

Southeast Asia Libraries of the Future Summit 2024



Enhancing Library AI Services

AI Services, AI Literacy Programs and Faculty AI Cases

Junjun Cheng

Research Support
Services Librarian

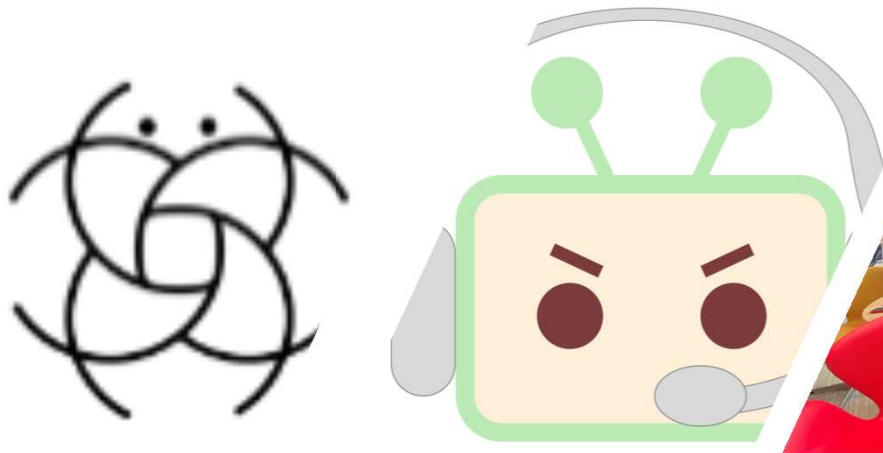
Foster Zhang

University
Librarian



香港科技大学 (广州)
THE HONG KONG
UNIVERSITY OF SCIENCE AND
TECHNOLOGY (GUANGZHOU)

