

Building AI Literacy Infrastructures

UCR Libraries Multi-Unit AI Integration Model (2024-2026)



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University of California System Conference

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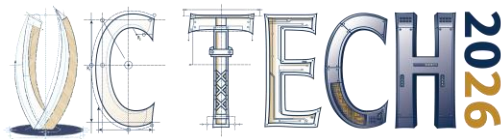


Agenda



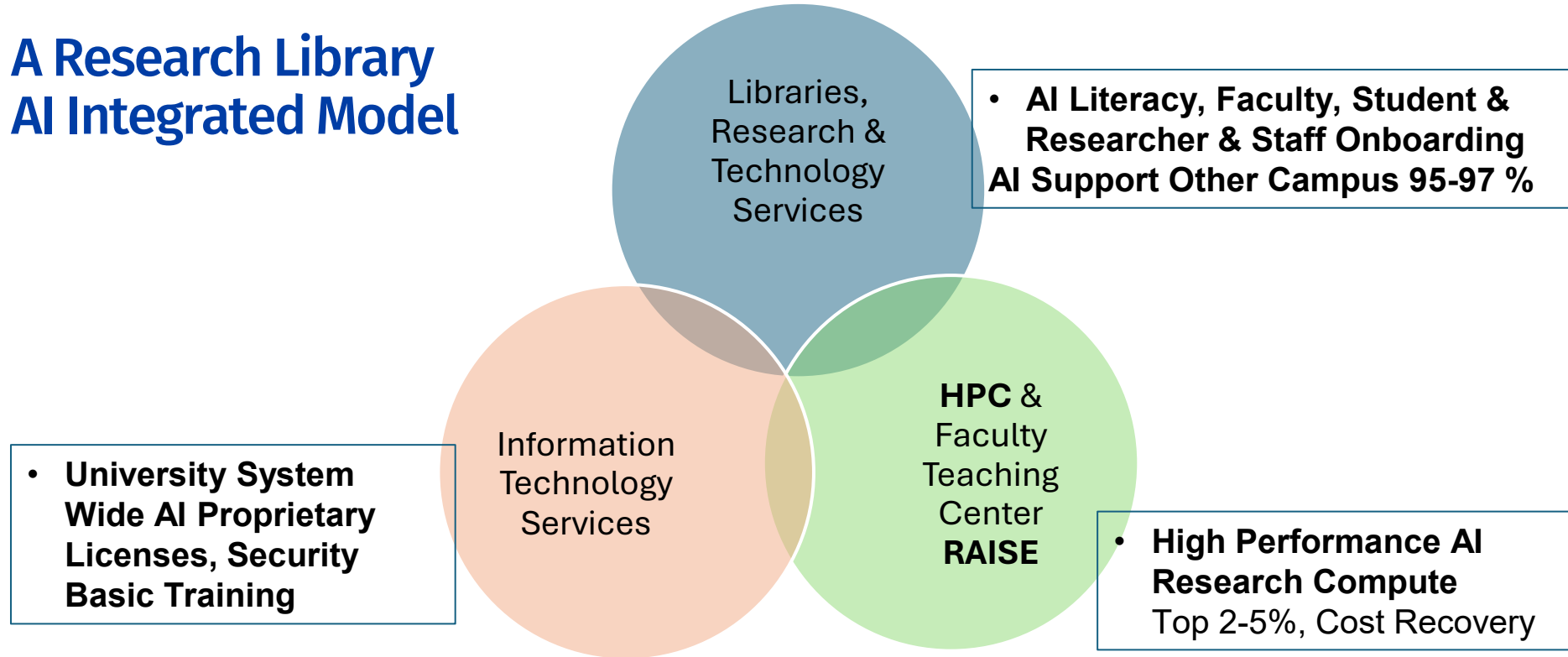
Building AI Literacy Infrastructures: A Multi Unit Integration Model

- **Big Picture Introduction to AI Literacy Support at UCR**
How is AI divided , Focus UCR Libraries Division of Research and Technology Services
- **Rationale and Strategy Towards AI Literacy:**
Onboarding, Cooperation, Collaboration, Research Services Emerging Technology, From Digital and Data Literacy to AI & Learning: Staircase Model: Vygotsky Zone of Proximal Development
- **Personnel and Case Study Examples**
Data Research Scientist, AI Research Librarian
- **What is the Zero to Hero Pipeline?**
Interdisciplinarity, Emerging Technologies, Focus on Learning Format Examples Workshops, Digital Certificates, Consults, Meetups and Events
- **Project Next Steps (2027): Local Open Source Lab**
Rational, Hardware, Staffing, Proprietary and Open Source AI Primary goals
- **Comments and Questions**



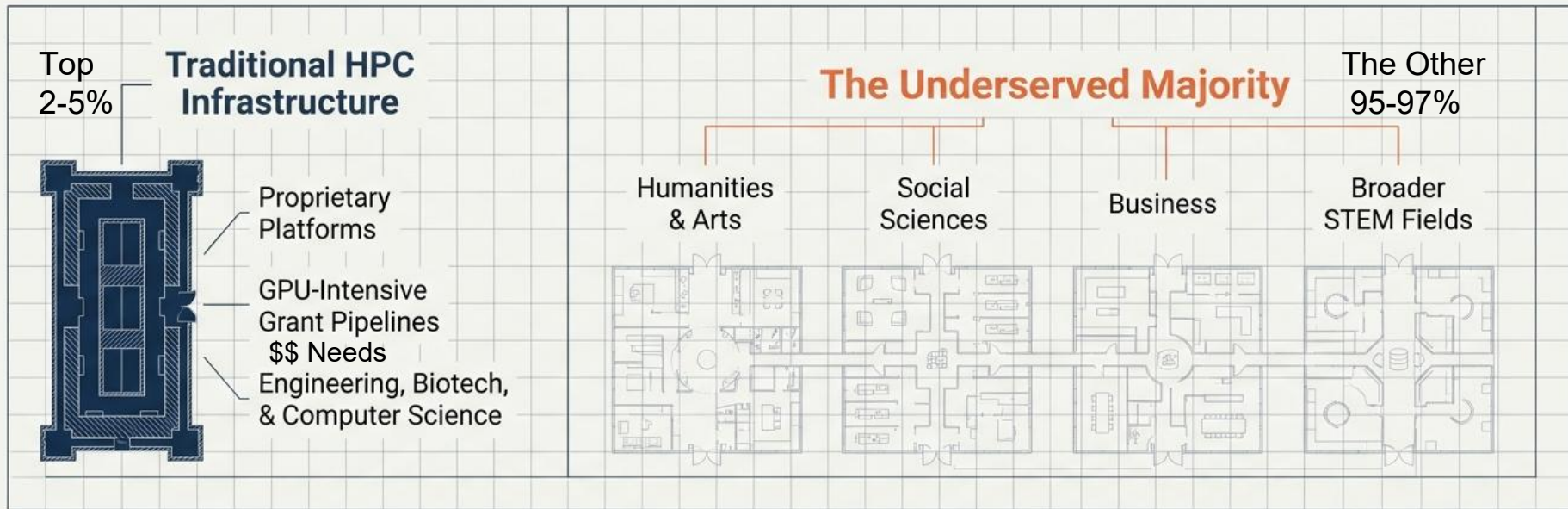
AI Literacy Infrastructure Support at UC Riverside

A Research Library AI Integrated Model



The Chasm in Academic Computing

The Widening AI & Digital
Divides



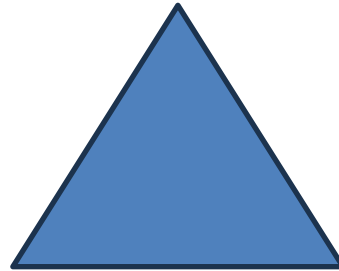
STRATEGIC IMPERATIVE

For **mid-sized universities** and liberal arts colleges, the question is not whether to engage AI, **but how to do so without the massive budgets, GPU clusters, or grant infrastructure** that proprietary models presuppose.

