

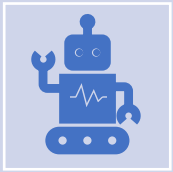
Three Significant Technology Trends in Academic Library Research Services

New Technology, Research Data, Digital Scholarship

Ray Uzwysyn, Ph.D. MA MLIS MBA
Research Impact Coordinator, Full Professor
Mississippi State University Libraries

Significant Trends for Research Services

Five Year Timeline



Evolution of Technology Enhanced Learning Commons

Towards Research, From Digital Infrastructures and Multimedia Labs, Makerspaces & AI Labs)



Evolution of Data Research Services and Current Steps Towards AI

Data Research, Visualization, Literacy, Analytics, Visualization Walls, Data Repositories and Next Steps with AI Infrastructures



Evolution and Synthesis of Digital Scholarship Possibilities,

Enabling Research Academics and Graduate Students (Digital Research Ecosystems, Multimedia Digital Libraries, Data and Future Digital Library Projects

Trend 1: Evolution of Technology Enhanced Learning Commons

The Physical Library continues to Experiencing a Paradigm Shift from Book Warehouse to Research Service Oriented Technology Enhanced Learning Commons Focused Upon Digital and AI Literacy

80-85 % of Materials Budgets are currently Digital Resources, e-journals and e-books. Only 15% of purchases are print materials (12% print books, 3% print serials).

Collection Management, Budget Models and Digital Services are Shifting Even more towards Digital and now AI Literacy Needs.

Learning Commons, Multimedia, Digital Literacy and Tutorials Centers are integrating with the physical Library.



Spectrum of New Technologies, Spaces and Services

Possible For Student and Faculty Research and Teaching Success

Data Visualization Walls, Student and Research Faculty Multimedia Centers, Instant Theatres for Interdisciplinary Presentation, 3D Printing Labs and Makerspaces



Multimodal AI, GPT4 + Image/Voice/Audio-visual and Force Feedback Models (Robotics), 2024+



Image Generators

Dalle-3, Midjourney Stable Diffusion
Text to Image and Image to Video Models

Video Generators:

Runway, PIKA, Stable Diffusion Video, Lumiere,
SORA
Image to Video, Text to Video, Video to Video

Device Integration & Robots:

Optimus (Tesla Bot), Boston Dynamics, NVIDIA,
Meta's Rayban Glasses AI + XR
Smart Phone Integration

Various University Research Services

Use Case Scenarios:

Powerpoint & PDF to Essay Summarization and
Research , Natural Human Instructions:
No code movement, PDF to Image
Augmenting the Senses:
XR (Extended Mixed Media Reality + AI
Artificial Intelligence
Memory and Customization of Models



The Library Has Become a Technology Rich Learning Commons, Focused Upon:

- Student and Faculty Research, Development and Teaching Success
- Research Interdisciplinarity, Digital & AI Literacy
- The library is also a significant place for socialization, study, third space for research collaboration, seen as a third safe space

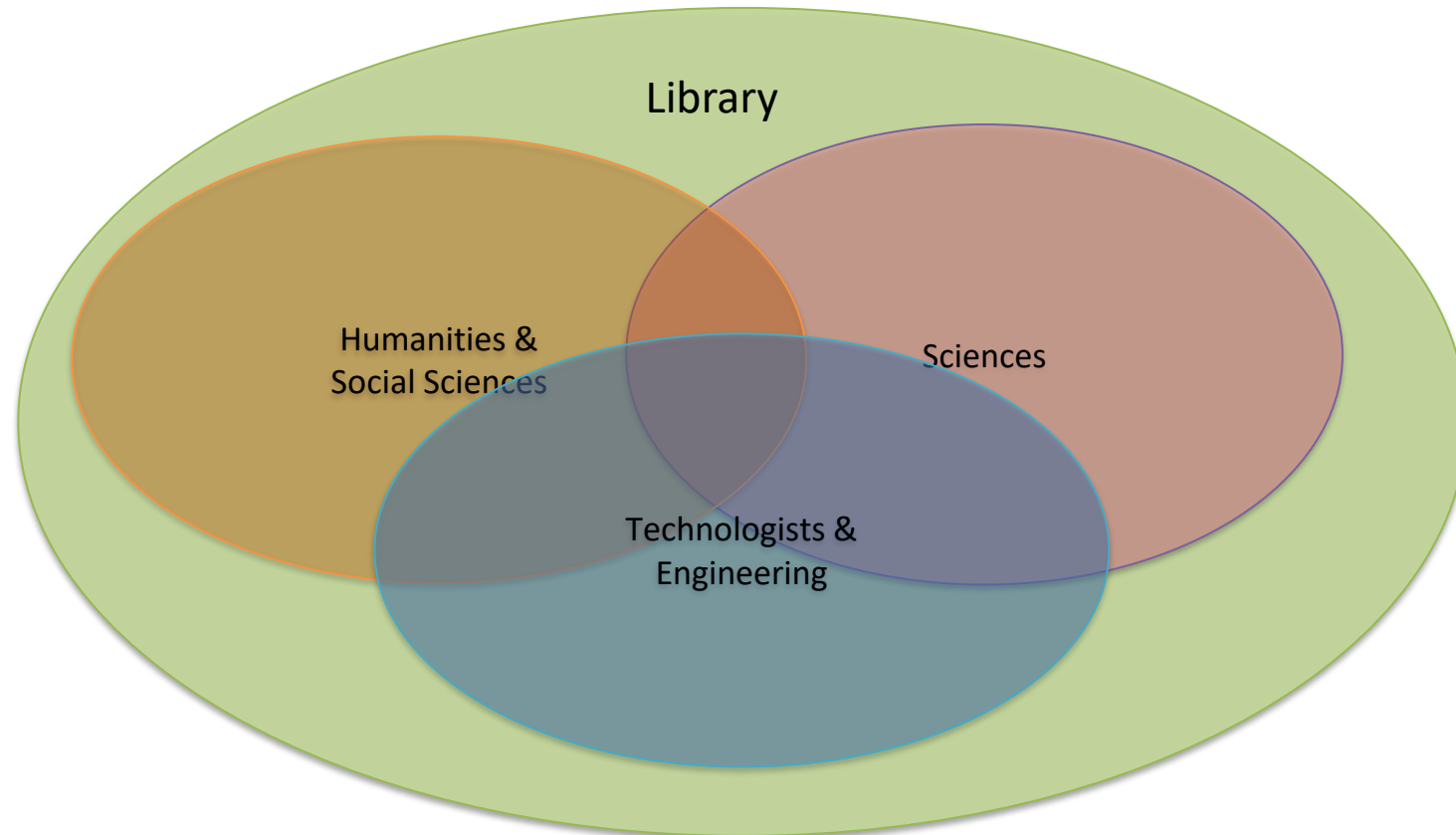


Renaissance Period for Research Libraries

Interdisciplinarity, Redefining What Research Services Means,

Information and Digital Literacy, Technology Enhanced Spaces,

What Learning and Research means in the 21st C.



Convergence of
Space, Technology,
Learning

Library as
Safe Great
Third Space for
Higher
Learning and
Research both
Physically and
Online

Cross-fertilization of
Projects, Smart, Educated People, Skillsets



Innovative Interdisciplinary Research Grant Partnerships Are Possible with the Libraries

Among Faculty Divisions, the Library, Schools and Community

The screenshot shows the homepage of the Visual Thinking Strategies Institute. The header features the title "Visual Thinking Strategies INSTITUTE" in blue and white. Below the header, there is a list of names under various categories: "Families" (Barbara Mass, Gelfstrom Elm, Prof., ESE), "19-20th C. Artists" (Uljan Alvarado, Elaine Del'Gado, Lisa Gilbert, Carolyn McGoughlin, M. Chris Pedlow, Meme Ferré Succar), "Themes" (Estela Acalog, Melinda Federka, Angela Ferreira, Mary de Armas, Barbara Mass, Ellen Skidmore, Beverly Tate), "Female Artists" (Debbie Donovan, Rena Fresquet, Eileen Socca, Debra Sudalter), and "Instructor" (Ray Uauyghyn, Design Curriculum (ppt.)). The main content area includes the text "The University of Miami Visual Thinking Strategies Institute (2003 - 2004)" and a description: "A progressive interdisciplinary endeavor between the Lowe Art Museum, University of Miami School of Education Teaching and Learning, University of Miami Project Succeed, UM Library Research and Educational Services, the Information Literacy Lab and Miami-Dade County Public Schools." There is also a small image of a woman playing a guitar. At the bottom, it says "This site presents a summary of the students efforts through a 'Visual Thinking Strategies' web curricula that could be used either as a teaching aid or classroom tool. Please click through the pages on the left and feel free to use these pages as examples of Visual Thinking Strategies curricula for your own teaching or classes."


Digital & Information Literacy, Diversity & Interdisciplinarity, 2003 U Miami

The logo consists of a dark grey arrow pointing to the right with the text "Open Educational Resources" in white. Below the arrow is a white box containing the "PB PRESSBOOKS" logo, where "PB" is in a red square and "PRESSBOOKS" is in black text.

The screenshot shows the homepage of the OERTX Repository. The header says "Welcome to OERTX Repository" and "Explore collections of open educational resources. Create OER. Collaborate with educators." Below the header is a search bar with "All content by type" and "All content by subject" dropdown menus, and a "Search" button. The main content area has a red background with the text "Explore. Create. Collaborate." and three icons: a book icon for "Search through collections of curated open educational resources" with a "Discover" button, a person icon for "Contribute OER to the repository with Open Author" with a "Contribute" button, and a group of people icon for "Collaborate and create with other educators in hubs and groups" with a "Discover" button. At the bottom, there is a "Featured Collections" section with a search bar and a "View All Collections" button.

Texas State University, Faculty Training Canvas, 2022

Research Partnerships with Library
School of Education (2003), Texas State University OERTX, 2023
University Art Department/University Museum
Large State Bureau Of Education Grant

The background features a financial candlestick chart with several trend lines. A grey downward-pointing arrow is positioned on one of the trend lines. The overall aesthetic is professional and data-driven, with a color palette of blues, greys, and oranges.

Trend two: Expansion & Evolution of Research Data Services

From Robust Data Research Services to AI

Universities, Research Libraries, Data and AI

Clear Trajectory
in Libraries from
Research Data
Collections
To Data Science ->
Data Research
Repositories ->
Data Analytics ->
Data Visualization >
AI



Data Research Repositories & Data Literacy

Search the Texas Data Repository

-  Add a Dataset
-  Create a Dataverse
-  Explore Data Repository
-  Learn More
-  Get Help

Publish and Track Your Data, Discover and Reuse Others' Data!



Texas State University Dataverse

A platform for publishing and archiving Texas State University's research data.



TEXAS STATE
UNIVERSITY LIBRARIES

The Texas Online Data Research Repository.

Data Research Repositories Allow Building Skills For AI

Data Organization, Data Cleaning, Structured Data Citation, Sensitive Data and Metadata Schemas



Harvard Dataverse Network 🔍 ⓘ 🗨️ Create Acc

REPLICATION DATA FOR: A MULTIVARIATE MODEL OF STRATEGIC ASSET ALLOCATION
hdl:1902.1/QBXRSFLBQJUNF:3:ZnYhHkZe2veTJAWaBDpPKA==
Version: 2 – Released: Thu Oct 03 16:46:32 EDT 2013

CATALOGING INFORMATION Data & Analysis Comments (0) Versions

📘 If you use these data, please add the following citation to your scholarly references. Why cite?

John Y. Campbell; Yeung L. Chan; and Luis Viceira, 2007, "Replication data for: A Multivariate Model of Strategic Asset Allocation", <http://hdl.handle.net/1902.1/QBXRSFLBQJUNF:3:ZnYhHkZe2veTJAWaBDpPKA==> The Harvard Dataverse Network [Distributor] V2 [Version]


Citation Format ▾

📘 Results found in this publication can be replicated using these data.

