# 生成式 AI 與提詞工程

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# 大綱

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- 提詞心法與技巧
- Q&A 時間

QuestionPro: Products sold to consumers
Dashboard
39
Viewed
14
Started
100%
Completion rate
0
Terminated
14
Completed
25 s
Average Time
Response Distribution
Responses
90.00%
5.00%
5.00%
100%

# 數據分析工作內容

# 數據分析三大業務

- **A**I (Artificial Intelligence)：使用資料建模
- **B**I (Business Intelligence)：建置企業報表
- **D**ata：資料倉儲、排程轉檔

# AI 建模流程

1 Data Preparation
Data cleansing and preparation
Human insight
Simulation-generated data
2 AI Modeling
Model design and tuning
Hardware accelerated training
Interoperability
3 Simulation and Test
Integration with complex systems
System simulation
System verification and validation
4 Deployment
Embedded devices
Enterprise systems
Edge, cloud, desktop

# AI 領域與應用

- **自然語言處理**：智能客服、文字訊息抽取、文字摘要整理、知識問答
- **語音辨識**：客服錄音轉文字、會議錄音轉文字
- **影像處理**：保單健診、簽名比對、證件 OCR、文函 OCR
- **預測模型**：預測核保風險等級、預測是否快速理賠
- **圖資料庫**：家庭關係、保單關係人、醫療理賠

# 語音相關的 AI 技術 與應用

# 語音辨識 (Automatic Speech Recognition)

語音辨識技術能夠將語音訊息轉換為可讀的文字資料

- **語音助手**：如 Siri、Google 助手和 Alexa 等，可以理解用戶的語音命令並執行相應的操作
- **語音轉文字服務**：如會議記錄、語音筆記等，可以將語音內容轉換為文字，方便閱讀和搜尋
- **語音搜尋**：用戶可以通過語音輸入關鍵詞進行搜尋，而不需要手動輸入
- **語音互動系統**：如語音導航、語音客服等，可以提供更自然的人機互動方式

# 語者分離 (Speaker Separation)

從混合語音信號中分離出單一語者的聲音

- **會議記錄**：在多人會議中，可以將每個人的語音分離出來，以便進行更準確的語音識別和轉錄
- **語音增強**：在嘈雜的環境中，可以將目標語者的語音從背景噪聲中分離出來，以提高語音的清晰度
- **語者識別**：在語者識別的前處理階段，可以將目標語者的語音從混合語音中分離出來，以提高識別的準確度
- **語音編輯**：在語音編輯和後期製作中，可以將不同語者的語音分離出來，以便進行單獨的編輯和調整

# 聲紋識別 (Speaker Recognition)

通過分析語音的特徵來識別說話者的身份

- 身份驗證：在電話銀行、語音助手和其他語音交互系統中，可以使用聲紋辨識來驗證用戶的身份
- 語音搜尋：在語音搜尋系統中，可以使用聲紋辨識來識別語音查詢的發音者
- 語音監控：在語音監控系統中，可以使用聲紋辨識來識別錄音中的語者
- 法證語音分析：在法證語音分析中，可以使用聲紋辨識來確定錄音中的語者身份

# 影像相關的 AI 技術與應用

# 物體檢測 (Object Detection)

物體檢測技術可以從一張圖片中辨識出所有出現的物體並標示出其位置

- 安全監控
- 自動駕駛
- 機器人視覺
- 保單簽名與日期辨識

# 人臉辨識 (Face Recognition)

人臉辨識技術可以從圖像或視頻中識別出人臉並確定其身份

- 個人身份驗證
- 遠距投保
- 會員 APP 登入

# 影像分類 (Image Classification)

影像分類技術可以將一張圖片分為不同的類別

- 醫療診斷
- 衛星圖像分析
- 農業監測
- 保單簽名比對

# 預測模型

預測標的：

“ 是連續數值？
還是非連續類別? ”

# 預測模型

- 預測**數值**：平均餘命、獲利年利率
- 預測**類別**：核保風險等級、是否快速理賠

# 圖資料庫

以下列元素儲存資料：

“ 節點
邊緣
屬性 ”

