



Exploring the Potential of AI in Academic Libraries through Powerful and Plausible Scenarios, Dynamic Experiments, and Provocative Opportunities

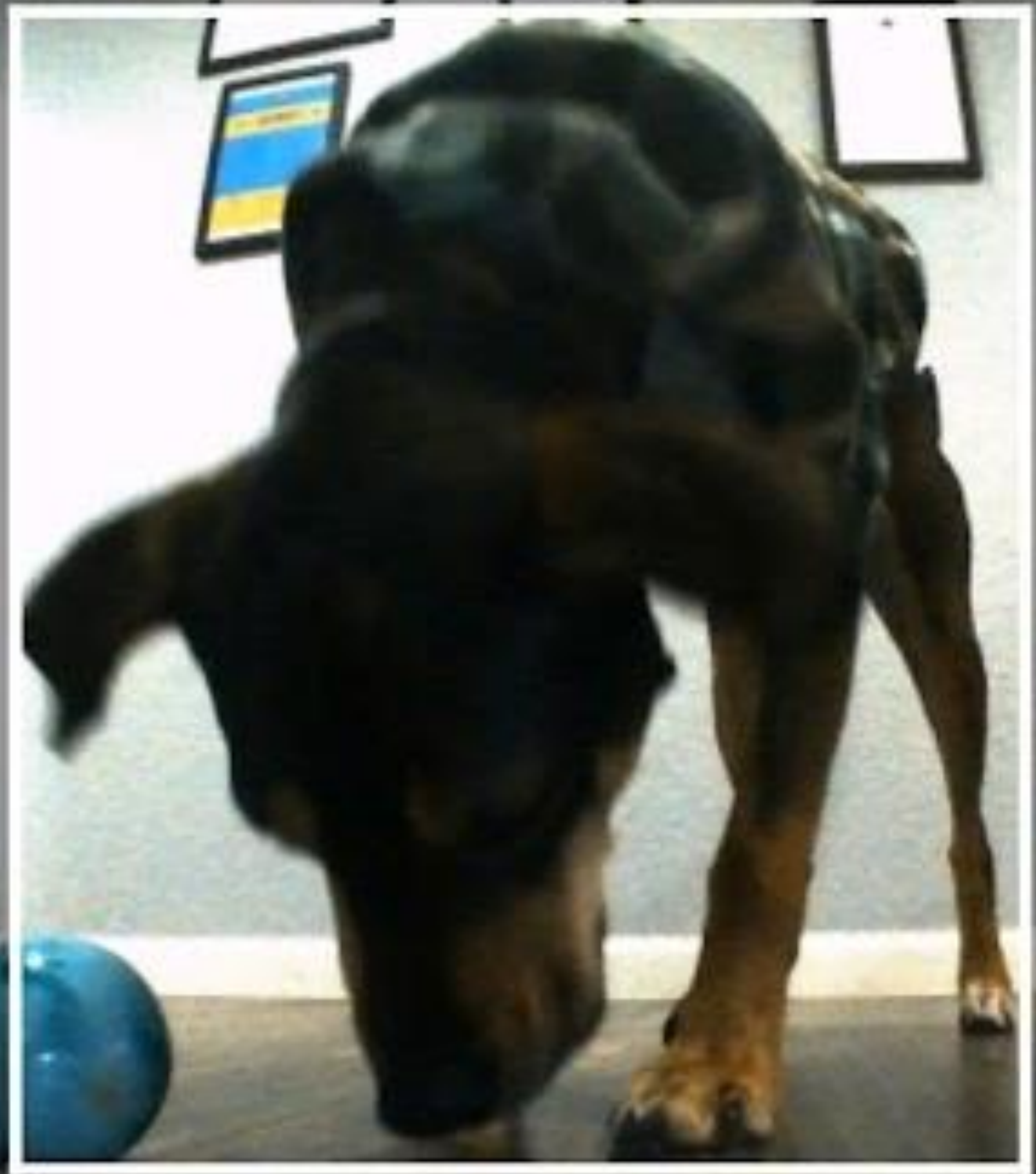
Dr. Karen Estlund, Dean of Libraries

karen.estlund@colostate.edu

3º Workshop das Bibliotecas do Ensino Superior
Santarém, Portugal



9:43

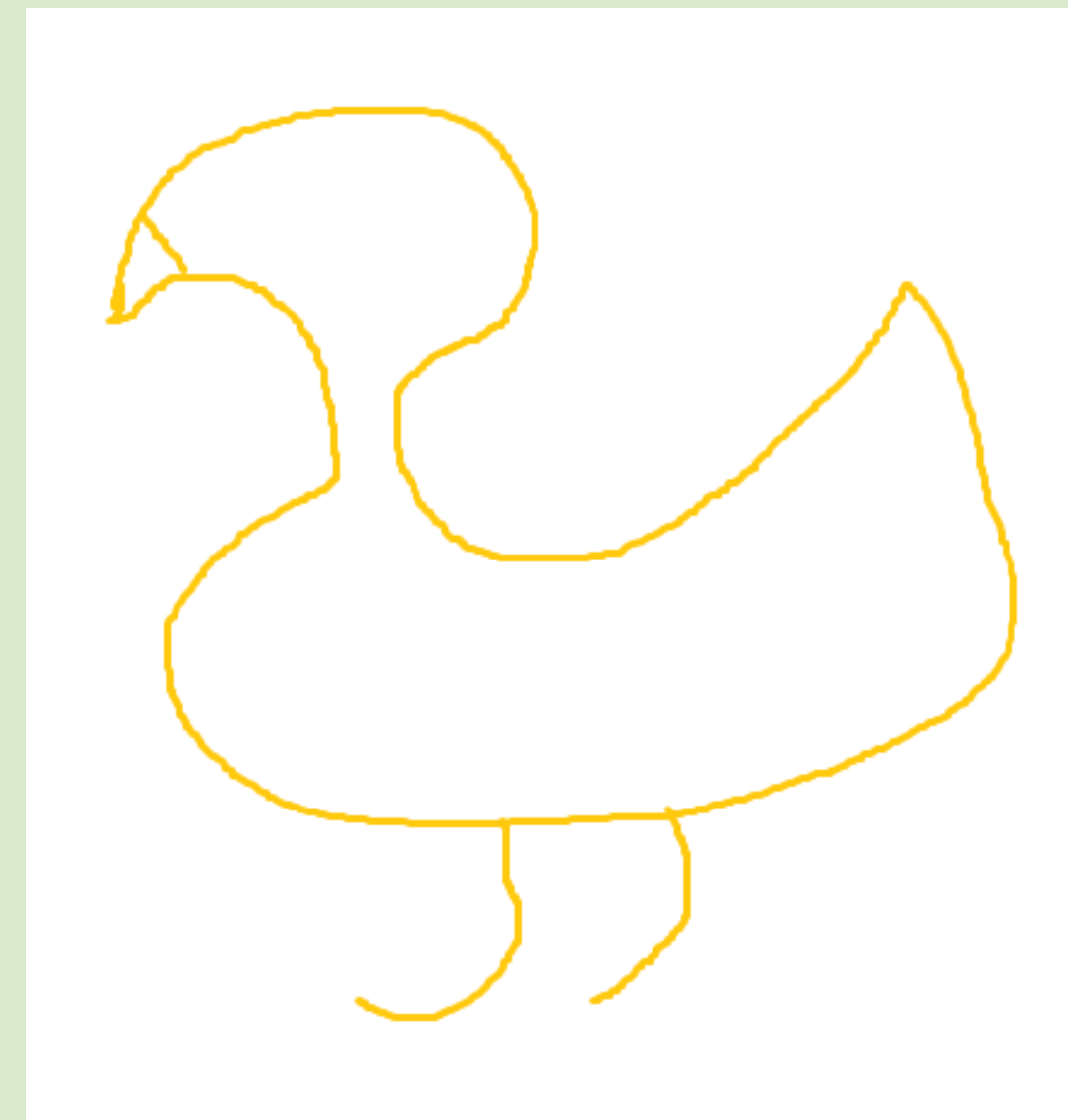


Artificial Intelligence: Some Subfields

Machine Learning



Generative AI





Powerful and Plausible Scenarios



The Future of AI and Research Libraries

- AI in the research and knowledge ecosystem?
 - Ensure responsible AI with data integrity, provenance, and persistence;
 - Achieve equitable and inclusive practices;
 - Optimally position the research and knowledge ecosystem for learning;
 - Clarify strategic role(s) for libraries that add value.



