



國立臺灣大學

NTUL-E-202536-0164

領域網絡分析概覽— 資料科學與人工智慧 2025

At a Glance – Domain Network Analysis for Data Science and Artificial Intelligence 2025

臺大圖書館研究支援組

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01

分析說明

- ▶ 領域類別以及評析學校係以 2025 年 QS 世界大學領域排名（QS World University Rankings by Subject）資訊為依據，並使用 QS 世界大學排名系統合作的 Scopus 和 SciVal 資料庫為數據來源。
- ▶ 運用書目計量及社會網絡分析等方法，側重分析各學科領域中全球及亞洲焦點學校之研究主題方向，提供本校教師及院系學術研究發展之參考。



The QS World University Rankings by Subject 2025 共分 5 大領域 55 個學科主題。

[Methodology](#) 學科領域排名計算方法及權重說明。

[QS Subject Categorization](#) QS WUR 2025 學科領域清單，以及與 Scopus ASJC codes 對照方法。

01

分析對象族群

- ▶ 以世界頂尖及亞洲精選各 **10** 所學校為焦點族群進行評析，非採個別單一學校方式。
- ▶ 「世界頂尖大學群」依 **QS WUR 2025** 於資料科學與人工智慧領域全球排名前 **10** 名學校。
- ▶ 「亞洲精選大學群」係挑選中國、香港、日本、南韓、新加坡等 **5** 個國家及地區於資料科學與人工智慧領域排名前 **2** 名學校。

● 世界頂尖大學群*

1		Massachusetts Institute of Technology
2		Carnegie Mellon University
3		University of Oxford
4		University of California, Berkeley
5		Nanyang Technological University
6		Harvard University
7		National University of Singapore
8		ETH Zurich - Swiss Federal Institute of Technology
9		Yale University
10		University of Toronto

● 亞洲精選大學群*

5		Nanyang Technological University (新加坡)
7		National University of Singapore (新加坡)
17		Hong Kong University of Science and Technology (香港)
18		University of Hong Kong (香港)
25		Seoul National University (南韓)
42		Korea University (南韓)
44		Shanghai Jiao Tong University (中國)
=47		Harbin Institute of Technology (中國)
51-100		Kyoto University (日本)
(日本僅1間學校進入本次排名)		

* 學校名稱前方數字為 QS World University Rankings by Subject 2025 — Data Science and Artificial Intelligence 排名序位，本校本次排名為第39名。

02

研究主題分析

- ▶ 提供 **2025 年 QS** 世界大學排名資料科學與人工智慧領域全球排名前 **10** 名、亞洲 **9** 個精選大學以及臺灣大學，共 **3** 個族群之發展概況資訊。
- ▶ 研究主題 (**Topics**) 資料來源為 **SciVal** 資料庫，其以 **Scopus** 蒐錄文獻間的直接引用關係進行聚類，全球共分成近 **1,500** 個 **Topic Clusters** (上層主題) 及 **95,000** 多個 **Topics**。

DATASET

Source	SciVal
Publication Year	2020-2024
Retrieved Date	2025.09.10-12

METHODOLOGY

1. **SciVal**之研究主題 (**Topics**) 屬文章層級 (**article-level**) 的聚類，每篇文章給予 **1** 個 **Topic**。不同於依文章的所屬期刊進行分類，給定 **1** 到多個不等的複分學科方法。
2. 詳細說明：[How are Topics and Topic Clusters created](#)

02

世界頂尖大學群



**Total
Scholarly Outputs**
63,122

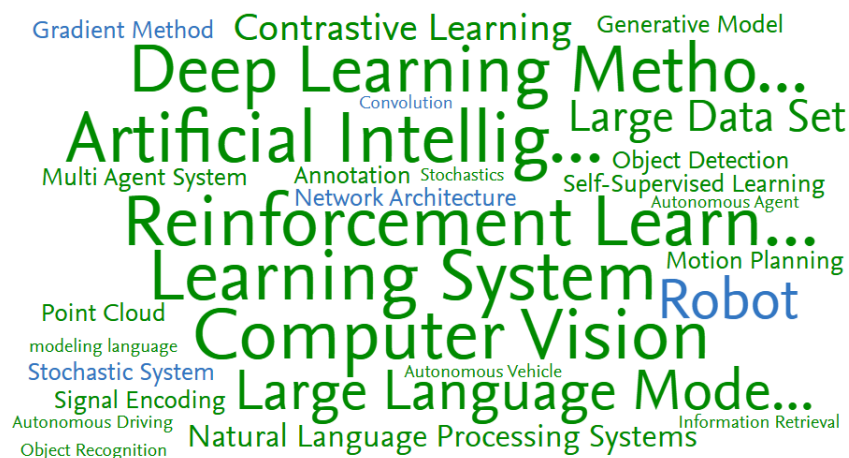


**Citations
per Publication**
21.2



**Total
Topics**
3,477

● Top 50 keyphrases* by relevance, based on 63,122 publications (2020–2024)



* Keyphrases產生方式說明：

https://service.elsevier.com/app/answers/detail/a_id/27763/supporthub/scival/

● Top 10 Topics by Scholarly Outputs

Topic ID	Scholarly Outputs	Topic 1st–3rd Relevance Keyphrases
T.462	1,345	Large Language Model; Computational Linguistics; Language Modeling
T.496	1,008	Reinforcement Learning; Deep Reinforcement Learning; Learning Algorithm
T.9363	556	Neural Radiance Field; Rendering in Computer Graphics; 3d Reconstruction
T.557	534	Federated Machine Learning; Learning System; Privacy-Preserving Technique
T.78	492	Generative Adversarial Networks; Image Synthesis; Image Translation
T.9129	482	Neural Network; Gradient Method; Deep Neural Network
T.3068	419	Graph Neural Network; Graph Convolutional Network; Graph Theory
T.541	384	Adversarial Machine Learning; Adversarial Example; Deep Neural Network
T.1012	336	Explainable Artificial Intelligence; Artificial Intelligence; Interpretability
T.11668	331	Self-Supervised Learning; Contrastive Learning; Representation Learning