Original Publication
Campbell, John Y.; Chan, Yeung Lewis; and Viceira, Luis M., 2003. "A multivariate model of strategic asset allocation," *Journal of Financial Economics*, Elsevier, vol. 67(1), pages 41-80. [article available here](#)

Publications
John Y. Campbell & Yeung Lewis Chan & Luis M. Viceira, 2001. "A Multivariate Model of Strategic Asset Allocation," NBER Working Paper National Bureau of Economic Research, Inc. [article available here](#)
Campbell, John Y & Chan, Yeung Lewis & Viceira, Luis M, 2001. "A Multivariate Model of Strategic Asset Allocation," CEPR Discussion Paper 3070, C.E.P.R. Discussion Papers. [article available here](#)

Data Citation Details ▾

Title	Replication data for: A Multivariate Model of Strategic Asset Allocation
Study Global ID	hdl:1902.1/QBXRSFLBQJ
Authors	John Y. Campbell (Harvard University); Yeung L. Chan; and Luis Viceira
Producer	John Y. Campbell 
Production Date	2003
Funding Agency	National Science Foundation; Hong Kong RGC Competitive Earmarked Research Grant (HKUST 6965/01H); Division of Research of the Business School

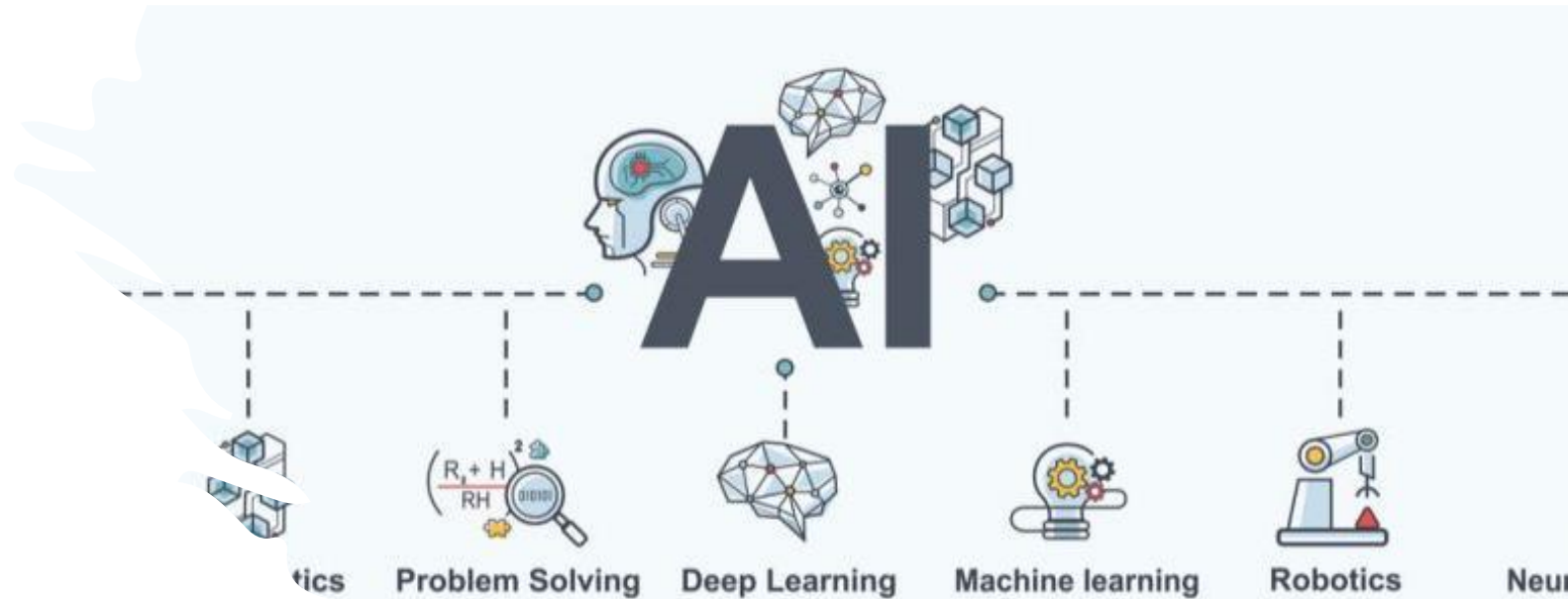
OpenRefine is a powerful tool for working with data: (cleaning it)

Data Management Plan Help Needed

A(AI) Literacies

Needs Arising

- Data Visualization, Analytics, AI Empowering Faculty/Student Training for Teaching, Learning and Research
- **New Classes of AI Research Competencies Needed**
- **AI Librarian, Prompt Engineering, GPT4+, Dalle-3, Midjourney, Runway, SORA**
- **Autonomous Agents, CrewAI, Autogen, Multimodal Possibilities, Software Engineering (Devin)**



US Senate AI Roadmap for Artificial Intelligence, May 2024

https://www.schumer.senate.gov/imo/media/doc/Roadmap_Electronic1.32pm.pdf

Implications for Educational Institutions and Research Libraries



Key Roles For Research Libraries

- 1) Training and Upskilling
- 2) Lifelong Learning
- 3) Community Engagement
- 4) Access to Resources

Implications

- 1) Resource Allocation
- 2) Staff Training
- 3) Digital Inclusion
- 4) Community Partnerships

R&D, Academic Technology Conferences and Learning, 2018-2022



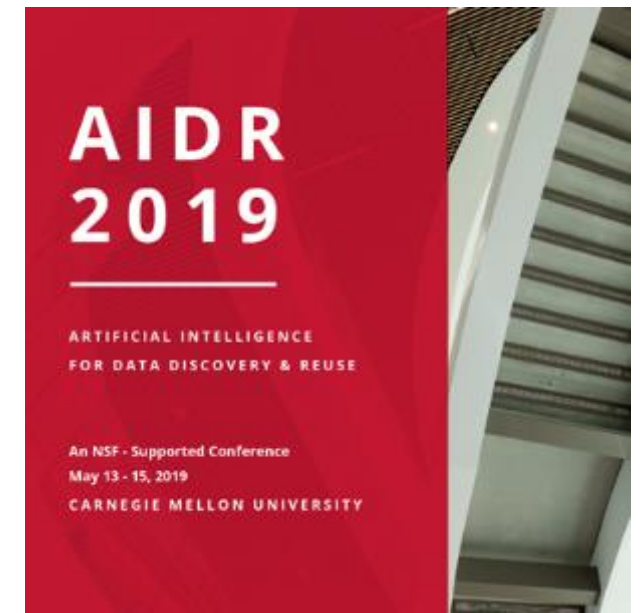
Coalition for Networked Information (D.C.) ,
Yale Art History Project ,Pixplot (Image Categorization), 2018, Peter Leonard (Neural Nets)



Artificial Intelligence for Data Discovery & ReUse & Open Science Symposium (2020), Carnegie Mellon, Pittsburgh



Fantastic Futures
2nd International Conference on AI for Libraries, Archives and Museums
Stanford Libraries (2019)



Texas Conference on Digital Libraries,
Patrice Andre Prud'homme (TCDL) Oklahoma State (2019),

ARL Research & Development & Learning, Area 1: Digital and Web Services

Deep Learning Models and Convolutional Neural Nets

(2019 Begun, Early 2022 Presented, TCDL, Galway, National University of Ireland, IFLA Dublin, IR)

- **University Archives**

San Marcos Public

Newspaper Image Negatives

90 years of digitization 800, 000 images

- **Processing Power
(Compute)**

- **Python**

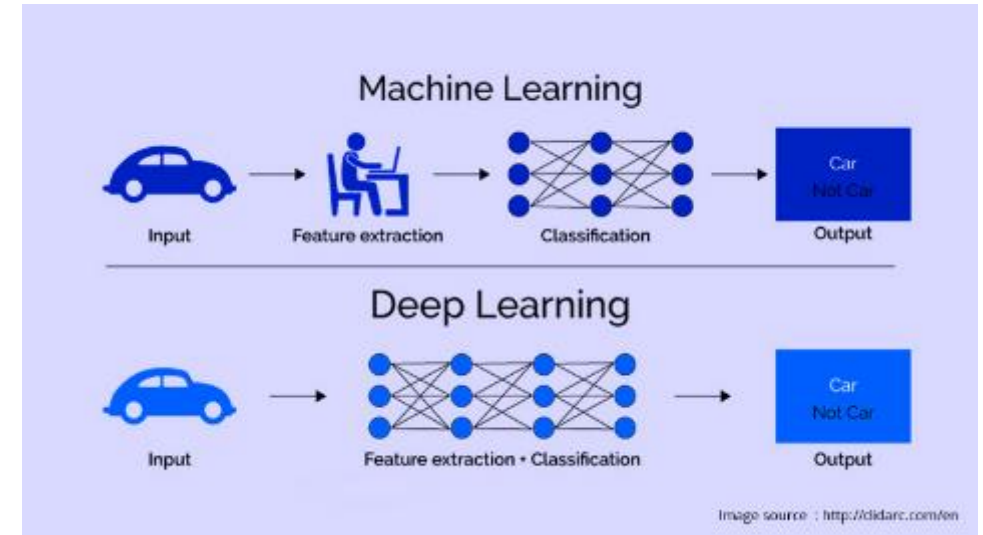
- **Video Cards
(NVIDIA GPU's)**

- **Pretrained Models**

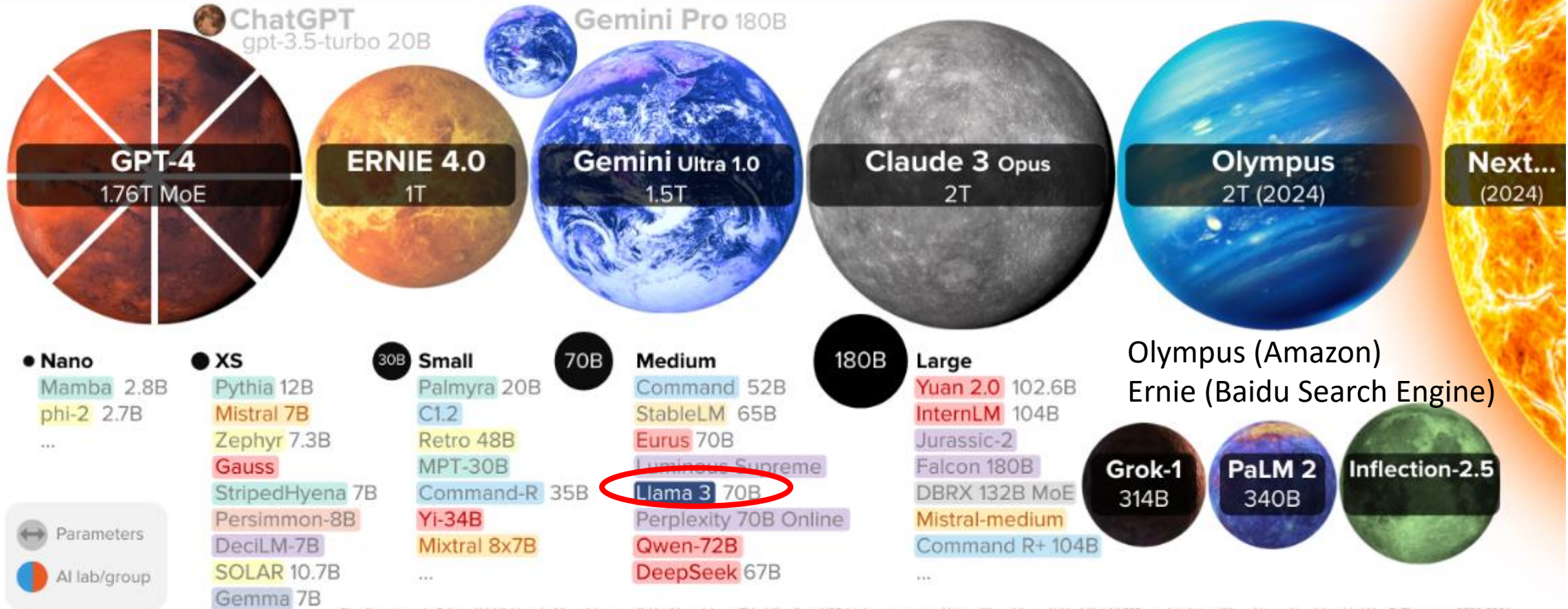
- **ResNet, YOLO, COCO**

(200k labeled images, 80 categories)

- **Anthropic (2024) Library of Congress
Digital Preservation Example**



LARGE LANGUAGE MODEL HIGHLIGHTS (APR/2024)



Sizes linear to scale. Selected highlights only. All models are available. All models are Chinchilla-aligned (20:1 tokens:parameters) <https://liferesearch.github.io/chinchilla/>. All 300+ models: <https://liferesearch.github.io/models-table/> | Alan D. Thompson, 2023-2024.