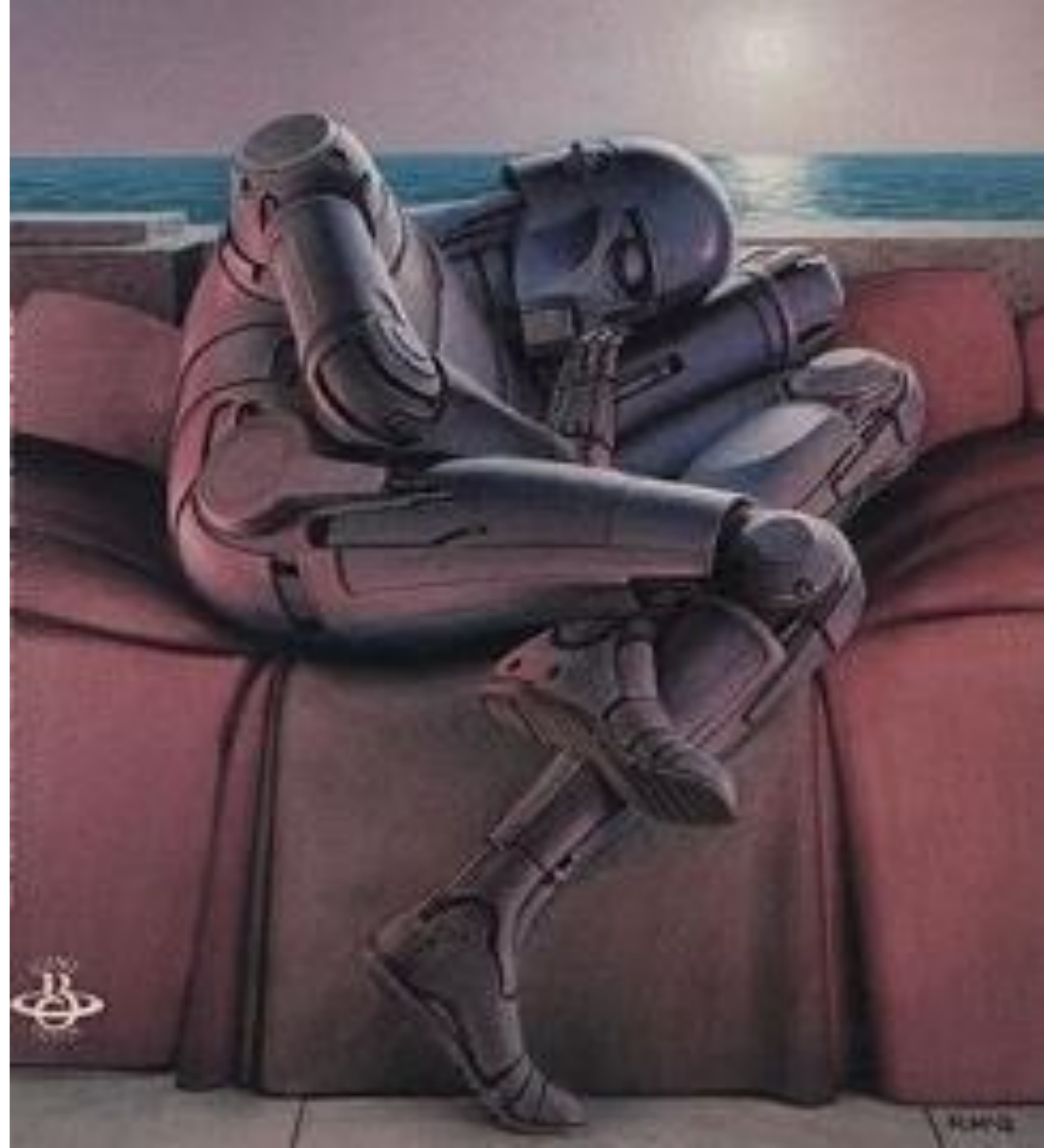
The ARL/CNI 2035 Scenarios: AI-Influenced Futures in the Research Environment. Washington, DC, and West Chester, PA: Association of Research Libraries, Coalition for Networked Information, and Stratus Inc., May 2024.
<https://doi.org/10.29242/report.aiscenarios2024>.

Cynthia Hudson-Vitale, coordinator

Why Scenario Planning?

- What don't we know?
- What are the possibilities?
 - Based on current drivers and trends
 - Based on history
- No one scenario is intended to be or predict the future
- Facilitates agile and quick decision-making

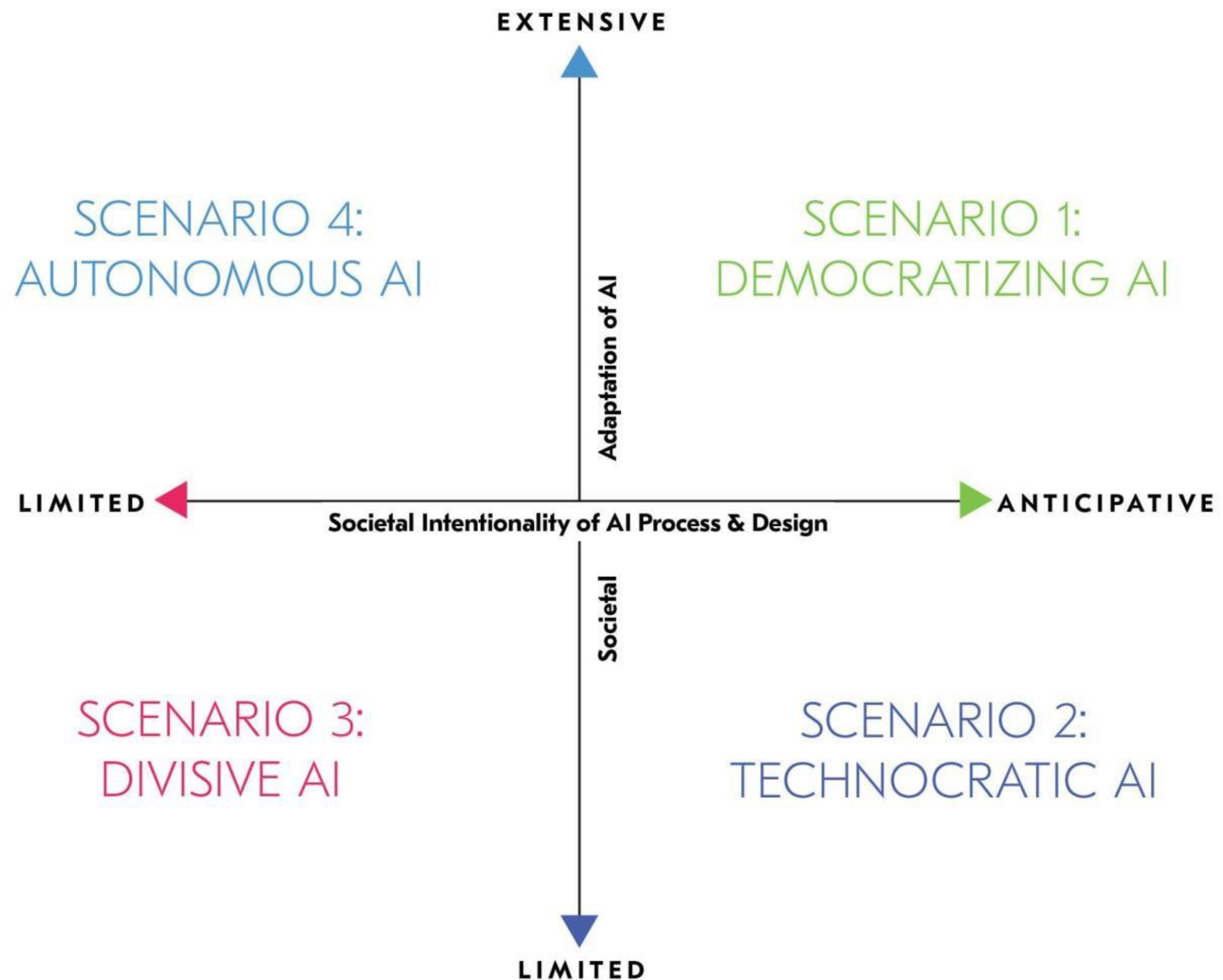
Image by Ralph McQuarrie



Critical Uncertainties

- Primary
 - Societal Adaptation of AI
 - Societal Intentionality of AI Process & Design
- Secondary (17)
 - Policy
 - Workforce
 - Cultural Heritage & Memory
 - Scholarly Record
 - Environmental Impact...

ARL/CNI 2035 Scenario Set



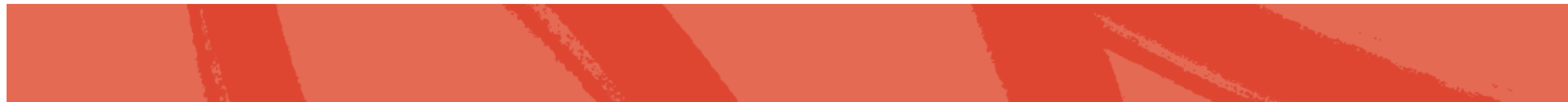
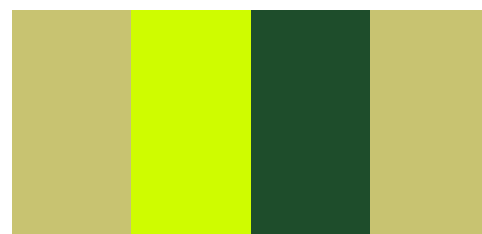
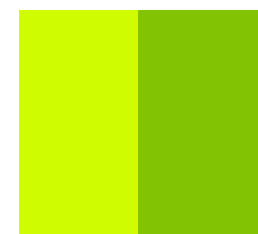
In a World...



2035 in Scenario 1: Democratizing AI

Extensive Adaptation and Anticipative Intentional Design

Research libraries focus on the researcher and learner experience. They provide a conduit to data, software, and knowledge, while stewarding the ever expanding scholarly record. The most advanced libraries operate almost exclusively on an AI platform.