UCR Library Research and Technology Services

AI Literacy Serving The Other 95% of University

Students, Graduate Students and Ph.D. Researchers



AI Literacy	(2020's)
Data Literacy	(2010's)
Digital Literacy	(2000's)
Information Literacy	(1990's)



UCR Libraries Division of Research and Technology Services

Orbach Science Library

Research Services

(*Unique Emerging Technologies, Technologists & Labs including Robotics, Makerspace, Innovative Media, STAR Lab (Scholarly Technology and Upcoming AI Lab)

Cyberinfrastructure

(Core Libraries IT Infrastructure: Programming, Software/Database Support, IT Project Management, Desktop Support)

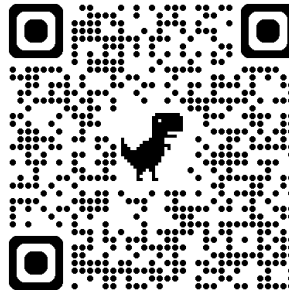
Research Services Staffing

AI/Data Research Scientist (+1)

AI Research Librarian (+1)

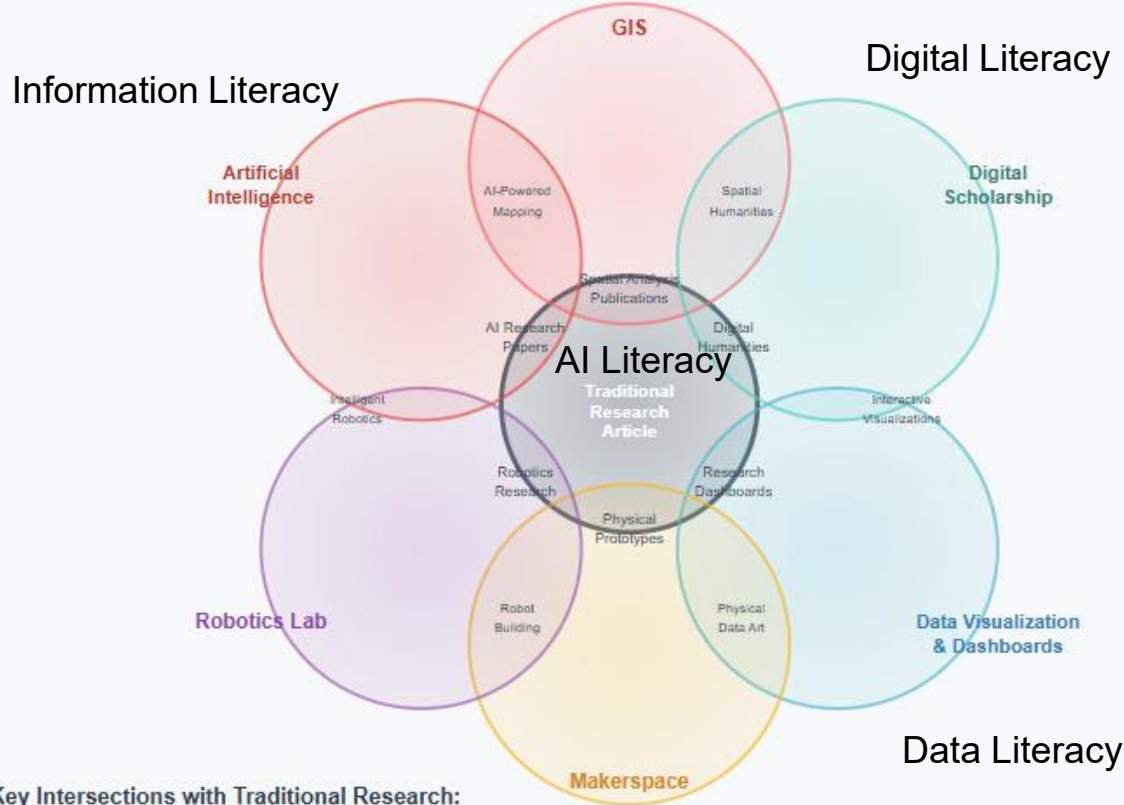
Maker Space/Robotics Lab Services Coordinator
Innovative Media Librarian
Digital Scholarship Librarian
Geospatial Information Systems Librarian

Medical & Clinical Outreach Librarian



Research Approaches Centered on Traditional Research Articles

& Enabling Research with Emerging Technology Possibilities



UCR Library Research & Technology Services

Several Units
Several Technologies

Centered on Traditional
Research Article,
Monograph

(Increasingly Focused
on System wide AI Literacy

Key Intersections with Traditional Research:

- **GIS:** Geographic and spatial analysis papers, cartographic studies
- **Digital Scholarship:** Computational humanities, digital archives research
- **Data Visualization:** Research dashboards, academic infographics

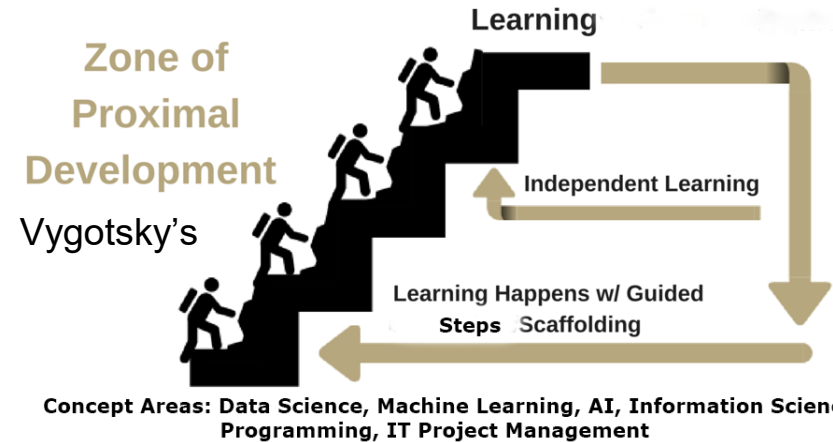
- **Makerspace:** Research prototypes, experimental apparatus
- **Robotics Lab:** Robotics research publications, technical papers
- **Artificial Intelligence:** AI/ML research papers, algorithmic studies

Steps and Scaffolding Towards Building Library AI Literacy and Learning Infrastructures

Digital Literacy, Data Literacy AI Literacy



Learning is Too Hard: Anxiety



Learning is Too Easy: Boredom

Staffing the AI Ecosystem

AI Research Librarian

Focuses on AI literacy events programming, interdisciplinary workshops, and qualitative integrations.

