



# AI赋能图书馆服务与业务重构的探索和思考 Exploration and Reflection on AI-Empowered Library Services and Operations Restructuring

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2025.10





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Reflection

### AIGC正在重塑社会，同样也改变着图书馆的信息组织、信息发现和服务方式等

- 2022-2025年间，AI大语言模型的出现和不断迭代，以大语言模型（以下简称“LLMs”）为代表的生成式人工智能和新技术正在重塑社会，同样，也改变着图书馆的信息组织、信息发现和服务方式等。
- 《IFLA趋势报告2024》指出“生成式人工智能和新技术正在改变我们创造、共享和使用信息的方式”。人工智能技术不可避免正在或将成为图书馆工作中的重要组成部分。

### AI is reshaping society , and transforming the way that information is organized, discovered and served in libraries.

- From 2022 to 2025, generative AI—particularly Large Language Models (LLMs)—has rapidly advanced, profoundly transforming the way that information is organized, discovered and served in libraries.
- **IFLA Trends Report 2024** highlights that generative AI is reshaping how information is created, shared, and consumed. AI technology is inevitably becoming, or will soon become, an essential component of library operations.



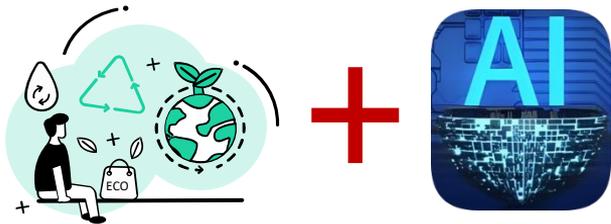
ChatGPT



## 图书馆如何深度的、嵌入式的AI应用? How can AI be deeply applied to library operations and services?

### 公共图书馆关注、跟踪AI，思考AI在图书馆的应用场景。

- 理论上，业界基本形成一个共识，“**图书馆的所有业务与服务都值得被AI重构**”；
- AI技术体系包括：LLMs、检索增强生成（RAG）、向量知识库、向量检索、智能体（Agent）、MCP框架等，为图书馆提供了新的技术路径。



### Public libraries are also actively following and tracking AI advancements, and exploring innovative applications of AI in library services.

- Theoretically, there is a broad consensus that "**all library operations and services are worth being restructured by AI.**"
- The AI technology provides libraries with new innovative approaches, such as LLMs, RAG, Vector Retrieval, Vector Database, Agents, and more.





## 检索 ( Retrieval)

### 问题

- 单一“**关键词**”式检索：固定检索字段，检索效率低；“**字符式匹配**”，无法意图识别，得到高相似度的内容；
- **结果排序策略简单**：结果排序或相关性的逻辑单一，输出依据仅“**时间前后**”或“**关键词**”完全或模糊匹配等；
- **元数据内容简单**：目录级的标引，元数据（如MARC）通常只包含有限的基本信息（如题名、作者、出版年份等）；缺乏学科领域、主题、人等知识的关联与表示，用户难以获取完整知识链。

### AI能力

- **自然语言处理 (NLP)** 和语义识别实现自然语言检索；
- **向量检索 (Vector Retrieval)** 提升相关性判断；
- **知识抽取**，可视化揭示知识链和主题关联，挖掘隐性知识脉络等等。



## Retrieval

### Problems

- Most systems still rely on "keyword matching," lacking semantic understanding;
- Fixed search fields result in low efficiency;
- Result ranking logic is simplistic (e.g., by time or match score);
- Metadata (e.g., MARC records) is limited and lacks knowledge interconnections ; Users find it difficult to obtain a complete knowledge chain.

### AI Solutions

- Use Natural Language Processing (NLP) and semantic recognition to enable natural language queries;
- Vector retrieval to improve relevance assessment;
- AI-powered knowledge extraction enables the visualization of thematic connections and knowledge chains, providing users with insights into implicit knowledge pathways, among other benefits.



## 资源 ( Collections and Data)

### 问题

- **编目效率低**：以人工编目方式进行，面临人力依赖高、工作强度大；效率低下，流程繁琐等等，是长期存在的业务瓶颈。
- **数字资源浅层标引**：大多为目录级标引（仅少量RDF数据）；对图像、文本、音视频等内容解析困难；
- **异构资源整合难**：不同阶段建设，加工深度不一，标准不统一；不同数据库、电子资源平台相互独立，统一检索、跨库检索不理想；

### AI能力

- **OCR + LLMs**：内容解析、元数据抽取、自动分类、主题标引、摘要生成等，实现自动编目
- **向量知识库 ( Vector Database )**：实现多模态数据融合与统一索引；支持跨平台、跨格式的统一资源发现与智能检索。



## Collections and Data

### Problems

- **Low Cataloging Efficiency**: Reliance on manual cataloging leads to high dependence on human labor, heavy workloads, low efficiency, and cumbersome processes—constituting a long-standing operational bottleneck.
- **Superficial Digital Resource Indexing**: Most digital resources are indexed only at the catalog level (with minimal RDF or structured data), and deep content analysis—such as full-text extraction from images, documents, audio, and video—remains challenging.
- **Difficulty Integrating Heterogeneous Resources**: Resources were developed in different phases with inconsistent processing depths and non-uniform metadata standards. Various database platforms operate in isolation, resulting in suboptimal unified discovery and cross-platform search capabilities.