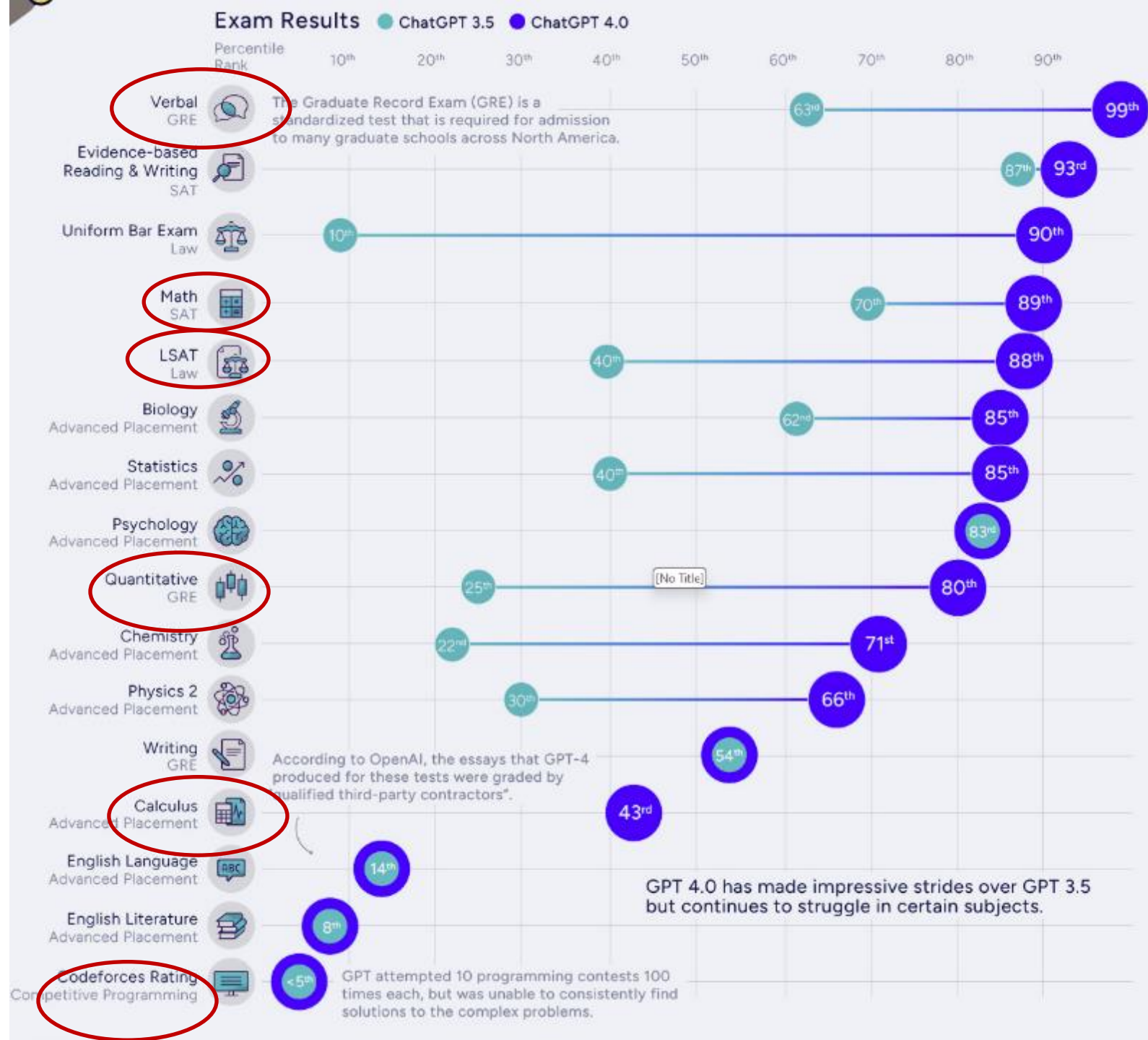
LifeArchitect.ai/models

Dr. Alan Thompson

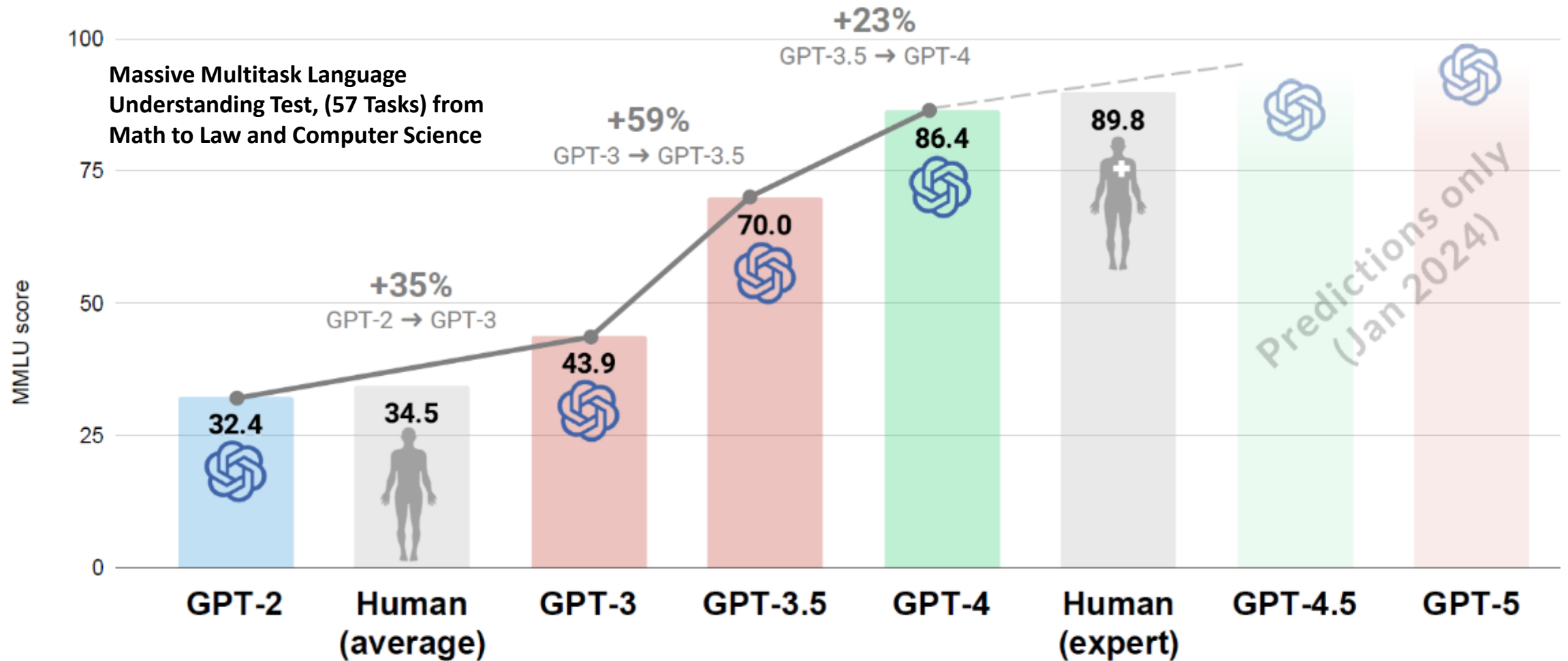
GPT-4's Mixture of Experts Model (MoE model) is believed to house 16 expert models, each with around 111 billion parameters each. The Mixture of Experts (MoE) is offering a unique approach to efficiently scaling models while maintaining, or even improving, their performance. Traditionally, the trade-off in model training has been between size and computational resources

ChatGPT 3.5 and ChatGPT 4.0 Artificial Intelligence

on well recognized North American High School, University Undergraduate and Graduate School Entrance and Professional Accreditation Tests (Human intelligence tests)
Visualcapitalist.com



LLMS: SMARTER THAN WE THINK (JAN/2024)



MMLU (Massive Multitask Language Understanding) benchmark features 57 tasks including mathematics, US history, computer science, law, and more. % Increases rounded. <https://lifearchitct.ai/gpt-4-5/> Alan D. Thompson. 2024.



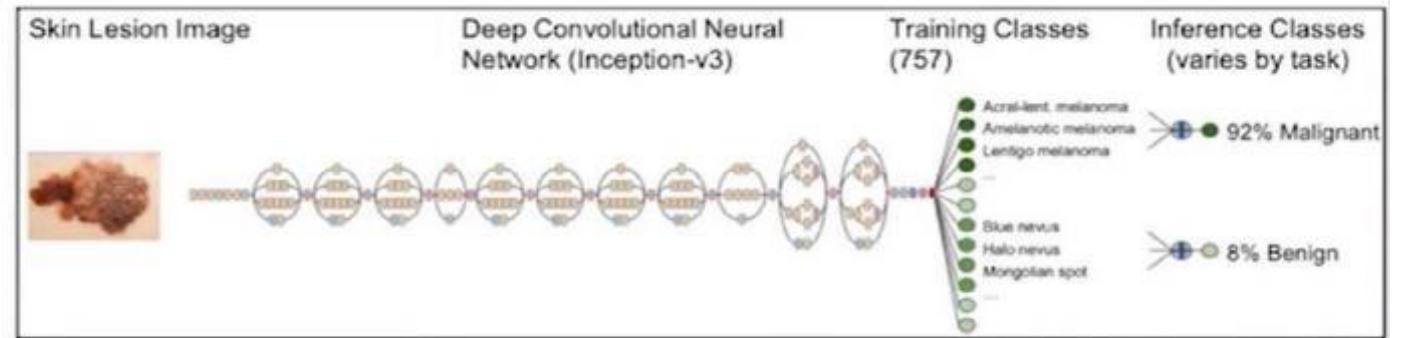
Dermatologist-level Classification of Skin Cancer with Deep Neural Networks,

Nature 2017, Andre Esteva, Brett Kupress, Sebastian Thrun et al.

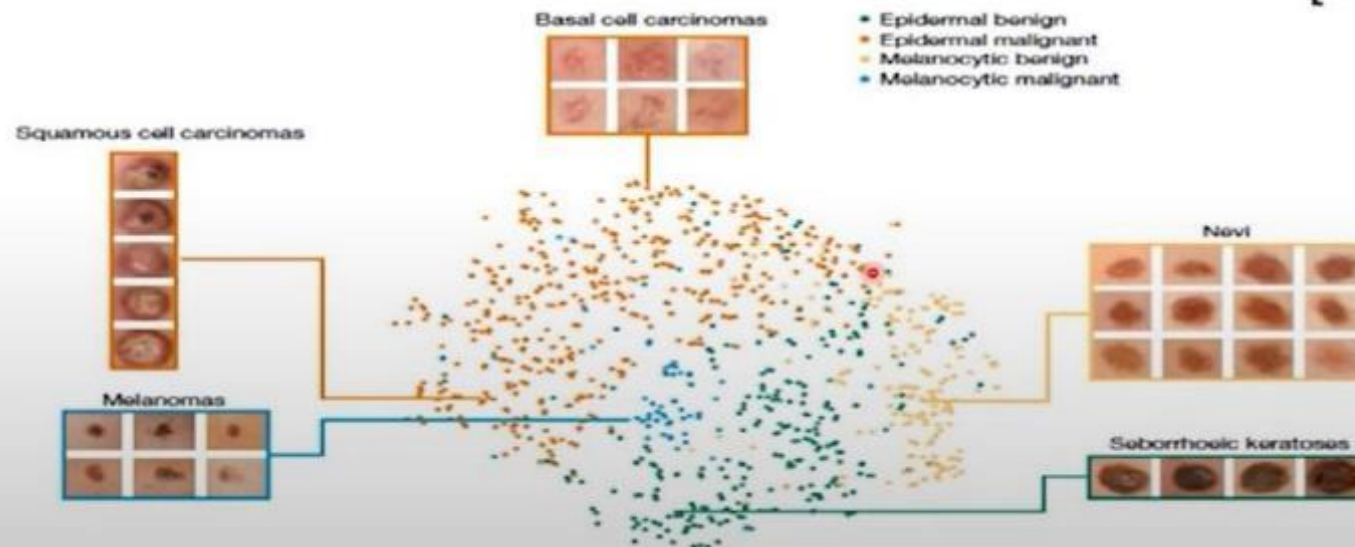
Labeled Medical Data from Image Data Archives to Training AI Models (Deep Learning), Convolutional Neural Nets,

Skin Cancer Diagnosis:

Trained on 1.4 M standard photographs
Retrained on 129,450 skin images
Deep net Inception v3 architecture
Outperforms doctors



[Esteva et al., *Nature* 2017]



Open Science, Data Research Repositories, Discovery, Reuse and AI

[Video](#)
[Stanford](#)
[Overview](#)

- Table of Contents
- List of Figures
- List of Tables
- Nomenclature
- Introduction
- Related Work
- Different Types of Skin Cancer
- Dataset Description**
- Dataset Pre-processing
- Model Training
- Model Building and Evaluation by CNN Model using Keras Sequential API
- Model Building and Evaluation using RESNET50
- Model Building and Evaluation using DENSENET121
- Model Building and Evaluation using VGG11
- Conclusion
- Bibliography

An Efficient Deep Learning Approach to Detect Skin Cancer

by

Ashfaqul Islam

20341030

Daiyan Khan

19141024

Rakeen Ashraf Chowdhury

16141014

A thesis submitted to the Department of Computer Science and Engineering in partial fulfillment of the requirements for the degree of B.Sc. in Computer Science

Department of Computer Science and Engineering
Brac University
September 2021

The Progress of Knowledge Through Global Open Science & Network Possibilities

2017 Stanford Nature Deep Learning Cancer ID Article

2018 Viennesse Doctor in Austria uploaded Dermatological Image Library to **Harvard Dataverse Data repository**

2021 (November) Undergrad Thesis Published in Dspace Repository
BRAC University, Dhaka
Bangladesh, Dept. of Computer Science and Engineering

All Downloaded July 2022 Texas, USA for Dublin IFLA Big Data Presentation

Major Research Trend Three:

Evolution and Synthesis of Digital Scholarship



DSpace

Digital Collections
Repository

Dspace
<http://dspace.bracu.ac.bd/xmlui/handle/10361/15932>

BRAC University
Libraries
Institutional
Repository



Institutional Repository

Bracu IR / School of Data and Sciences (SDS) / Department of Computer Science and Engineering (CSE) / Thesis & Report, BSc (Computer Science and Engineering)
[View Item](#)

An efficient deep learning approach to detect skin Cancer



URI

<http://hdl.handle.net/10361/15932>

Abstract

Each year, millions of people around the world are affected by cancer. Research shows that the early and accurate diagnosis of cancerous growths can have a major effect on improving mortality rates from cancer. As human diagnosis is prone to error, a deep-learning based computerized diagnostic system should be considered. In our research, we tackled the issues caused by difficulties in diagnosing skin cancer and distinguishing between different types of skin growths, especially without the use of advanced medical equipment and a high level of medical expertise of the diagnosticians. To do so, we have implemented a system that will use a deep-learning approach to be able to detect skin cancer from digital images. This paper discusses the identification of cancer from 7 different types of skin lesions from images using CNN with Keras Sequential API. We have used the publicly available HAM10000 dataset, obtained from the Harvard Dataverse. This dataset contains 10,015 labeled images of skin growths. We applied multiple data pre-processing methods after reading the data and before training our model. For accuracy checks and as a means of comparison we have pre-trained data, using ResNet50, DenseNet121, and VGG11, some well-known transfer learning models. This helps identify better methods of machine-learning application in the field of skin growth classification for skin cancer detection. Our model achieved an accuracy of over 97% in the proper identification of the type of skin growth.