# 保單關係網絡

Agent
Claim History Stats
Demographics
Customer
Demographics
Income & Tax
Employment
Premium & Claim History
Family
Demographics
Medical History
Policy
Policy Dates
Policy Type
Inclusion & Exclusions Flags
Beneficiaries
Payments
Event Flags
Device
Internet Domain
Device Info
Machine IP
Browser Details
Claim
Claimant Info
Amounts & Dates
Status
Incident Report Flags
Hospital
Recent Stats
Type
Address
Medical Notes
Key Medical Personnel
Treatment Stats (days in hospital etc.)
Billing & Payment
Billing Mode
Billing Flags
Payment Amounts
Billing Amounts
Dates
Property
Owners
Geo
Mortgage Info
Inspection Dates
Damage

# Power BI

“處理大量的多源數據，並快速建立互動式的視覺圖表，協助企業了解數據背後的洞察”

# Power BI

讓數據從平面轉為立體

# 資料倉儲

- 集中式資料存放庫，可儲存結構化資料 (Excel 工作表) 和半結構化資料 (網頁)
- 資料會從各種來源 (如應用程式和資料庫) 流入
- 將當前和歷史資料儲存在一起，可用於資料採礦、資料視覺化，以及其他形式的商業智慧(BI)報告

# 生成式 AI 簡介

# 兩種類型 AI

- 分辨式 AI
- 生成式 AI

# 生成式 AI 應用領域

Generative AI use cases
Visual Content
Audio Generation
Text Generation
Code Generation
Image Enhancement
Video Prediction
3D shape Generation
Music Composing
TTS Generator
STS Conversion
Creative Writing
Chatbots
Translation
Code Generation
Code compilation
Bug Fixing

# 生成式 AI 應用場景

# 生成式 AI 營收與支出預估

# 生成式 AI 投資領域

Where is all the money going in generative AI?
Distribution of generative AI funding, 2021 – 2022
Visual media
$822M | 58 deals
Consumer social apps & tools $133M
Enterprise AI avatars $253M
Graphics & product design $22M
Images & NFTs $114M
Photo & video editing tools $131M
Synthetic training data $126M
Generative interfaces
$586M | 20 deals
General search $85M
Human-machine interfaces $290M
Productivity & knowledge management $211M
Cross-functional (APIs) $249M
Social media & marketing content $317M
Summarization $199M
Customer support $65M
Text
$852M | 48 deals
Audio editing $80M
Music generation $47M
Voice dubbing $42M
Voice synthesis & cloning $43M
Speech & audio
$212M | 26 deals
Code completion $103M
Code
$140M | 20 deals
Source: CB Insights
Based on an analysis of 210+ generative AI companies building cross-industry enterprise solutions; excludes deals to industry-specific companies and model developers such as OpenAI.
CBINSIGHTS

# 生成式 AI 對人力市場的衝擊

# 生成式 AI 對不同職業的衝擊

# 大語言模型

UNDERSTANDING THEIR IMPACT
Exploring Large Language Models

# ChatGPT

- OpenAI 這間公司所開發的對話機器人
- 使用大語言模型 GPT-3 (Generative Pre-trained Transformer)

# ChatGPT 的地位

“ The best artificial intelligence chatbot ever released to the general public. The New York Times ”

# ChatGPT 的重要性

“ Bill Gates: ChatGPT’s history is as significant as the birth of the PC or the Internet ~TechGoing ”

# ChatGPT 的個人應用情境

# 大語言模型家族

WebGPT
InstructGPT
GPT3.5 Turbo
text-davinci
CODEX
code-davinci
GPT3
GPT4 Vision
GPT4 Turbo
GPT2
GPT1
GPT4
GPT Family
OpenAI
WizardLM
Tulu
Long LLaMA
Gorilla
Vigogne
Koala
Vicuna
Giraffe
Guanaco
Mistral
Stable Beluga2
Code LLaMA
Baize
Alpaca
LLaMA 1/2 Family
Meta
PaLM2
Med-PaLM
Med-PaLM2
U-PaLM
PaLM
PaLM-E
FLAN-PaLM
PaLM Family
Google