### AI Solutions

- **OCR + LLMs**: Enable **automated cataloging** through content parsing, metadata extraction, automatic classification, subject indexing, and abstract generation.
- **Vector Database**: Facilitates multimodal data integration and unified indexing, supporting cross-platform, cross-format resource discovery and intelligent retrieval.



## 服务 (Services)

### 问题

- **服务平台分散**：PC端网站、H5、微信小程序、app等，服务内容不统一、服务逻辑不一致等；系统多而杂、多跳转等；
- **智能化程度低**：AI应用多为“一般性咨询问答”的服务场景；个性化服务不足；

### AI能力

- **智能体 (Agent) 与MCP架构**：实现多任务协同、跨平台集成；
- **提供主动式、定制化服务**，提升用户体验。



## Services

### Problems

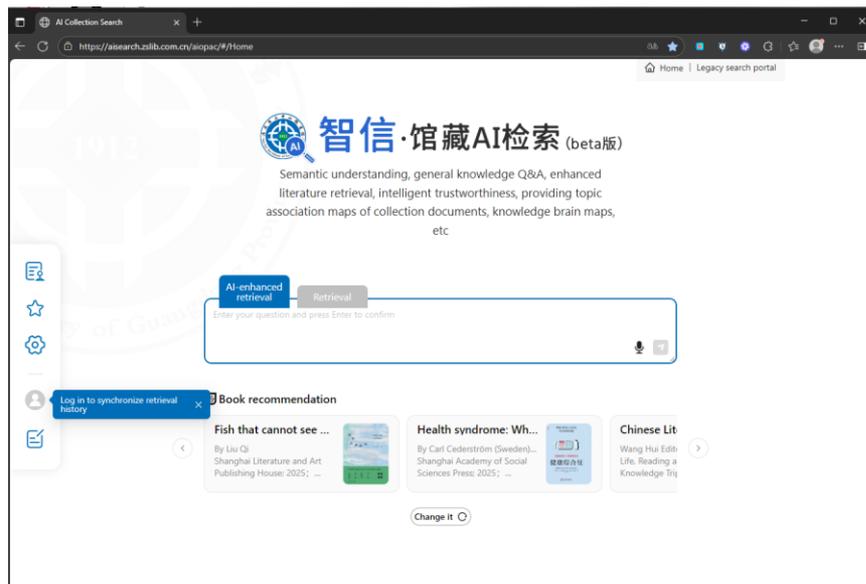
- **Fragmented Service Platforms**: Services are dispersed across multiple platforms such as PC websites, H5 pages, WeChat mini-programs, and mobile apps, leading to inconsistent content, divergent service logic, system complexity, and frequent inter-platform navigation.
- **Low Level of Intelligence**: AI applications are mostly limited to "general consultation and Q&A" service scenarios, with insufficient personalized services.

### AI Solutions

- **Agents and MCP Architecture**: Enable multi-task coordination and cross-platform integration; deliver proactive and customized services to enhance user experience.

## 实践1: AI馆藏书目检索系统 (Beta版)

## Case 1: AI Library Catalog Search System (Beta Version)



- **目标:** 重构传统OPAC系统, 实现语义化检索与知识脉络可视化
- **Objective:** To reconstruct the traditional OPAC system, enabling semantic search and Knowledge pathway visualization.
- **技术架构:** 采用 "LLMs (DeepSeek) + 关系数据库+API" 模式; 暂未进行MARC->Bibframe语义化, 及向量化处理
- **Technical Architecture:** "LLMs (DeepSeek) + RDBMS+ API" approach. Semantic and vectorization processing (e.g., from MARC to Bibframe) is not yet implemented
- 采取**合作开发与自主开发**结合的模式
- collaborative development and in-house development.



### 3. A Brief History Today: 21 Lessons in the 21st Century proposes

critical thinking on the core issues of contemporary society:

- Challenges such as globalization, artificial intelligence, and climate change were analyzed, and education needed to shift from skills training to general competencies (critical thinking, collaboration, creativity).
- It calls on humanity to reshape its values in the wave of technology and respond to identity crises and systemic risks.