02

亞洲精選大學群



**Total
Scholarly Outputs**
64,129

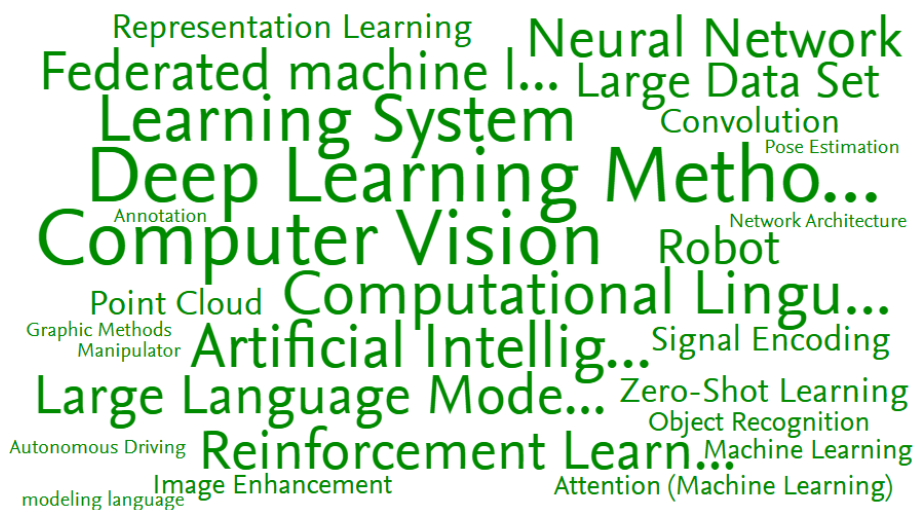


**Citations
per Publication**
16.9



**Total
Topics**
3,548

● Top 50 keyphrases by relevance, based on 64,129 publications



● Top 10 Topics by Scholarly Outputs

Topic ID	Scholarly Outputs	Topic 1st-3rd Relevance Keyphrases
T.462	1,139	Large Language Model; Computational Linguistics; Language Modeling
T.557	751	Federated Machine Learning; Learning System; Privacy-Preserving Technique
T.78	588	Generative Adversarial Networks; Image Synthesis; Image Translation
T.0	536	Object Detection; Object Recognition; YOLO
T.496	492	Reinforcement Learning; Deep Reinforcement Learning; Learning Algorithm
T.9363	405	Neural Radiance Field; Rendering in Computer Graphics; 3d Reconstruction
T.3068	403	Graph Neural Network; Graph Convolutional Network; Graph Theory
T.541	353	Adversarial Machine Learning; Adversarial Example; Deep Neural Network
T.769	328	Recommender System; Collaborative Filtering; Graph Neural Network
T.8518	324	Visual Question Answering; Visual Language; Language Modeling