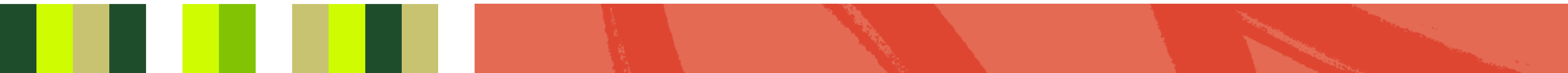


2035 in Scenario 2: Technocratic AI

Limited Adaptation and Anticipative Intentional Design

Training researchers is less efficient and more expensive than the interactive edutainment offered to the vast majority of learners, K–12 and beyond. There are fewer research libraries than there once were that serve well-resourced programs, offering AI-enhanced research and learning tools. Interestingly they serve not only the remaining elite research institutions but also their commercial collaborators.

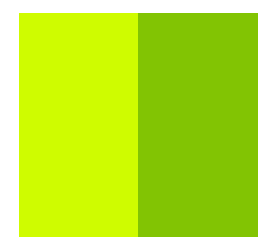
Community colleges and state institutions struggle for resources and survival, focusing primarily on human-based education enhanced with online, virtual options. They are among the few that champion education in digital literacy skills.



2035 in Scenario 3: Divisive AI

Limited Adaptation and Limited Intentional Design

In research and learning, those institutions with the means to do so create models to successfully apply AI in research and learning, leading to moments of expected and unexpected successes. The few remaining open AI models in use are being leveraged by smaller academic and research institutions that are struggling to achieve scale or noteworthy impact....Research libraries face increasing expenses, less independence, and forced reallocation of efforts, even among the well-funded programs. Many libraries shift to a curricular focus, ensuring the quality, integrity, and provenance of content used in educational programs.

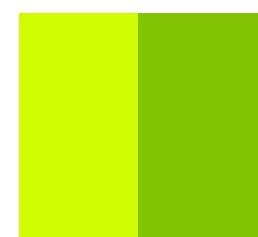


2035 in Scenario 4: Autonomous AI

Extensive Adaptation and Limited Intentional Design

Research teams made up of both AI and human researchers are at the cutting edge, producing rapid advances in many fields of study....Traditional systems of scholarly research publishing and communication are evolving in complex ways, becoming both more and less transparent and reproducible; there are parts primarily intended for inter-AI data-sharing that are difficult for humans to navigate, parts for human-to-human communication, and other forms of scholarly communication that are intended to bridge the interface between humans and AIs.

Traditional library functions and information management are embedded in many AI research platforms. The research and library enterprises both undergo significant restructuring, de-structuring, and pruning of the human workforce with the inclusion of AI workers and robotics.

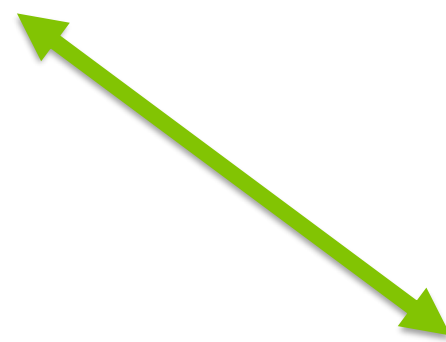


Using the Scenarios

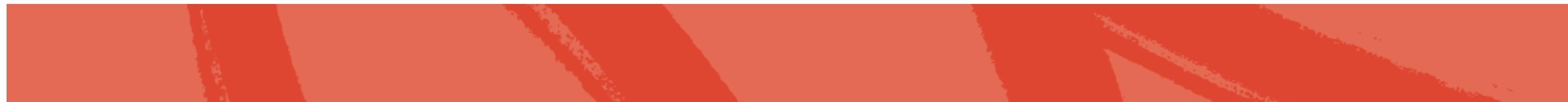
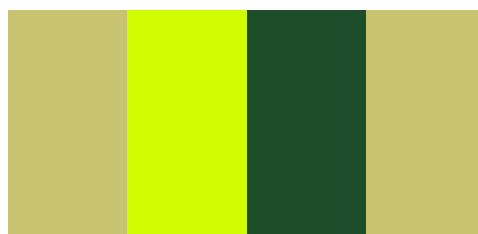
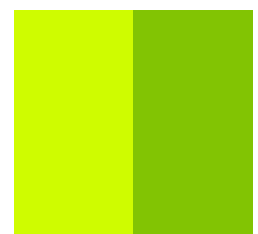
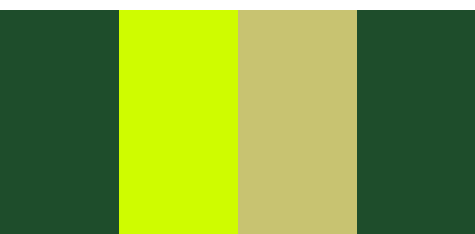
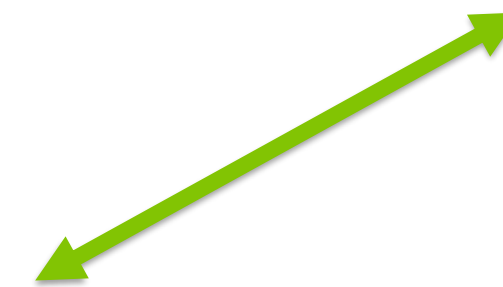
$X \rightarrow \text{IF}$



$\text{THEN} \rightarrow Y$



$\text{IF} \rightarrow \text{THEN}$



second issue

The Adventures of Sherlock Holmes

Doyle, Arthur Conan.

Doyle, A. Conan - 1st edition
York: Harper & Brothers, Franklin
Square, 1892.

307 p.

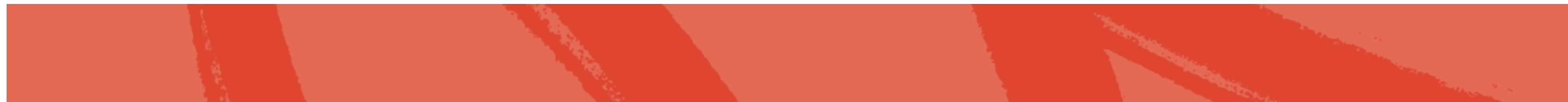
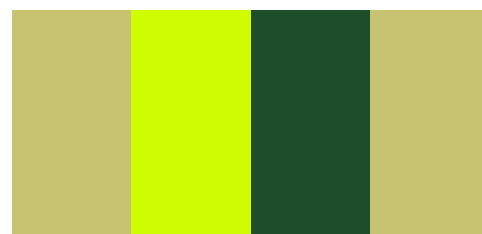
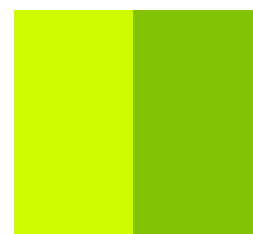
First Edition, Second State, with
he had" (instead of "if had) on p
line 4

Dynamic Experiments

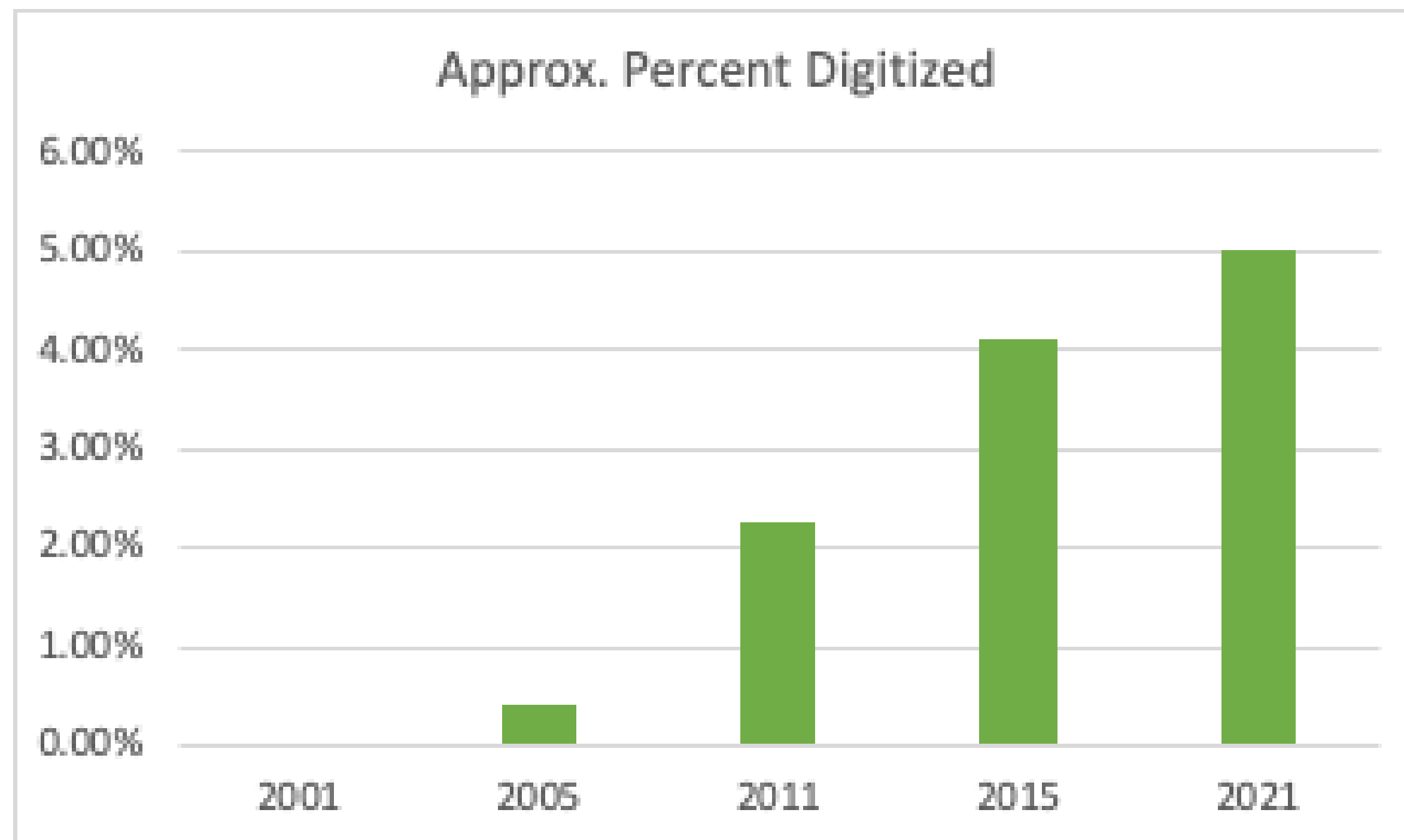
Library Operations, Library Services, and Discipline Expertise