图书馆
LIBRARY

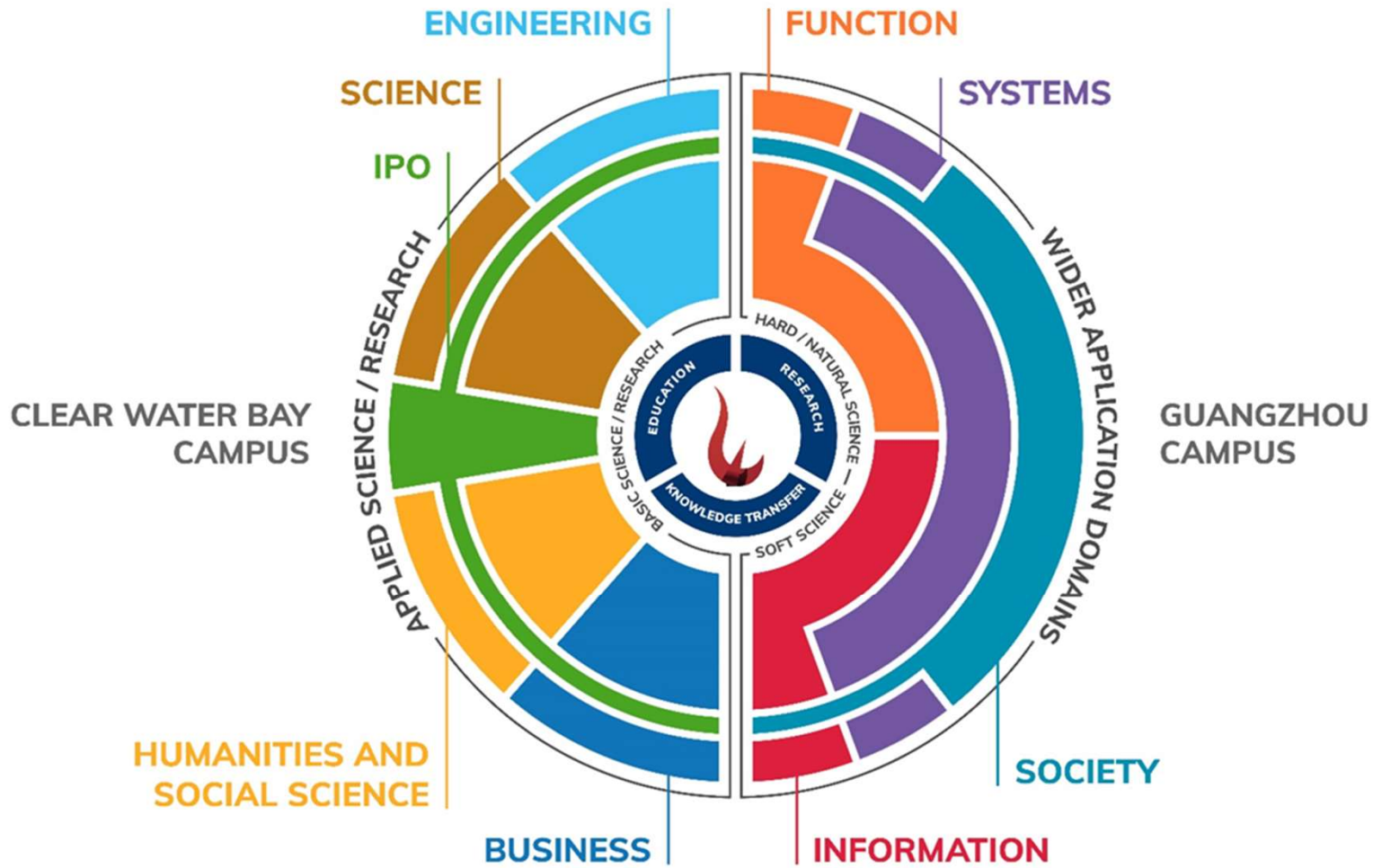


Outline

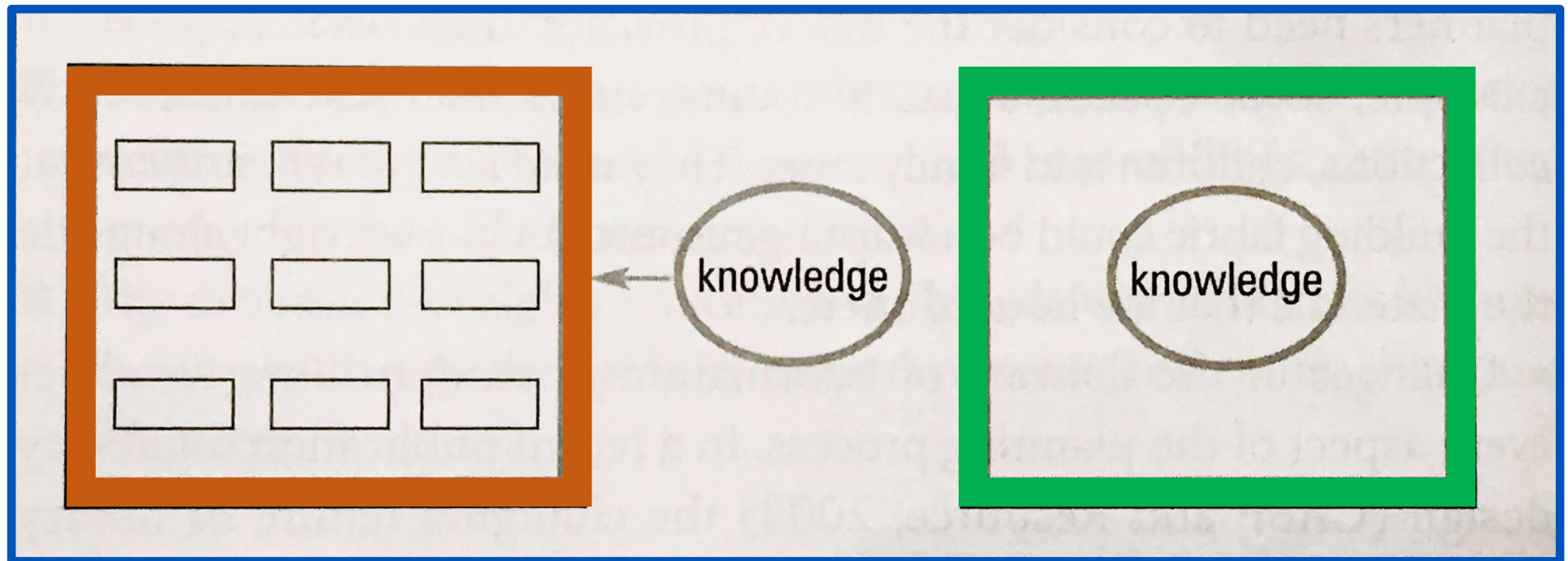
- About HKUST(GZ)
- Library Roles for the Future Learning Society
- AI Services
 - General VS Research Support
- AI Literacy Programs
 - LibGuides VS Workshops VS Events
- Future Directions



About HKUST(GZ)

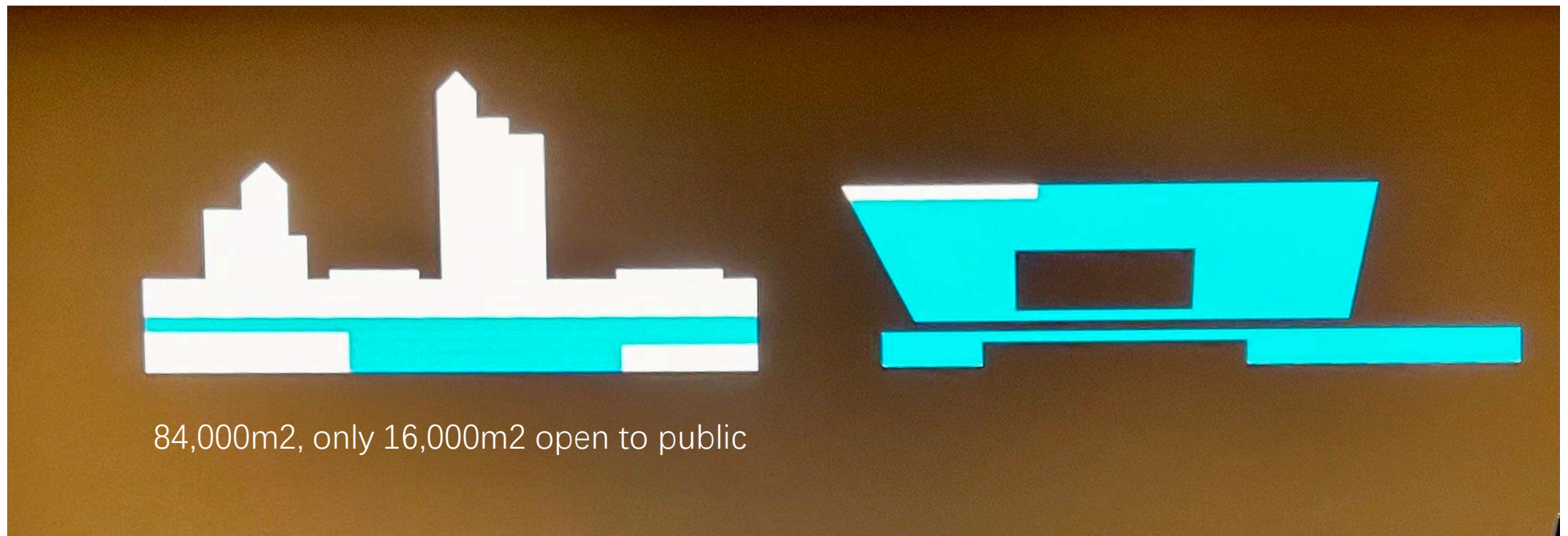


Library roles for the future learning society (resources surrounding users VS knowledge at the core of the users)



Ayub Khan: Better by design, 2009

Library focus: from collection to connection



Chris Hardie, Shanghai Library East,
2022-10-1

Connections help with knowledge discovery



- Discovery during discussion
 - ✓ Innovation is a group efforts
- Identify Knowledge from resources
 - ✓ People are resources
- Contribution to the society
 - ✓ 3rd space for life

AI Services



AI Services for Research Support

Business | Health | Nation | Nation & World | Science | Technology | World

Ex-Google CEO bets AI will shake up scientific research

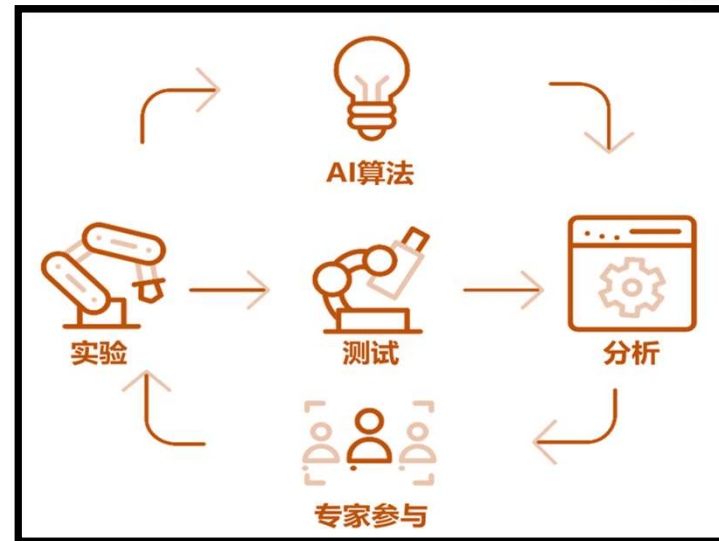
Nov. 6, 2023 at 7:00 am



Xi ZHU

Associate Professor, The Chinese University of Hong Kong, Shenzhen

Deputy Director, Universal Artificial Intelligence Application Research Center at the Shenzhen Institute of Artificial Intelligence and Robotics for Society



AI Services for Research Support



Xi ZHU

Associate Professor, The Chinese University of Hong Kong, Shenzhen

Deputy Director, Universal Artificial Intelligence Application Research Center at the Shenzhen Institute of Artificial Intelligence and Robotics for Society



Abstract

In this study, formamidine lead triiodide (FAPbI₃) black powder was synthesized using a mixture of formamidine iodide (FI) and lead(II) iodide (PbI₂) in a 1:1 ratio.