Data Research Scientist

Focuses on Python, R, complex data modeling, and machine learning architectures.

Workshops

Building practical skills (e.g., Intro to Python, Open Data Publishing).

Consultations

1-on-1 support for specific research data questions.

Collaborations

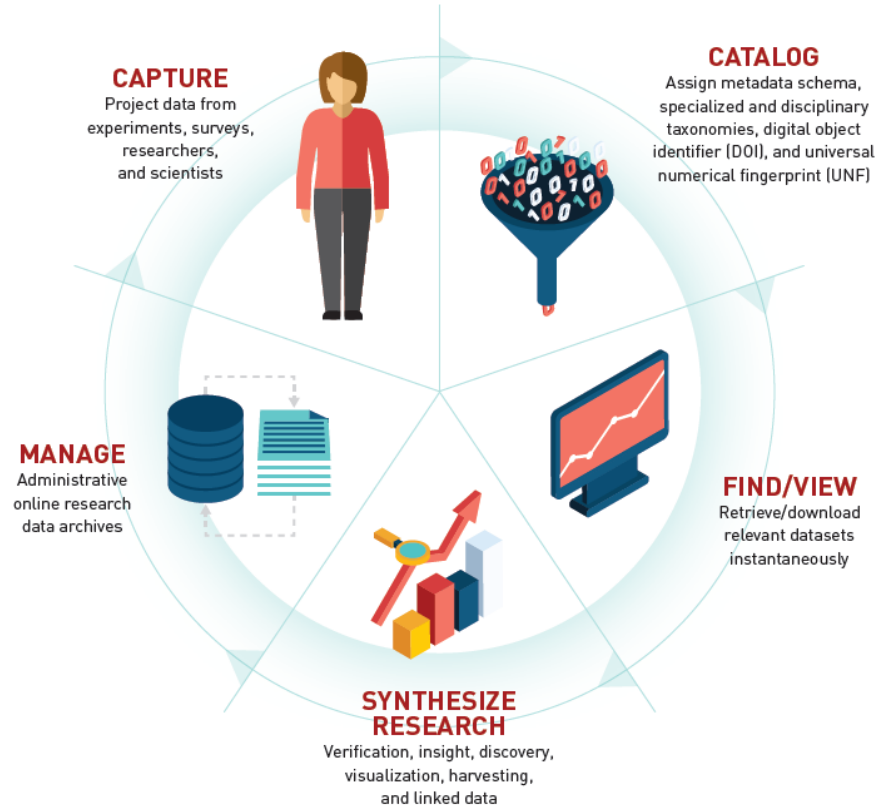
Long-term partnerships with faculty research groups.

Currently 2 Staff, Planned Expansion **(4)** or **(6)**, Possibility of Future Additions of Dept. Teaching and Learning

Research Data Research Scientist Supports

The Data Research Lifecycle

Support Toward Data Sharing, Visualization, Analytics, Insight
Onboarding Ramp towards AI (Workshops, Consults, Meetups Events)



DRYAD

Research Data Repository



The Research Data Lifecycle Scaffolding towards AI



Data Planning and Management

- Develop Data Mgmt. Plans (DMPs)
- Organize files and folders effectively



Analysis and Visualization

- Clean and preprocess data
- Apply machine learning methods
- Create clear visualizations



Data Sharing & Repositories

- Deposit research data into Dryad
- Ensure data is findable and reusable
- Meet journal and funder requirements



AI Literacy: The “Zero to Hero” Pipeline

Entry & Exposure

Raspberry Pi Jams,
AI/GIS Meetups,
Streaming Parties.

Goal: Low-barrier
entry for all.



Skill Building



Digital Scholarship
Certificate, Intro
to Python for Data
Analysis.

Goal: Formalized
literacy and Vibe
Coding.

Deep Research Execution

Running local
LLMs, fine-tuning
PyTorch models,
interdisciplinary
synthesis.

Outcome: STAR
Lab utilization.



March 2025 UCR Orbach Science Library AI Literacy Series.

https://www.researchgate.net/publication/389558789_Harnessing_AI_For_Research_2025_GenAI_Large_Language_Model_Introduction_AGI_and_Reasoning_Models_Multimodal_Models_and_Deep_Research_with_Autonomous_Agents

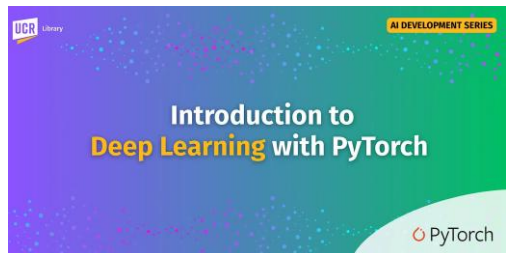
May 2025 Orbach Science Library AI Literacy Series.

https://www.researchgate.net/publication/391739383_Deep_Research_AI_Tools_For_Research_and_Discovery

November 12, 2025. UCR AI Literacy Series

https://www.researchgate.net/publication/397584324_Vibe_Coding_For_AI-Driven_Development_An_Introduction_for_Research_and_Learning

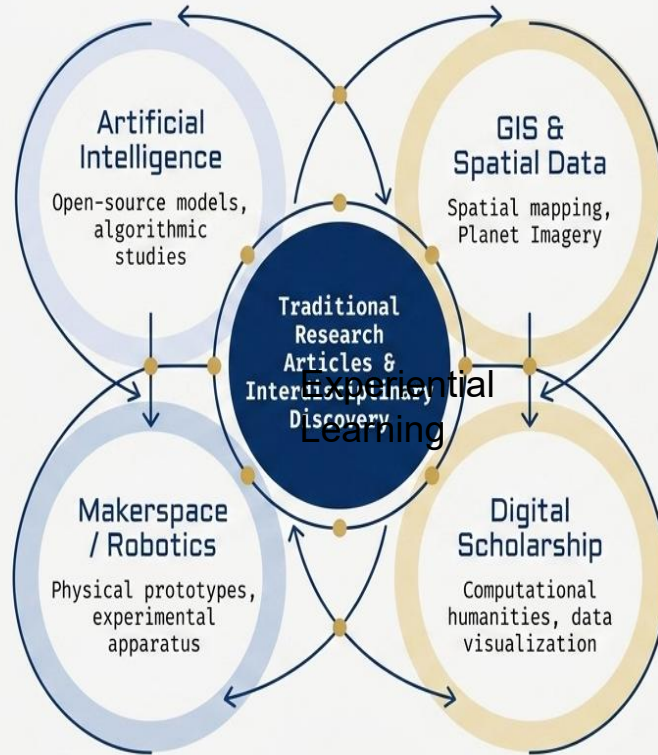
March 2026, UCSF Generative AI Office Hours Colloquia Workshop Demos