**Total
Scholarly Outputs**
3,313

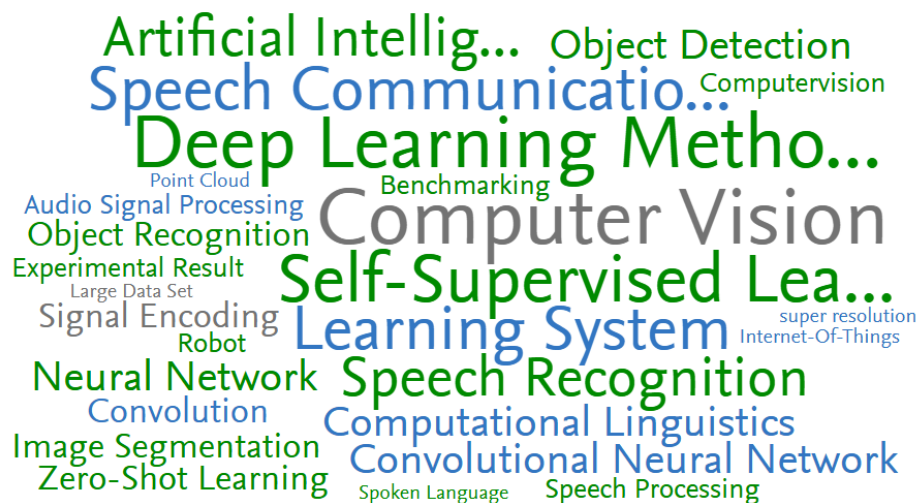


**Citations
per Publication**
10.6



**Total
Topics**
698

● Top 50 keyphrases by relevance, based on 3,313 publications



● Top 10 Topics by Scholarly Outputs

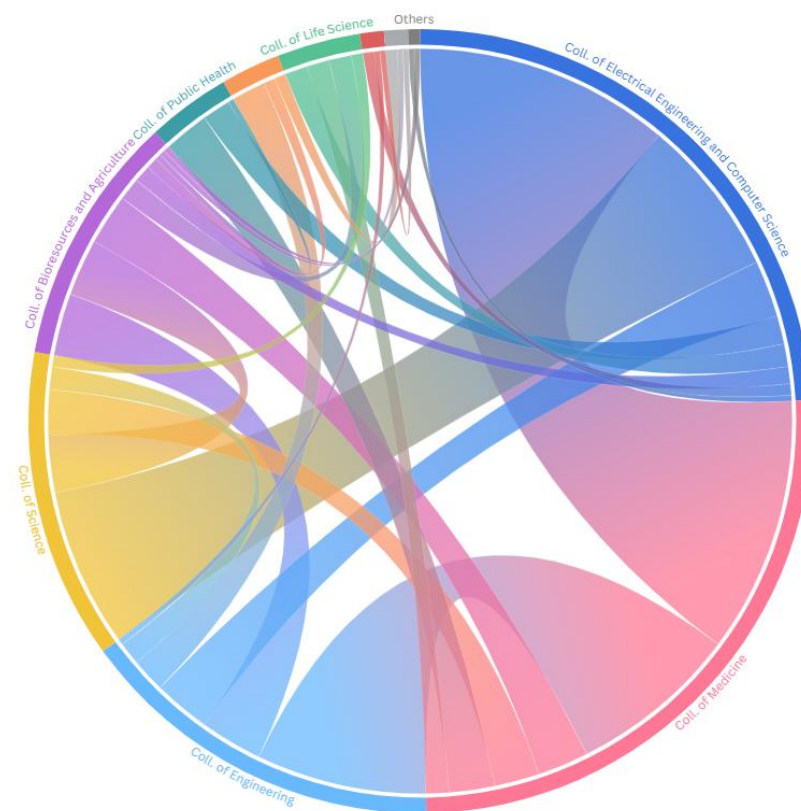
Topic ID	Scholarly Outputs	Topic 1st-3rd Relevance Keyphrases
T.4031	80	Speech Recognition; Speech Communication; Automatic Speech Recognition
T.462	57	Large Language Model; Computational Linguistics; Language Modeling
T.0	29	Object Detection; Object Recognition; YOLO
T.78	28	Generative Adversarial Networks; Image Synthesis; Image Translation
T.1516	22	Quantum Computer; Quantum Computing; Quantum Machine Learning
T.13792	22	Speech Synthesis; Text To Speech; Speech Communication
T.557	21	Federated Machine Learning; Learning System; Privacy-Preserving Technique
T.541	20	Adversarial Machine Learning; Adversarial Example; Deep Neural Network
T.496	18	Reinforcement Learning; Deep Reinforcement Learning; Learning Algorithm
T.1951	17	Knowledge Distillation; Model Compression; Deep Neural Network

02

本校學院參與情形

- ▶ 本校 **2020-2024** 年於 **QS** 世界大學排名資料科學與人工智慧領域計有論文 **3,313** 篇，運用可茲取得之本校教師 **Scopus Author ID** 進行所屬系所比對，共 **2,867** 篇可查得 ID 資料。
- ▶ 相同單位之 **2** 位以上作者之文章，於該單位統計時計數 **1** 篇。醫學院與臺大醫院合併統計，校級研究中心列入「**Others**」。
- ▶ 各學院於 **QS** 世界大學排名資料科學與人工智慧領域論文數比例如右上圖。右下圖為各學院合著情形，點選[線上檢視](#)，可選擇學院分別檢視。

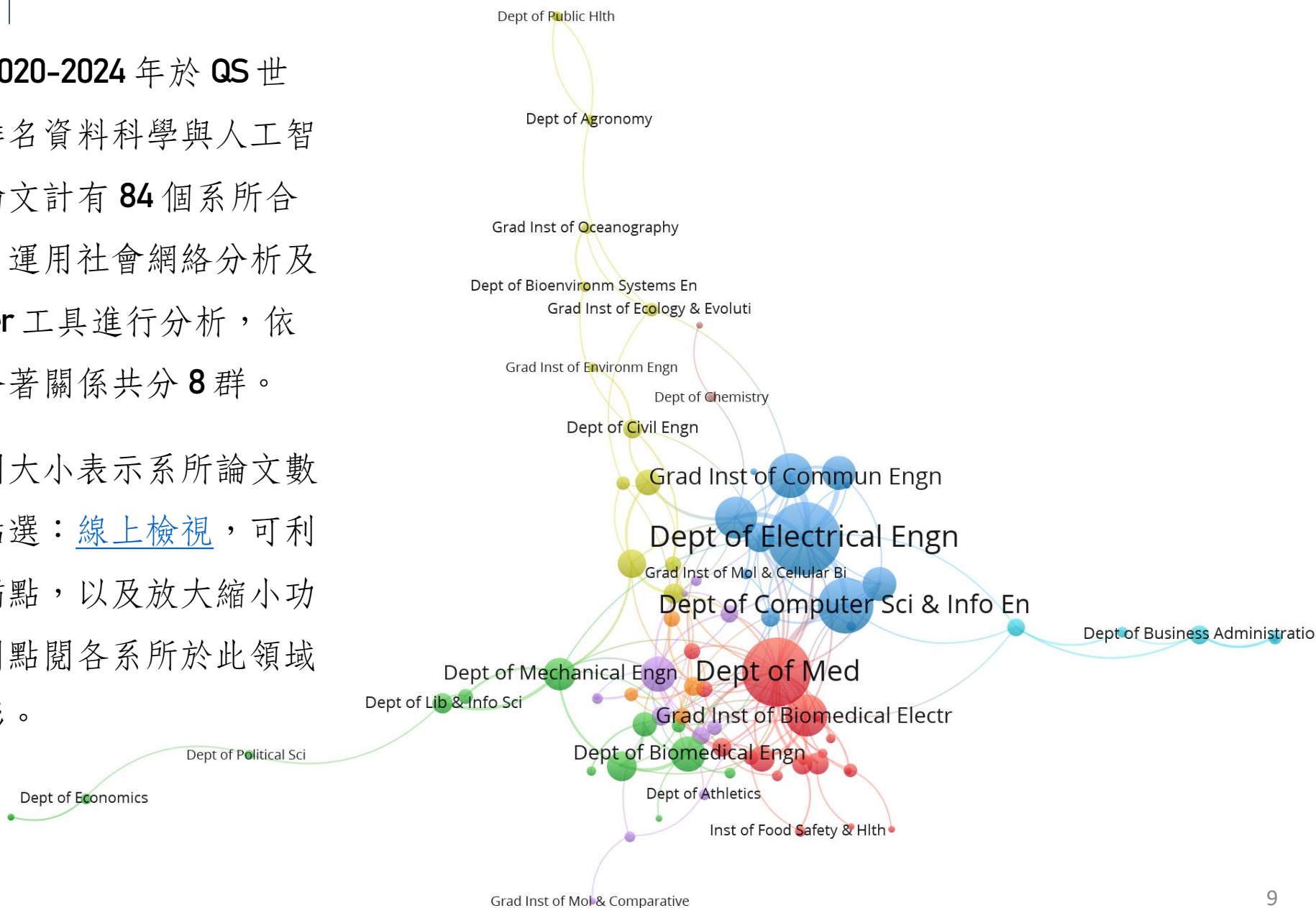
College of Bioresources and Agriculture	■
College of Electrical Engineering and Computer Science	■
College of Engineering	■
College of Law	.
College of Liberal Arts	■
College of Life Science	■
College of Management	■
College of Medicine	■
College of Public Health	■
College of Science	■
College of Social Sciences	■
Graduate School of Advanced Technology	.
Others	.