Result

The experiment embarked on the ambitious task of synthesizing formamidine lead triiodide (FAPbI₃) by combining formamidine iodide (FI) with lead(II) iodide (PbI₂) in 2-methoxyethanol (2-ME) as the solvent. The ultimate goal was to meticulously characterize the synthesized product.

Conclusion

The synthesis of formamidine lead triiodide (FAPbI₃) black powder was successfully achieved using a simple and efficient method. By mixing...

Introduction

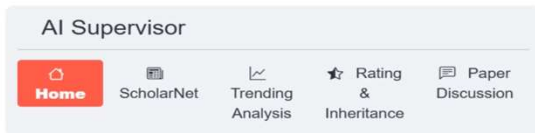
Previous works in the field of materials science have focused on the synthesis and characterization of perovskite materials for use in solar cells. One such method involves the...

References

AI Services for Research Support

The Knowledge-Works (KW)

The video introduction



AI Supervisor

AI Supervisor is a research assistant that can help you to find the most suitable research direction.

It can also help you to analyze the papers you are interested in, and give you a general comment on the papers.

It is trained with the ever-updating database **ScholarNet**, which contains **all scientific papers in human history till now**.

Main Services

1. Research trending analysis

Based on millions of publications, AI Supervisor can:

1. Conclude the previous hotspots in the form of worldcloud, and output analyse results in natural language;
2. predict potential hotspots in the coming one, two, three, or further years.

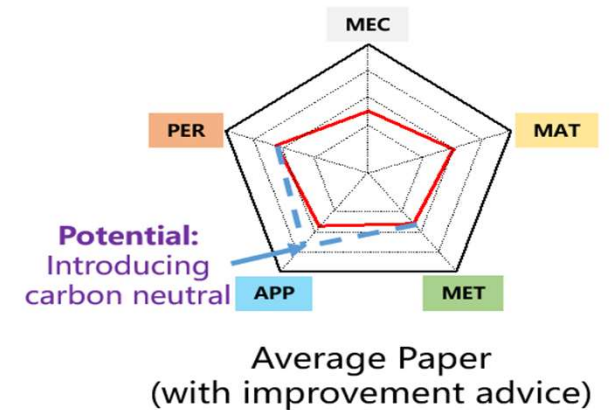
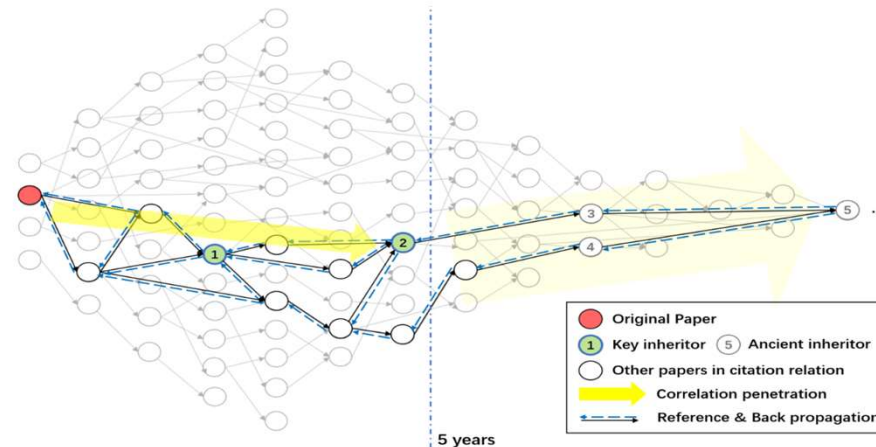
See tab **Trending Analysis** for more information.

2. Paper necessity rating and knowledge inheritance

Homepage.
service introduction

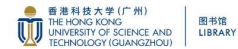
The Key Function

- Paper evaluation
- Research planning
- Detailed guidance



AI Services for Research Support

Spider Matrix (KW 2.0)



KnowledgeWorks

Home | Trending Analysis | Rating & Inheritance | Paper Discussion

Welcome to KnowledgeWorks (KW)!

This service using the AI supervisor provides you with the intelligent research direction and helps you analyze the papers you're interested in. With KW, you can receive general comments on your selected papers and optimize your research process. KnowledgeWorks is powered by ScholarNet, a comprehensive knowledge source that aims to include all scientific papers. ScholarNet is continuously updated to make sure you have access to the latest research and findings.

Mar, 2023

- Launched Spider Matrix 1.0 initial version with core functionality and SSO integration