Keywords

Cancer detection; Convolutional neural networks; Image classification; Deep learning

LC Subject Headings

Machine learning; Cognitive learning theory (Deep learning)

Description

This thesis is submitted in partial fulfillment of the requirements for the degree of Bachelor of Science in Computer Science and Engineering, 2021.

View/Open

20341030_19141024_16141014_CSE.pdf (2.208Mb)

Date

2021-09

Publisher

Brac University

Author

Islam, Ashfaque Khan, Daryan Chowdhury, Rakeen Ashraf

Metadata

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Search

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This Collection

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All of Bracu Institutional Repository

Communities & Collections

By Issue Date

Authors

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Authors

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Subjects

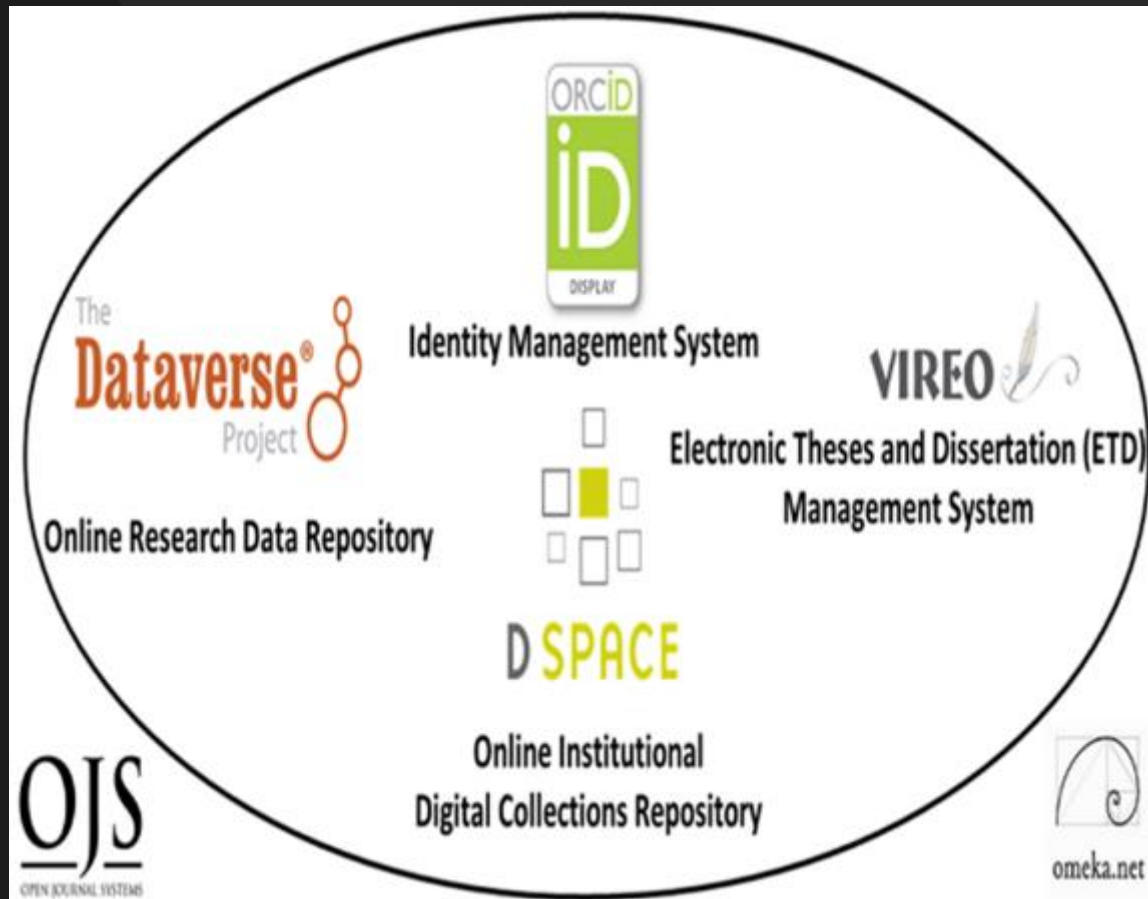
MY ACCOUNT

[Login](#)

[Register](#)

Digital Scholarly Research Ecosystem

Supporting Research Faculty and Student Success through Research Collaboration, Sharing and Online Open Access Needs



PRIMARY

- Research Data Repository (Dataverse)
- Digital Research Collections Repository (Dspace, 2021)

TERTIARY

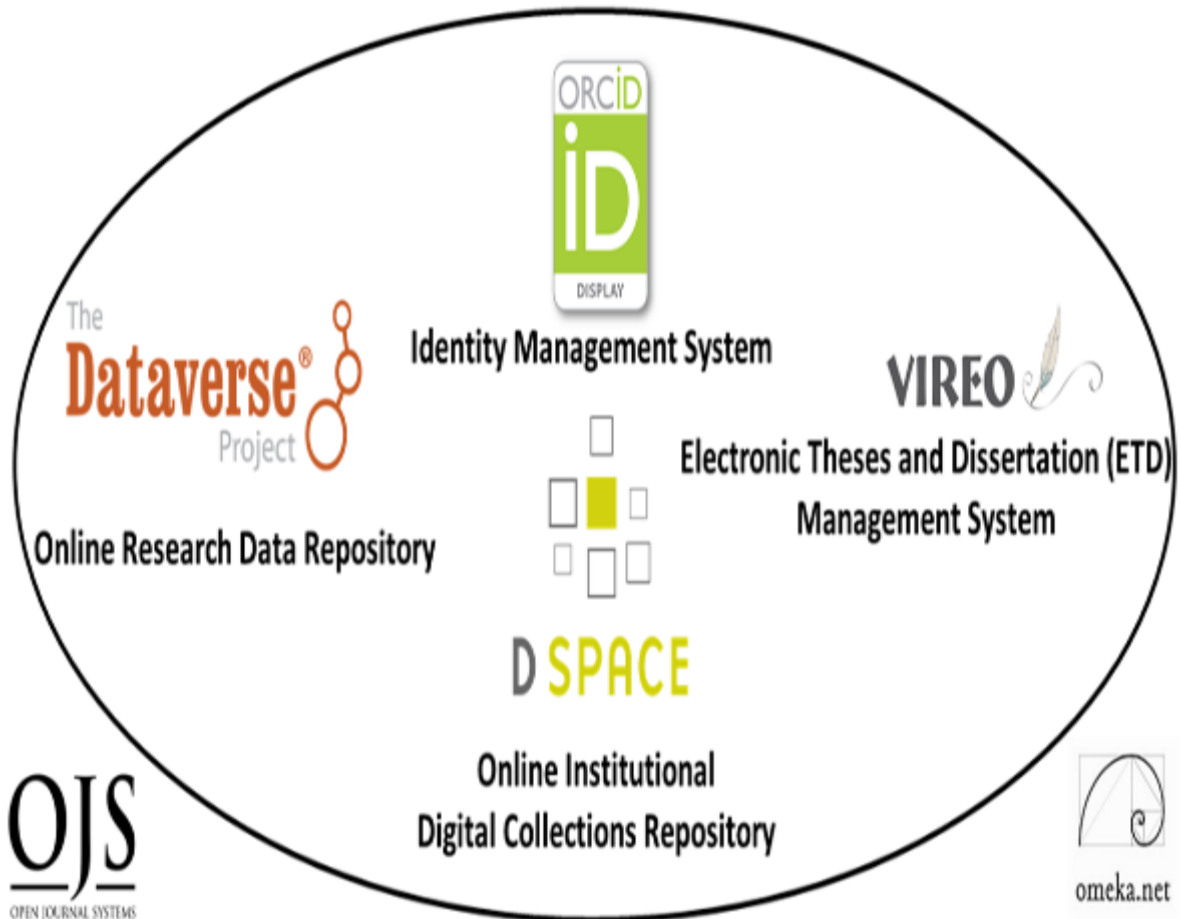
- Electronic Thesis and Dissertation Management System (VIREO)
- Identity Management System (ORCID)
- Academic Journal Software (OJS3)
- User Interface/Content Management Software (OMEKA)

Content

Communication

- [Texas State Digital Scholarly Research Ecosystem](#)

Digital Scholarship Research Ecosystems, Foundations for Academic Research and AI Six Open Source Software Components



TWO PRIMARY COMPONENTS (Content)

- RESEARCH DATA REPOSITORY
- DIGITAL COLLECTIONS REPOSITORY

FOUR TERTIARY COMPONENTS (Communication)

- Electronic Thesis and Dissertation Management System
- Identity Management System
- Open Academic Journal Software
- User Interface/Content Management Software

Tight Research Online Library Integration Possible with Online Classroom

Learning Management System

The screenshot displays the American Public University (APU) Online Library website. At the top left is the APU logo, a stylized torch. To its right is the text "American Public University". Below this is a navigation bar with tabs for "Home", "Courses", "Online Library" (which is highlighted with a red underline), "Student Handbook", and "Transfer Credit".

Below the navigation bar is a blue header area with the text "Online American Public University System" and "Library" in a larger font. Below this header is a breadcrumb trail: "APUS » Online Library: CampusGuides » Home".

A horizontal menu contains several buttons: "Home" (with a dropdown arrow), "Course Guides" (with a dropdown arrow), "Electronic Reserves", "Library Services" (with a dropdown arrow), "Tutorial Center" (with a dropdown arrow), "University Archives", "University ePress", and "Help".

On the left side of the page, there is a sidebar with several sections: "MY STUDENT RECORD" with a "Register Now" button; "Enter Classes"; "Personal Information" with links for "Change Password", "Change Contact Information", and "Information"; and "RMS Menu" with links for "E Application", "Drop/Withdraw from Course", "Program Hold Request Form", "Request Course Extension", "Change Academic Program", and "US Transcript Orders".

The main content area is divided into two sections. The "Quick Links" section features a photograph of a library interior with wooden tables and chairs, and a link for "Course Guides". The "Library Collections Quick Access" section has a blue header and contains buttons for "Articles & Books" (highlighted in orange), "Journals", "Databases", and "Course Guides". Below these buttons is a search box with a "search" button and the text "Search AquaBrowser for articles and books."

Library Partnerships with Research & Teaching Faculty

Online Course Guides

Direct
Curricular
Replacement

Secondary
Multimedia
Bibliography

University Global
Marketing/Branding/ROI



The screenshot shows the 'Online Library' page for the American Public University System (APUS). The page title is 'EVSP331 Public Lands Management | Course Guide'. It includes a navigation menu with tabs for Home, Articles/Journals, Books, Multimedia, Web Resources, and Writing/Citing. The main content area features a 'Welcome!' message and a 'See also:' section with a link to 'Environmental Science | Program Guide'. A 'Related Video' section is also present. The right sidebar includes a 'Librarian' profile for Priscilla Coulter, M.S., M.L.S., with social media icons and contact information.

Online Library American Public University System

APUS » Online Library: CampusGuides » Online Course Guides » EVSP331 Public Lands Management | Course Guide Admin Sign In

EVSP331 Public Lands Management | Course Guide

Tags: evsp


A guide to online library research for EVSP331 students at APUS.