# 大語言模型大在參數量

只有一個參數的公式

“ $y = 0.1x + 5$ ”

# 什麼是語言模型

- 語言模型本質上就是基於條件機率預測下一個詞的模型

P(S) = P(Where) x P(are | Where) x P(we | Where are) x P(going | Where are we)

# 語言模型具有某種程度的世界知識

# 大語言模型定義

## Large Language Model (LLM)

*['lärj 'laŋ-gwij 'mä-dᵊl]*

A deep learning algorithm that's equipped to summarize, translate, predict, and generate human-sounding text to convey ideas and concepts.

Investopedia

# LLM 的企業應用情境

LLM Use Case Categories
DATA TRANSFORMATIONS
A data product that transforms a text input into a text output, e.g. classify, summarize, convert to JSON
NATURAL LANGUAGE INTERFACES
A language-based interface to data or a tool, e.g. chat-your-documents, sql query
WORKFLOW AUTOMATIONS
Automate predefined workflows using access to data and tools, e.g. write a proposal, book a flight
COPILOTS & ASSISTANTS
A mixture of natural language interfaces and automation capabilities, used in the loop with a human user , e.g. Microsoft Copilot
AUTONOMOUS AGENTS
Automate arbitrary, unseen workflows using data and tools
Less complex
More complex

# PROMPT ENGINEERING

## 提詞工程

# 電腦科學所謂的 prompt(命令提示符)

# 生成式 AI 所謂的 prompt(提詞)

# 提詞的好壞影響回答的品質

| BAD PROMPT | GOOD PROMPT |
| --- | --- |
| **PROMPT**<br>"Suggest some books." | **PROMPT**<br>"Recommend contemporary novels that weave themes of AI ethics and human dilemmas, preferably from authors recognized for their deep exploration of technology's impact on society." |
| **OUTPUT**<br>"Here are some classics: 'Moby Dick', 'Brave New World', 'War and Peace'." | **OUTPUT**<br>"Certainly! 'The Quantum Thief' by Hannu Rajaniemi tackles issues of identity in a post-human society. Annalee Newitz's 'Autonomous' delves into AI autonomy and human agency, while 'Daemon' by Daniel Suarez examines the blurring lines between virtual and physical realities" |

# 好的提詞應該具備的元素

4/5 提詞工程

# 提詞工程的工作流程

“

## 提詞工程

- 因生成式 AI 的流行而產生的新興領域，用於控制語言模型的輸出
- 涉及設計和構建一個問題，以指導機器生成所需的回答

”

# 提詞工程的市值預估

Prompt Engineering Market Size, By Region, 2019 - 2032
(USD Million)
213.24
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
North America
Europe
Asia Pacific
Latin America
Middle East & Africa
Source: Polaris Market Research Analysis

# 提詞工程師

## Prompt Engineer

freelancermap

### The Role

- Work with cross-functional teams to discuss product development
- Identify uses of AI tools
- Design, develop and refine AI-generated text prompts

### Background

- Bachelor's degree in Computer Science or Machine Learning or a related field
- Additional certifications recommended

### Skills

- Excellent knowledge of natural language processing
- Knowledge of machine learning
- Comprehensive knowledge of AI-generated content development

### Salary

| | |
|---|---|
| Junior: | $ 280,000 |
| Average: | $ 327,000 |
| Senior: | $ 375,000 |

# 提詞工程師是職場新寵

# 提詞工程師不需要 CS 學位

X 平台發文

← Post

**AI Breakfast** @AiBreakfast

Wow - Anthropic (Google's latest $300M AI investment) is hiring a "Prompt Engineer" for $250k-$335k/yr + equity

No CS degree required, just have "at least basic programming and QA skills"

Wild times.

