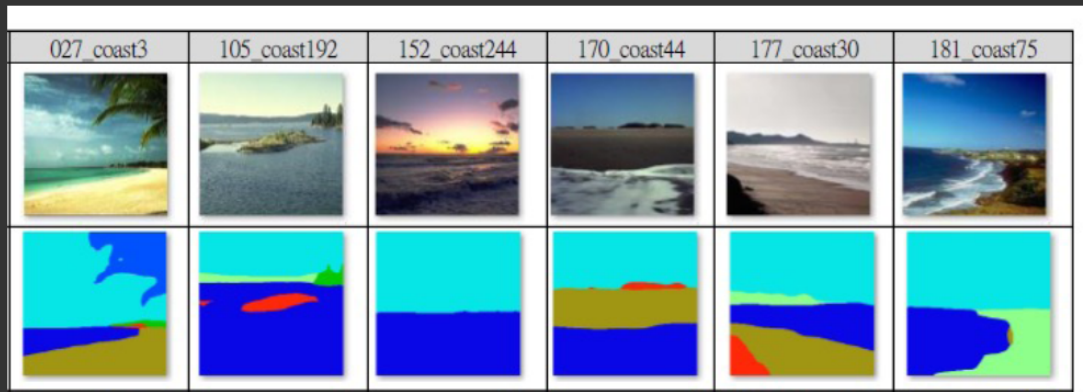
LaDeco (Landscape Decoder) 景觀元素分析軟體



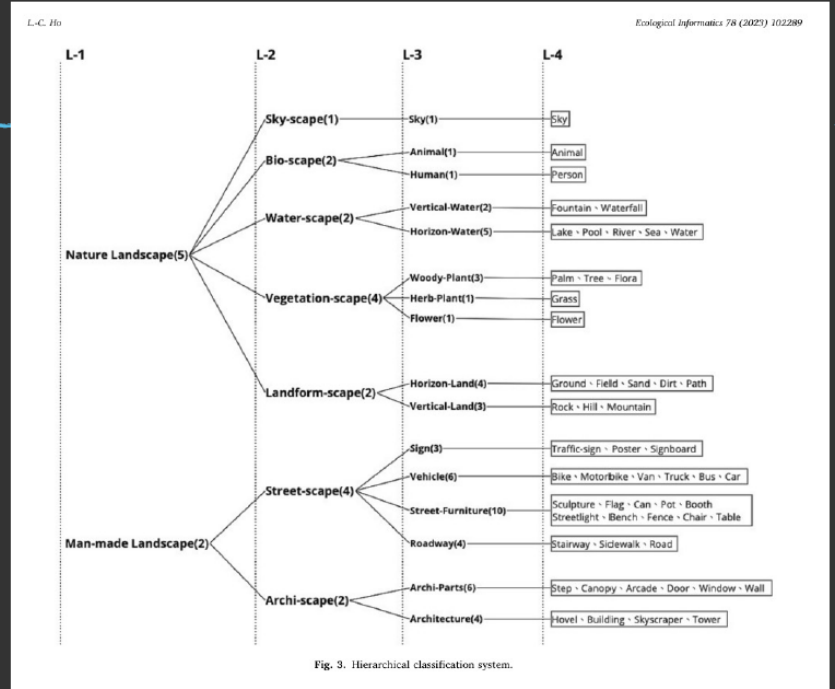
- ◆ 專為景觀元素分析的目的而開發
- ◆ 由150項元素中經專家三角檢測後挑選55項景觀元素
- ◆ 將景觀元素層級化，有系統地進行景觀元素分類

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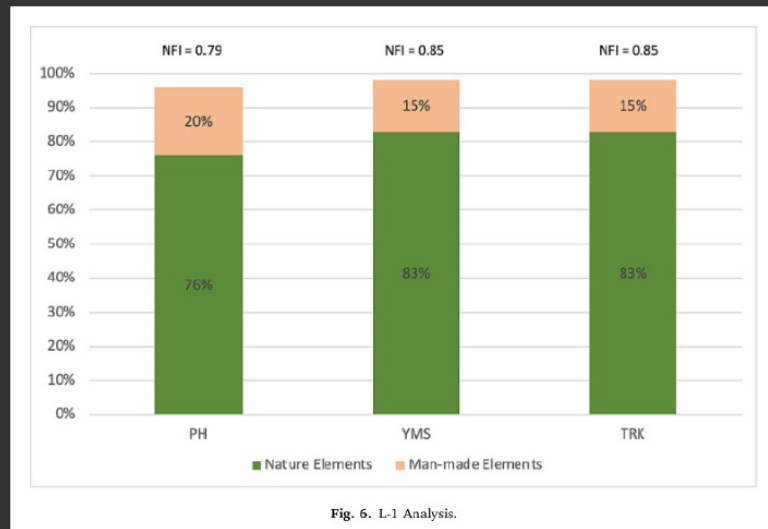
分割結果 (coast)