需求描述	模块	开发状态	优先级	相关反馈意见
网站前端的文章	网站前端的文章	待开发	低-P1	"MDPI数据库的文章质量不稳定, 容易出现水文。" "数据源ScholarNet展示部分, 可以告知..."
文字颜色修改	网站前端的文章	待开发	低-P2	"页面的一字颜色, 没有超链接的text不要蓝色标出"
[future papers]新增文章	网站前端的文章	待开发	低-P2	"[future papers] 栏目没有变化"
文章 revision	文章 revision	待开发	中-P1	"[翻译稿中文]不支持大段翻译, 输入大量文字只能翻译一部分。"
[Grammar Check] 支持"详细"	文章 revision	待开发	中-P1	"[Grammar Check] 测试时请主动识别无法识别"
Auto Polish 功能改进	文章 revision	待开发	低-P2	"给出专业词汇的建议, 而非general语法纠错"
论文评分	论文评分	待开发	高-P0	"重要"[Publisher Paper Analysis] Necessity Level] 3CR分区不准确, 如何Physical Re..."
判断文章类型再按程度打分	论文评分	待开发	中-P1	"重要"[Necessity Level] [Material/Mechanism/Method/Performance/Application] 处理..."
PDF摘要/总结	PDF摘要/总结	待开发	高-P0	"重要" 2. 测试发现, 多几个问题 (5个左右) 出现提示信息, "overloaded requestXXX..."
PDF摘要/总结	PDF摘要/总结	待开发	高-P0	"上传pdf文章, 向原来的问题(原pdf文章)的问题, 必须更新问题才行。"
PDF 图表公式提取	PDF摘要/总结	待开发	低-P2	"重要" 1. [Input DOI] 向文章中图表公式相关问题, 出现读取错误, 没有读到正确公式..."
同问题保持未输入问题	PDF摘要/总结	待开发	低-P2	"[upload file] 上传文章后, summarize 后, 提交点[Answer questions] 问题, 再..."
对话	对话	待开发	高-P0	"重要" 测试让AI Supervisor推荐相关文章时, 出现所推文章不存在, 显示的link/标题/..."
对话功能推荐论文方案...	对话	待开发	低-P2	"点击submit按钮时出现(AISupervisor is thinking_此时), 之前的聊天内容消失了, ..."
对话的关闭按钮	对话	待开发	高-P0	"AI当前告知问题, 页面会跳转到第一个问题位置, 需要下拉至当前问题跳转答案, 对于有..."
对话的转化	对话	待开发	低-P2	"回答问题时, 建议回答都在一个对话框, 而非多个。"
[Paper Discussion] 功能完善	对话	待开发	中-P1	把[Paper Discussion] 功能做到极致, 使推荐PDF更加准确, 辅助与用户阅读, 比如比..."
对话减少冗余	对话	待开发	低-P2	"对比两篇文章问题时, 给出的回答和最开始输入doi给出的答复信息有重复, 建议..."
科研趋势	科研趋势	待开发	低-P2	"[topic trend] 可以点击进入 [Details] 下拉框支持用户自定义输入" "科研人员更关心小方..."
网站整体设计	网站整体设计	待开发	中-P1	"AI Supervisor is thinking_响应时间超过半分钟, 运算速度较慢。"
合并[Trending Analysis]和...	网站整体设计	待开发	低-P2	建议合并[Trending Analysis]和[Rating & Inheritance] 两个功能留下[Paper Discussio..."



Spider Matrix

Paper analysis

DOI: 10.1021/acs.jclett.3c01668 Search

* Publications after 2003 and in this journal list are mostly supported

Example doi: (Click for the free full report)

10.1021/acs.jclett.3c01668

Want to know how AI can help you in research and innovation?

<https://www.spider-matrix.win/>



Do you want to know the

Apr, 2023 - Apr, 2024

- Selected initial trial users (Professors from related area)
- Conducted user research and collected feedback
- Iterated on the platform

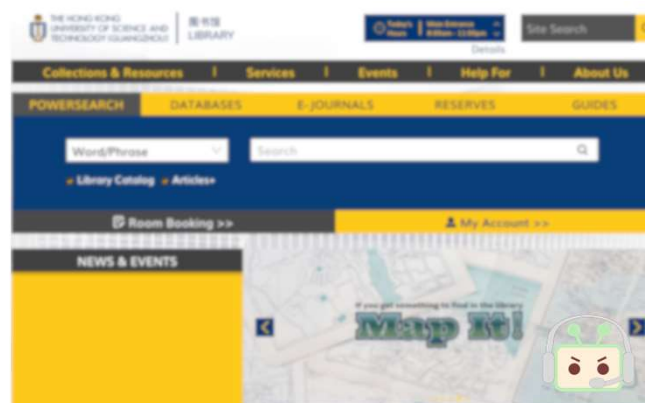
April, 2024

- Released Spider Matrix 2.0 with enhanced features

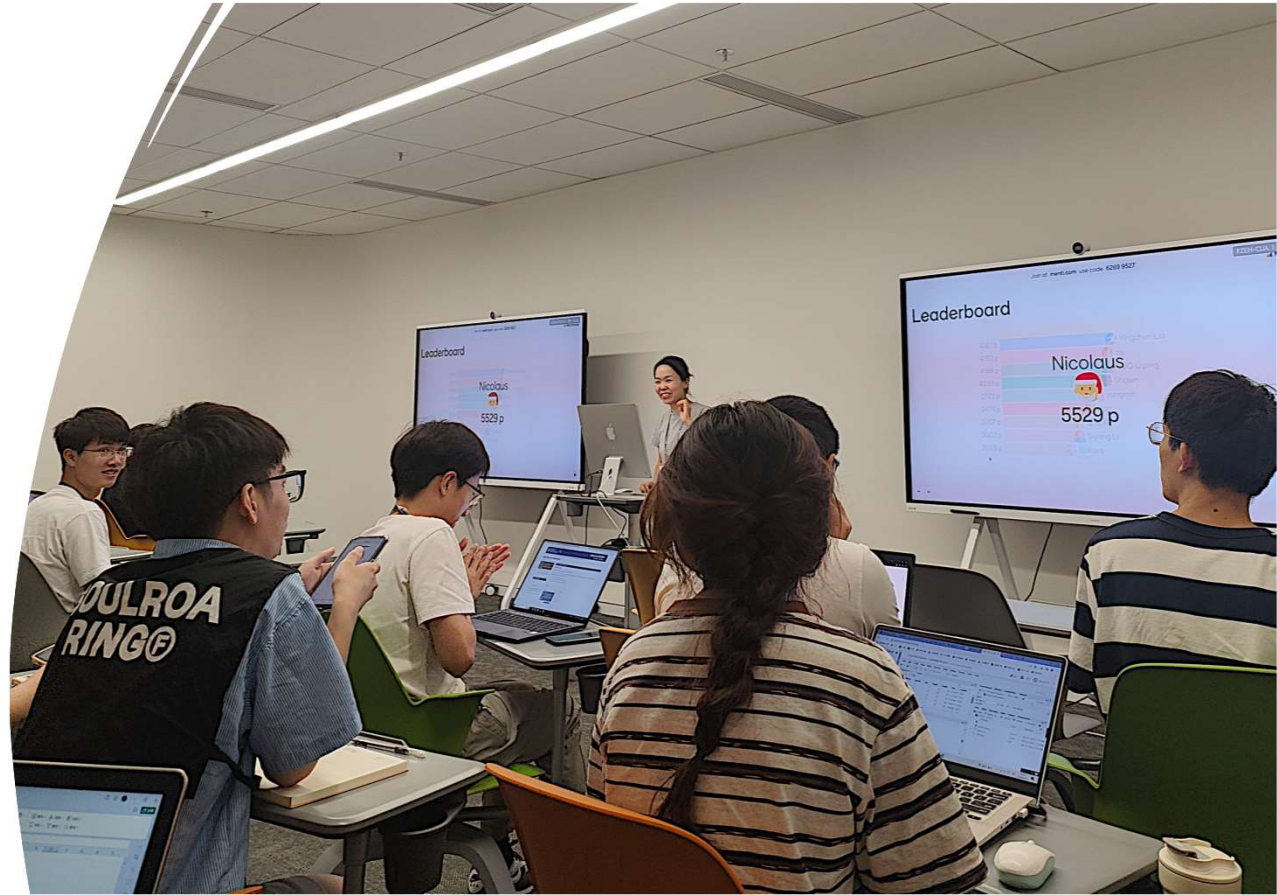
Library Chatbot

AI Chatbot for General Questions

- ❑ Available 24/7 to provide traditional library services
 - Answering general inquiries
 - Explaining policies and procedures
 - Helping locate resources
- ❑ Enhances the user experience



AI Literacy Program Overview



What is AI Literacy ?