Representative Projects

- Discover, test, and document best practices for a wide range of tasks relevant to our customers.
- Build up a library of high quality prompts or prompt chains to accomplish a variety of tasks, with an easy guide to help users search for the one that meets their needs.
- Build a set of tutorials and interactive tools that teach the art of prompt engineering to our customers.

You may be a good fit if you:

- Have a creative hacker spirit and love solving puzzles.
- Are an excellent communicator, and love teaching technical concepts and creating high quality

# 提詞工程師更需要軟技能

## 5 non-tech prompt engineering skills

Language

Communication

Creativity

Critical thinking

Subject matter expertise

zapier

# 提詞工程 - 語言能力

## Prompt Engineering

**1 Clarify Objective**

- Align your prompts with your overarching marketing goals
- Specify the desired output and tone

**2 Specific and Clear**

- Leave no room for misinterpretation
- Harness the power of detail

**3 Contextual Info**

- The more context you offer, the more accurate and relevant the AI's response will be

**4 Experiment**

- Try tweaking the wording, altering the focus, or rephrasing the instructions to find the most effective approach

# 提詞工程 - 批判思維

| Prompting Approach | Description | Comparison to Human Thinking |
|---|---|---|
| Zero-shot Prompting | AI answers without prior examples, using its training | Like answering a question using only what you already know. |
| Few-shot Prompting | AI uses a few examples to understand how to respond. | Learning from a few examples before trying something new. |
| Chain-of-Thought Prompting | AI breaks down its process into steps before answering. | Thinking through steps to solve a problem, like in math. |
| Self-Consistency | AI generates multiple answers and picks the most consistent one. | Choosing the best solution after considering several options. |
| Generate Knowledge Prompting | AI creates new ideas or information. | Using imagination or knowledge to come up with new ideas. |
| Prompt Chaining | Sequential prompts guide AI through a process to a result. | Following steps in a plan to achieve a goal. |
| Active-Prompt | Prompts adjust based on AI's responses in real-time. | Adjusting conversation based on feedback, like in a dialogue. |
| Directional Stimulus Prompting | Prompts direct AI towards a desired outcome. | Organizing thoughts or information in a structured way. |
| Multimodal CoT | AI organizes information in graph structures for tasks. | Organizing thoughts or information in a structured way. |

@Generative Engineer

# 提詞工程 - 程式撰寫

Instruction: Write a Java method
Context: The method should take an array of integers as input and return a new array with each element squared.
Input Data: An array of integers, for example, {1, 2, 3, 4, 5}.
Output Indicator: The output should be in Java code format.
Prompt
>_
{{ }}
LLM
LLMs
Java Code
@Generative Engineer

# 最強大的程式語言 - 英文

來源文章

santiagof.medium.com/english-is-the-most-powerful-programing-language-even-for-data-s...

Member-only story

## English is the most powerful programing language — even for data science: Introduction to prompt engineering

What prompt engineering is, which are the steps involved in it, and how it changes the way we solve problems with ML.

Facundo Santiago · Follow

10 min read · May 9, 2023

# 生成式 AI 帶來軟體工程的典範轉移

# 推薦入門的程式語言 - Python

# Prompt Engineering

## 提詞心法與技巧

### 1 Clarify Objective

- Align your prompts with your overarching marketing goals
- Specify the desired output and tone

### 2 Specific and Clear

- Leave no room for misinterpretation
- Harness the power of detail

### 3 Contextual Info

- The more context you offer, the more accurate and relevant the AI's response will be

### 4 Experiment

- Try tweaking the wording, altering the focus, or rephrasing the instructions to find the most effective approach

# 提詞心法與技巧

1. 提詞基本公式
2. 善用特殊符號
3. 使用變數泛化

“商用範例：抽取訂單內容”

# 基本公式

- {角色}
- {任務}
- {格式}

## Basic Structure of a Prompt:

Acting as a **[ROLE]** perform **[TASK]** in **[FORMAT]**

### Act as a [ROLE]

Marketer
Advertiser
Copywriter
Accountant
Lawyer
Analyst
Ghostwriter
Project Manager
Therapist
Journalist
Chief Financial Officer
Prompt Engineer