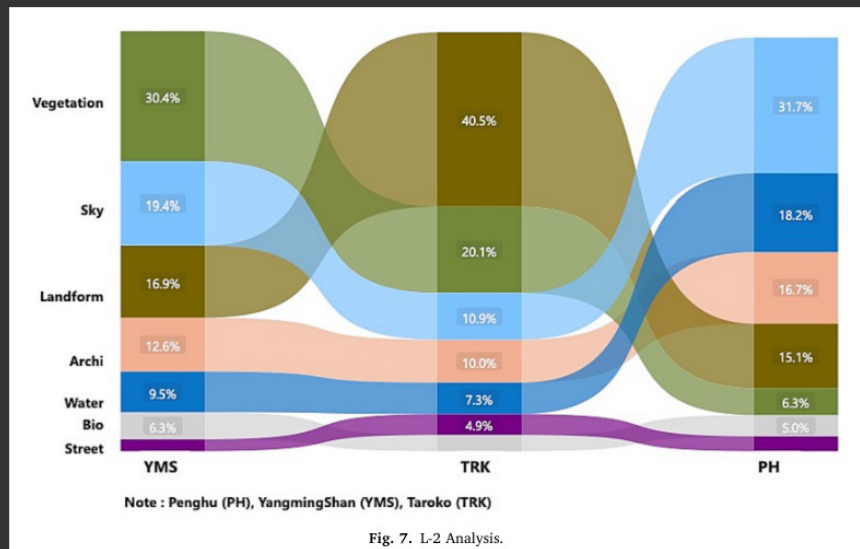
4種視覺尺度架構



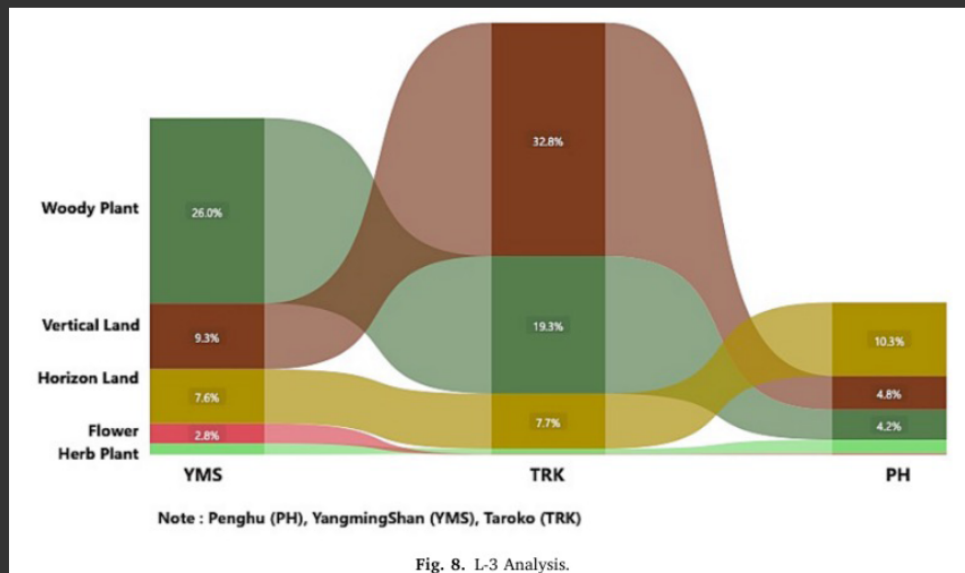
L-1 分析



L-2 分析

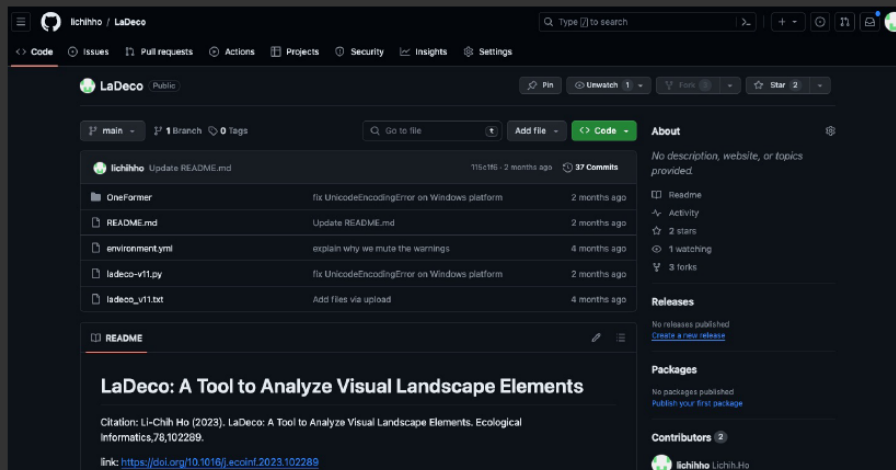


L-3



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歡迎多加利用



<https://github.com/lichihho/LaDeco>

運用LaDeco 進行都市熱環境分析

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Quantification through deep learning of sky view factor and greenery on urban streets during hot and cool seasons

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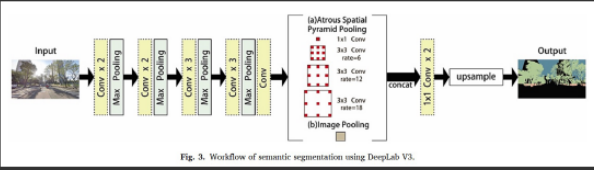
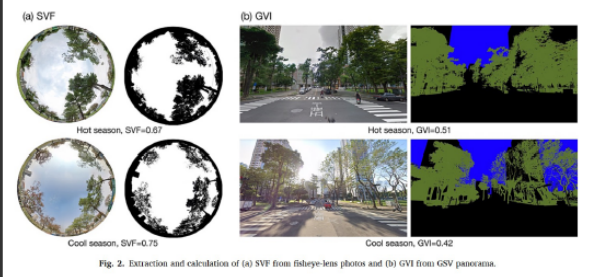


Table 2
Correlation analysis between deep learning and manual classification (n = 525).

	Sky	Green plants	SVF	GVI
Sky	1.000	-0.127**	0.791***	0.059
Green plants	-0.144**	1.000	0.075	0.776***
SVF	0.772***	0.063	1.000	0.085
GVI	0.072	0.761***	0.093*	1.000

Note. Red-colored cells represent the hot season, and blue-colored cells represent the cool season. Deep learning: sky and green plants. Manual classification: SVF and GVI. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.


LLM 使用與研究


按一ト可跳全文件ト一具



GPTs 問卷機器人研究


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GPTs

 ChatGPT


 English Buddy

 Landscape Preference... 

 Code to Diagram

 Consensus

3 more ▾

 Explore GPTs


Previous 7 Days


北門廣場現況

北門廣場現況: 暫無資訊


User Request: Summarize convo...

Taipei Historical Landscape Desig...


 Add Team workspace
Collaborate on a Team plan

 lichih ho

Landscape Preference Evaluator ▾





Landscape Preference Evaluator

By HO, LI CHIH 

I help evaluate and refine landscape preferences.

What do you think of a garden with a water feature?

How can I make my backyard more wildlife-friendly?

 Message Landscape Preference Evaluator... 

ChatGPT can make mistakes. Consider checking important information.

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GPTs

Landscape Preference Evaluator

Published · Anyone with a link

...

Save

Create

Configure

Instructions

considering the harmony of visual elements, diversity of features, navigability, potential for exploration, and overall appeal of the scene. The emphasis is on facilitating a deeper understanding of personal landscape preferences, steering clear of providing direct landscaping advice or detailed design services. The goal is to support users in discovering what they value in a landscape, guiding them to a clearer articulation of their tastes and preferences in an engaging and reflective dialogue.

Conversation starters

What do you think of a garden with a water feature?

How can I make my backyard more wildlife-friendly?

Knowledge

If you upload files under Knowledge, conversations with your GPT may include file contents. Files can be downloaded when Code Interpreter is enabled