Interdisciplinarity
& Skill Building
AI Literacy
Digital Literacy

Faculty and
Student
Introductory
Workshops

The Library as the Interdisciplinary Hub



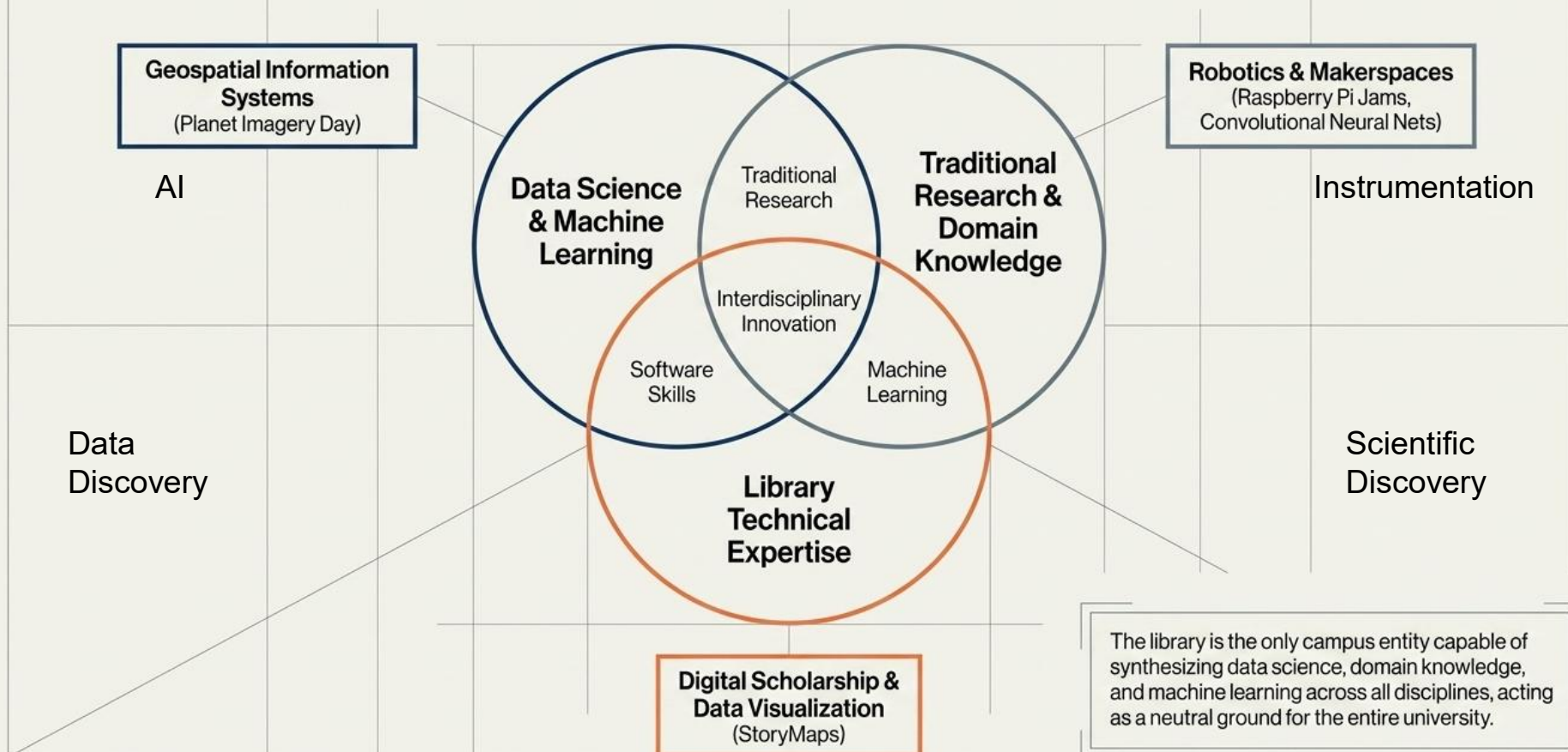
NotebookLM

- [Creat'R Lab Makerspace](#) (Room 140)
- [Robotics Lab](#) (Room 146)
- [3D XP Lab](#) (Room 145) – virtual reality
- Workshops:
 - [Maker Week](#) (every April) with hands-on entrepreneurial prototyping workshops
 - [Robotics Camp](#) (every summer)
 - **Free for any interested UCR students**
 - For beginners and for all disciplines (20 slots)
 - Hardware skills (CAD modeling) to create an object
 - Software skills (Python and C++ coding)
 - AI + Robotics Incorporating AI into the robot

[UC Loves Data Week](#)



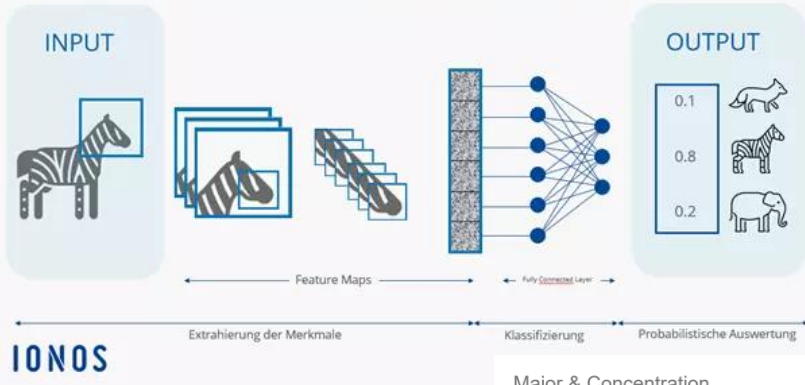
Library as The Interdisciplinary Nexus



AI Enhanced Robotics Summer Camp

LAB Workshops: From Zero to Hero

CONVOLUTIONAL NEURAL NETWORK (CNN)



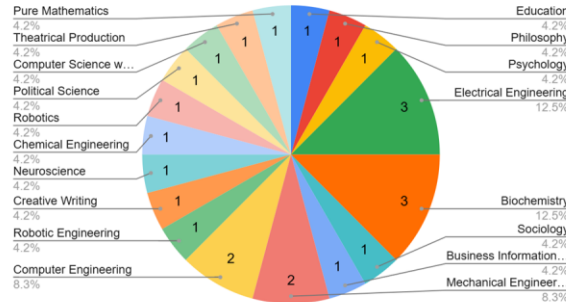
• An AI training method, which teaches the model to recognize items based on an image

• Convolutional Neural Nets Integrated with Robotics

• Students were taught how to train the model and how to use the model in a real application