### Create a [TASK]

Headline
Presentation / Webinar
Essay
Book Outline
Email Sequence
Social Media Post
Product Description
Cover Letter / Resume
Blog Post / Article
Summary
Tiktok, YT Reel - Video Script
Sales Page / Ad Copy

### Show as [FORMAT]

A Table
A list
Summary
HTML
Code
Spreadsheet
CSV file
Plain Text file
Rich Text
PDF
Markdown
Word Cloud

# 提詞 3C 原則

- Clarity 清晰意圖
- Context 清楚情境
- Constraint 清確限制

# 物理學概念解釋範例

- 指令大全

## Mastering Prompt Engineering: The 3Cs Framework

### Clarity

Provide specific details to guide the model
Provide clear intentions

### Context

Help the model understand the level of complexity
Be concise

### Constraints

Limit the output length, style, format

Give a role

Clarity and Context

Provide constraints

Give Examples

Specific Output and Constraints

You are an expert physicist. Imagine you are explaining the concept of Einstein's theory of relativity to a 10-year-old. Use simple language and provide examples they can relate to. Here are a few examples of other concepts explained to a 10-year-old:

Concept: Gravity Explanation: Gravity is like an invisible force that pulls things towards the center of the Earth. It's the reason we stay on the ground and don't float away.

Concept: Photosynthesis Explanation: Photosynthesis is a process in which plants use sunlight to turn water and carbon dioxide into food and oxygen. It's like the plant is cooking its meal using the sun's energy.

Now, please explain the theory of relativity to a 10-year-old in less than 200 words.

# 改寫國語文範例

- 範例文章：潮間帶上的彰化味：彰化永續漁業的未來

PROMPT:

“你是一位國語文老師，你的任務是撰寫適合不同學生閱讀的文章。將這個網頁上的內容改寫成適合國小三年級學生閱讀的文章：https://www.verse.com.tw/article/sea。同時，在文章後面新增五個學生可能不認識的單詞，要有單詞發音、解釋與例句。”

- Bing Chat 的回答 💯

“ 在台灣的彰化，有一個很特別的地方叫做潮間帶。這裡的人們從很久以前就開始養殖海洋生物，像是蚵仔和文蛤。他們會在海水退潮的時候，駕駛一種叫做鐵蚵車的車子去採蚵。

近年來，越來越多的漁民開始嘗試新的養殖方式，他們希望能更友善地對待海洋生態，也希望能吸引更多的人來參觀和學習。

彰化的海岸線很長，有很多不同的養殖業，像是養蚵、養文蛤，甚至還有養鰻魚的地方。這些地方都有他們獨特的故事和文化... ”

- Bing Chat 的回答 💯

單詞：

1. 潮間帶 (cháo jiān dài)：這是一個地理名詞，指的是海岸線在潮水漲退時露出和隱藏的區域。例如：「潮間帶是許多海洋生物的家。」
2. 養殖 (yǎng zhí)：這是一個動詞，指的是人們飼養和照顧動植物，讓它們生長，然後收穫。例如：「他在農場養殖雞。」
3. 漁民 (yú mín)：這是一個名詞，指的是以捕魚或養殖海洋生物為生的人。例如：「漁民每天早上都會出海捕魚。」

# 善用特殊符號

PROMPT:

> 產生一篇有關<阿朗壹古道>的短文，內容要適合國小五年級的學生閱讀。正文之後附上需要學生學習的單詞，以及單詞的例句。最後，列出三個跟短文相關的討論問題。使用以下格式： 正文：<正文內容> <單詞>(單詞注音)：<單詞解釋>。例句：<單詞例句> 問題：<討論問題>

- Google Gemini 的回答
- Google Docs

# 使用變數泛化

變數　　物件

A = 1234567

A就像是一個箱子，而我們將1234567放進去！

- 原始文章: 瓊林風獅爺

PROMPT:

“ 你是文史專家，你的任務是根據<>當中的文本，比較不同地區的{文物}的差異，結果以表格呈現，包含{文物名稱}、{材質}、{方位}、{大小}、{類型}。如果相關資訊在文本當中找不到，不要隨意增加內容，顯示「未知」即可。文物：風獅爺。文本：<瓊林風獅爺共有四尊，包含北風獅爺、南風獅爺、蔡氏家廟後壁風獅爺、二十一號民宅牆上風獅爺。... > ”

- Bing Chat 的回答

| 文物名稱 | 材質 | 方位 | 大小 | 類型 |
|---|---|---|---|---|
| 瓊林北風獅爺 | 泉州花崗岩白石 | 西南朝東北 | 約 193 公分 | 村落型風獅爺 |
| 瓊林南風獅爺 | 花崗石 | 東北朝西南 | 約 114 公分 | 村落型風獅爺 |
| 瓊林蔡氏家廟後壁風獅爺 | 泉州深綠青斗石 | 未知 | 約 76 公分 | 牆垣型風獅爺 |
| 瓊林二十一號民宅牆上風獅爺 | 青斗石 | 未知 | 約 25 公分 | 牆垣型風獅爺 |

# 商用範例：抽取訂單內容

速食餐廳點餐內容

“ Hey there! I’d like to make an order for pick-up. Could I get **one large fries**, **two fish fillet sandwiches**, **three cheeseburgers with no onions**, and **four vanilla milkshakes**? Oh, and could you also add **five apple pies** to that order? Thanks a lot! ”

# 抽取方式一：使用語言學知識+模型標記能力

“

```
[
    {'LIKE_NUM': True},
{'POS': 'ADJ', 'OP': '?'},
{'POS': 'NOUN', 'OP': '+'}
]
```

”

- 點擊這裡看結果

# 規則+模型標記的抽取結果

# 抽取方式二：使用提詞

PROMPT

“ You work at a fast food restaurant and are good at summarizing what a customer orders from a text. Extract ordered items from the following text. Use the json format, with two keys, quantity and item:
Text: <Hey there! I’d like to make an order for pick-up. Could I get one large fries, two fish fillet sandwiches, three cheeseburgers with no onions, and four vanilla milkshakes? Oh, and could you also add five apple pies to that order? Thanks a lot!> ”

# LLM 的抽取結果

- 點擊這裡看 Bing Chat 的回答

```
[
  { "quantity": 1, "item": "large fries" },
  { "quantity": 2, "item": "fish fillet sandwiches" },
  { "quantity": 3, "item": "cheeseburgers with no onions" },
  { "quantity": 4, "item": "vanilla milkshakes" },
  { "quantity": 5, "item": "apple pies" }
]
```

# 商業應用：溫蒂漢堡得來速

“ Wendy’s FreshAI uses generative AI to generate responses and adapt in real-time … – it's a personalized, responsive experience for every customer. Considering **there are more than 200 billion ways to order a Dave’s Double®**, leveraging generative AI is a crucial piece of innovating the Wendy’s drive-thru experience for customers. ”

- 原始文章來源

# 結語 1/3

“ **語言的力量**：在生成式 AI 時代，語言不再只是溝通的工具，它也成為了操控和理解 AI 的關鍵。作為中文專業的學生，你們對語言的深入理解和敏感度是無可比擬的。這種能力可以幫助你們更好地理解和使用生成式 AI，並在提詞工程中發揮重要作用。 ”

# 結語 2/3

“ **創新的可能**：AI 時代需要新的思維方式和創新的解決方案。你們的中文專業知識和獨特視角，可以為 AI 領域帶來新的靈感和創新。不論是在語言處理技術的改進，還是在 AI 應用的開發上，你們都有可能成為改變遊戲規則的人。 ”

# 結語 3/3

“ **文化的價值**：AI 需要理解和適應不同的文化背景，才能提供真正有價值的服務。中文不僅是一種語言，也是一種文化。你們的中文專業知識可以幫助 AI 更好地理解和適應華語文化，從而提供更準確和有深度的服務。 ”

# Q&A 時間

# 有任何問題，歡迎聯絡我

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- 個人網頁: https://howard-haowen.github.io