02

本校系所參與情形

- ▶ 本校於 **2020-2024** 年於 **QS** 世界大學排名資料科學與人工智慧領域論文計有 **84** 個系所合著發表。運用社會網絡分析及 **VOSViewer** 工具進行分析，依其文章合著關係共分 **8** 群。
- ▶ 圖中圓圈大小表示系所論文數量，請點選：[線上檢視](#)，可利用釘選錨點，以及放大縮小功能，分別點閱各系所於此領域合作情形。



02

研究主題差異分析

論文數佔比 World Top 10 Universities



排序功能圖示

- 下圖為全球頂尖大學群論文佔比排序前 **15** 位之研究主題。[線上檢視](#)可自行選擇排序群組，藉此瞭解學校群體間前 **500** 名研究主題領域發展之相近或差異情形。

Topic ID	Topic	論文數佔比 World Top 10 Universities	論文數佔比 Asia Selected 9 Universities	論文數佔比 National Taiwan University
T.462	Transformative Approaches in Language Model Performance	2.13%	1.78%	1.72%
T.496	Reinforcement Learning Applications in Autonomous Systems	1.60%	0.77%	0.54%
T.9363	Neural Representations for 3D Shape Reconstruction	0.88%	0.63%	0.36%
T.557	Federated Learning Systems for Data Privacy Enhancement	0.85%	1.17%	0.63%
T.78	Generative Models for Image Synthesis and Translation	0.78%	0.92%	0.85%
T.9129	Neural Network Training Dynamics	0.76%	0.16%	
T.3068	Graph Neural Networks in Data Representation	0.66%	0.63%	0.18%
T.541	Adversarial Techniques in Deep Learning Models	0.61%	0.55%	0.60%
T.1012	Explainable Neural Networks in Artificial Intelligence	0.53%	0.31%	0.18%
T.4031	Speech Recognition and Neural Networks	0.52%	0.36%	2.41%
T.11668	Self-Supervised Learning for Image and Video Representation	0.52%	0.39%	0.09%
T.2679	Fairness and Bias in Algorithmic Decision-Making	0.49%	0.10%	0.06%
T.3265	Multi-Armed Bandit Algorithms in Stochastic Systems	0.48%	0.21%	
T.0	Innovative Deep Learning Techniques for Object Detection	0.45%	0.84%	0.88%
T.8518	Visual Question Answering Models	0.42%	0.51%	0.27%
T.1951	Neural Network Optimization through Quantization and Pruning	0.42%	0.44%	0.51%

02

本校重點研究主題

- 依國立臺灣大學於資料科學與人工智慧領域各研究主題之論文百分比進行排序，其中論文佔比 **0.5%** 以上之研究主題項目如下圖。各群體研究主題論文百分比前 **500** 名資訊請詳參：[線上檢視](#)。

Topic ID	Topic	論文數佔比 World Top 10 Universities	論文數佔比 Asia Selected 9 Universities	論文數佔比 National Taiwan University
T.4031	Speech Recognition and Neural Networks	0.52%	0.36%	2.41%
T.462	Transformative Approaches in Language Model Performance	2.13%	1.78%	1.72%
T.0	Innovative Deep Learning Techniques for Object Detection	0.45%	0.84%	0.88%
T.78	Generative Models for Image Synthesis and Translation	0.78%	0.92%	0.85%
T.1516	Quantum Algorithms for Machine Learning Optimization	0.23%	0.12%	0.66%
T.13792	Neural Speech Synthesis Systems	0.12%	0.18%	0.66%
T.557	Federated Learning Systems for Data Privacy Enhancement	0.85%	1.17%	0.63%
T.541	Adversarial Techniques in Deep Learning Models	0.61%	0.55%	0.60%
T.496	Reinforcement Learning Applications in Autonomous Systems	1.60%	0.77%	0.54%
T.5342	Integrated Circuit Design Methodologies		0.04%	0.51%
T.1951	Neural Network Optimization through Quantization and Pruning	0.42%	0.44%	0.51%

03

國際合作



**Worldwide
Scholarly Outputs**
2,127,703



**Worldwide
Citations per Publication**
8.7



**International
Collaboration**
20.2%

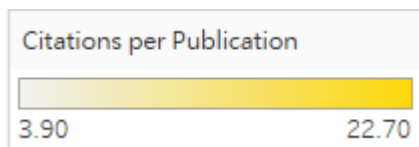
Institutions Collaborating with National Taiwan University



03

合作情形

- ▶ 合作模式區分為個人著作、機構合作、國內合作與國外合作四種類型。
- ▶ 於 2025 年 QS 世界大學排名資料科學與人工智慧領域，四個群組皆以國際合作模式所取得的平均文章被引次數為最高。