Harari's new work in 2024, "**Above Homo sapiens: A Brief History of Information Networks from the Stone Age to the AI Age**" (*Nexus: A Brief History of Information Networks*), further expands on his perspective:

- Core proposition:** Information technology is the underlying driving force of historical change, and the current "autonomy" of artificial intelligence is ending the history of human-dominated history.
- Core warning:** AI has the ability to make independent decisions and innovate narratives, and may place humans in a "dream woven by non-organic agents", and the risk of loss of control needs to be avoided through global cooperation and ethical constraints.

Harari's works have been translated into 65 languages and sold more than 27 million copies worldwide (trilogy combined) with a clear logic that integrates history, biology, philosophy and the ethics of science and technology. The core of its thinking is to reveal that **the advantages of human collaboration through shared narratives are transforming into vulnerabilities that need to be vigilant in the AI era.**

The above content is collected, summarized and generated by AI and is for reference only

#### 🔍 Matching books in the collection Article 15

Chinese books and foreign documents

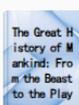
#### 人类简史：从动物到上帝：a bri...

by Yuval Noah Harari  
 Publisher: CITIC Publishing Group Co...  
 Collection/Borrowable copies: 8 copi...  
 Introduction: The author of this boo...



#### The Great History of Humanki...

哈拉瑞(Yuval Noah Harari)著  
 Publisher: Foresight World Culture P...  
 Collection/Borrowable Copies: 1/0 C...  
 Introduction: This book is divided int...



#### A Brief History of Humankind. ...

by Yuval Noah Harari  
 Publisher: CITIC Publishing House  
 Collection/Borrowable copies: 24 co...  
 Introduction: This is a history of hum...



#### Above Homo sapiens: A brief h...

by Yuval Noah Harari  
 Publisher: CITIC Publishing Group Co...  
 Collection/Borrowable Copies: 14 co...  
 Introduction: The book is divided int...



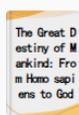
#### Today's Brief History: The Grea...

(Israel) by Yuval Noah Harari  
 Publisher: CITIC Publishing House  
 Collection/Borrowable Copies: 9 copi...  
 Introduction: This is a historical popu...



#### The Great Destiny of Mankind: ...

(以)哈拉瑞(Yuval Noah Harari)著  
 Publisher: Foresight World Culture P...  
 Collection/Borrowable Copies: 1/0 C...  
 Introduction: The content of this boo...



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#### 2 Yuval Harari: The real threat to AI is bure...

Yuval Noah Harari Professor of History, PhD from the University of Oxford, Professor at the Hebrew...

Sohu.com 2024-12-29

#### 3 Yuval Harari: A naïve view of information...

Yuval Noah Harari was born in Haifa, Israel in 1976. A cutting-edge historian and philosopher who ha...

NetEase 2025-05-17

#### 4 Yuval Harari and his historical book A Bri...

English: Yuval Noah Harari, 1976-), Israeli historian. A Brief History of Man: From Animals to God,...

Baidu Baijia number 2025-05-17

#### 5 An in-depth report on the works and th...

An In-depth Report on the Works and Thoughts of Yuval Noah Harari Introduction Yuval Noah Harari...

CSDN technical community 2025-03-15

< 1 2 3 >

匹配可信馆藏

Identify trusted library collections



智信·馆藏AI检索

AI-enhanced search: Enter your question and press Enter to confirm

Yuval Noah Harari

15 online materials were found

DeepSeek-R1思考完成

Smart Q&A

Regarding the writings of Israeli h

1. A Brief History of Mankir

book traces the entire jour... the earth through large-sc... agricultural revolution on i

2. "A Brief History of the Fu

focuses on three major iss... bioengineering and artific... hegemony replaces human

3. "A Brief History of Today

puts forward the core prop... the most important resourc... to deal with algorithmic he