- **From ChatGPT**

what is AI literacy

AI literacy refers to the understanding and knowledge of artificial intelligence (AI) concepts, principles, and applications. It includes being familiar with the fundamental ideas behind AI, such as machine learning, natural language processing, and computer vision, as well as knowing how AI is used in various industries and its potential impact on society. Being AI literate also involves being aware of the ethical considerations and challenges that come with AI development and implementation. In essence, AI literacy helps individuals to better comprehend, use, and evaluate AI systems and their implications in the world around them.

- **From researchers**

AI LITERACY DEFINITIONS

Source	Level	Context	Definition
Long and Magerko (2020)	All	Work.	AI literacy is "a set of competencies that enables individuals to evaluate AI technologies critically; communicate and collaborate effectively with AI; and use AI as a tool online, at home, and in the workplace (p.2)."
Mikalef and Gupta (2021)	Org.	Work.	AI capability is "the ability of a firm to select, orchestrate, and leverage its AI-specific resources (p.2)."
Hermann (2021)	Ind.	Students	"AI literacy is individuals' basic understanding of (a) how and which data are gathered; (b) the way data are combined or compared to draw inferences, create, and disseminate content; c) the own capacity to decide, act, and object;(d) AI's susceptibility to biases and selectivity; and (e) AI's potential impact in the aggregate (p.13)."
Kandlhofer & Steinbauer (2018)	Ind.	Students	AI literacy is sound knowledge about the principles of AI and its application.
Dai et al. (2020); Lee et al. (2021)	Ind.	Students	AI literacy is a student's ability to access and use AI-related knowledge and skills.

- Understanding AI
- Using AI
- Evaluating AI

Source:

- OpenAI. (2023). *ChatGPT* (October 24 version) [Large language model]. <https://chat.openai.com/chat>
- Cetindamar, D., Kitto, K., Wu, M., Zhang, Y., Abedin, B., & Knight, S. (2022). Explicating AI literacy of employees at digital workplaces. *IEEE Transactions on Engineering Management*. <https://doi.org/10.1109/TEM.2021.3138503>

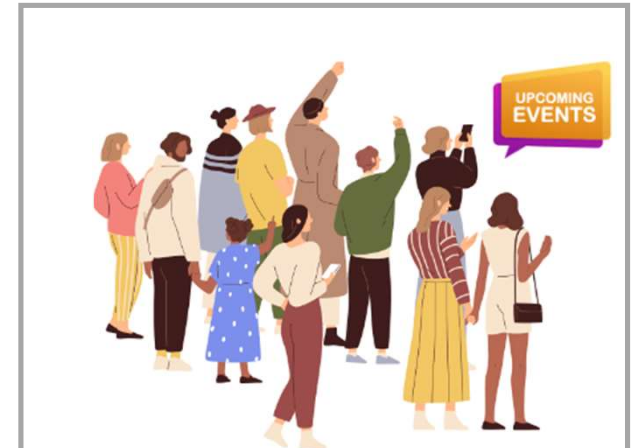
AI Literacy Program Overview



LibGuides

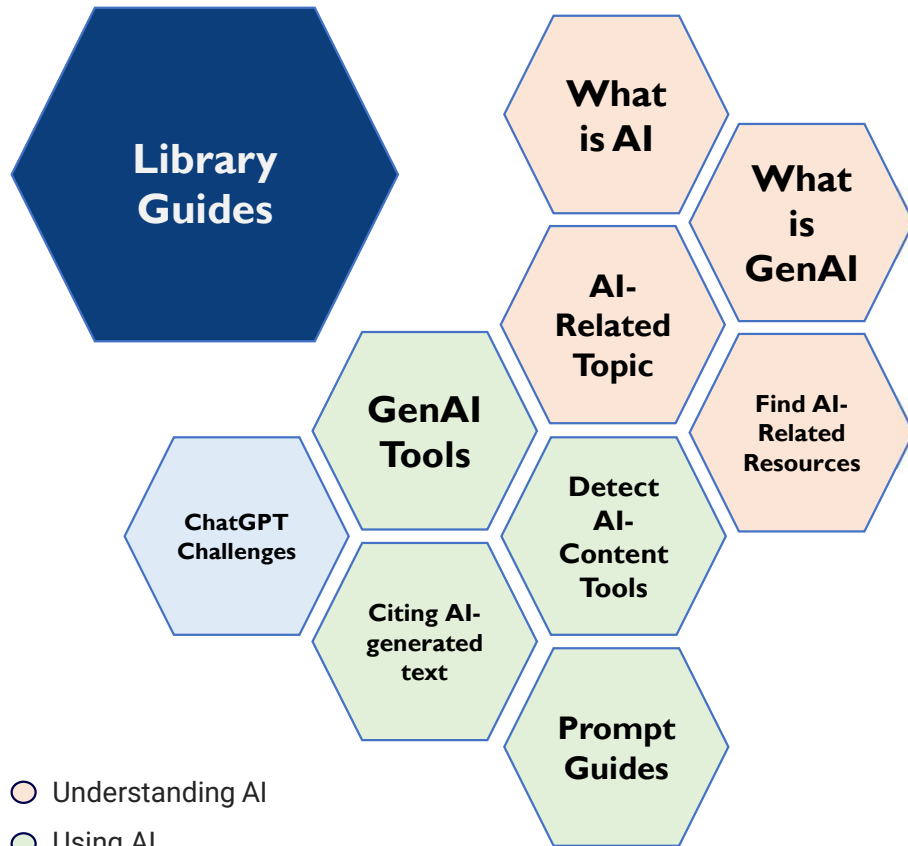


Workshops



Events

AI Literacy Program - LibGuides



- Understanding AI
- Using AI
- Evaluating AI

Artificial Intelligence: Home

Search this Guide Search

Home Find Books Find Articles Generative AI Using AI Tools to Teach ChatGPT Citing AI-Generated Text

5 mins Intro of AI

Artificial Intelligence (or AI) is the human-like intelligence, judgment, learning, and awareness exhibited by machines, along with the branches of computer science and engineering that seek to create intelligent machines.