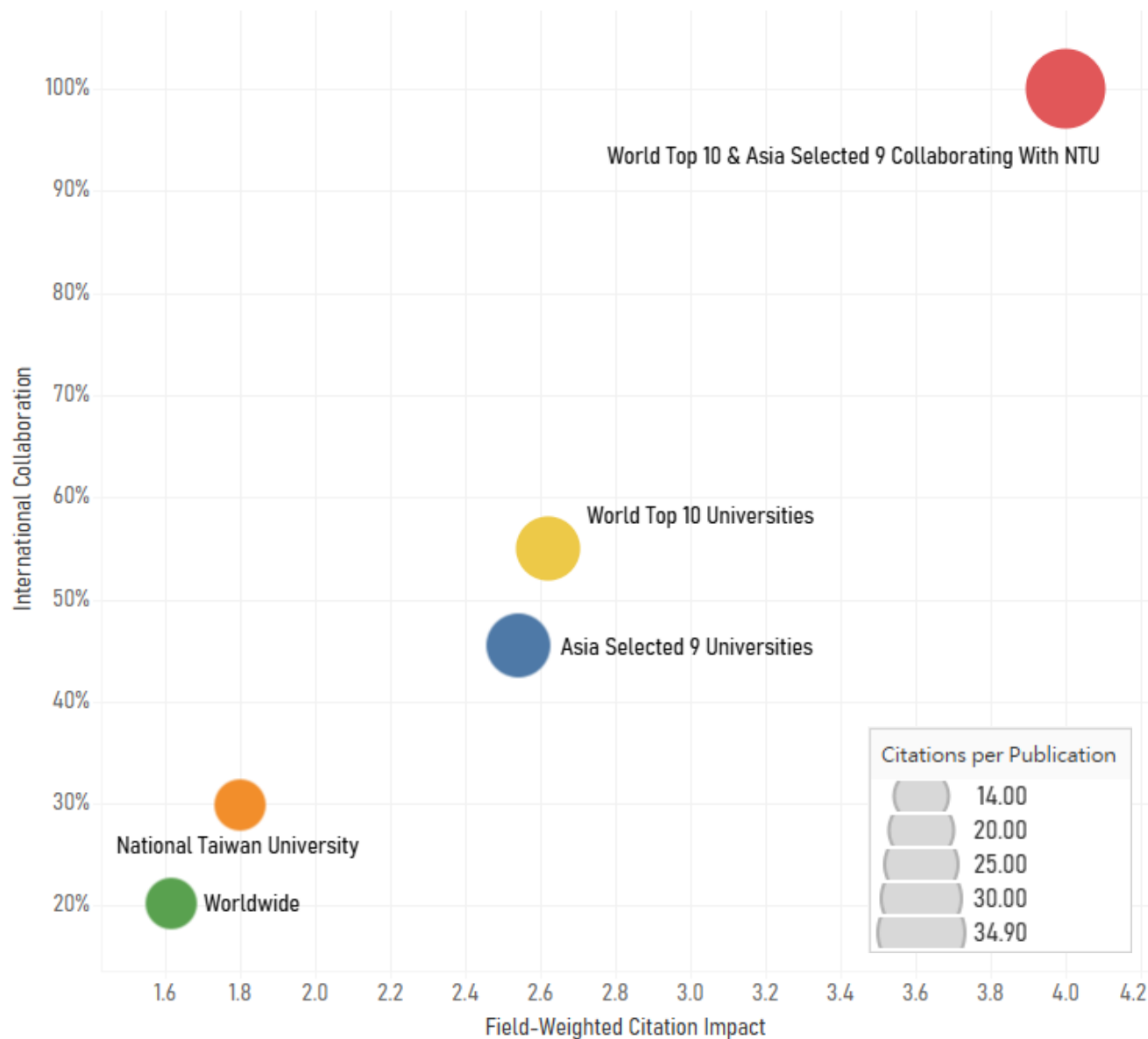


Group	International collaboration	Only national collaboration	Only institutional collaboration	Single authorship (no collaboration)
National Taiwan University	29.8%	38.2%	30.1%	1.9%
World Top 10 Universities	55.0%	25.1%	17.2%	2.7%
Asia Selected 9 Universities	45.5%	31.0%	22.0%	1.5%
Worldwide	20.2%	32.4%	40.5%	6.9%

03

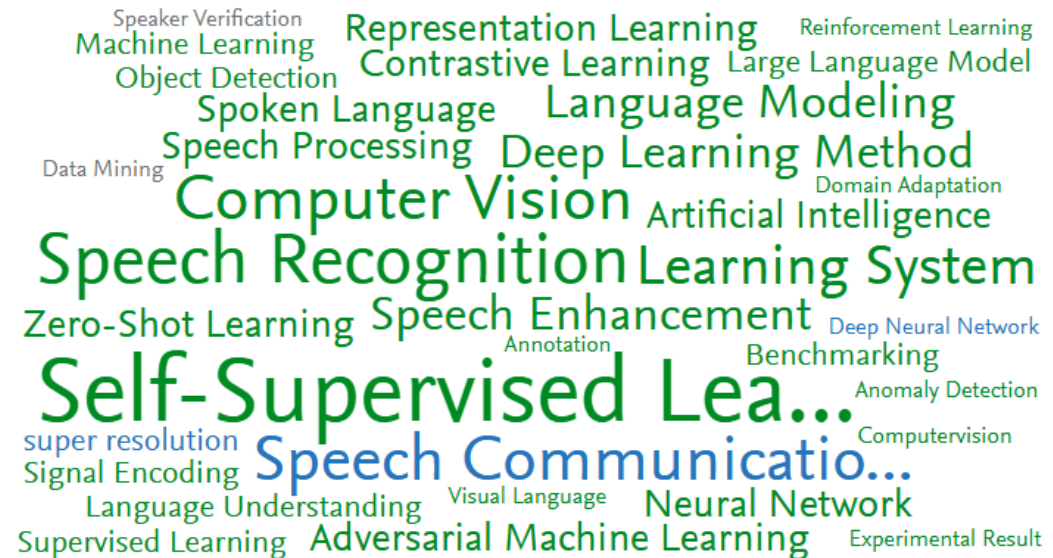
國際合作表現

- ▶ 於 2025 年 QS 世界大學排名資料科學與人工智慧領域，本校與全球頂尖大學群以及亞洲精選大學群等 13 個學校合作論文發表共 156 篇。
- ▶ 本校與全球及亞洲頂尖學校之國際合作學術產出，由右圖可知其影響力高於其他群組的平均表現。



本校國際合作研究主題

- Top 50 keyphrases by relevance, based on 988 publications of international collaborating with NTU