landscape-preference.txt

Document

Preview

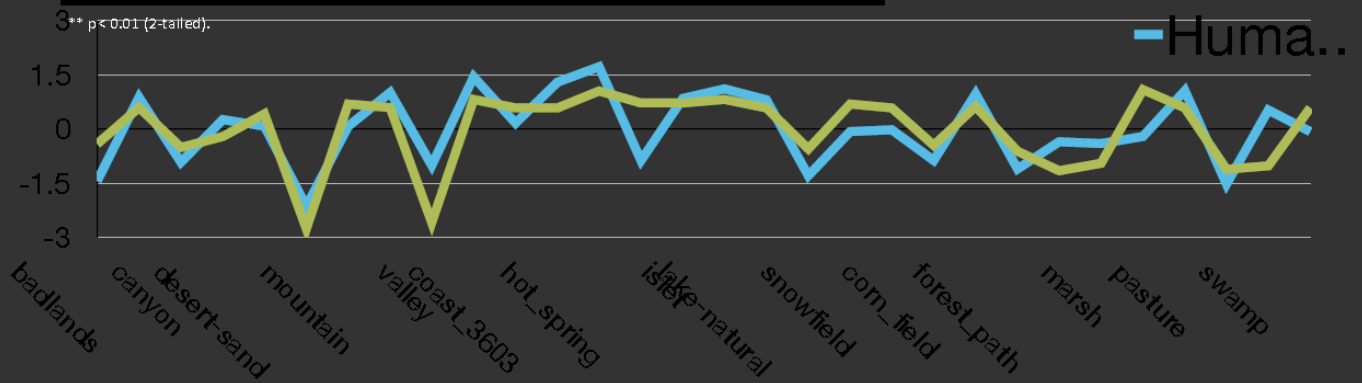
Landscape Preference Evaluator

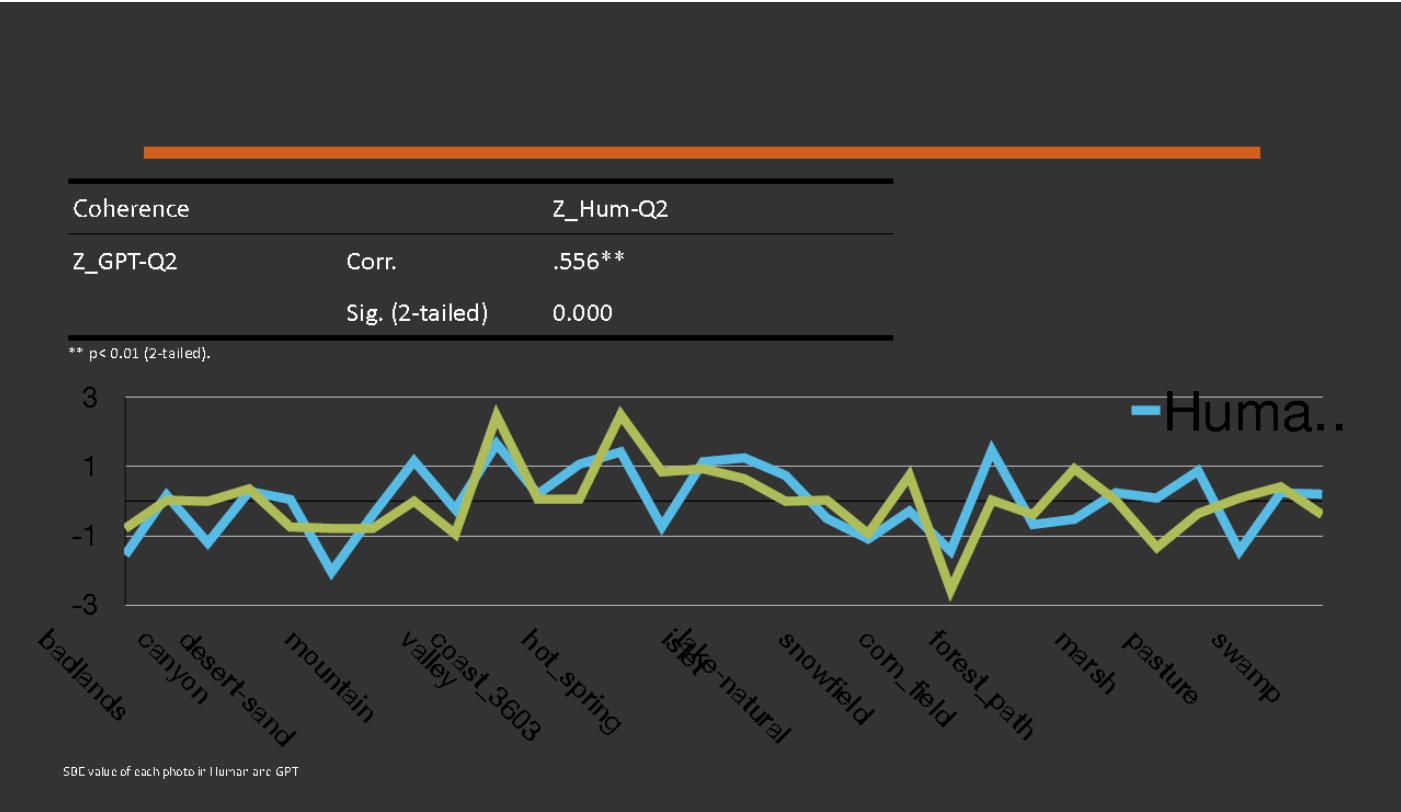
I help evaluate and refine landscape preferences.