The goal of AI is to develop a machine that can think like humans and mimic human behaviors, including perceiving, reasoning, learning, planning, predicting, and so on.

There is a quiz in the video.

The answer to the quiz is: Option D: AI that develops emotions over time

Explanation: An AI which develops emotions does not exist as of now. Such an AI would be classified as Strong AI and we haven't yet cracked the code for it.

The Umbrella of AI

Artificial intelligence (AI) is the development of machines and algorithms that mimic human intelligence, for example, by optimizing actions to achieve certain goals.

Machine learning (ML) is a subset of AI, and provides the ability to learn without explicitly being programmed for a given dataset such as playing chess, social network recommendation etc.

Deep Learning (DL) is the subset of ML that takes inspiration from biological brains and uses multilayer neural networks to solve ML tasks.[1]

Figure 1 below shows the relationship between Artificial Intelligence methods, Machine Learning algorithms, and Deep Learning algorithms. [2]

AI is an umbrella term for machines capable of perception, logic and learning.

Machine learning employs algorithms that learn from data to make predictions and performance improves when exposed to more data over time.

Deep learning uses multi-layered neural networks to build algorithms that find the best way to perform tasks on their own, based on vast sets of data.

Any technique which enables computers to mimic human behavior.

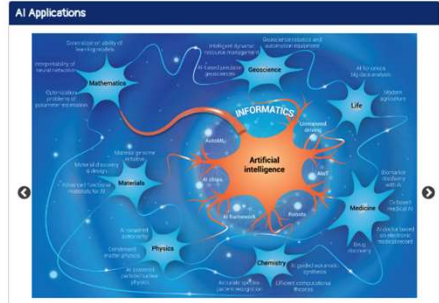
Subset of AI techniques which use statistical methods to enable machines to improve with experiences.

Subset of ML which make the computation of multi-layer neural network feasible.

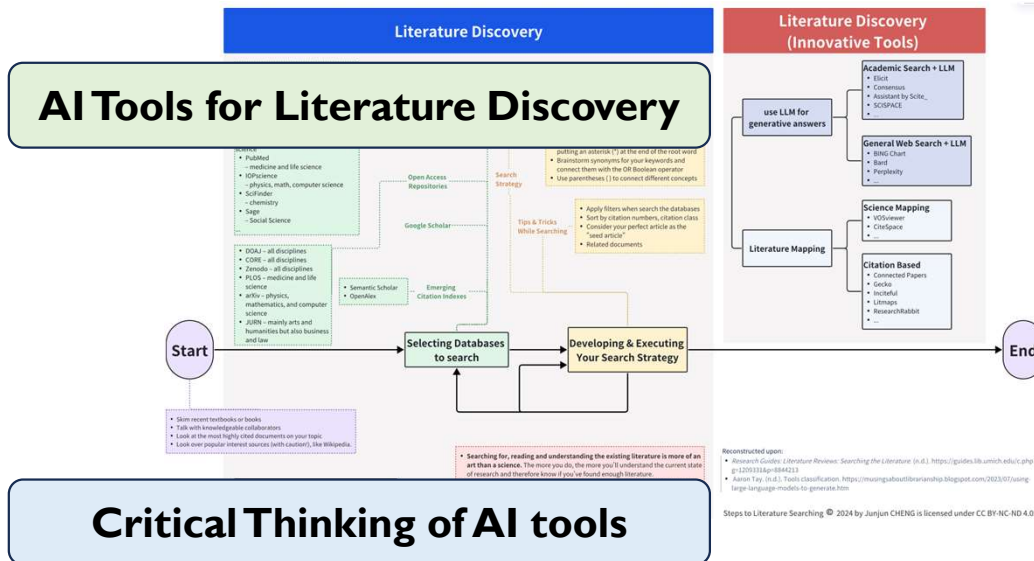
Fig 1. Relationship between Artificial Intelligence, Machine Learning and Deep Learning.

In simple terms, AI is an umbrella term that includes a diverse array of sub-topics (Figure 2).

<https://hkust-gz.libguides.com/ai>



AI Literacy Program – Workshops



Exercise Summary

Junjun Cheng

Please help me to write R code to do data manipulation and make a graph using tidyverse package.
subset data frame, we only need the city in Albany, Berkeley, Piedmont, Emeryville.
Keep only 6 columns, there are city, zip, price, br, bsqft, year.
further subset the dataframe, use quantile function to eliminate the 99th percentile of price and 99th percentile of bsqft. Remember to get rid of NA values if there is.
create a new variable called pricepsqft, which is equal to price divided by bsqft.
create a new variable called br5, which ensure the variable br in data is range from 1-5.
create a new variable called brCols, which using the rainbow function to generate the colors and corresponds to the value in variable br5.
Make a scatter plot, y axis is price per bsqft, x axis is bsqft. the point type is solid circle, the point color should be the brCols.

Here is what my data looks like:
image.png county city zip street price br bsqft year date long lat quality match wk
Alameda County Alameda 94501 1220 Broadway 509000 4 4420 1834 1910 2003/4/27 15:00
-122.241561 37.759344 gpsvisualizer Exact 2003/4/21
Alameda County Alameda 94501 429 Fair Haven Road 504000 4 6300 1411 1964 2003/4/27 15:00
-122.268385 37.762781 QUALITY_ADDRESS_RANGE_INTERPOLATION Exact 2003/4/21

ChatGPT Prompts Guide

AI Assistance for Coding

香港科技大学 (广州)
THE HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY (GUANGZHOU)
图书馆 LIBRARY

Innovative Tools – Can we trust them?

Don't outsource your critical thinking. Consider these when evaluating tools:

Technical aspects:

1. What is the data source behind the tools?
2. Are there ways for users to check/verify accuracy of the generated direct answer, or extracted information in the literature review matrix?
3. How accurate are the generated direct answers and/or extracted information in the literature review matrix in general?