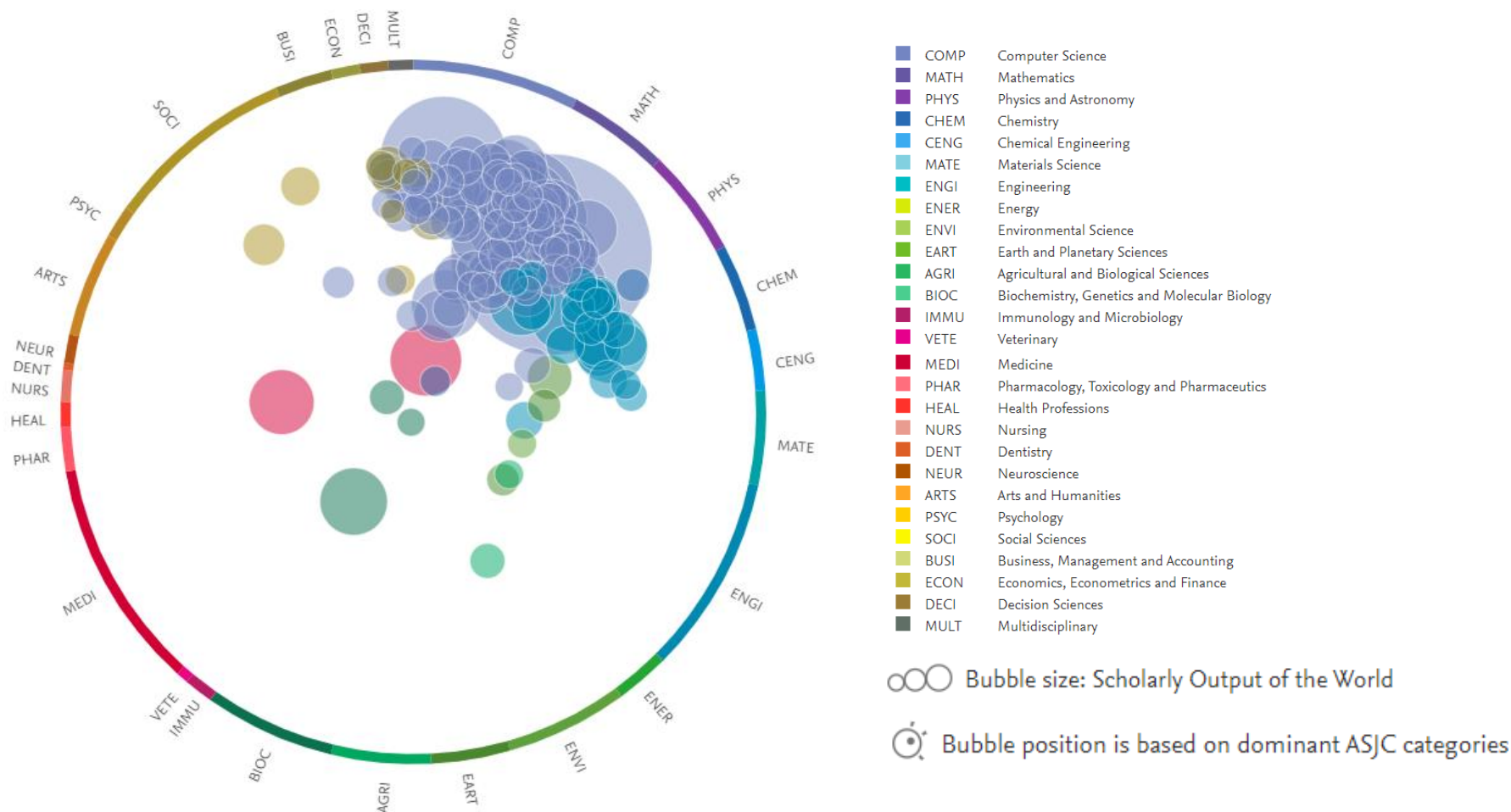


A A A relevance of keyphrase | declining A A A growing (2020-2024)

04

全球前 1% 熱門主題領域分布

- 研究主題熱門指數（**Topic Prominence**）是由 **Scopus** 近 2 年的引用次數、瀏覽次數和期刊影響指數三種指標綜合計算，排序後按照百分位表示，以顯示研究主題的發展趨勢（**momentum**）。