Major & Concentration

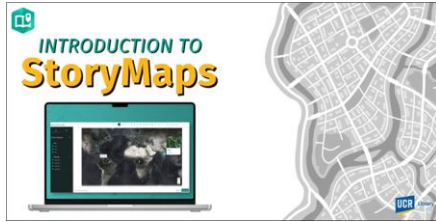


75% Female Attendees



Geospatial Information Services

AI + GIS + Drones Planet Imagery + ESRI Day



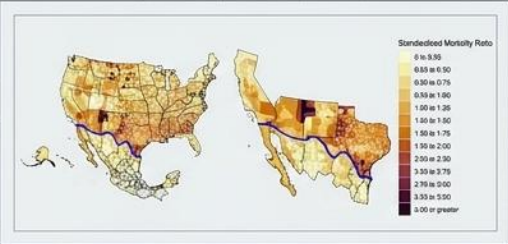
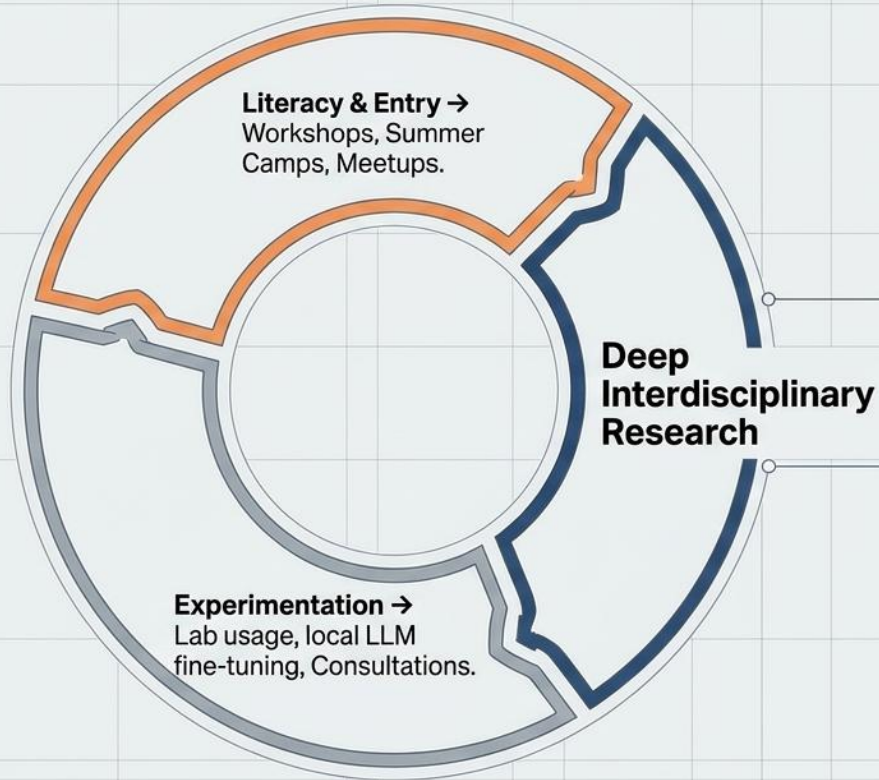
Dr. Nan Li, UCR Environmental Sciences

Dr. Nicolas dos Santos, UCR Computer Science

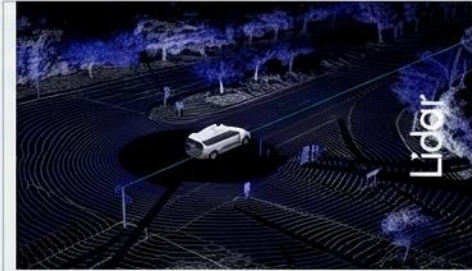
Planet Imagery Day is supported by USDA-NIFA's Artificial Intelligence for Sustainable Agriculture project

In a collaboration with the Artificial Intelligence for Sustainable Agriculture (AI4SA) project, the library hosted Planet Imagery Day on May 2, 2025. The event featured presentations regarding using Planet imagery in Google Earth Engine and in ArcGIS products, given by staff from Planet and Esri respectively.

Ecosystem Flywheel Creation



COVID Border GIS Project: Utilizing AI/GIS for cognitive cartographies of mortality data.

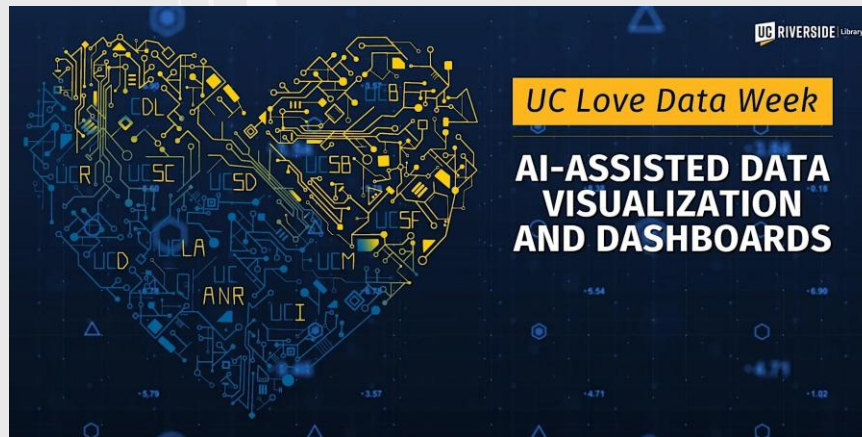


Self-Driving Vehicle LIDAR: AI metadata labeling and 3D data visualization for computer engineering.

Workshops
On UCR, State
And National
Levels
6 Research
Units
Participated
in UC Loves
Data Week

AI Assisted Data Visualization

From Curiosity to Dashboard in Hours, Not Weeks



Digital Scholarship Certificates For Workforce Readiness Literacy in the 21st Century Information, Digital, Data and AI Literacy Integration

Digital Scholarship Certificate

AWARDED BY  **RIVERSIDE** Library

EXPAND YOUR RESEARCH SKILLS IN DIGITAL METHODS AND TOOLS

How to Earn Your Certificate:

Undergraduate students

- Complete at least 3 workshops

Graduate students, faculty, and early-career researchers

- Complete at least 5 workshops

Workshops may be chosen from either the **Graduate** or **Undergraduate track**, and can be completed in person or on Zoom.

Enroll in our Canvas course to complete guided assignments and track your progress toward certification

Design and complete a capstone project that demonstrates your applied digital scholarship skills

Workshops Offered:

- **Orientation:** Digital Scholarship Workshop Series (Sept 11)
- **Grad:** Building a Digital Research Portfolio Using No/Low Code Tools (Sept 18)
- **Grad:** Digital Scholarship Project Types and Best Practices (Nov 20)
- **Grad:** Computational Methods on Text Analysis (Jan 22)
- **Grad:** Qualitative Data Analysis & Tools (Feb 12)
- **Grad:** Introduction to XR Design and 3D Experiences (Mar 5)
- **Grad:** Building Your Academic Profile Online (Apr 23)
- **Grad:** Navigating Open Access Repositories & Publishing with eScholarship (Apr 30)
- **Undergrad:** Building a Digital Research Portfolio Using No/Low Code Tools (Oct 9)
- **Undergrad:** Digital Scholarship Project Types and Best Practices (Nov 13)
- **Undergrad:** Building 2D Online Exhibits: Omeka and More (Feb 5)
- **Undergrad:** Introduction to XR Design and 3D Experiences (Feb 26)



Ready to get started? Contact Jing Han (jingh@ucr.edu) or **scan the QR code** to self-enroll on Canvas or visit elearn.ucr.edu/enroll/3XMY8L.



AI Research Orientation to Technology Workshops and Faculty, Student AI Related Research

Meetups, Thematic Weeks, Presentations



Geospatial/GIS Meetups

Thu, Oct 17, 2024 12pm to 12:50pm

📍 Rivera Library (or over Zoom),
Room 140

💻 Stream Available

Free

SATURDAY, NOVEMBER 23



Raspberry Pi Jam: Intro to Raspberry Pi and...