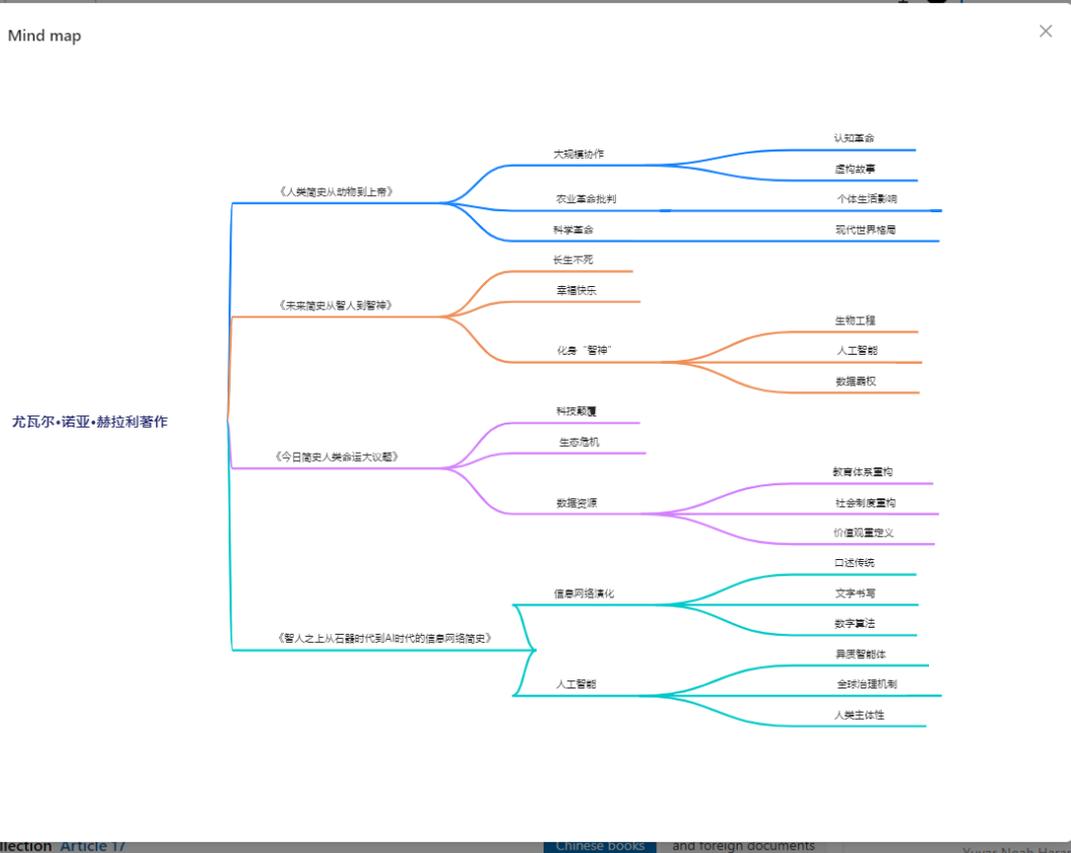
4. "Above Homo sapiens: A

(latest book published in... This book systematically so... information networks shap... establish a global governa

As a PhD in history at the Univers... from a grand historical perspecti... this foundation". The above book

The above content is collected, su

Matching books in the collection Article 17



Resources (15)

Yuval Noah Harari, Israeli writer, masterpiece "A

智信·馆藏AI检索 (Beta版)

AI-enhanced search: Enter your question and press Enter to confirm

Home | Legacy search portal

### Yuval Noah Harari

Find 15 online materials

DeepSeek-R1思考完成

#### Smart Q&A

Yuval Noah Harari is an Israeli his...  
University of Jerusalem. His writin...

1. A Brief History of Mankir...  
book traces the evolution of...

- Cognitive Revolutio...  
races to become the...
- Agricultural Revolu...  
and civilization form...
- Scientific Revolutio...  
controversial.

2. A Brief History of the Fut...  
focusing on the reconstruc...

- Exploring technologi...  
control), but will rais...
- The concept of "data...

3. A Brief History Today: 21...  
critical thinking on the core...

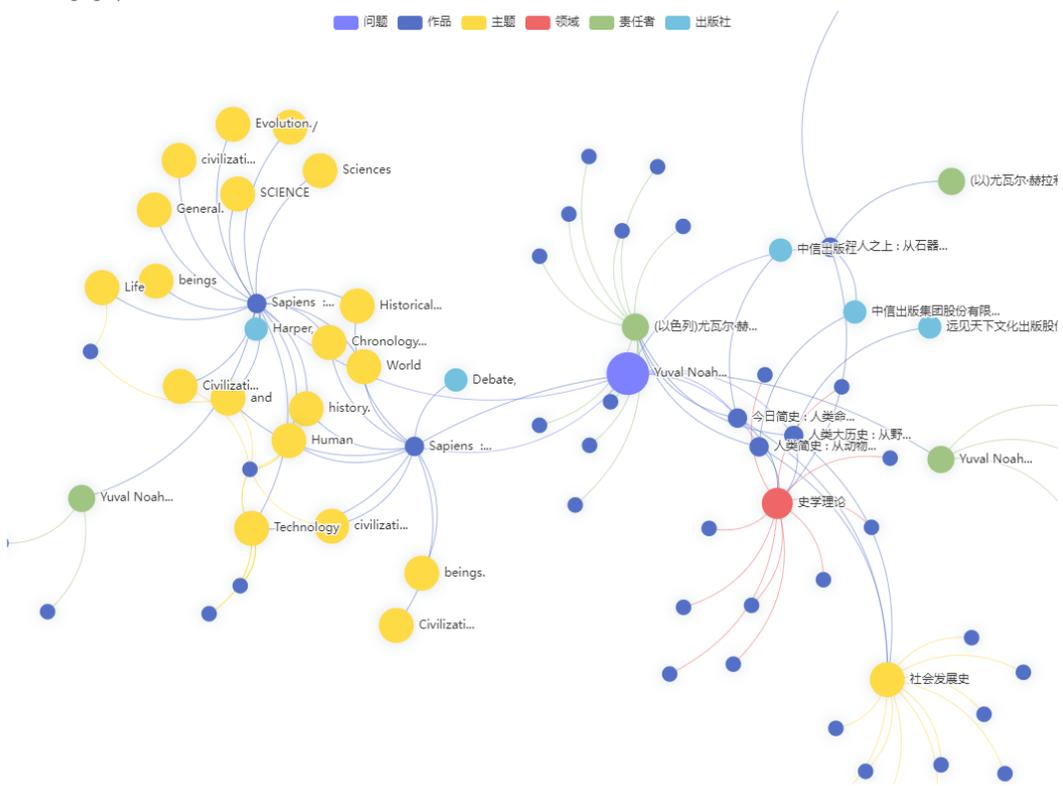
- Challenges such as g...  
competencies (critic...
- It calls on humanity...