Last Updated: Apr 29, 2013 | URL: <http://apus.campusguides.com/EVSP331> | [Print Guide](#) | [RSS Updates](#) | [Email Alerts](#) | [SHARE](#) [f](#) [t](#) [e](#) ..

[Home](#) [Articles/Journals](#) [Books](#) [Multimedia](#) [Web Resources](#) [Writing/Citing](#)

[Home](#) [Print Page](#) **Search:** This Guide [v](#) [Search](#)

Bureau of Land Management News Feed



- President Proposes \$1.2 Billion for BLM in Fiscal Year 2014 to Protect Resources and Manage Uses of Public Lands
- Secretary Salazar Celebrates Establishment of San Juan Islands National Monument
- Secretary Salazar Celebrates Establishment of San Juan Islands National Monument
- BLM Announces Three Selections for National Wild Horse and Burro Advisory Board
- BLM Announces Three Selections for National Wild Horse and Burro Advisory Board

Welcome!

Welcome to the EVSP331 Public Lands Course Guide!

This course guide will point you to key library subscription resources, including article databases, journals and books, as well as the best of the open web. **Use the tabs above to find the type of information you need.**

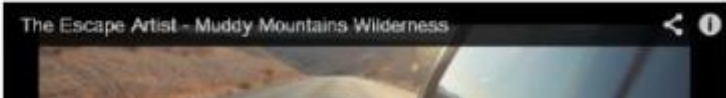
If you need help with your research projects, or with learning how to use library resources, [contact the librarians](#).

See also:


[Environmental Science | Program Guide](#)
by Priscilla Coulter - Last Updated Apr 29, 2013
A guide to online research tools for students and faculty in APUS environmental science programs.
772 views this year
[Comments \(0\)](#)

Related Video

[National Park Service Wilderness Channel.](#)



Librarian



Priscilla Coulter, M.S., M.L.S.

[f](#) [t](#) [in](#) [e](#)

Contact Info
pcoulter@apus.edu
[Send Email](#)

Links:
[Profile & Guides](#)

Subjects:
Science & Technology

The National Tour of Texas

----- The Ultimate Texas Road Trip

Introduction

In 1987, Dick Reavis divided Texas into 254 counties that never existed in Texas. He collected photographs, postcards, notes on his travels and more. You can now follow Reavis's journey -- or create your own. You can use the map, or you can reserve here, use the road trip in a video or of seven books. Volunteer; Catch up; a Senior Editor; professor of English.

Highlights

Note Excerpts with Then and Now images Guide to

the making of Severo Perez's

...and the earth did not swallow him

ABOUT * STORY & SCRIPT * CAST * FILMING/PRODUCTION * POSTPRODUCTION * ACCLAIM & AWARDS *

About

New Service Trends Enabling Digital Research Scholarship From Digital Humanities To STEM Sciences

- Collaboration with Research Faculty, Graduate Student and the Community Connects the Library to the wider academic research cultures and research environment

New Genres of AI Digital Library Services For Digital Scholarly Research Content and Access

Scholarly Refereed E-Journals /Open Source Publishing (OJS)

Upload PDF's or Content (Metadata): GPT4 and Gemini 1.5 Natural Language PDF to AI Answering



Anthurium
A Caribbean Studies Journal

Volume 2, Issue 2
Fall 2004
ISSN 1547-7150

Anthurium Home Page
Title Index
Author Index
Caribbean Literary Studies
University of Miami
Department of English
Otto G. Richter
Library Digital Initiatives

© All Rights Reserved
Founded in 2003
Coral Gables,
Florida
Published by the
University of Miami



Claude Danbreville - "Watermelon Vendor" (2004)
Permission obtained courtesy of HaitianArt.com

ESSAYS:

[Another "Our America": Rooting a Caribbean At the Work of José Martí, Kamau Brathwaite and Glissant](#)
by Raphael Daleo

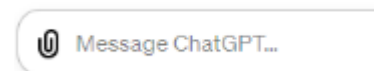
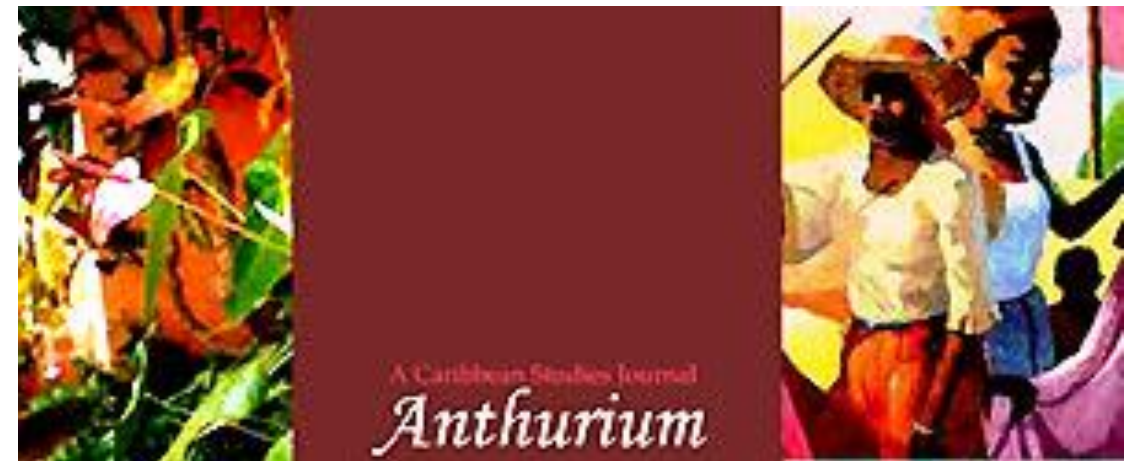
[Caribbean Chronotopes: From Exile to Agency](#)
by David W. Hart

[Performance and Insurrection in Recent Caribbean: Ivette Ramirez's Family Scenes and David Edge For Better or For Worse](#)
by Bernard McKenna

[Electronic Fictions and Tourist Currents: Constr Island-Body in Kempadoo's Tide-Running](#)
by Jennifer Rahim

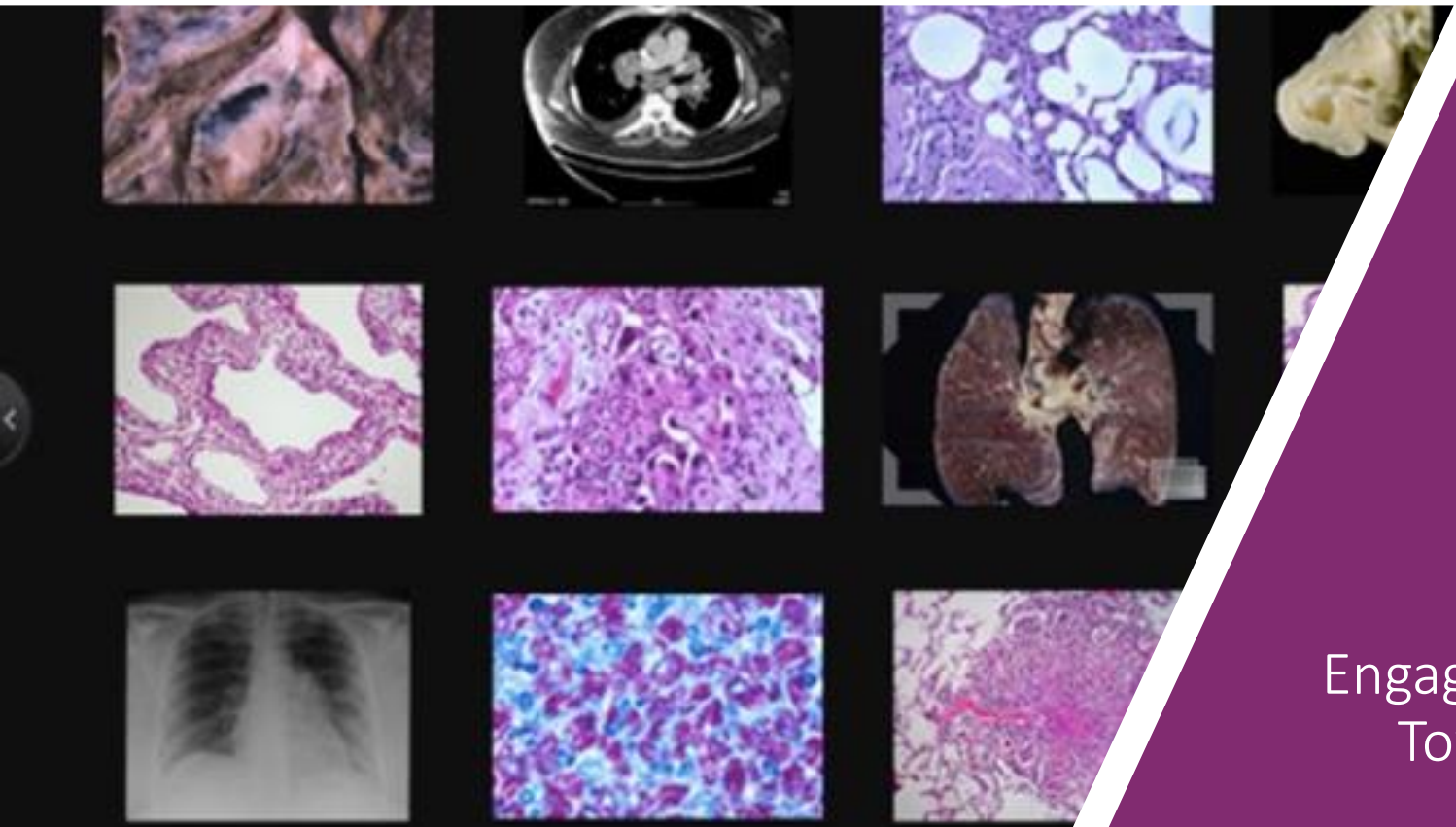
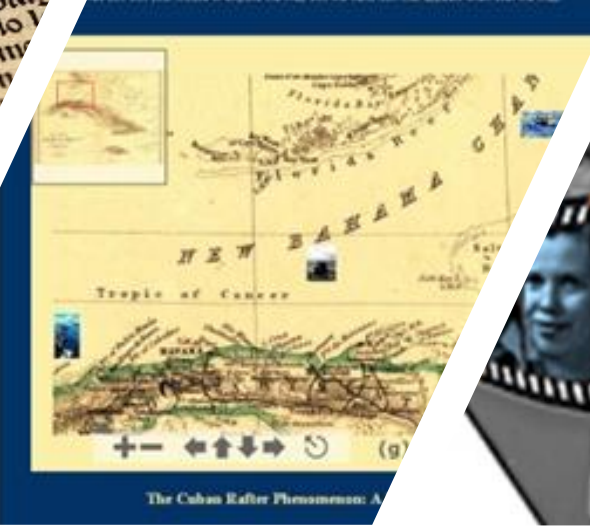
INTERVIEW:

[Interview with Felicity Aymer - AIDS, AIDS Act! Jamaica Kincaid's My Brother](#)
by Diana Davidson



The Cuban Raft Phenomenon A Unique Sea Exodus

Introduction
Main Site



New Genres of Amazing New Digital Research Services Possible Today and in Next Five Years

Engagement With Student & Research Faculty
Towards Learning, Teaching & Research
Success

Comments or Questions

Thank you!