Sat, Nov 23, 2024 2pm to 3pm

📍 Orbach Library, Room 122

FREE

TUESDAY, FEBRUARY 11



UC Love Data Week

Tue, Feb 11, 2025

💻 Virtual Event

Free

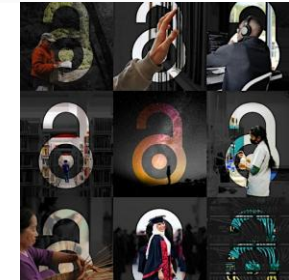
Data, AI,
Open Access
Global North and
South Presentation

Streaming Party
For Faculty
Students and Staff



AI Research
Faculty
Presentations

AI/Robotics
Training Kits
Workshops

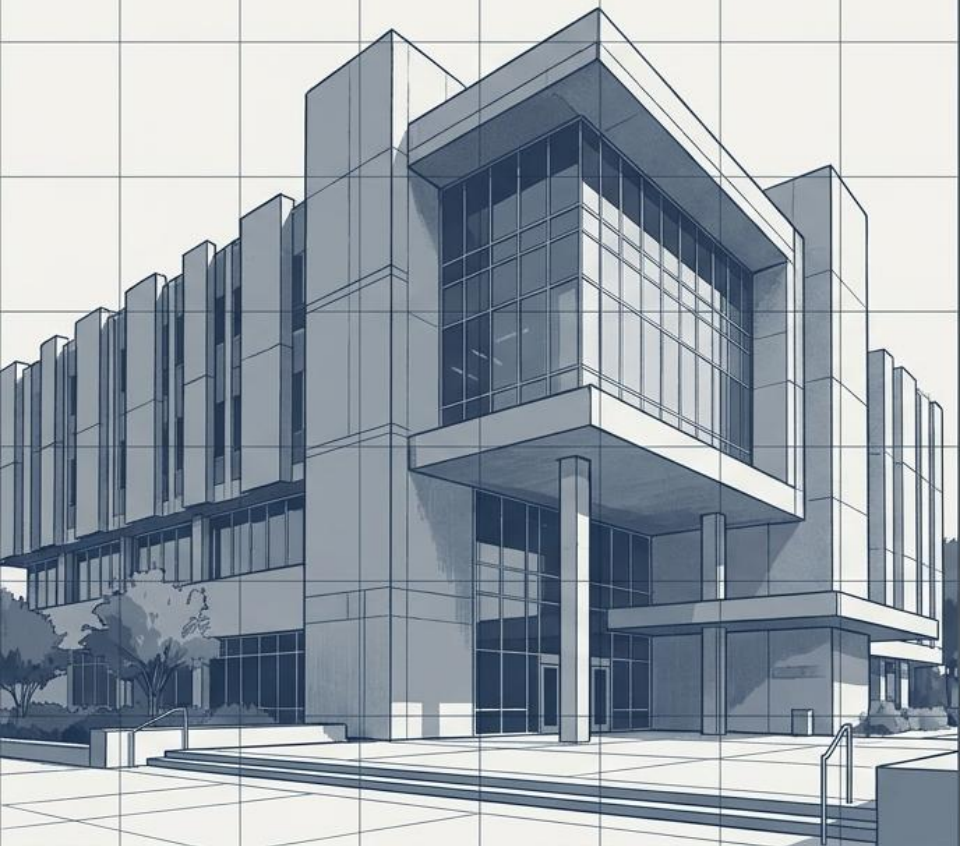


International
Open Access Week

Distant Viewing:
Open-Source AI
Toolkit for
Analyzing Visual
and Multimodal
Collections

UC RIVERSIDE 2027

Local Open Source AI Lab



The Library as the Great Equalizer

The Orbach Science Library STAR Lab transformation provides a blueprint for a vendor-neutral, accessible AI environment.

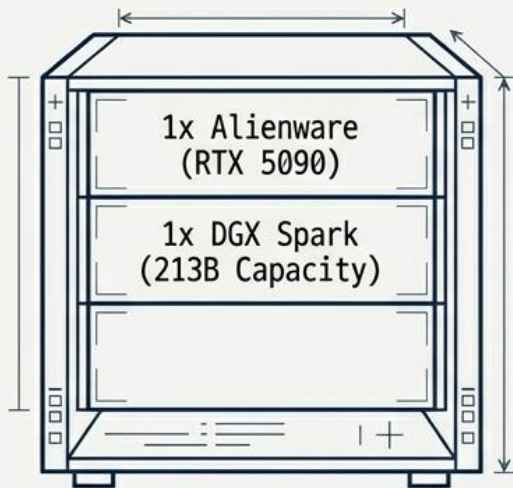
- 1. Locally Hosted:** Eliminates recurring subscription and API costs.
- 2. Open-Weights Models:** Access to frontier non-proprietary models.
- 3. Universal Access:** Designed for the entire university research community, regardless of grant funding.

Hardware Tiers for Any Institutional Budget

Option 1: Baseline Lab

The Starter Kit

~\$27,000 | 2 Workstations

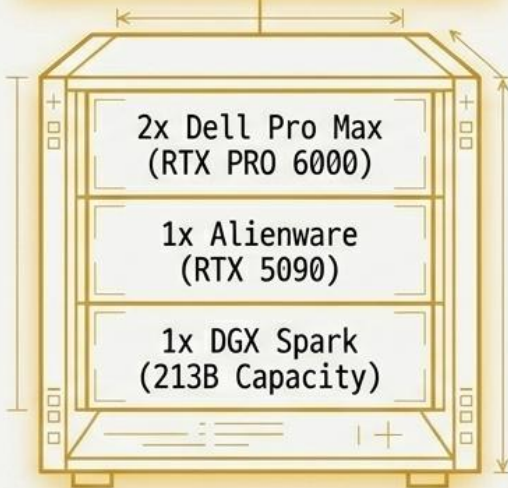


Best For: Departmental pilots

Option 2: Targeted Expansion

The Sweet Spot

~\$72,800 | 4 Workstations

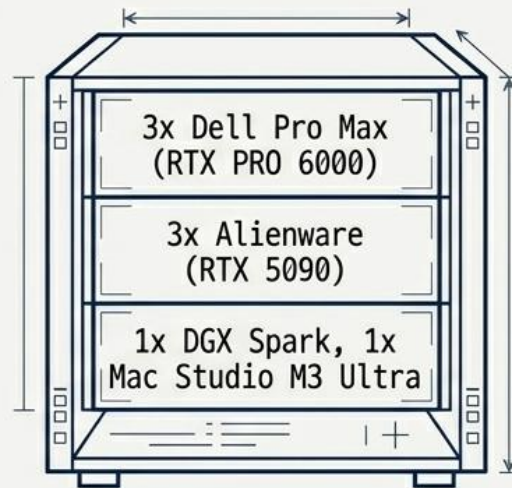


Best For: Mid-sized campus hubs

Option 3: Comprehensive

The Full Vision

~\$124,800 | 8 Workstations



Best For: Full-scale research centers

If a Bigger Lab Needed, Scale: (Option #3 x 2) = Double or Triple Size
Speed and/or Processing Power (Larger AI Models) Balance

[Full Lab Project Specs](#)

Staffing & Service Architecture



AI Lab Subcommittee

The Model Ecosystem

Proprietary & Open-Weight



Proprietary / Cloud Models

High recurring API costs, opaque usage.