Cultural Heritage Labor



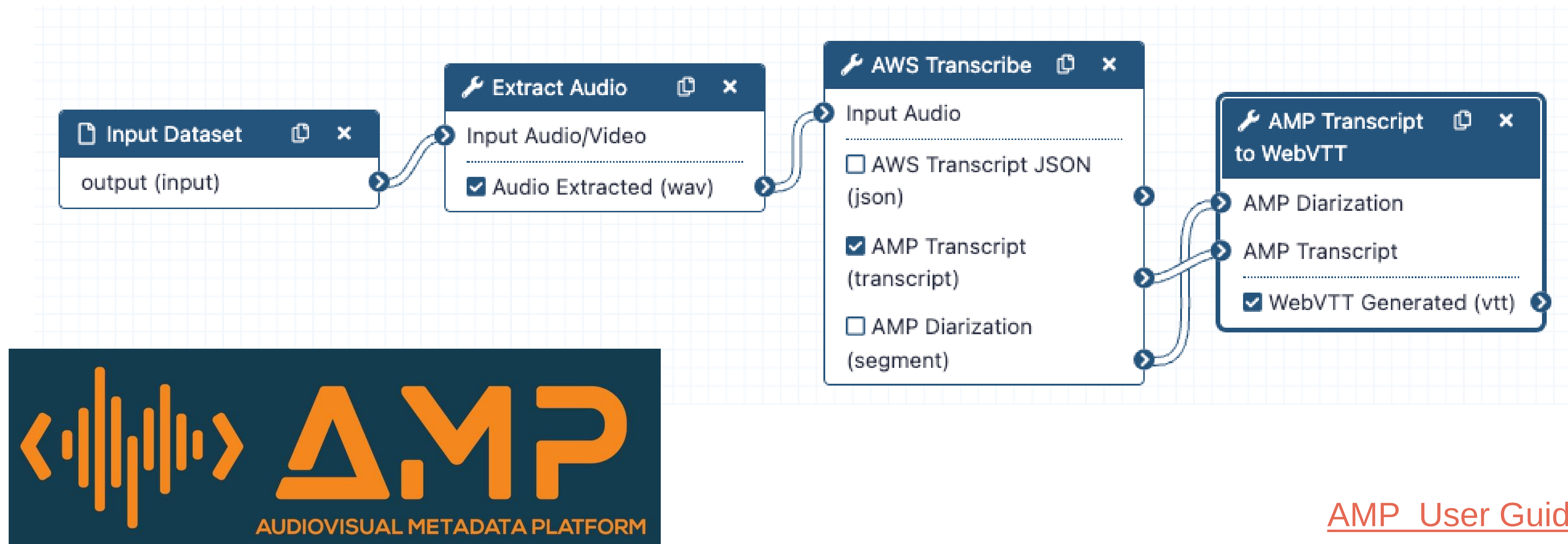
Water Resources Content – estimated 50+ years to process with current system



Tasks to-do:

- Digitize
- Create Derivates and Store
- Describe w/Technical and Descriptive Metadata
- OCR
 - Print text
 - Handwritten text
- Transcribe/Caption
- Summarize, context, and curation
- Preserve

Transcripts and Accessibility



[AMP User Guide](#)

Indiana University - Bloomington

Cataloging

Introducing the AI metadata generator from Ex Libris

We are excited to share the creation of an AI-driven metadata generator that has already been able to enrich [Alma Community Zone](#) Bibliographic records. The current enrichment is focused on generating metadata for three specific MARC fields:

- Language (041 and 008)
- Summary (520)
- LC subject headings (650)



Record Deduplication



Are these records analogous?
For questions or assistance contact us at datalabeling@oclc.org

[Logout](#)
[FAQ](#)
[Leaderboard](#)

Random Pair

Generate new pair

Select language of cataloging
ENG

Select material type
BOOK

Select age of record
After 1830

Generate Pair

Do these two records describe the same item?

☐ Yes
☐ No
☐ Unsure

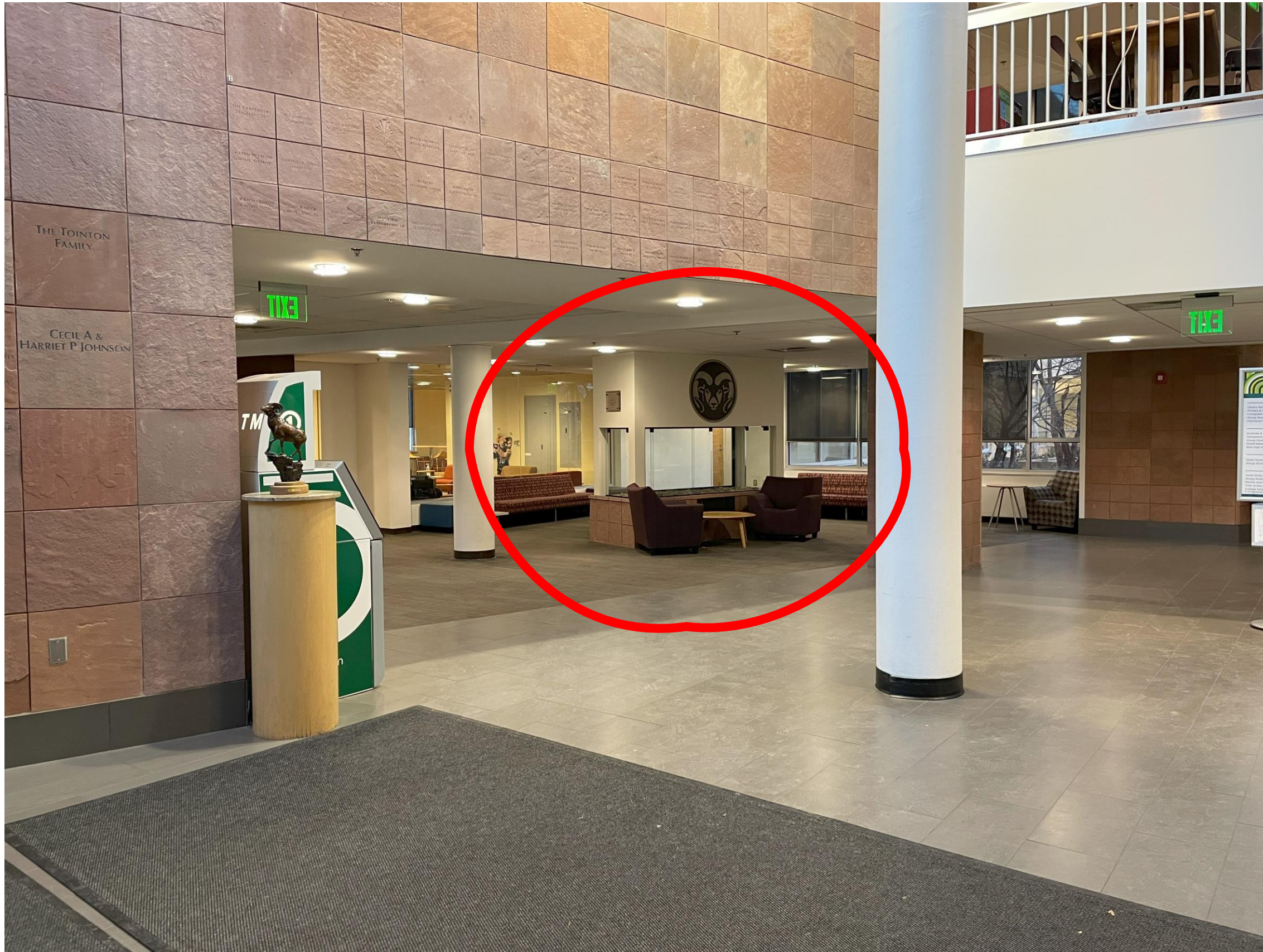
Use checkboxes to select the fields most relevant to your decision