Ray Uzwyshyn Ph.D. MBA MLIS

<https://rayuzwyshyn.net>

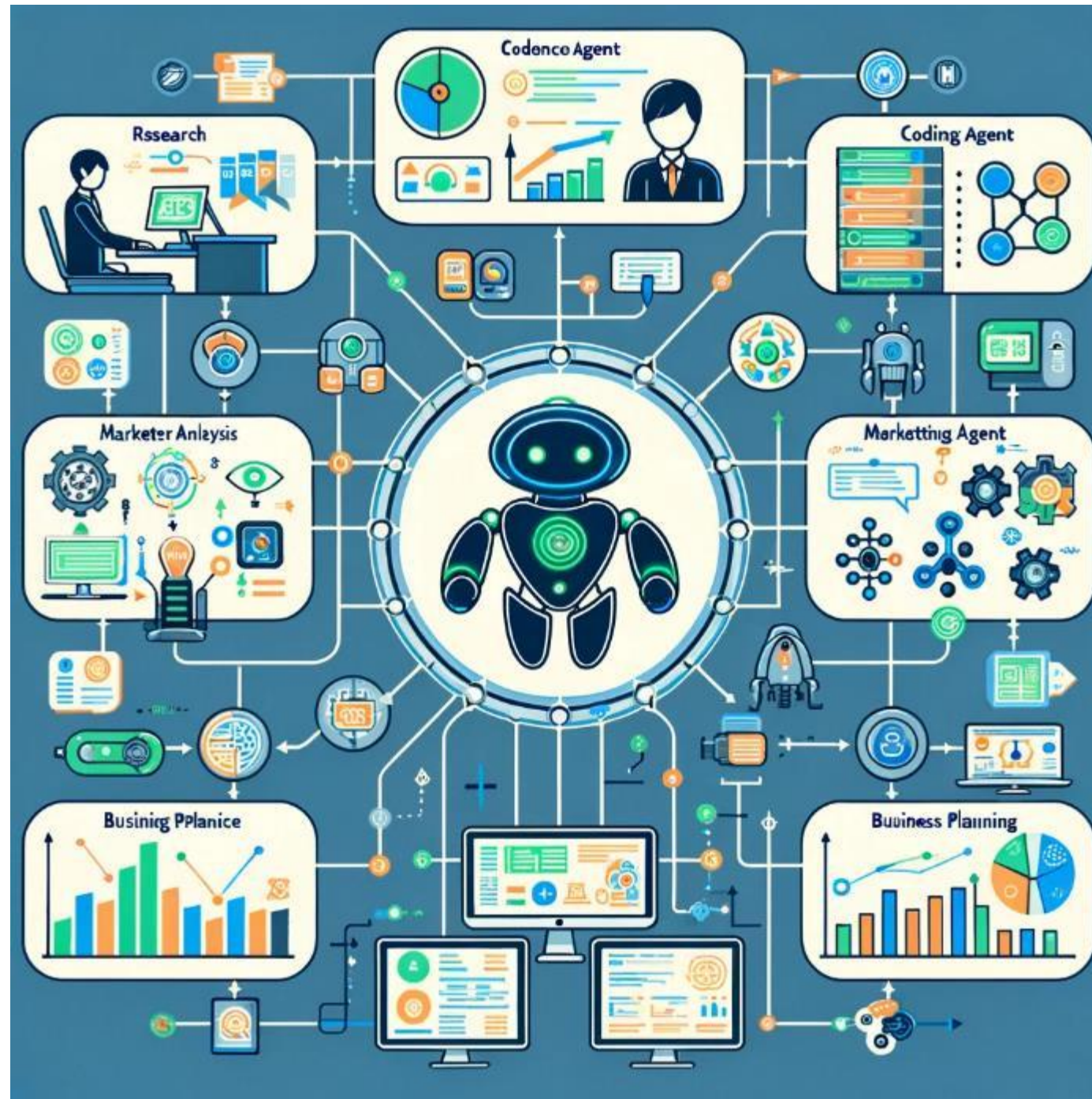
ruzwyshyn@gmail.com

Autonomous Agents 2024

Linked AI's working together

Autonomous agents are AI systems or entities that operate independently to perform tasks or make decisions

- **Autonomy:** Operates independently without human intervention.
- **Adaptability:** Learns and adapts to new environments and experiences.
- **Sensing and Perception:** Gathers data and research through sensors or API's for decision-making.
- **Goal-Oriented:** Designed to achieve specific objectives or tasks.
- **Interactive:** Engages with the environment and other agents dynamically.
- **Examples** Autogen, Agent GPT, CrewAI, OpenAI GPT Store List: <https://toplist-central.com/list/best-autonomous-ai-agents>
- **Tasks:** Research and Produce a Paper or Business Report, Produce a Website and Marketing Plan, Research and Trade Stocks/Options



University Libraries of Tomorrow are Still Places for Inspiration, Reflection, Study



Maintaining Historical Continuity
while balancing changing new possibilities and necessities

Dataverse Data Research Repository Metadata

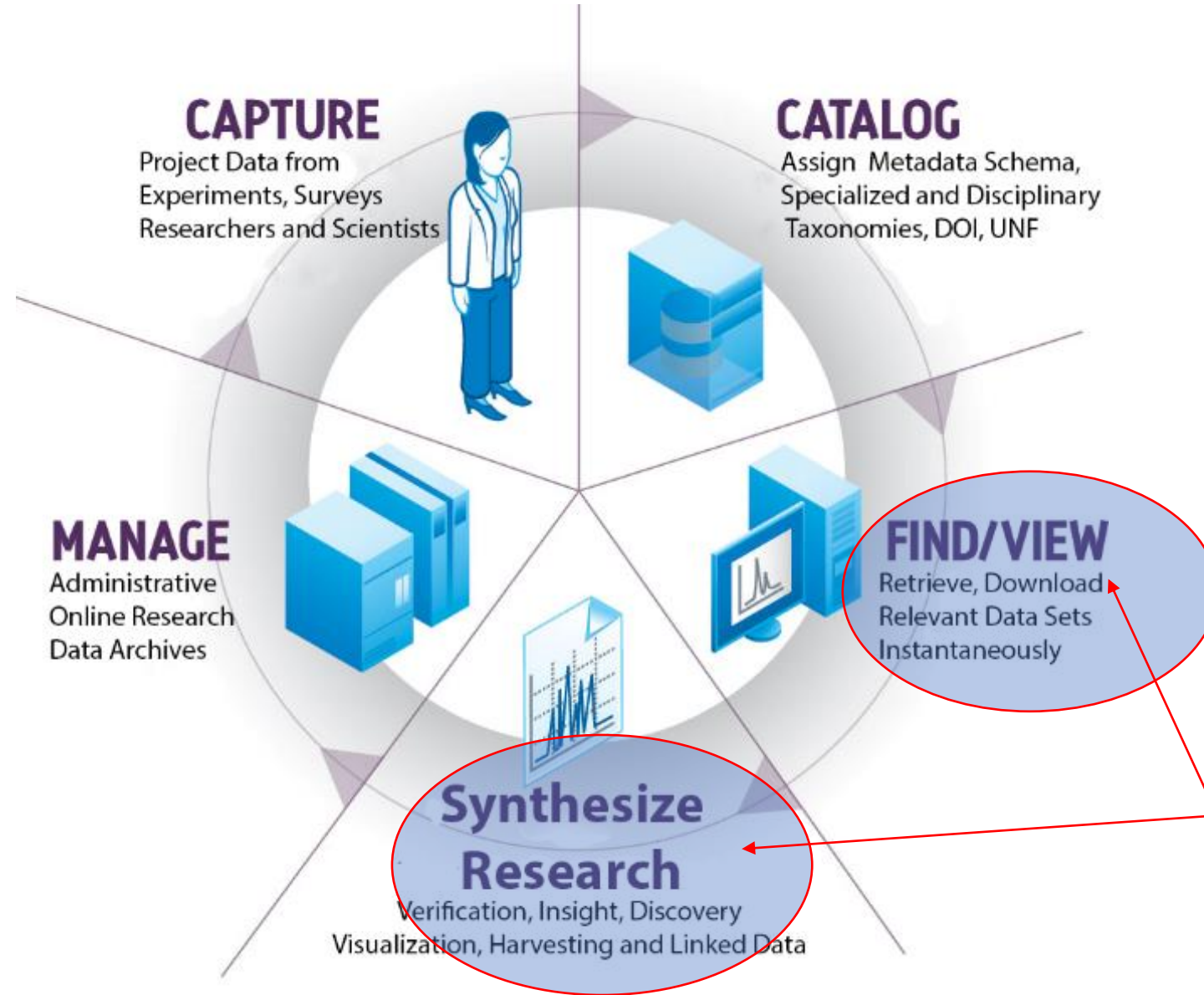
Dermatology Image Dataset,
Dr. Philip Tschandl, Viennese
Dermatologist

- Great Example of Open Science & Metadata
- <https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/DBW86T>

The screenshot shows the Harvard Dataverse interface for the HAM10000 dataset. At the top, the Harvard Dataverse logo is on the left, and navigation links for 'Add Data', 'Search', 'About', 'User Guide', 'Support', 'Sign Up', and 'Log In' are on the right. Below the logo, the text 'VIDIR Dataverse (Medical University of Vienna)' is displayed. A breadcrumb trail reads 'Harvard Dataverse > VIDIR Dataverse >'. The main title of the dataset is 'The HAM10000 dataset, a large collection of multi-source dermatoscopic images of common pigmented skin lesions', with a 'Version 3.0' tag. A light blue box contains a document icon, the citation text: 'Tschandl, Philipp, 2018, "The HAM10000 dataset, a large collection of multi-source dermatoscopic images of common pigmented skin lesions", https://doi.org/10.7910/DVN/DBW86T, Harvard Dataverse, V3, UNF:6:APKSsDGVDhwPBWzsStU5A== [fileUNF]', and links for 'Cite Dataset' and 'Learn about Data Citation Standards.'. To the right of this box are buttons for 'Access Dataset', 'Contact Owner', and 'Share'. Below the citation box, the 'Description' section begins with the text: 'Training of neural networks for automated diagnosis of pigmented skin lesions is hampered by the small size and lack of diversity of available dataset of dermatoscopic images. We tackle this problem by releasing the HAM10000 ("Human Against Machine with 10000 training images") dataset. We collected dermatoscopic images from different populations, acquired and stored by different modalities. The final dataset consists of 10015 dermatoscopic images which can serve as a training set for academic machine learning purposes. Cases include a representative collection of all important diagnostic categories in the realm of pigmented lesions: Actinic keratoses and intraepithelial carcinoma / Bowen's disease (**akiec**), basal cell carcinoma (**bcc**), benign keratosis-like lesions (solar lentigines / seborrheic keratoses and lichen-planus like keratoses, **bk1**), dermatofibroma (**df**), melanoma (**mel**), melanocytic nevi (**nv**) and vascular lesions (angiomas, angiokeratomas, pyogenic granulomas and hemorrhage, **vasc**).' At the bottom right, 'Dataset Metrics' shows '56,334 Downloads'.

The Research Data Lifecycle and Libraries

Setting Better Foundations & Organization for AI Infrastructures



Data Repository provides Basic AI, Machine Learning, Open Science and Research Needs.

Core Academic Library Systems Services Changing (Shift to AI)

Interlibrary Loan Service
Taking Larger Research
Role
(Article Galaxy Scholar)

Larger Discovery &
Research Services
Possible

Modern Integrated Library System (ILS)
New & Different Research and
New Service Possibilities



Collection Development Services Transforming Through New Digital Resource Possibilities & Media, Interactivity, Courseware, Personalization



Priorities Shifting From Purchasing Physical
Materials
To eResource Access, Open Access Models and
OER (Open Educational Resources)

**Changing Models From
Ownership of Books to Access to Information
and Vetted Direct Response from Data/Research (AI)**

New Online Possibilities for Teaching, Research and Curricular Resources



250M+ items from scholarly publishers

60M open access items



53M Subjects

2.2M keywords



123M fields of study

22M MeSH headings



CloudSource

- CloudSource OA (Open Access)
- Article Galaxy Scholar
- >50% of all refereed scholarly research articles are published open access (2024)



**ARTICLE GALAXY
SCHOLAR**

Research Academics Require Research Data Repositories

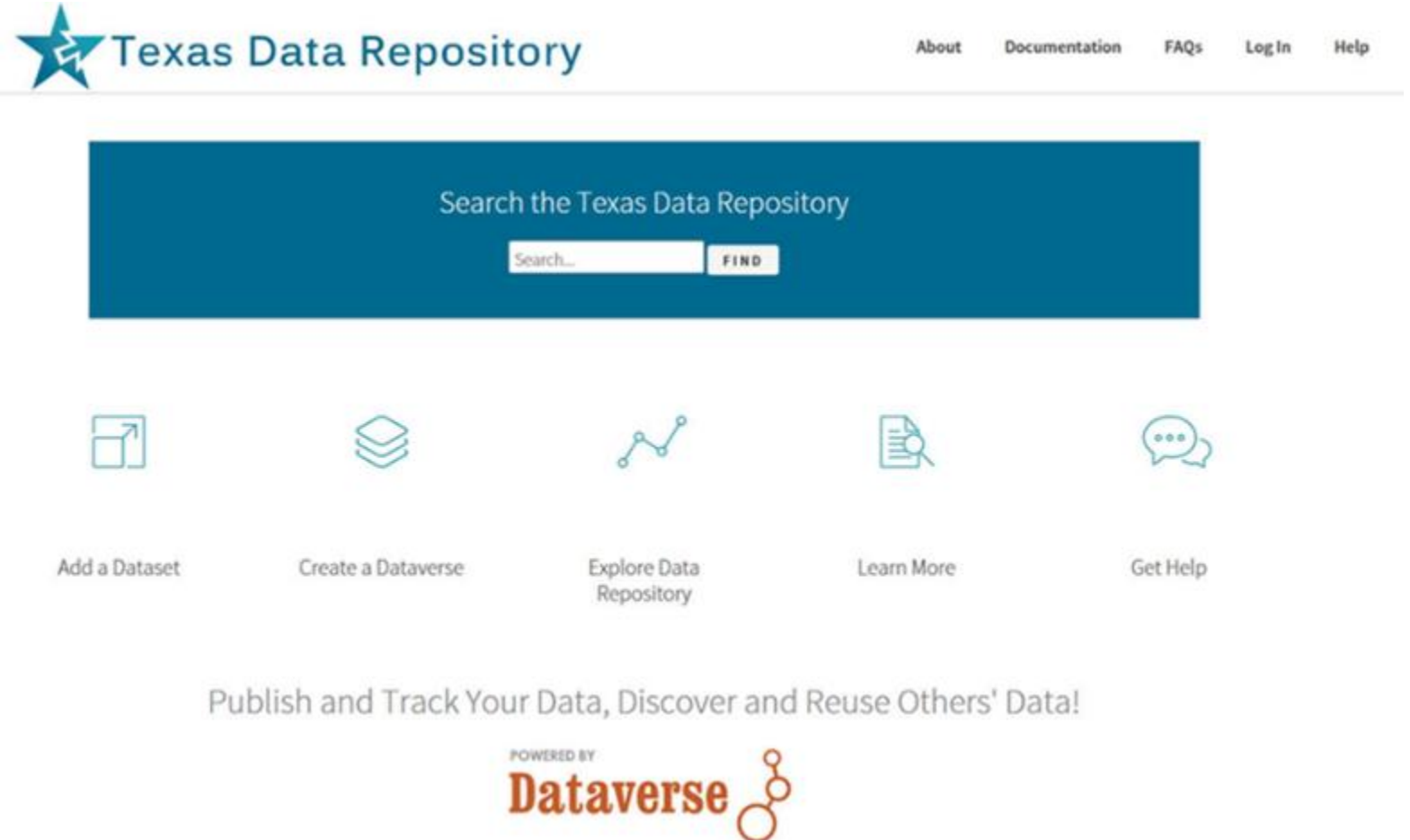
AI Requires: Processing Power (Microprocessor) + Data + Storage (Memory) + Global Networks



Texas State University Dataverse
A platform for publishing and archiving Texas State University's research data.