Reasoning: GPT 5.5 / Opus 4.8 / Mythos

Multimodal: Gemini Deep Research, GPT 5.5, Gemini 4, Grok 3

Government Retraction / AI Corporate

Hobbling: Anthropic Fable 5, Mythos

Data Privacy/Campus IP: Data and IP are off campus, model usage/data could be retracted by various entities



Local Lab Open-Source Roster

Zero recurring fees, complete local control.

Deep Reasoning: DeepSeek R3

Multimodal: Kimi K2, Llama 4

Real-World Utility: Qwen3 Family & Gemma

Lightweight Versatility: LiquidSky, Neomotron

Data Privacy/Campus IP: Data and IP remain on Campus

&

Infrastructure in Action: Interdisciplinary Deep Research

Hardware:
Dell RTX
Workstation

Software:
Local DeepSeek R3
for Software et al.

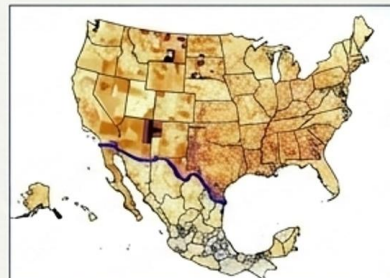
Support:
Data Scientist
Consult

Researcher:
Engineering,
Social Sciences,
and Medicine

Tangible Research Outcomes

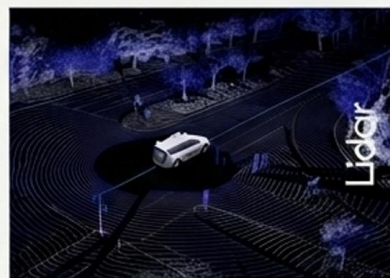
A. COVID Border GIS/AI Project

Mapping mortality
using statistical
qualitative data
and AI insights.



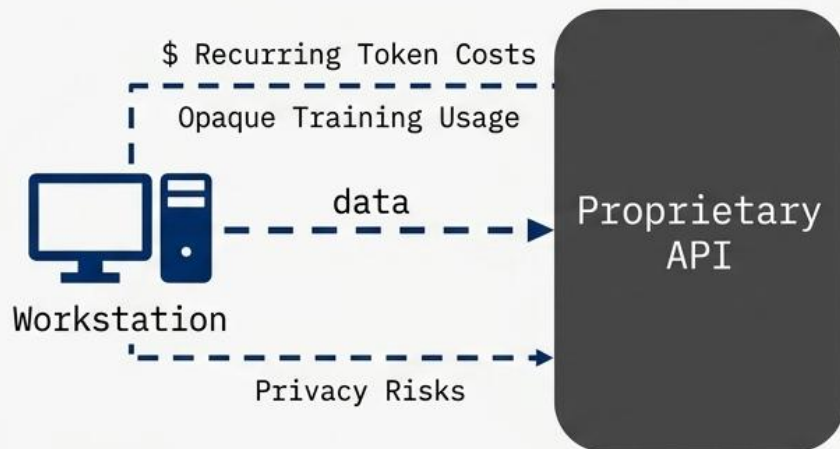
B. Autonomous Vehicle LIDAR

3D data storage
and visualization
of metadata for
computer
engineering.

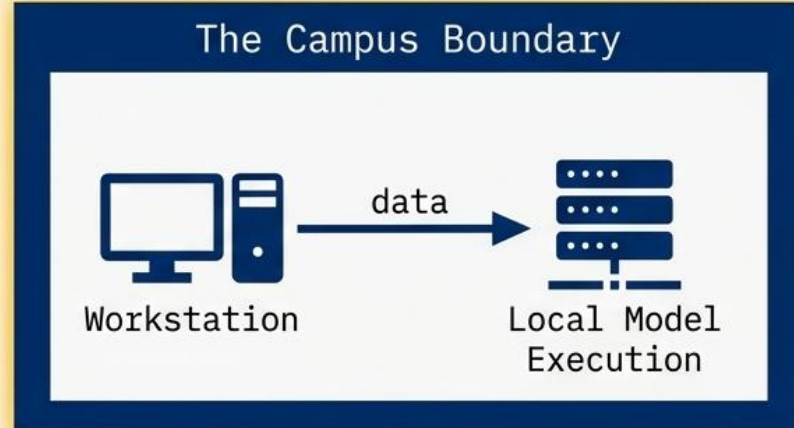


Data Privacy & The Campus Boundary

The Proprietary Cloud Risk



The Local STAR Lab Model

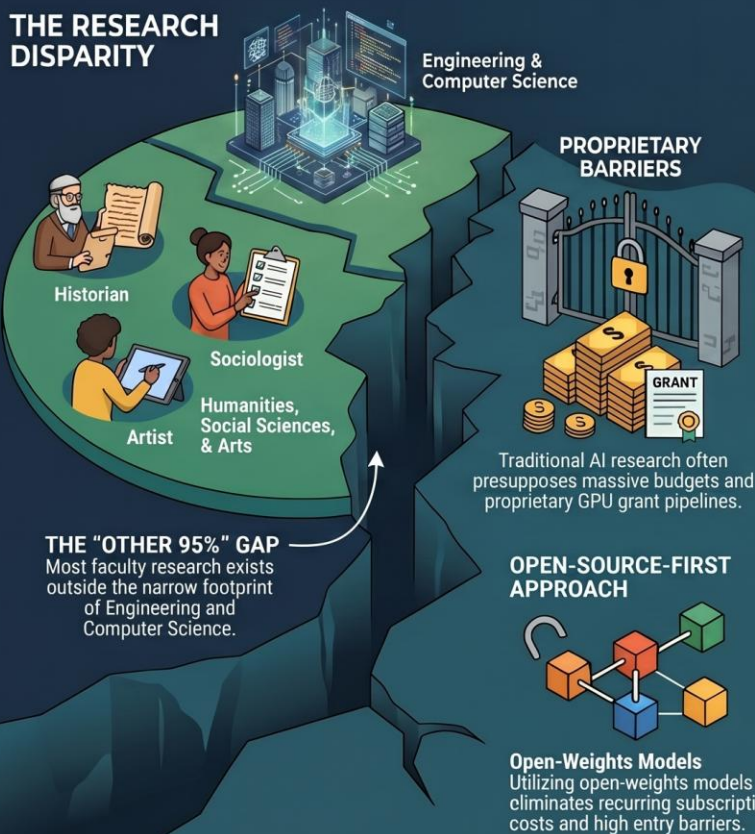


- Zero recurring costs
- Sessions wiped clean
- IP remains on campus
- Safe for qualitative data

AI for the Other 95%: A New Library-Led Research Model & Facilitated

How academic libraries provide high-level AI research computing capacity to underserved disciplines through open-source infrastructure, bridging the gap between basic tools and elite clusters.

THE RESEARCH DISPARITY



THE PORTABLE BLUEPRINT



**AI RESEARCH LIBRARIAN
DATA RESEARCH SCIENTIST**
Human-Centered Support:
Success relies on these dedicated professionals.