Other Non-technical factors:

1. user privacy (is the system training on your queries)
2. sustainability of the system (what's their business model)

- Understanding AI
- Using AI
- Evaluating AI

AI Literacy Program - Event



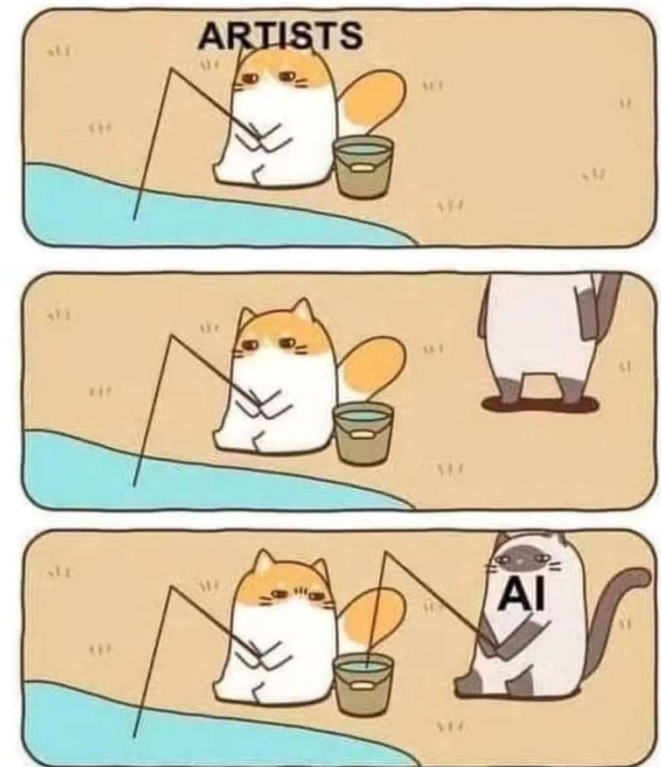
Kang ZHANG

Professor , Thrust Head,

Thrust of Computational Media and Arts,

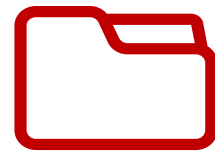
Hong Kong University of Science and Technology (Guangzhou)

AI:
I am not a creative intelligence,
I am an intelligent transporter.



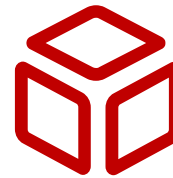
AI Literacy Program - Event

AI Projects by Faculty Members



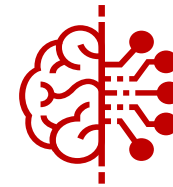
Data set

Train
>>>>>>>>>>



LORA

Generate
>>>>>>>>>>



Stable Diffusion



red tone + description

yellow tone +
description

blue tone + description

orange tone + description

green tone +
description

purple tone +
description

Style learning
Semantic injection

red tone + description

yellow tone +
description

blue tone + description

orange tone + description

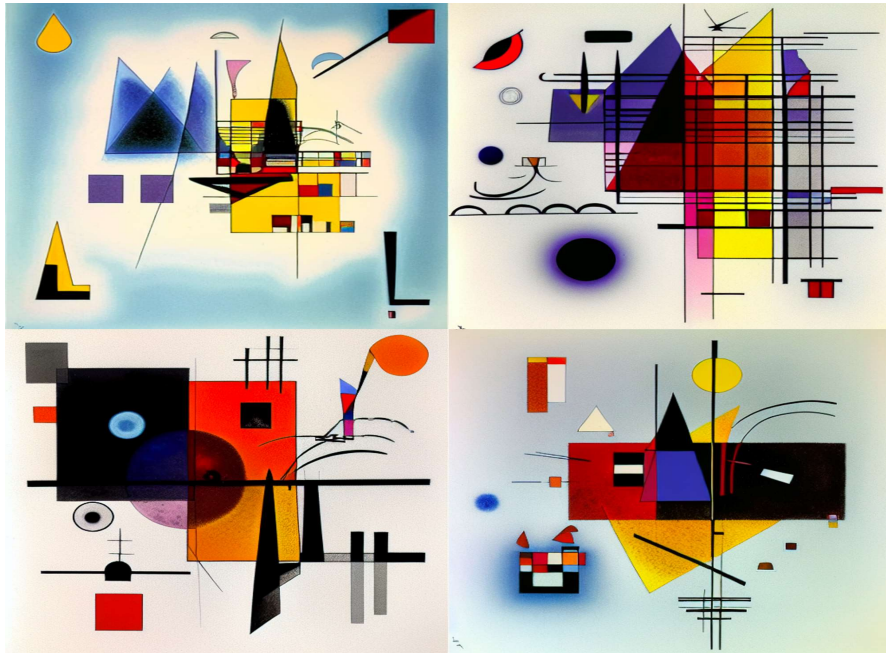
green tone +
description

purple tone +
description



AI Literacy Program - Event

AI Projects by Faculty Members



kandinsky,white,greyscale,orange,point,angular line,square,the acentric structure , <lora:kandinsky_t7t2_2:1>, <lora:direction_ex:0.5>



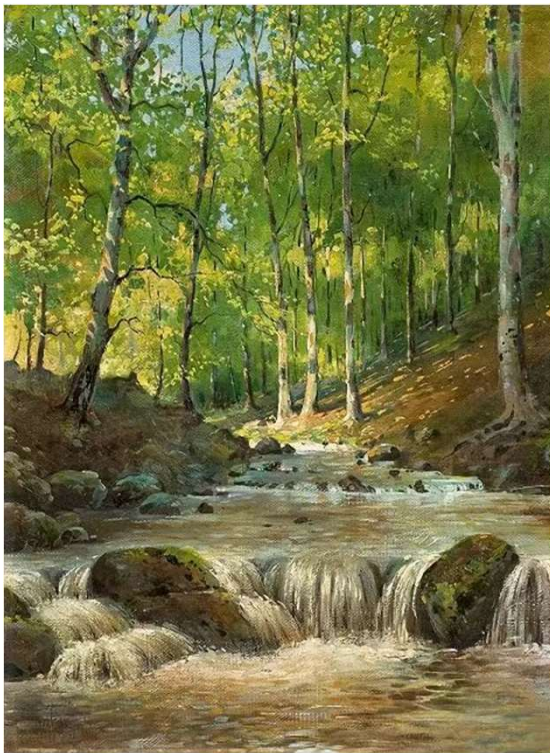
kandinsky,green,blue,violet,point,curved line,straight line,the centric structure , <lora:kandinsky_t7t2_2:1>, <lora:direction_in:0.5>