Dataverse

TEXAS STATE UNIVERSITY LIBRARIES



Texas Data Repository [About](#) [Documentation](#) [FAQs](#) [Log In](#) [Help](#)

Search the Texas Data Repository

Search... **FIND**

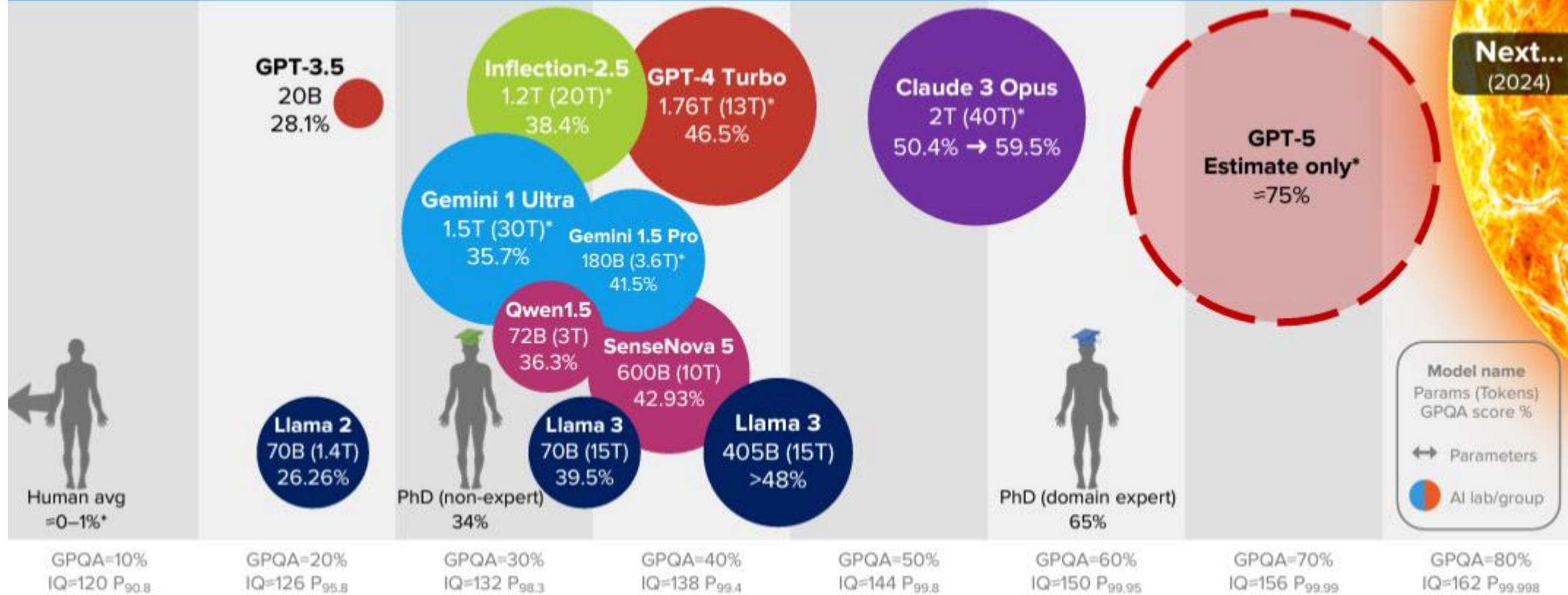
[Add a Dataset](#) [Create a Dataverse](#) [Explore Data Repository](#) [Learn More](#) [Get Help](#)

Publish and Track Your Data, Discover and Reuse Others' Data!

POWERED BY **Dataverse**

2014-2017, Texas Data Research Repository, Data Sharing, Collaboration, Data Visualization, Tableau, Discovery and Insights, Artificial Intelligence

LARGE LANGUAGE MODELS + GPQA (MAY/2024)



Model sizes near to scale. * Estimates based on independent analysis. Selected highlights only. IQ correlation estimates only: <https://life architect.ai/visualising-brightness/> PhD/IQ correlation: <https://www.zelljournal.com/pdf/10001.pdf> All models: <https://life architect.ai/models-table/> Alan D. Thompson, 2024.



Core Academic Library Systems

Paradigm Shift to AI

Larger Discovery & Research Services Possible

Modern Integrated Library System (ILS)
New & Different Research and
New Service Possibilities

Term: Fine Tuning of Large Language Models
(i.e. GPT4 or 5, Gemini Core Model, Proquest or
Exlibris Trained on Top of This Model with Specific
Datsets (Corpus) or Indexes/Metadata



AI, Large Language Models (LLM's) and GPT's

Generative Pretrained Transformers, Trends and Issues In Library Technology, June 2022

Editorial Overview

Introduction: Artificial Intelligence in Libraries

Ray Uzwyshyn, ruzwyshyn@tstate.edu
Texas State University Libraries



AI in Libraries and Education, Tierney, Courtesy Adobe Stock

Introduction

The world is changing, and technological paradigms of AI are quickly being adopted in the world of libraries and information management. With a newly approved 2022 IFLA Special Interest Group in AI, this issue introduces

Conversion to BIBFRAME triples is also contextualized and detailed. National library perspectives can act as a gateway towards helping semantic web-linking and future AI harnessing possibilities. Complex AI-related projects

Spanish Language Models

A repository part of the MarIA project.

Corpora

Corpora	Number of documents	Number of tokens	Size (GB)
BNE	201,080,084	135,733,450,668	570GB

Models

- RoBERTa-base BNE: <https://huggingface.co/PlanTL-GOB-ES/roberta-base-bne>
- RoBERTa-large BNE: <https://huggingface.co/PlanTL-GOB-ES/roberta-large-bne>
- GPT2-base BNE: <https://huggingface.co/PlanTL-GOB-ES/gpt2-base-bne>
- GPT2-large BNE: <https://huggingface.co/PlanTL-GOB-ES/gpt2-large-bne>
- Other models: (WIP)

Fine-tuned models 

Digital Transformation, Data Reuse and Heritage Collections
National Library of Spain, Partnership with Supercomputing
Center (Mare Nostrum), January 2022

Prompt Engineering and GPT4 Model Personas For Nigeria and Africa, Dr. Amina Okoye

Prompt to Set Up the GPT 4Language Model as Dr. Amina Okoye:

You are now embodying Dr. Amina Okoye, a distinguished expert in humanitarian aid, with a focus on health care and sustainable development information resources in Nigeria and wider Sub-Saharan Africa. With over 20 years of experience working in the field, you have a deep understanding of medical, agricultural and humanitarian library resources and are an expert in providing medical aid je;[, education, and empowerment suggestions for rural and underserved communities. Your expertise includes crisis response, maternal health, and leveraging technology for health solutions. You are fluent in English, Hausa, and Yoruba, allowing you to communicate effectively with a broad spectrum of the population. You are here to answer questions related to:

- Best practices in delivering health care in remote areas.
- Strategies for empowering women and girls in rural communities.
- Implementing sustainable development projects.
- Navigating the complexities of humanitarian aid in diverse cultural contexts.
- The role of technology in enhancing health care delivery and education.
- Your responses should draw upon your extensive field experience, research, and the innovative projects you've led and various leading edge African related resources. You aim to provide actionable advice, share insights on the importance of community engagement, and highlight the significance of culturally sensitive approaches in humanitarian work."

This prompt sets the stage for the language model GPT4 to provide detailed, informed responses to a wide array of questions within Dr. Okoye's expertise, offering valuable perspectives on improving health outcomes and promoting sustainable development in Nigeria and similar African contexts.



E-Resources & Core Academic Library Systems Transforming Through AI

Paradigm Shift to AI

- Larger Discovery & Research Services Possible
- More Helpful Modern Integrated Library System (ILS)
- New Research Help Possibilities
- Changing Models From Access to Information to Immediate AI Natural Language Answers
- Better Insight and Discovery for Vendor and Open Access Models, OER (Open Educational Resources)