Submit Decision

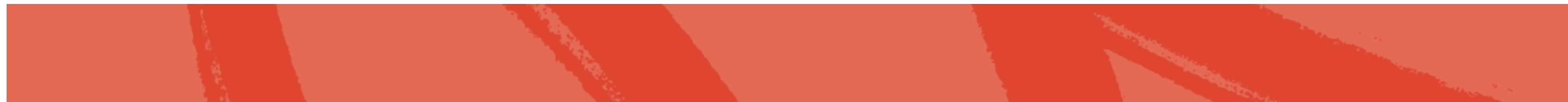
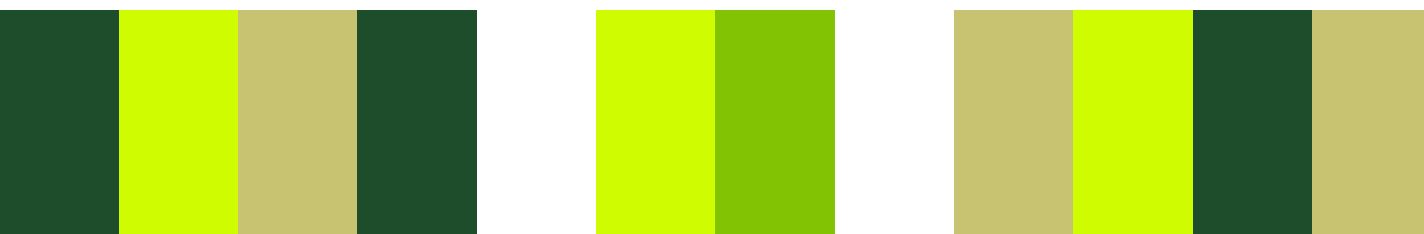
Record 1	Fields	Record 2
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☐ \$a NAM \$b eng \$c NAM	d040	\$a CASUM \$b eng \$c CASUM
☐ Missing Entry	d050	\$a RA971 \$b M24 1957
☐ \$a MacEachern, Malcolm Thomas, \$d 1881-1956.	d100	\$a MacEachern, Malcolm Thomas, \$d 1881-1956.
☐ \$a Hospital organization and management.	d245	\$a Hospital organization and management / \$c by Malcolm T. MacEachern.
☐ \$a [Rev. 3d ed.].	d250	\$a Rev. 3rd ed.
☐ Missing Entry	d260	\$a Chicago : \$b Physicians' Record Co. , \$c 1957.
☐ \$a Chicago : \$b Physicians' Record Co. , \$c 1957.	d264	Missing Entry
☐ \$a xlii, 1,316 pages : \$b illustrations, color portrait, forms ; \$c 25 cm	d300	\$a xlii, 1316 pages, 27 unnumbered leaves of plates : \$b illustrations (some color) ; \$c 25 cm
☐ \$a text \$b txt \$2 rdacontent	d336	\$a text \$b txt \$2 rdacontent
☐ \$a unmediated \$b n \$2 rdamedia	d337	\$a unmediated \$b n \$2 rdamedia
☐ \$a volume \$b nc \$2 rdacarrier	d338	\$a volume \$b nc \$2 rdacarrier
☐ \$a Includes bibliographies.	d504	\$a Includes bibliographical references and index.



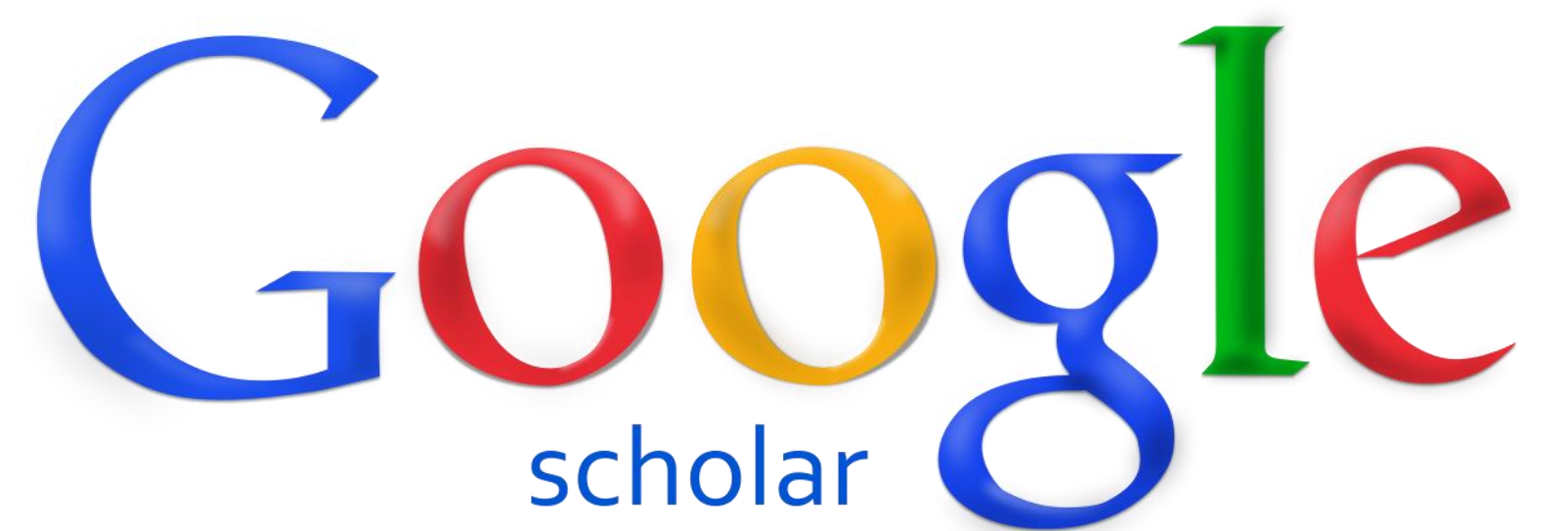
Library as Space - Visualizations



Work by Professor Robert Ayala using [AI Room Planner](#)



Information Discovery



Research Questions: Claude AI Example

I'm looking for scholarly articles on best practices for evaluating candidates to hire

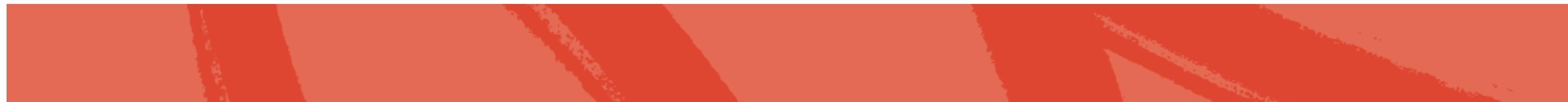
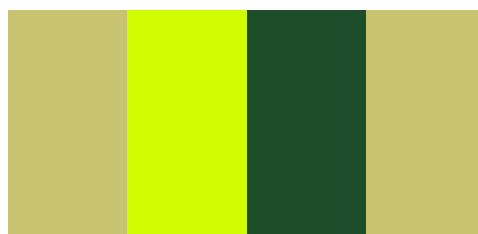
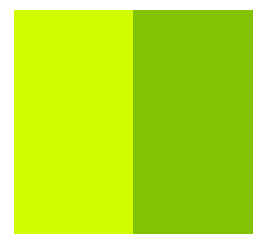
Here are some suggestions for finding scholarly articles on best practices for evaluating job candidates:

1. Use academic databases: Access databases like Google Scholar, JSTOR, or EBSCOhost through your university library or public library. These databases contain a wide range of peer-reviewed articles from academic journals.
2. Search using keywords: Use relevant keywords and phrases to narrow your search, such as "candidate evaluation," "hiring practices," "personnel selection," "employment interviews," or "assessment methods."
3. Look for reputable journals: Target journals in the fields of human resources, organizational psychology, and management. Some examples include the International Journal of Selection and Assessment, Personnel Psychology, and the Journal of Applied Psychology.
4. Check the article's methodology: When reviewing articles, pay attention to the study's methodology to ensure that it follows a rigorous, scientific approach. Look for empirical studies with large sample sizes and well-designed experiments or surveys.
5. Consider the publication date: Aim for articles published within the last 5-10 years to ensure that you're getting the most up-to-date information. However, seminal works or foundational studies may still be relevant even if they are older.
6. Review the references: Once you find a useful article, check its reference list for other relevant sources that you can explore further.