04

主題關鍵詞共現分析

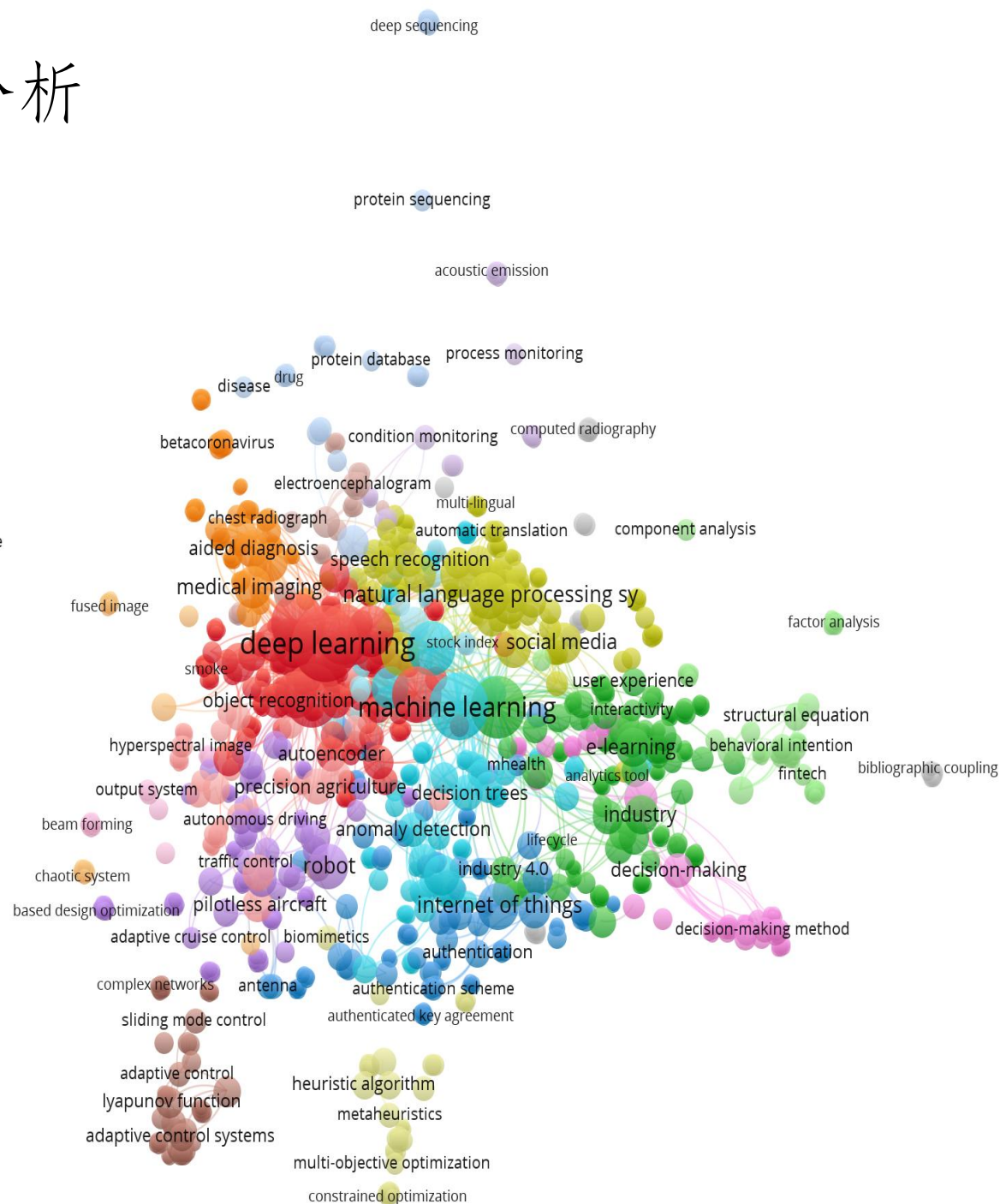
- ▶ 全球 **QS WUR** 資料科學與人工智慧領域共計 **188** 個 **Topics** 列於全球前 **1%** 熱門主題。

- ▶ **SciVal** 提供每個研究主題 **15** 個主題關鍵詞 (**Keyphrases**) 為主題描述，運用社會網絡分析及 **VOSViewer** 工具進行共現詞分析。**188** 個研究主題計 **1,574** 個主題關鍵詞，共分 **21** 群。

- ▶ 藉由主題關鍵詞共現分析，快速掌握全球前 **1%** 熱門主題概況。

additive manufacturing

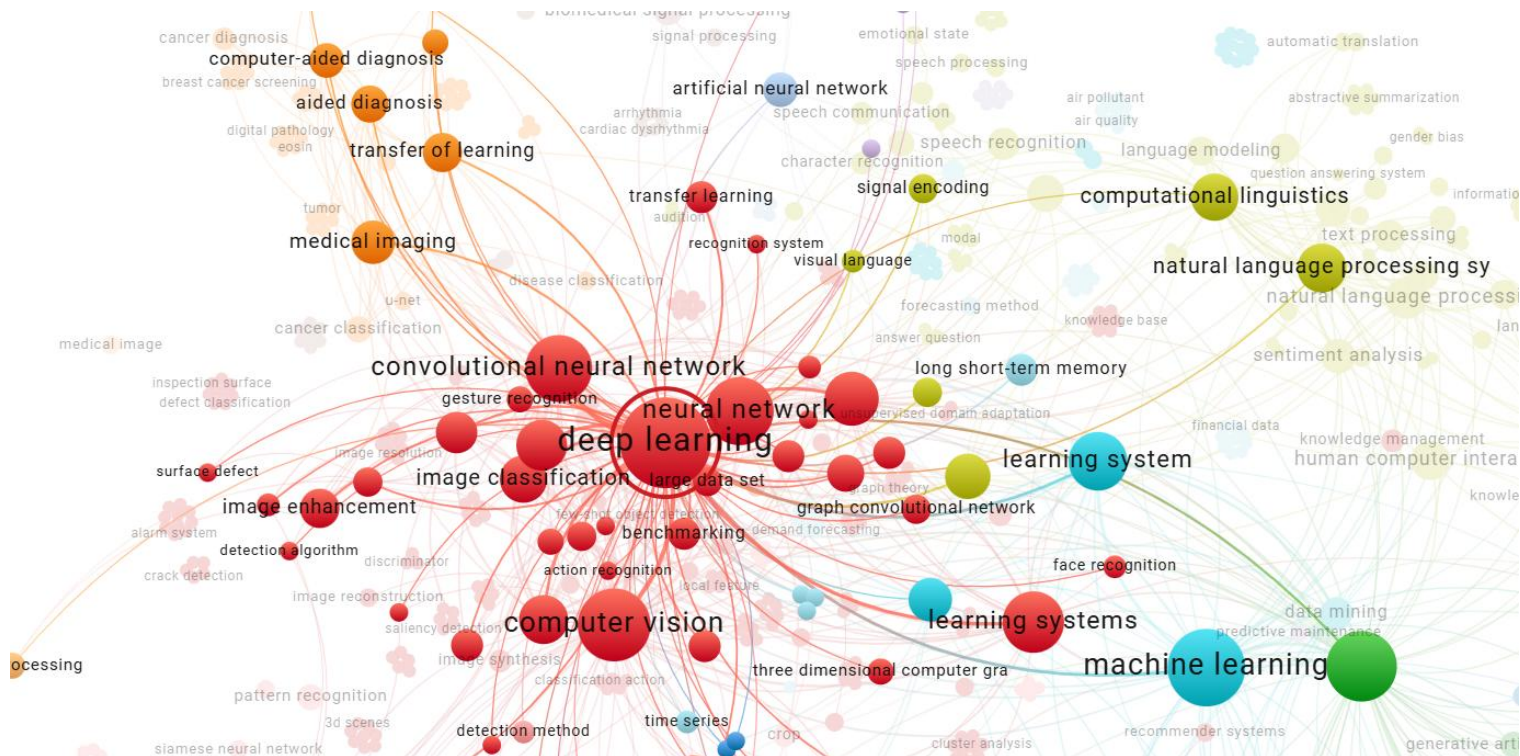
multiscale



04

相關主題關鍵詞檢視

- ▶ 全球前 **1%** 熱門指數研究主題的關鍵詞共現分析，請點選：[線上檢視](#)，可利用釘選錨點，以及放大縮小功能查閱共同出現字詞，瞭解更多的共同出現詞彙，及其所組成的研究主題概念。
- ▶ 以出現次數最多的 **deep learning** 為例，選定詞彙後可放大檢視如下圖。