Harari's new work in 2024, "Abov...  
Networks), further expands on his...

- Core proposition: Informa...  
of human-dominated history.

#### Knowledge graph

问题 作品 主题 领域 责任者 出版社

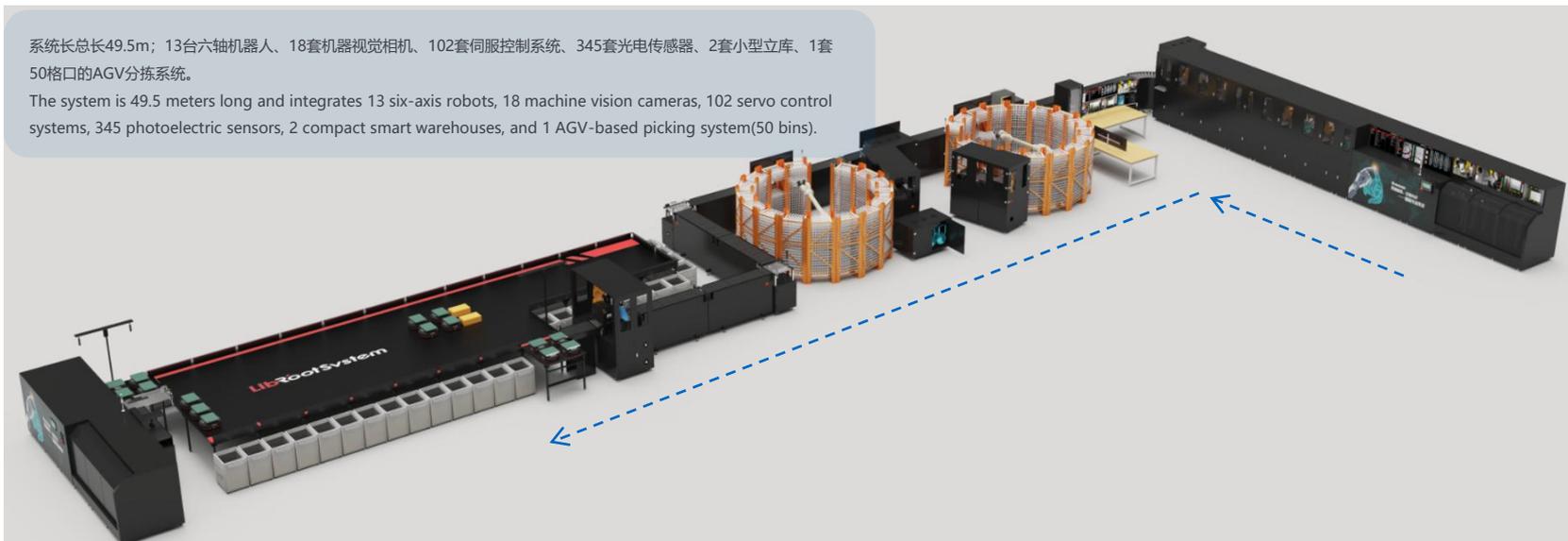


## 实践2：图书采编全流程智能作业系统--“采编图灵”

### Case 2, “AC Turing” : An Intelligent End-to-End Workflow System for Library Acquisitions and Cataloging

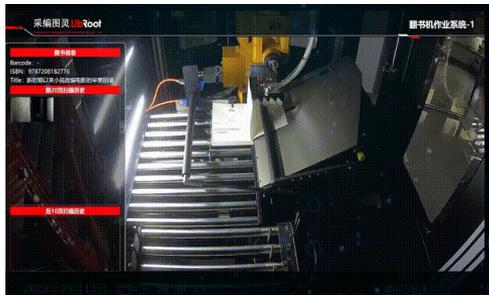
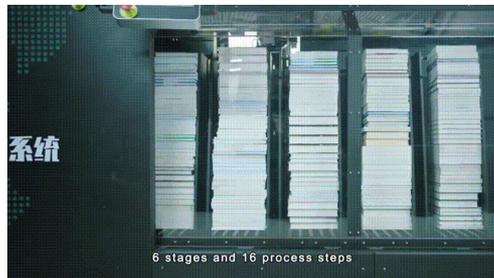
系统长总长49.5m；13台六轴机器人、18套机器视觉相机、102套伺服控制系统、345套光电传感器、2套小型立库、1套50格口的AGV分拣系统。

The system is 49.5 meters long and integrates 13 six-axis robots, 18 machine vision cameras, 102 servo control systems, 345 photoelectric sensors, 2 compact smart warehouses, and 1 AGV-based picking system(50 bins).



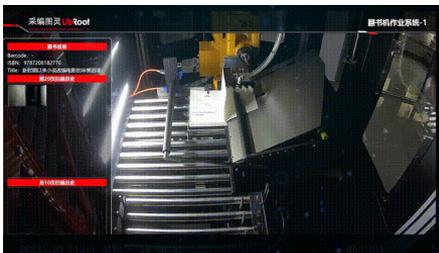
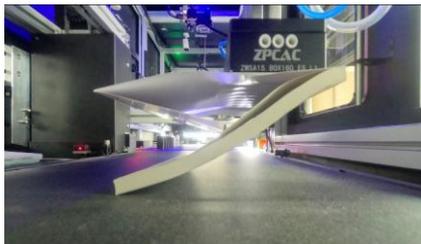
- **建设周期：**2020–2023年；2023年8月全面运行；  
**Project Duration:** 2020–2023; fully operational since August 2023.
- **技术组成：**RFID、机器视觉、工业机器人、AI图像识别；  
**Technology Stack:** RFID, machine vision, industrial robots, and AI-based image recognition.
- **成效：**实现图书采编人工16道工序全部自动化作业，处理效率达230册/小时；  