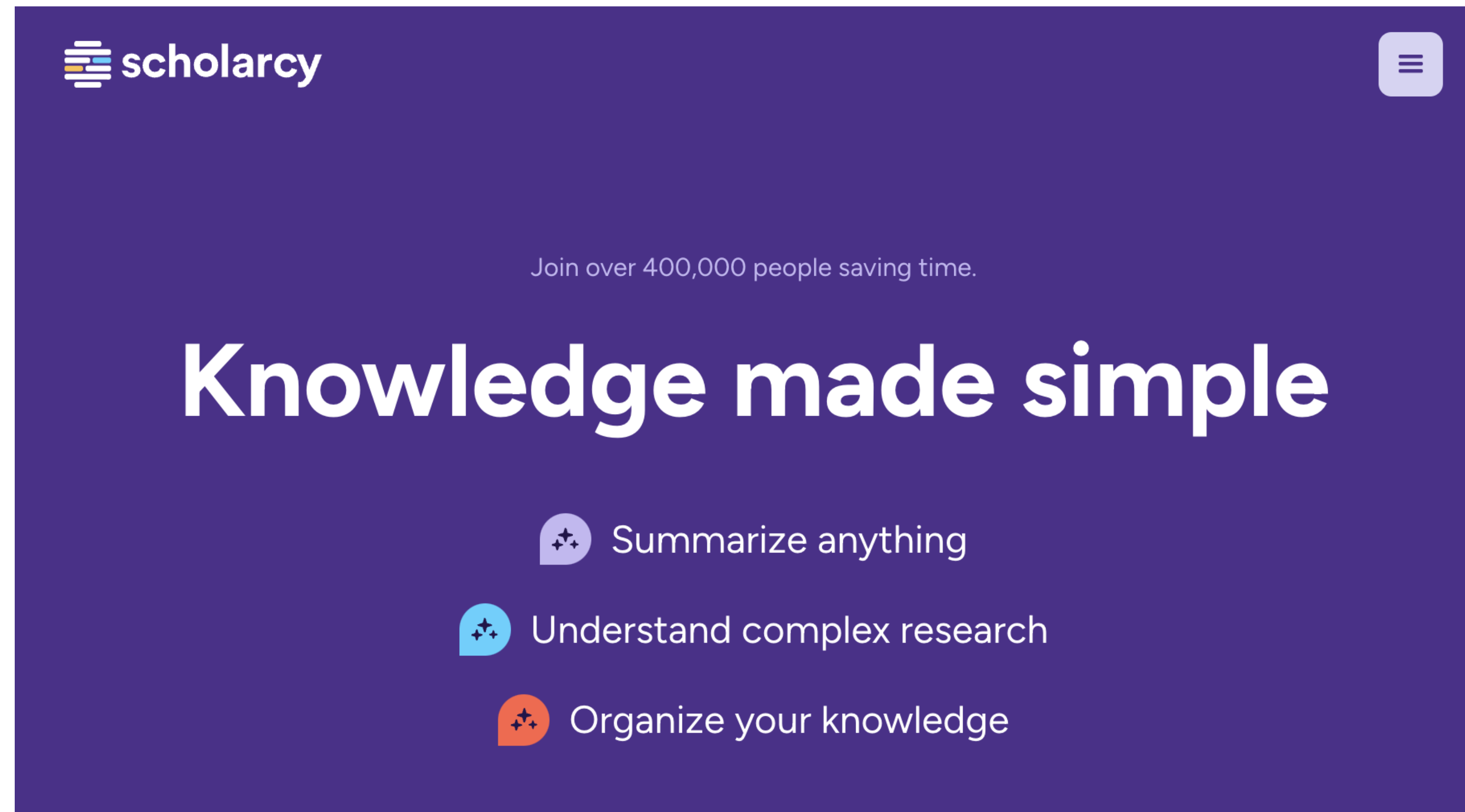
Some specific articles that you may find helpful include:

- Schmidt, F. L., & Hunter, J. E. (1998). The validity and utility of selection methods in personnel psychology: Practical and theoretical implications of 85 years of research findings. *Psychological Bulletin*, 124(2), 262-274.
- Sackett, P. R., & Lievens, F. (2008). Personnel selection. *Annual Review of Psychology*, 59, 419-450.
- Huffcutt, A. I., & Arthur, W., Jr. (1994). Hunter and Hunter (1984) revisited: Interview validity for entry-level jobs. *Journal of Applied Psychology*, 79(2), 184-190d utility of selection methods in.

These articles should provide a solid foundation for understanding best practices in candidate evaluation and selection. Let me know if you have any other questions!



Summarizations and Analysis

A screenshot of the Scholarcy website. The background is a solid dark purple. In the top left corner is the Scholarcy logo, which consists of a stylized icon of three horizontal bars with a small square at the end, followed by the word "scholarcy" in a white sans-serif font. In the top right corner is a small white square button with three horizontal lines. Centered on the page is the text "Join over 400,000 people saving time." in a small, light purple font. Below this is the main headline "Knowledge made simple" in a large, bold, white sans-serif font. Underneath the headline are three features listed vertically, each preceded by a circular icon containing three small white stars. The first feature has a purple icon and the text "Summarize anything". The second feature has a blue icon and the text "Understand complex research". The third feature has an orange icon and the text "Organize your knowledge".

 scholarcy

Join over 400,000 people saving time.

Knowledge made simple

-  Summarize anything
-  Understand complex research
-  Organize your knowledge

[scholarcy](https://scholarcy.com)

Beware!

- Bias
- Deep Fakes
- Hallucinations
- Reinforced Assumptions
- Copyright and Attribution
- Plagiarism

Thomson, T.J., & R.J. Thomas.
(2023-07-09). [*The Conversation*](#).



Ageism, sexism, classism and more: 7 examples of bias in AI-generated images

Published: July 9, 2023 11:44pm EDT

AI Tutoring: Grammarly



Set goals

Get tailored writing suggestions based on your goals and audience.

Domain

- Academic
- Business
- General
- Email
- Casual
- Creative

General (default): Applies most rules and conventions with medium strictness.

Intent

- Inform
- Describe
- Convince
- Tell A Story

Experimental. What are you trying to do? This helps us build new suggestions and won't affect your feedback today.

Audience

- General
- Knowledgeable
- Expert

Knowledgeable (default): Requires focus to read and understand.

Formality

- Informal
- Neutral
- Formal

Neutral (default): Restricts slang but allows standard casual expressions.

Rewrite

Improve it

Ideas for school

Suggest counterarguments

Suggest cuts

Brainstorm topics for my assignment

Draft an outline

Give me a research plan

Evaluate

Identify any gaps

Give me ideas for improvement

Pick out my main point

Ideate

Generate ideas for a blog post

Brainstorm some thought-provoking questions

Try "Is it persuasive?"

Generative AI for Presentation Outline

Prompts created by Grammarly

- "Draft an outline"

For presentation on Ai and machine learning for libraries, museums, and archives for a general audience.



Suggested Outline

I. Introduction

- A. Definition of AI and Machine Learning
- B. Importance of AI and Machine Learning in Libraries, Museums, and Historical Archives

II. Opportunities for AI and Machine Learning in Libraries

- A. AI-powered Library Catalogs
- B. Personalized Recommendations and Suggestions
- C. Data Analysis and Management

III. Opportunities for AI and Machine Learning in Museums

- A. Enhanced Visitor Experience
- B. Intelligent Collection Management
- C. Conservation and Preservation

IV. Opportunities for AI and Machine Learning in Historical Archives

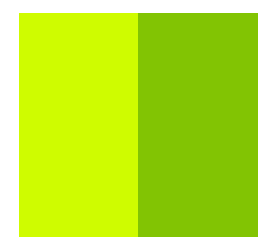
- A. Digital Preservation and Access
- B. Intelligent Retrieval and Analysis
- C. Enhanced User Experience

V. Challenges and Considerations

- A. Ethical and Privacy Concerns
- B. Training and Implementation
- C. Funding and Resources

VI. Conclusion

- A. Recap of Opportunities and Challenges
- B. Future Directions for AI and Machine Learning in Libraries, Museums, and Historical Archives.



User Experience



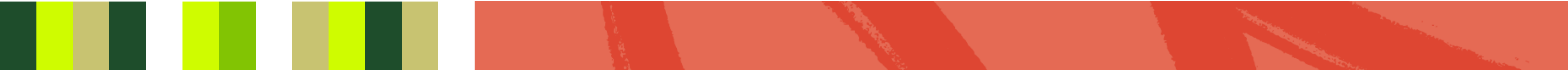
DISCOVERABILITY &
CUSTOMIZATIONS



REFERENCE
QUESTIONS



JARGON REMOVED



Reference and Chat

The screenshot shows the University of Delaware Library, Museums and Press website. The header features the university logo and navigation links: RESEARCH, SERVICES, VISIT, ABOUT, HELP, MY ACCOUNTS, HOURS, and S. Below the header is a search bar with the text "Search Library Resources" and "Search Libro". A white overlay box contains the text "FOR: resources at UD and worldwide..." and "IN:". Below this is a "GO TO:" section with links to "DELCAT Advanced Search", "Databases", and "E-". At the bottom of the overlay are three buttons: "Ask UDStax Chatbot", "Request Materials", and "Online Resources". Below these buttons is a section titled "Need to Know" with a link "View Available Seats".

UDStax: Library, Museums and Press AI Chatbot

Hello, I'm UDStax, a friendly AI chatbot from the University of Delaware Library, Museums and Press! I can answer questions about library services and spaces. If you have questions about specific resources or need research help, you can send a message to a librarian to get help during staffed hours: <https://ask.lib.udel.edu/>.

Message...

Powered By **Chatbase.co**

Ask UDStax Chatbot

Audience-focused Writing

ADVANCED RESEARCH & SCHOLARSHIP SUPPORT



The CSU Libraries provides expertise, services, and resources to support the CSU community throughout the research process. We're available for one-on-one or group consultations, and we're happy to adapt any of the following topics for guest lectures or workshops.

Personal Research Help and Consultations

If you need personalized, one-on-one research support, you can request a consultation either by filling out our form or by contacting an expert directly.

[Request a Research Consultation](#)

LITERATURE REVIEWS

A high-quality research project starts with a high-quality research question and literature review. Literature reviews are broad overviews of what has been written on a given topic. They are a component of peer-reviewed journal articles, theses and dissertations, and other scholarly works. If you're working on a literature review, we can help you identify gaps, refine methods and questions, and develop effective research strategies.

CHAT-GPT3.5 Prompt: Remove jargon, rewrite for First-generation students as audience

EXPERT SUPPORT FOR YOUR STUDIES

Illustration of hands typing on a keyboard with books and notes nearby

Hey there, awesome first-gen undergrads! We're here to make your academic journey smoother. At CSU Libraries, we've got your back with all things research and learning. Whether you're feeling a bit lost or ready to dive deep, we're your partners. Check out how we can help:

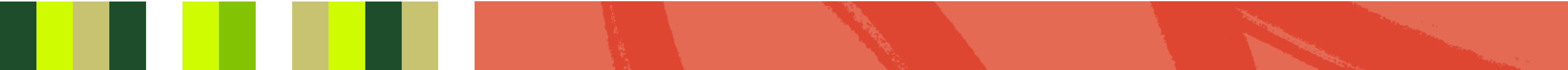
Personal Guidance for Your Research

When you're feeling stuck or have questions about research, we're just a click away. Request a one-on-one chat with our experts or drop us a line directly.