What do you think of a garden with a wat... How can I make my backyard more wildl...

Message Landscape Preference Evaluator...

Mystery		Z_Hum-Q1
Z_GPT-Q1	Corr.	.707**
	Sig. (2-tailed)	0.000






問卷機器人研究 (開源llava + Gradio + Langchain)

LAE Remaster - DEMO (alpha)

This is early alpha version, you may encounter problems like model do not rate a score, never ending generating, or so.

Target Images



Respondents

Simulate how many respondents

3

Generate

Download Result

Landscape Preference Questionnaire

(1) Do the visual elements of the scene fit together well?
Explore the harmony of the visual elements in the scene.

(2) Does the scene contain diverse elements and features?
Refers to the degree of diversity of elements, the more diversity, the more the individual is encouraged to explore more in the environment.

(3) Is it easy to find your way around the environment in the scene?
Means reading and understanding the environment. Clearing and identifying paths is important as it gives a sense of security. Any signs, landmarks or focal points enhance the recognisability of the environment.

(4) Is this an interesting scene to explore further?
Explore whether this scene will stimulate more exploration of the surroundings and gain a wealth of information through exploration of the environment.

(5) Overall, do you like this scene?
The scores are determined from the perspective of landscape, aesthetics and beauty.

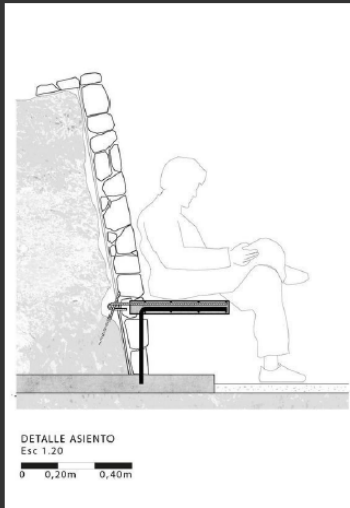
Edit Questionnaire

Output

```
{
  027_casst13.jpg: [
    0: {
      questionIndex: 1,
      score: 5,
      discussion: "The scene has a tropical feel with beautiful blue water
        contrasting nicely with the sandy beach, and the lush greenery adds to the
        overall harmony of the environment."
    },
    1: {
      questionIndex: 2,
      score: 4,

```

AutoCAD 機器人 (我給她一張手繪稿，她給我CAD圖)



GPT4之後，進入多模態模型



這張圖片顯示了一個座椅的設計詳細圖。座椅的背部看起來像是由多個垂直的墊子組成，提供用戶支撐。圖片中還有一個人形剪影坐在座椅上，以示座椅的使用方式。



在圖片的下方，有一些文字和尺寸資訊。文字「DETALLE ASIENTO」在西班牙語中意味著「座位的細節」。而「Esc 1:20」可能表示這張圖片的縮放比例是1:20。圖中還有一個尺度尺，顯示0, 0.20m, 和0.40m的標記，用來幫助理解座椅的實際大小。

總的來說，這是一張關於座椅設計的詳細示意圖。

AutoCAD 機器人



請建議如何在autocad中以autolip繪製上面的圖片



AutoLISP 是 AutoCAD 的程式語言，用於自動化和客製化設計程序。以下是一個基本的 AutoLISP 程式的大致步驟，以幫助您在 AutoCAD 中重現上述圖像：



1. 開始 AutoLISP:

首先，打開 AutoCAD，然後從命令行打入 `(vl-load-com)` 以載入 Visual LISP 函數。

2. 繪製座椅底座:

lisp

Copy code

```
(defun c:drawBase ()  
  (command "line" '(-10,0) '(10,0) "")  
  (command "line" '(-10,0) '(-10,-5) "")  
  (command "line" '(10,0) '(10,-5) "")  
)
```

AutoCAD 機器人

1. 繪製座椅背部:

```
lisp Copy code  
  
(defun c:drawBack ()  
  (command "pline" '(0,0) '(0,15))  
)
```

1. 繪製座椅墊子:

這部分可能需要使用循環來建立多個墊子，例如：

```
lisp Copy code  
  
(defun c:drawCushions ()  
  (setq x 0)  
  (repeat 10  
    (command "ellipse" "c" (list x 10) (list (+ x 1) 10) "R" "0.5")  
    (setq x (+ x 1))  
  )  
)
```

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Thanks!!

lichih.ho@gmail.com