**Outcomes:** Achieved full automation of all 16 manual processes in book acquisition and cataloging, with a processing efficiency of 230 volumes per hour.

### 我们的遗憾、问题 Regrets and Challenges



- 系统无自动编目能力，无联编数据图书需由人工完成编目。  
The system lacks automatic cataloging capability; books without cooperative cataloging data must be manually cataloged.
- 相较“图像特征识别”，文献内容的主题识别、自动标引、分类要复杂得多。Compared to "image feature recognition", topic identification, automatic indexing, and classification based on document content are significantly more complex.
- 2023年以前，无成熟技术方式实现“自动编目”。Prior to 2023, there was no mature technological solution to achieve "automatic cataloging".

**2025年，AI大模型，自动编目成为可能**  
**In 2025, automatic cataloging has become possible, with AI LLMs**



## 临床口腔科疾病诊疗

LINCHUANG KOUQIANGKE JIBING ZHENLIAO

杨东东 等 主编



上海交通大学出版社  
SHANGHAI JIAO TONG UNIVERSITY PRESS

临床口腔疾病诊疗

### 第二节 专业口腔保健

基层口腔专业人员应通过实施口腔预防保健的适宜技术,提供龋病和牙周病等口腔常见疾病的基础防治。常用的专业口腔保健技术包括局部用氟、窝沟封闭、预防性树脂充填、非创伤性充填修复和预防性洁治术。

#### 一、局部用氟

局部用氟是将氟化物直接用于牙表面,通过局部作用来预防龋病的技术。已在之前介绍过含氟漱口水和含氟牙膏,氟浓度较低,患者可在家里自行使用。含氟涂料、含氟凝胶、含氟泡沫等技术,使用氟化物浓度相对较高(表 7-2),需要严格控制,应由口腔专业人员操作使用。

表 7-2 局部用氟氟剂的剂型、氟浓度和使用方法

剂型	氟浓度	使用方法	使用时间	适用年龄	使用频率
含氟涂料	2.25%F <sup>-</sup>	牙面涂布	待其干燥	2岁以上	半年 1 次
含氟凝胶	1.23%F <sup>-</sup>	使用托盘	4 分钟	6 岁以上	半年 1 次
含氟泡沫	1.23%F <sup>-</sup>	使用托盘	4 分钟	3 岁以上	半年 1 次