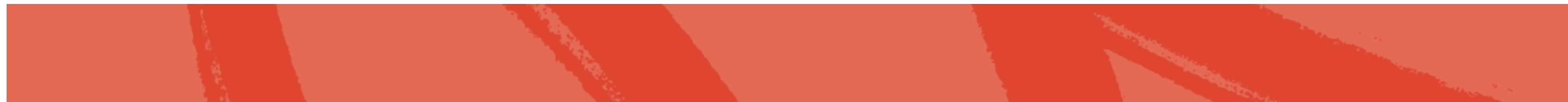
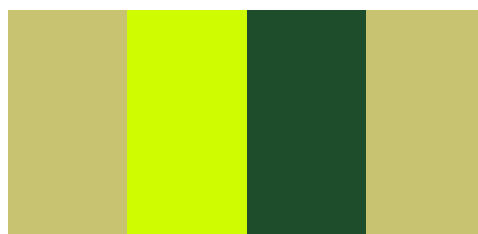
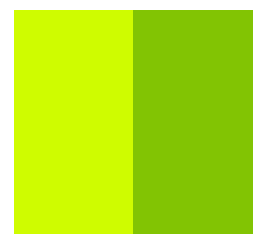
Request a Research Chat

Nailing Down Your Research

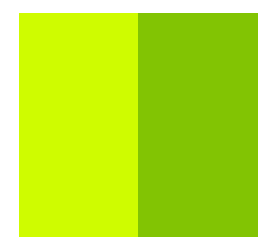
Getting into research can be tricky, but we're here to help you kickstart your projects. Whether it's understanding what's been written on your topic or crafting a strong research question, we've got your back.



Taxonomies and Knowledge Organization



Personalized Discovery



Research and Prompt Engineering

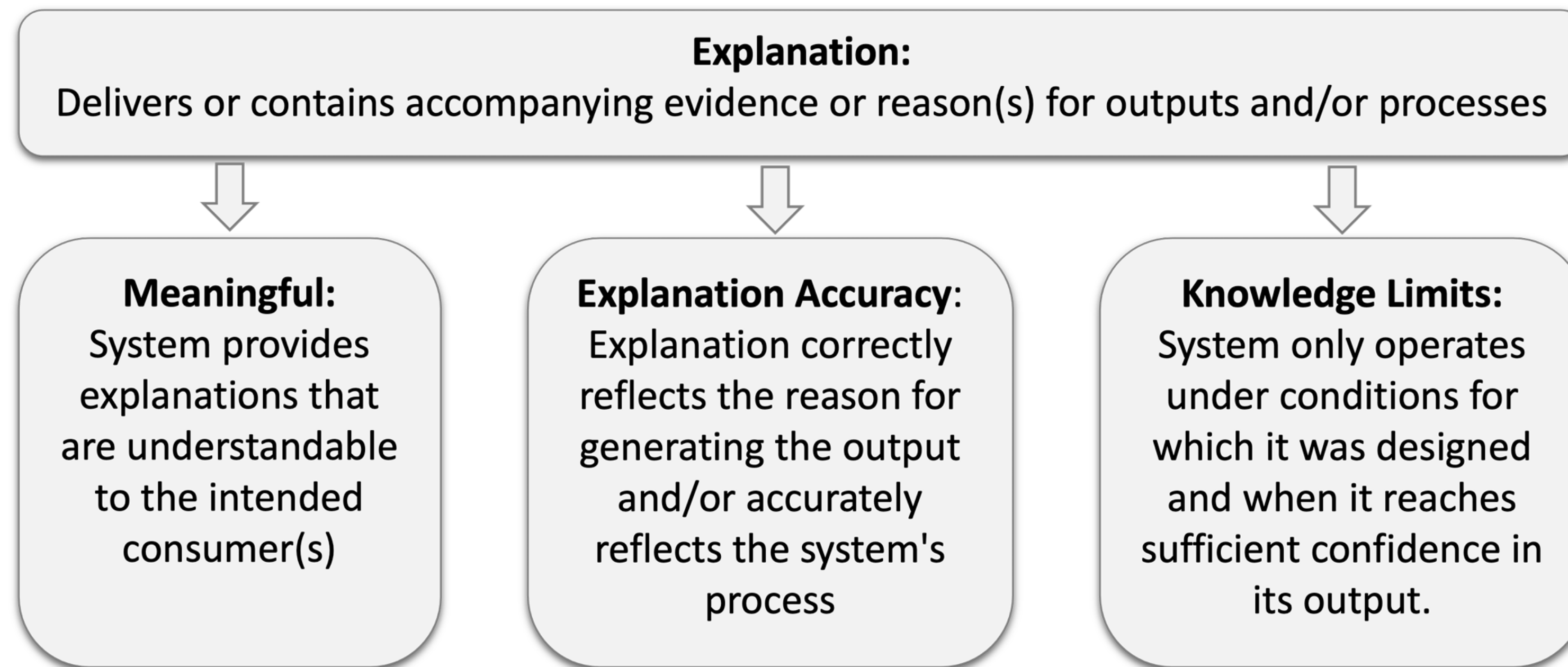
1. Zero-Shot
2. One-Shot Learning
3. Few-Shot Learning
4. Chain-of-Thought
5. Iterative
6. Negative
7. Hybrid
8. Prompt Chaining

Aryani, A. [“8 Types of Prompt Engineering.”](#) (Dec.2, 2023.) *Medium.com*

See also: Liu, X., et al. “Prompting Frameworks for Large Language Models: A Survey” (Nov. 2023) ACM Comput. Surv., Vol. 1, No. 1. <https://doi.org/10.48550/arXiv.2311.12785>



Explainability - European Union: AI Act



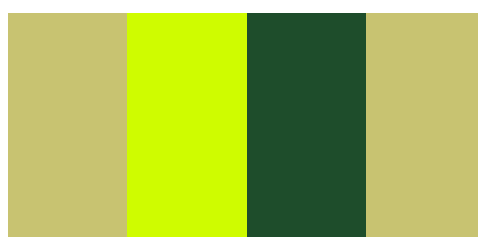
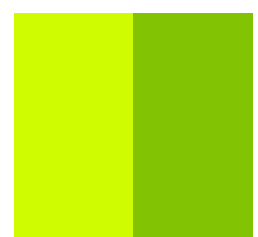
Phillips, P.J. et al. "Four Principles of Explainable Artificial Intelligence." (Sep. 2021) *NISTIR 8312*

National Institutes of Standards and Technology, U.S. Department of Commerce: <https://doi.org/10.6028/NIST.IR.8312>

Digital Divide

- Student AI survey (7800+ respondents) - a collaboration with the Associated Students Organization – Digital Divide Widens?
 - More devices correlated with more comfort with AI
 - Students concerned about paid tool and access
- AAAI Microcredential – prioritizing faculty training (voluntary)
 - Modes: 2 hours to complete min or 4 hours to earn a badge
 - (1/5 faculty members signed up) – 664 enrolled; 64 completed so far
 - 5 modules on canvas; student and staff specific version to be released

San Diego State University Academic AI: IT, Libraries Partnerships, & Center for Teaching and Learning



Information Ethics

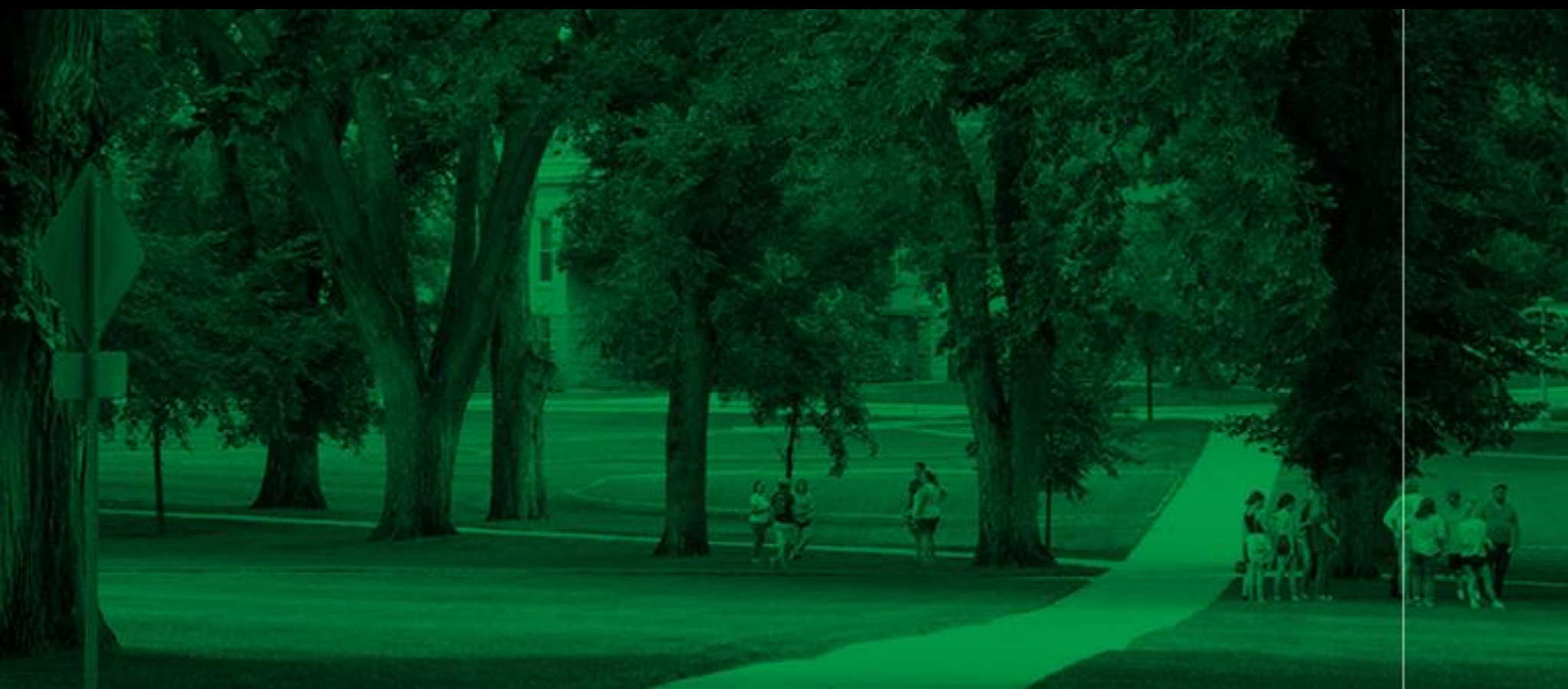
- Dissemination
- Privacy and Security
- Data Governance
- Indigenous Sovereignty
- Copyright
- Context of Use