AI Literacy Program - Event

AI Projects by Faculty Members



Kandinsky Style



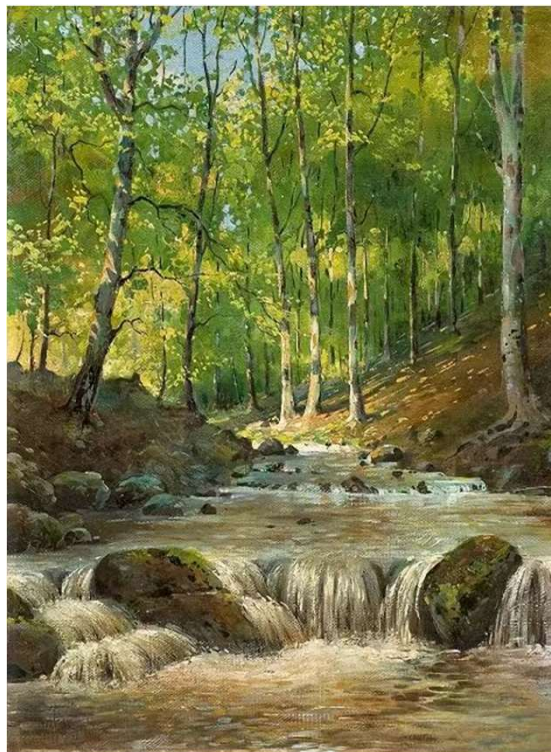
Generate



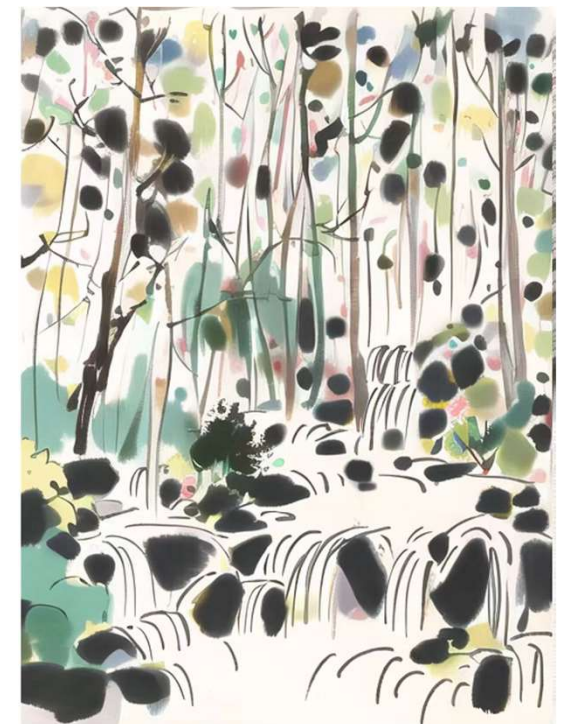
AI Literacy Program - Event

AI Projects by Faculty Members

Guanzhong WU Style



Generate

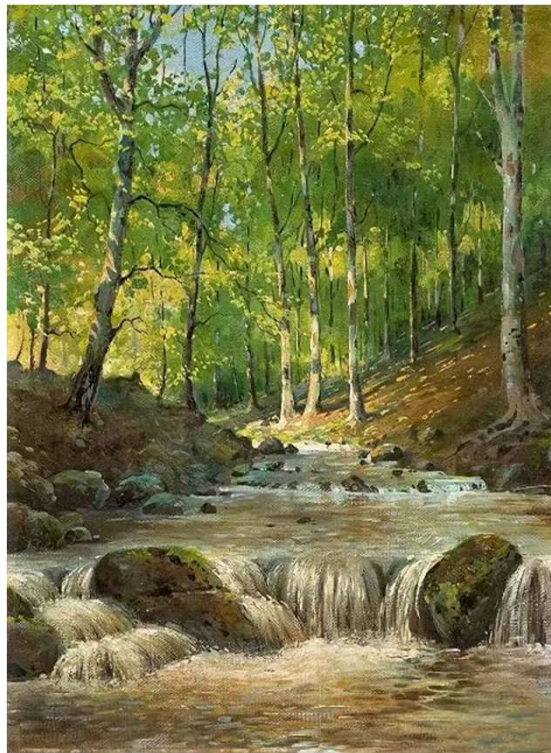


AI Literacy Program - Event

AI Projects by Faculty Members



Merge the characteristics of two artists



Generate



AI Literacy Program - Event

AI Projects by Faculty Members



HKUST (Guangzhou) Campus, as silk scarf

AI Literacy Program - Event

香港科技大学 (广州)
THE HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY (GUANGZHOU)
图书馆 LIBRARY

THEME 1: AI + ART

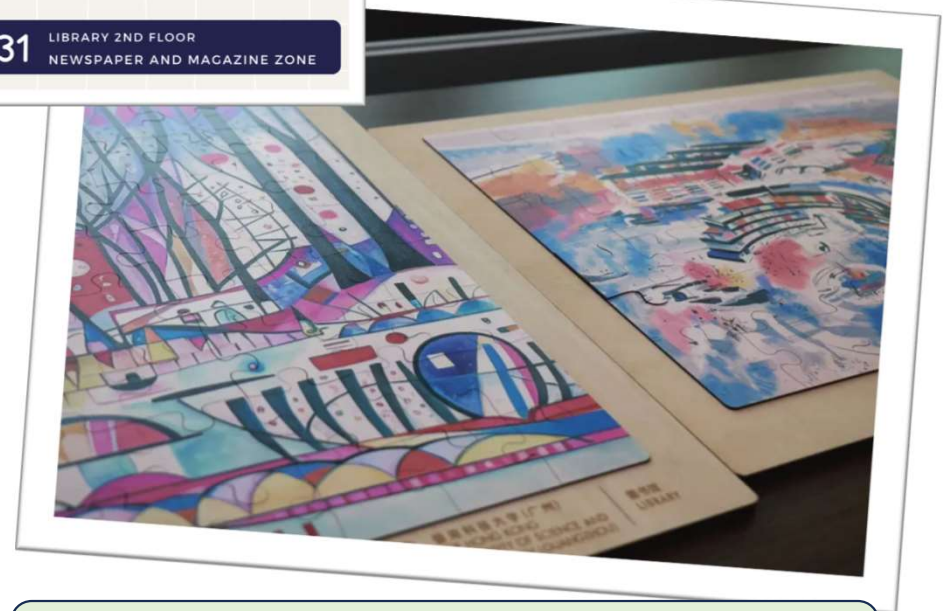
PUZZLE WEEKS

EXAM? PROPOSAL? STRESS?
SPEND SOME TIME AT LIBRARY PUZZLE TABLE!

MAY 17-31 LIBRARY 2ND FLOOR
NEWSPAPER AND MAGAZINE ZONE



On-site exhibition board, displaying Prof. Zhang Kang's team's AI artworks



Six featured puzzles showcasing Prof. Zhang's work on the 2nd floor of the library

AI Literacy Program





Future plans for AI integration in the library

□ Intelligent General and Research Services

- **Predictive Analytics:** Utilize predictive analytics to anticipate user needs, such as suggesting upcoming relevant workshops or new resources based on user interests and academic calendar events.
- **Personalized Research Assistance:** Develop AI-driven personal research assistants that can provide tailored recommendations for resources, databases, and articles based on individual research profiles and past usage patterns.

□ Innovative Methods to Showcase AI Projects

- **Interactive Virtual Exhibitions:** Develop virtual reality (VR) or augmented reality (AR) exhibitions to showcase AI projects, allowing users to interact with and explore projects in immersive and engaging ways.
- **AI Project Showcases and Hackathons:** Organize hackathons and project showcases where students and faculty can present their AI projects, fostering a collaborative environment and encouraging cross-disciplinary innovation.