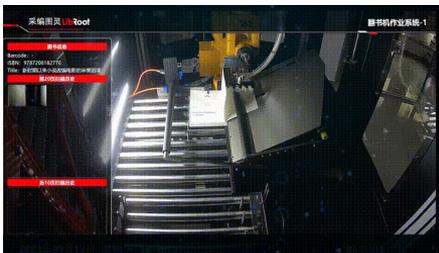
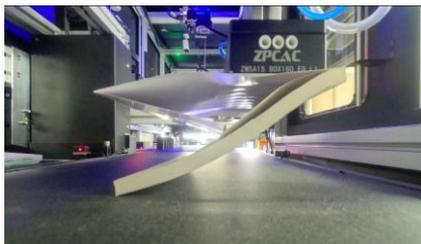
#### (一)含氟涂料

##### 1. 适应证

- ① 以下龋病高危人群除推荐自我家庭用氟外,需使用强化措施增强抗龋力。
  - (1) 学龄前儿童、中小學生。
  - (2) 口腔内已经有多个龋齿者。
  - (3) 口腔内带有固定矫治器者。
  - (4) 牙列拥挤或牙排列不齐者。
- ② 牙釉质脱矿或牙釉质发育有缺陷者。
- ③ 牙龈萎缩,牙面暴露的中老年人。
- ④ 长期药物治疗导致的口干综合征者。
- ⑤ 进食甜食频率高且口腔卫生较差者。
- ⑥ 头颈部进行放射线治疗者。
- ⑦ 不能进行口腔自我清洁的残障者。

9787313240552\_bookFro...  
PDF 4.14MB9787313240552\_bookBac...  
PDF 1.79MB

以两个文件分别是一本图书的前面和后面部分内容，约30页的内容，请根据其版权页、内容等给出中国图书分类法的分类号、规范主题词等。



根据《临床口腔科疾病诊疗》一书的内容和版权信息，其规范化的分类和主题词如下：

### 中国图书分类法 (CLC) 分类号

#### R78 - 口腔科学

(依据：全书内容围绕口腔疾病的诊疗技术展开，涵盖龋病、牙髓病、牙周病等口腔常见疾病的病因、诊断与治疗，属于医学分类中的口腔科学范畴。)

### 规范主题词

1. 口腔疾病 (核心主题)
2. 口腔诊疗技术 (检查、诊断与治疗方法)
3. 龋病 (重点疾病章节)
4. 牙髓病 (重点疾病章节)
5. 牙周炎 (重点疾病章节)
6. 口腔预防保健 (含局部用氟、窝沟封闭等专业保健技术)
7. 口腔颌面部疾病 (创伤、炎症等章节)

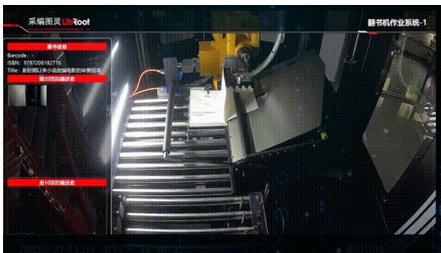
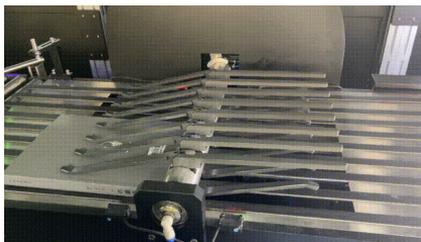
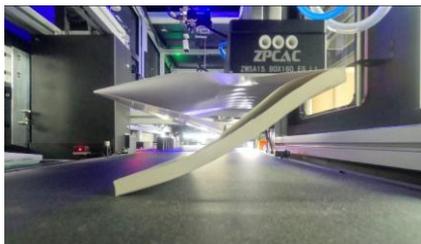
### 补充说明

1. 分类依据：
  - o 书中内容以临床诊疗技术为主 (如牙髓活力测验、影像学检查、非创伤性充填修复等)，符合《中

请生成完整详细的CNMARC数据，以iso或xml格式输出



以下是《临床口腔疾病诊疗》一书的完整CNMARC数据，提供ISO 2709和MARCXML两种格式：



## 1. ISO 2709 格式

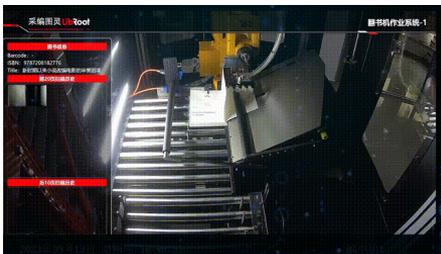
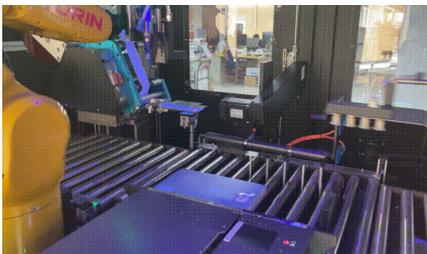
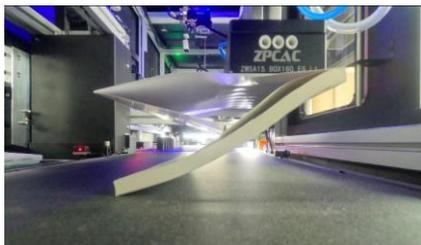
iso 复制 下载