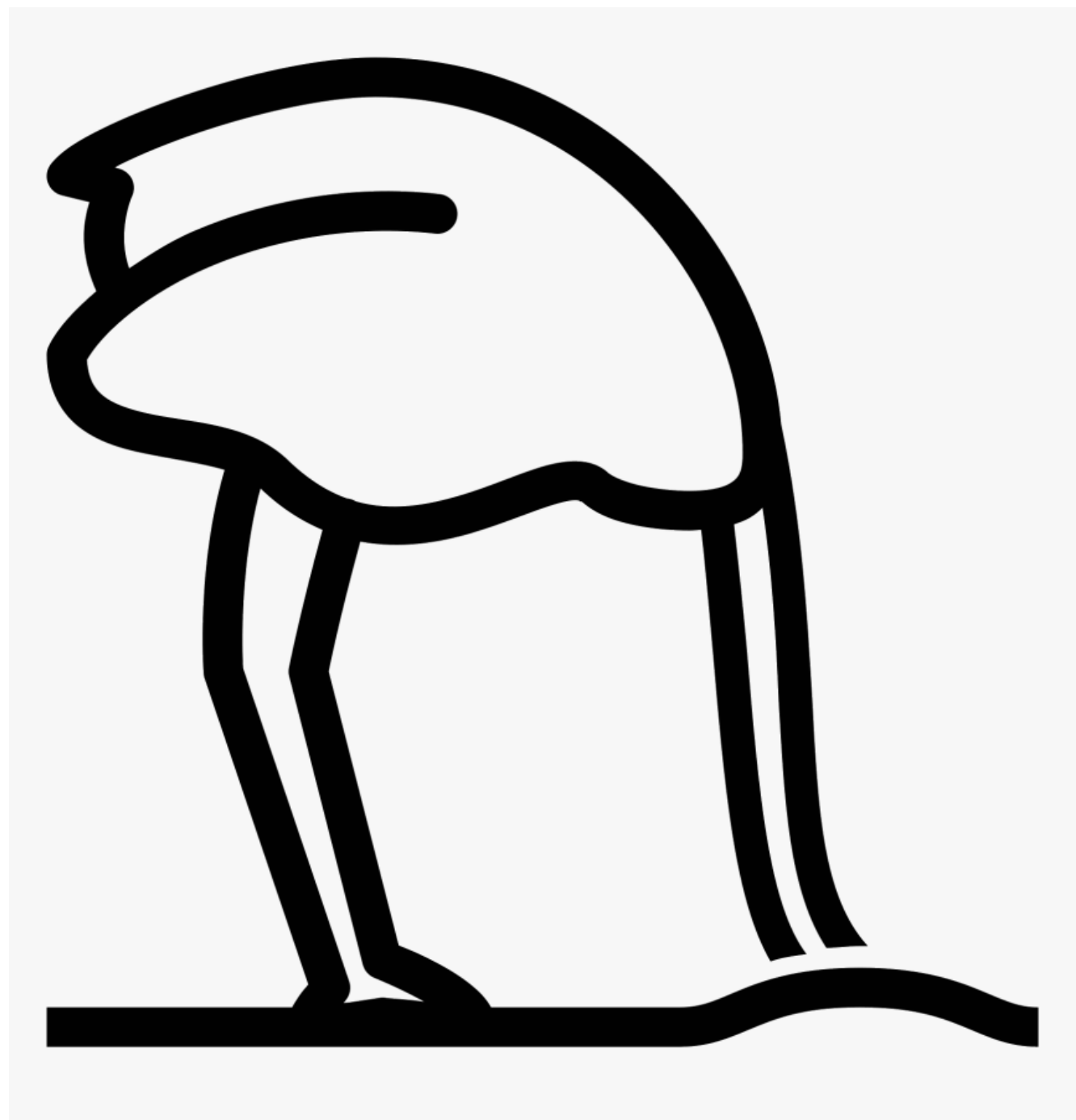


Image by [NNBTK](#) at [Deviant Art](#)

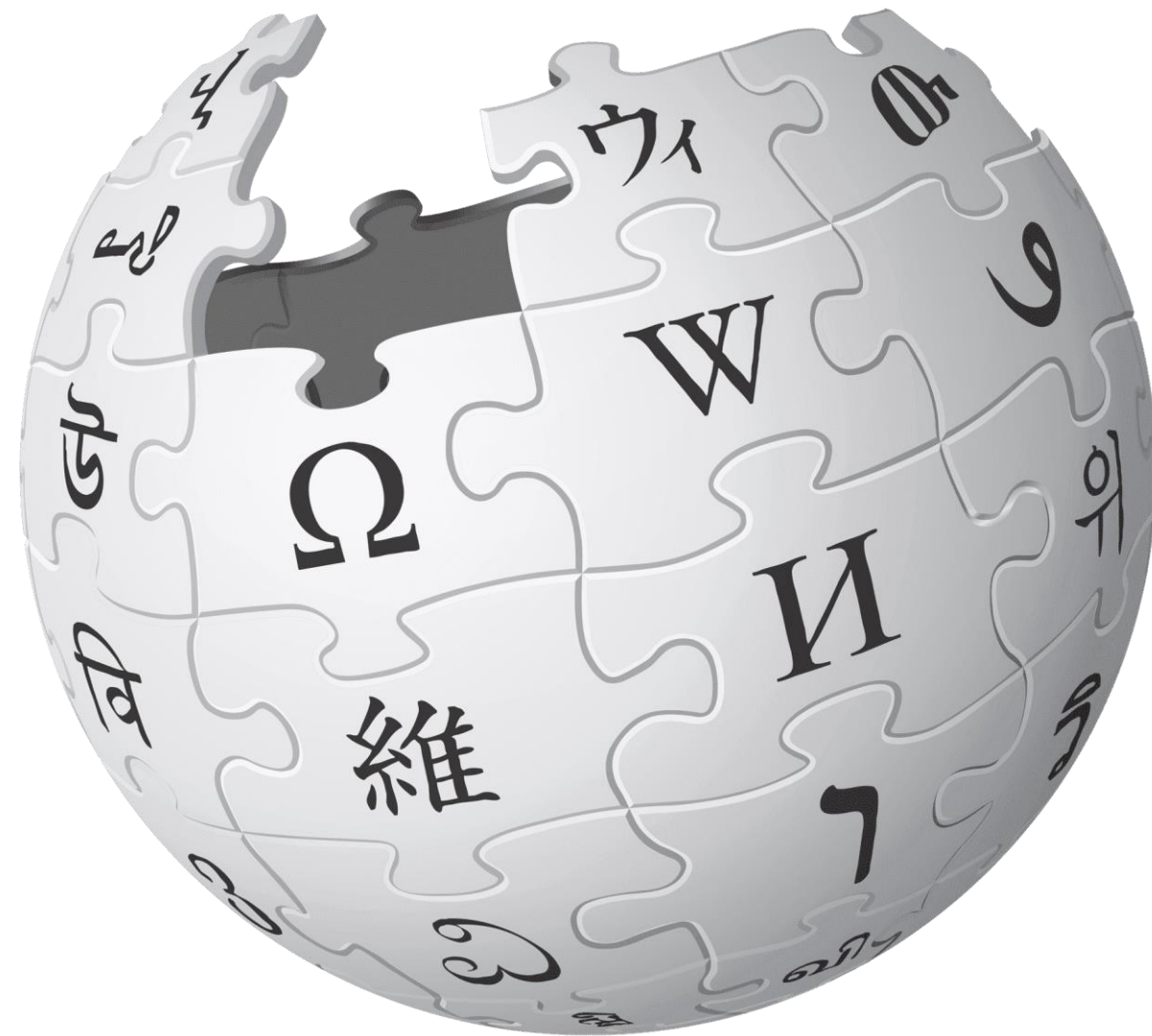
Provocative Opportunities



Opportunities for dialogue



Realities of technology changes



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Opportunities for Consideration





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