04

全球前 1% 熱門主題

- ▶ 依熱門指數排序，下圖列出全球前 10 位熱門指數之研究主題的全球論文數量、領域加權引用影響（FWCI*），以及三個群組共 18 個學校參與研究主題情形。
- ▶ 完整 188 個 Topics 資訊請點選：[線上檢視](#)，可利用 Topic ID、學校名稱進行交叉組合查閱資訊，自行依需求選擇排序欄位檢視。

Topic Number	Topic	Prominence Percentile	Scholarly Output	Worldwide FWCI	Number of Universities ★
T.462	Transformative Approaches in Language Model Performance	99.996	19,902	3.34	18
T.0	Innovative Deep Learning Techniques for Object Detection	99.995	33,599	1.65	17
T.557	Federated Learning Systems for Data Privacy Enhancement	99.989	15,104	2.61	18
T.2507	Artificial Intelligence Transforming Diagnostic Imaging in Healthcare	99.983	8,323	3.13	17
T.12545	AI-Enabled Service Robots in Customer Experience	99.973	3,227	3.65	7
T.1847	Digital Twin Technology in Cyber Physical Systems	99.972	9,275	2.25	17
T.342	Integration of Cyber Physical Systems in Industry 4.0	99.971	8,616	1.92	14
T.601	Single-Cell RNA Sequencing in Cancer Research	99.965	8,797	2.22	18
T.748	Innovative Fault Diagnosis Methods for Machinery	99.959	9,996	2	13
T.106	Blockchain Innovations in Healthcare Data Security	99.958	12,584	1.63	14

* 領域加權引用影響（Field-Weighted Citation Impact, FWCI）說明：https://tw.service.elsevier.com/app/answers/detail/a_id/16216/supporthub/scopus/

04

各校熱門主題分析

- ▶ 本校全球前 **1%** 熱門指數研究主題佔論文百分比 **2%** 以上者計有 **13** 個，各校參與研究情形同時呈現如下圖，圓圈大小代表佔該校論文比例。
- ▶ **188** 個 Topics 以及 **18** 個評析學校之完整資訊請點選：[線上檢視](#)。藉由各校研究主題、論文佔比情形等資訊，提供本校探索學術合作之參考。

Topic Number	Topic	Natl Taiwan Univ	MIT	Carnegie Mellon Univ	Univ of Oxford	UC Berkeley	Nanyang Tech Univ	Harvard Univ	Natl Univ of Singapore	ETH Zurich	Yale Univ	Univ of Toronto	Hong Kong Univ of Sci and Tech	Univ of Hong Kong	Seoul Natl Univ	Korea Univ	Shanghai Jiao Tong Univ	Harbin Inst of Tech	Kyoto Univ
T.4031	Speech Recognition and Neural Networks	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
T.462	Transformative Approaches in Language Model Performance	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
T.0	Innovative Deep Learning Techniques for Object Detection	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
T.78	Generative Models for Image Synthesis and Translation	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
T.1516	Quantum Algorithms for Machine Learning Optimization	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
T.557	Federated Learning Systems for Data Privacy Enhancement	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
T.541	Adversarial Techniques in Deep Learning Models	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
T.496	Reinforcement Learning Applications in Autonomous Systems	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
T.1951	Neural Network Optimization through Quantization and Pruning	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
T.1767	Deep Learning Techniques for Image Super Resolution	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
T.1066	Person Re-Identification Techniques	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
T.3909	Point Cloud Semantic Segmentation	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
T.349	Resource Allocation and Task Offload in Edge Computing	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

05

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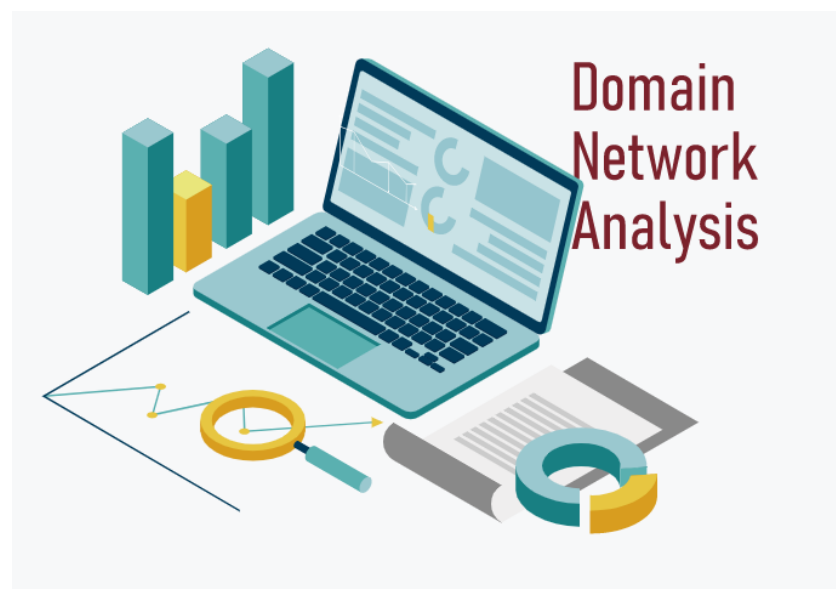
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國立臺灣大學

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