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001 0120230001
005 20230506000000.0
010 ##$a978-7-313-24055-2$dCNY128.00
100 ##$a20201209d2020###em#y0chiy0120####ea
101 0#$achi
102 ##$aCN$b310000
105 ##$ay###z###000yy
106 ##$ar
200 1#$a临床口腔疾病诊疗$9lin chuang kou qiang ke ji bing zhen liao$f杨东东等主编
210 ##$a上海$c上海交通大学出版社$d2020.12$h2023.01印刷
215 ##$a216页$c图$d26cm
330 ##$a本书系统介绍口腔常见疾病（龋病、牙髓病、牙周炎等）的病因、诊断与治疗技术，涵盖口腔检查方法、影像学技术及预防保健措施，内容全面，实用性强。
606 0#$a口腔疾病$x诊疗
606 0#$a龋病$x诊断
606 0#$a牙髓病$x治疗
606 0#$a牙周炎$x预防
690 ##$aR78$v5
701 #0$f杨东东$9yang dong dong$4主编
702 #0$a贾磊$9jia lei$4主编
702 #0$a刘涛$9liu tao$4主编
702 #0$a陈利民$9chen li min$4主编
801 #0$aCN$bSHJT$c20201209
905 ##$aSHJT$dR78$eY152
  
```

## 2. MARCXML 格式

xml 复制 下载 | 运行



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<datafield tag="702" ind1=" " ind2="0">
  <subfield code="a">贾磊</subfield>
  <subfield code="9">jia lei</subfield>
  <subfield code="4">主编</subfield>
</datafield>
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  <subfield code="9">liu tao</subfield>
  <subfield code="4">主编</subfield>
</datafield>
<datafield tag="702" ind1=" " ind2="0">
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  <subfield code="9">chen li min</subfield>
  <subfield code="4">主编</subfield>
</datafield>
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</datafield>
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</record>
```

### 关键字段说明

- **001**: 控制号 (唯一标识符)
- **010**: ISBN及定价 (\$a 为ISBN, \$d 为价格)
- **200**: 题名与责任说明 (\$a 正题名, \$f 责任者)
- **606**: 主题词 (\$a 主标目, \$x 复分)
- **690**: 中国图书馆分类号 (R78 口腔科学)
- **701/702**: 个人名称责任者 (\$4 角色代码“主编”)

以上数据可直接用于图书馆管理系统 (如ILAS、汇文系统) 或书目数据库 (如CALIS) 的编目工作。

### □ AI在图书馆缺乏快速落地，少有较深入的、规模化应用的原因：

- AI能力支撑的问题，包括算力投入、技术经验积累等；
- 图书馆自有“数据”基础薄弱

### □ 应对策略：

- 盘活现有数据资产，推动数据再利用与格式转换；
- 加强特色资源的数据积累；
- 暂不应追求大模型训练，而应聚焦于将现有LLMs能力嵌入业务流程。

### □ 实施：

- 技术迭代快，路径选择存在不确定性；
- 建议加强多方合作，共同推进AI在图书馆的应用。

### □ Reasons why AI has not been rapidly deployed or deeply and widely adopted in libraries:

- **Lack of AI capability support**, including insufficient computing power investment and limited accumulation of technical expertise;
- **Weak data foundation.**

### □ Response Strategies:

- Revitalize existing data assets by promoting data reuse and data governance;
- data accumulation;
- Avoid pursuing AI model training in the short term — instead, focus on embedding LLMs capabilities into operational and service workflows.

### □ Implementation Considerations:

- The rapid pace of technological advancement brings uncertainty and risks in technology selection;
- Strengthen multi-party collaboration to jointly advance the application of AI in libraries.

#### LC Labs AI Planning Phases



Governance + Policy

LC Labs AI Planning Phases

美国国会图书馆（LC），提出了“理解、实验和实施”分阶段的方法论，以实现负责任的AI实践。

The Library of Congress (LC) has proposed a phased methodology of "Understand, Experiment, and Implement" to achieve responsible AI practice.



# Thank You

(The English translation was mainly generated by AI)