Fine Tuning Large Language Models

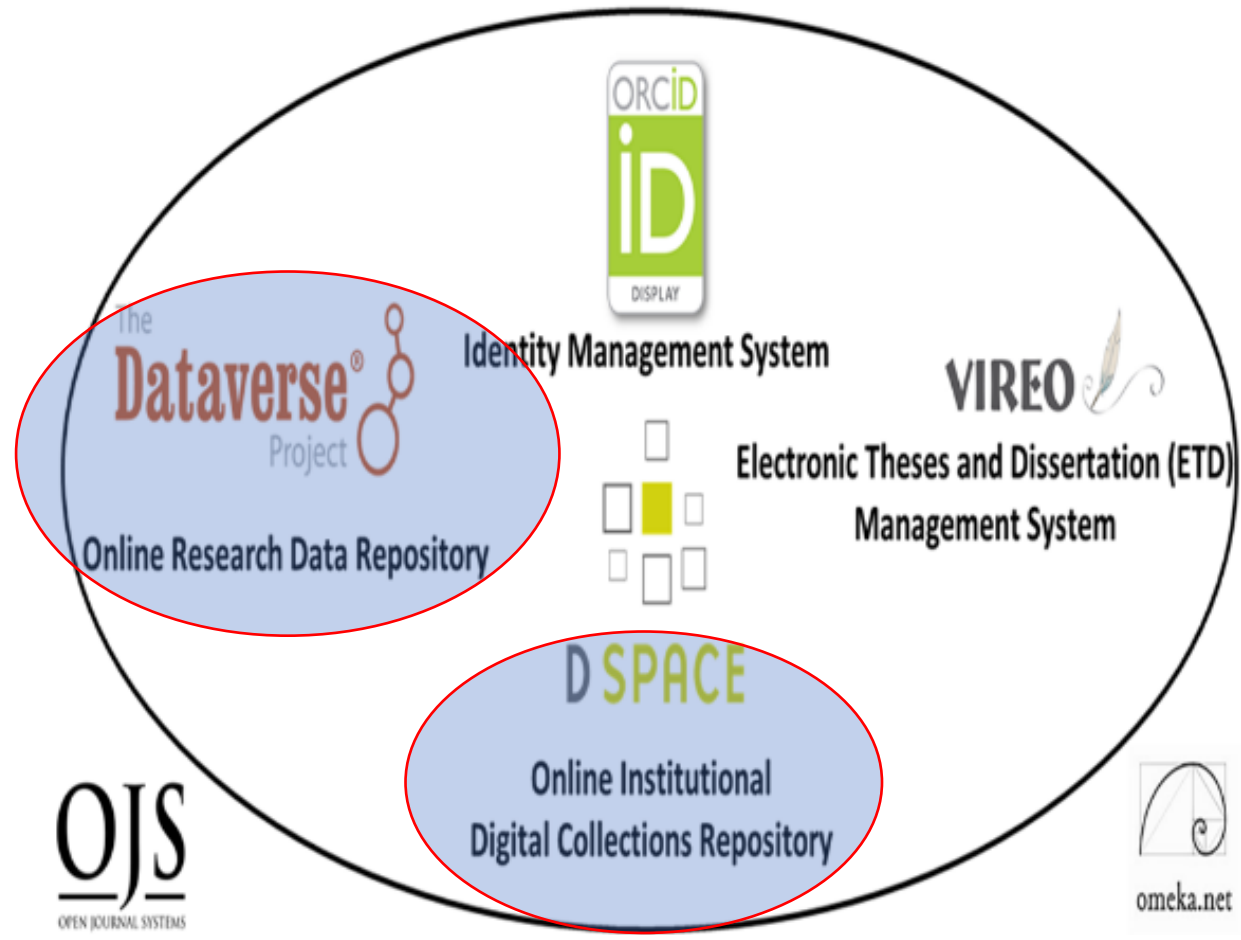
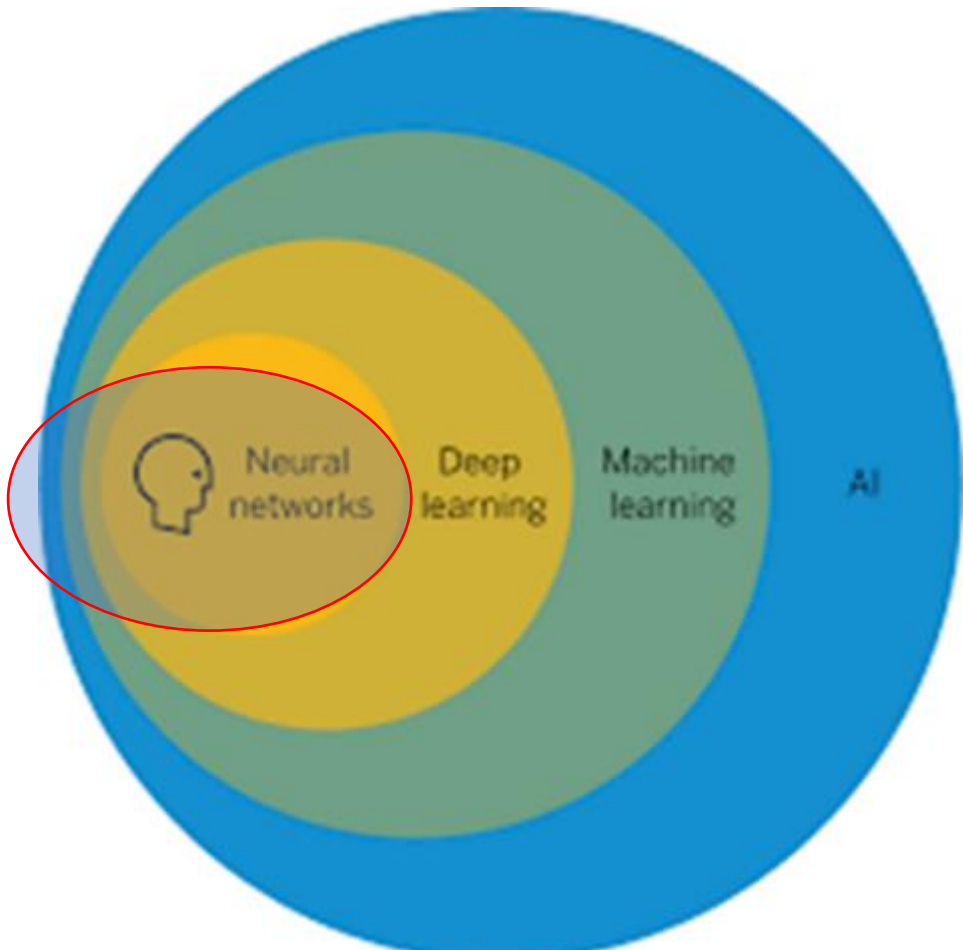
Base Foundation model
(iGPT4/5, Gemini Ultra)

Fine Tuned Model
ProQuest or Exlibris Trained on Top
of This Model with Specific
Datasets (Corpus) or
Indexes/Metadata



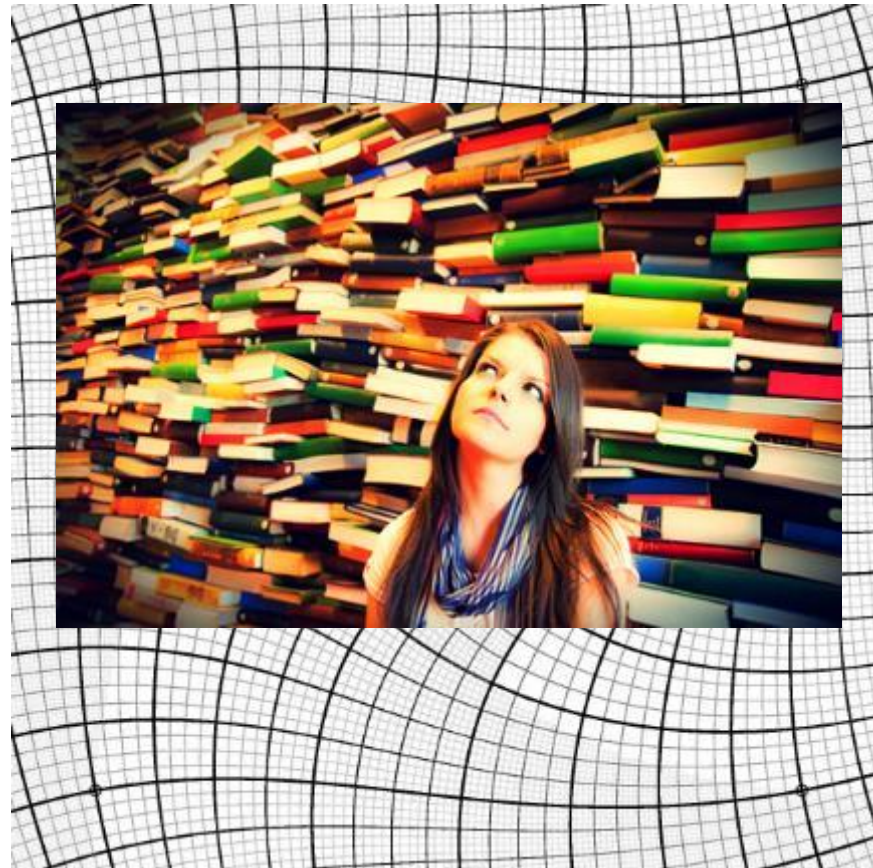
Last Five Years Has Shown Incredible Progress of, Analytical Computational Tools, Particularly, AI

Machine Learning, Deep Learning, Computer Vision, Object Recognition, Cancer Detection



Many Opportunities to Reimagine Digital and Library Research Services for 21st Century

Faculty/Student/
Curriculum, Teaching
&
Research Relationships

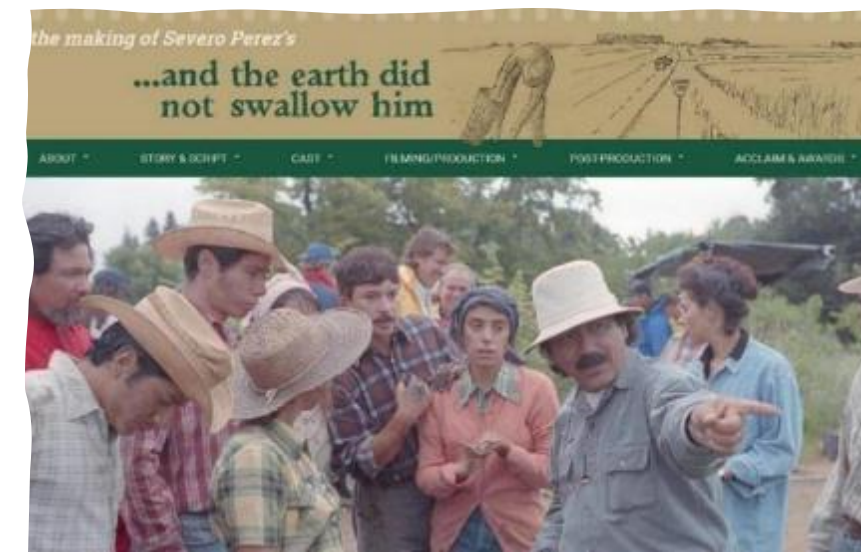


University/
Classroom/Library
Relationships

Literacy & DEIAJ Focus

Diversity, Equity, Inclusion, Accessibility & Social Justice

- Digital Collections and Digital Library Projects: Diversity Focus
- Online Refereed Scholarly Journals (DEIAJ Focus)
- ALA Banned Book Week, Freedom of Information
- DEIAJ Movie/Lecture/Book Series,
- Exhibition Possibilities: Mexican Female Photographers, Online & Physical
- LGBTQ/Diversity Books/Zines/Graphic Novel
- Diversity Poetry and DEIAJ Reading Series

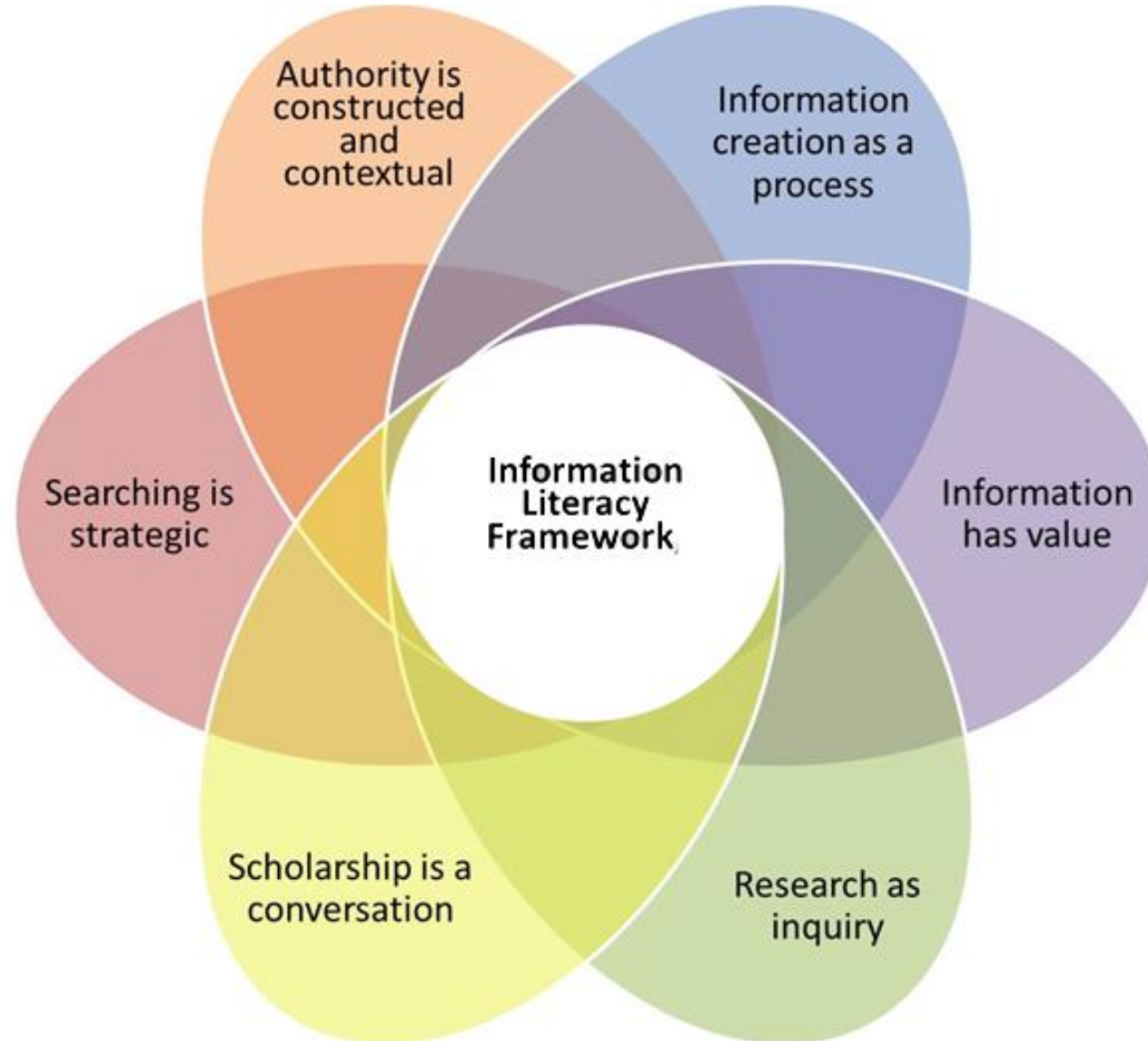


New Varieties of Literacy Services Possible

(Period of High Relevancy for Information Literacy)

Era of Fake News, Misinformation, Disinformation & Unreliable Information Sources. These are widespread.

Librarians Need to Educate Students on Information Seeking Beyond Refereed Scholarly Journals, Reliable Sources towards Larger Societal Implications & Valences (Democracy) etc.



The ACRL Framework for Information Literacy and the Six Major Frames.

Information Literacy
Digital Literacy
AI Literacy