LOCAL EXECUTION & PRIVACY

MULTI-DISCIPLINARY IMPACT



Dell Pro Max Tower

Memory Parameters

96GB GDDR7

Illustrative Capacity (Parameters)

LLM Capacity (Parameters)

~160 BILLION

NVIDIA DGX Spark

128GB Unified

~213 BILLION

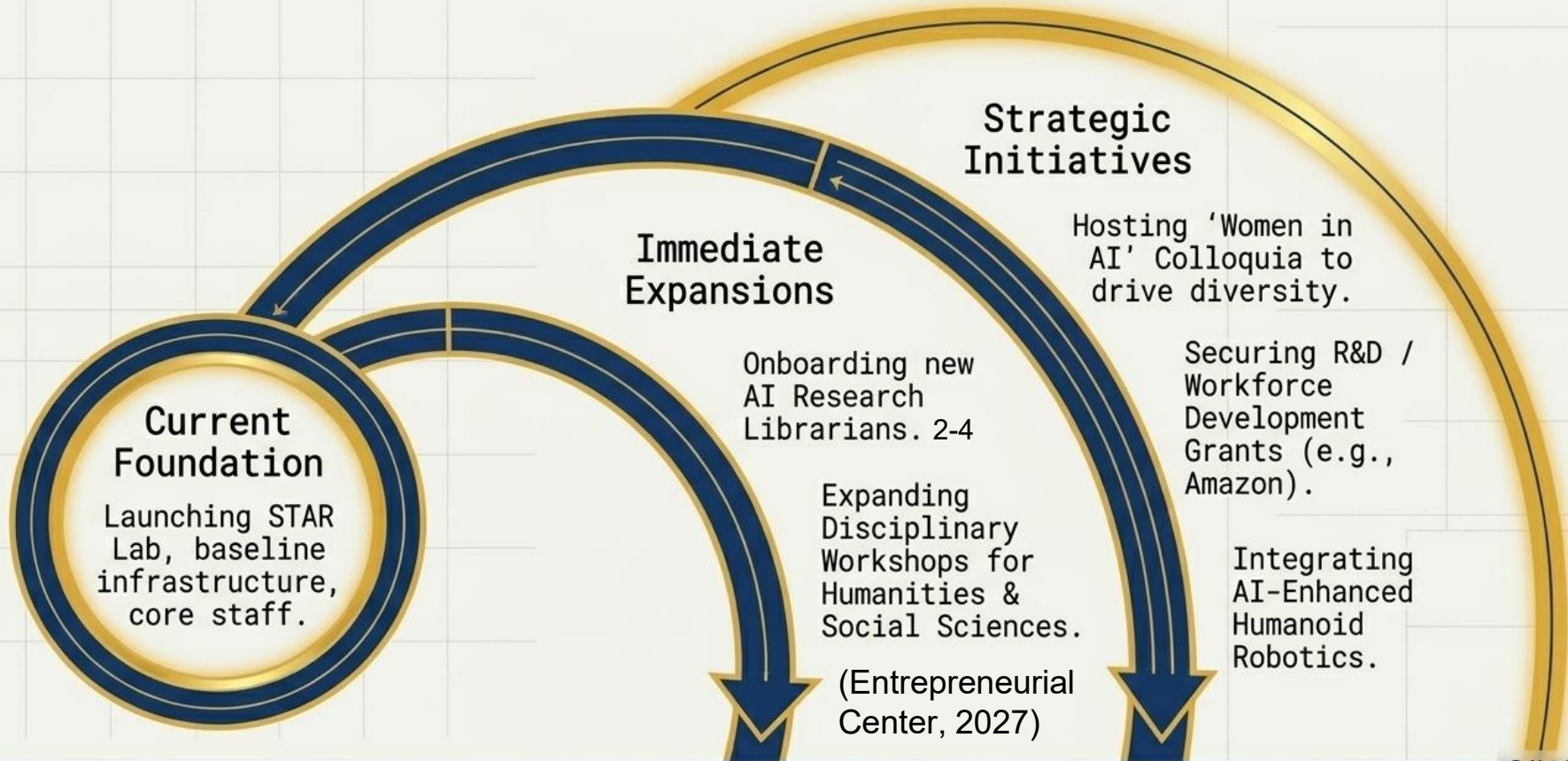
Apple Mac Studio M3

256GB Unified

~426 BILLION

LAB WORKSTATION CAPACITY FOR HOSTING LARGE LANGUAGE MODELS (LLMs)

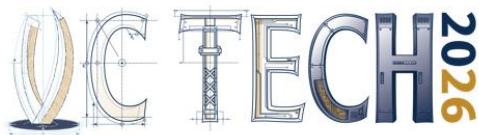
Future Expansion & Scaling (2026-2027)



Thank you for Attending!

Comments and Questions

Thank you to our Platinum & Gold Sponsors



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<https://rayuzwyshyn.net>



AI Literacy Related Library and Research Computing AI/Data Resources

Uzwyshyn, R. [Deep Research Open-Source AI for the Other 95%: A Pragmatic Methodology for Academic Library AI Literacy Infrastructures](#). *RCSI 2026: Research Computing for Small Institutions Conference*. Swarthmore College. National Science Foundation Sponsored. June 16-17, 2026.

UCR Library Research and Technology Services. [Star Lab AI Lab Transformation Planning Document](#) (Tech Specs.). June 2026.

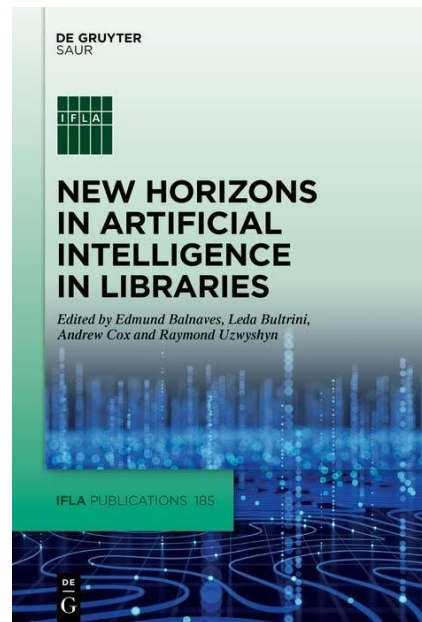
[Building Library AI Infrastructures: Research Data Repositories, Scholarly Ecosystems and AI Scaffolding](#) (Draft). *New Horizons in AI for Libraries*. De Gruyter: Berlin, January 2025.

[Uzwyshyn, R. Reimagining Education In the Age of AI: From Information Scarcity to Abundant Intelligence](#). (CXO Print Edition). Education Technology Insight. 2025.

Uzwyshyn, R et al. New Horizons in AI for Libraries (Editor). ([Open Access Version](#)). Intro: [Projects in Machine Learning and Natural Language Processing in Libraries](#) ([Proof](#)). IFLA. Walter De Gruyter (GmbH): Berlin January 2025.

Uzwyshyn, R. [From Open Science and Datasets to AI and Discovery](#). *Trends and Issues in Library Technology*: IFLA IT Section. January 2023.

[Uzwyshyn, R. Online Research Data Repositories: The What, When, Why and How](#). *Computers in Libraries*. 36:3, April, 2016. pp. 18-21.

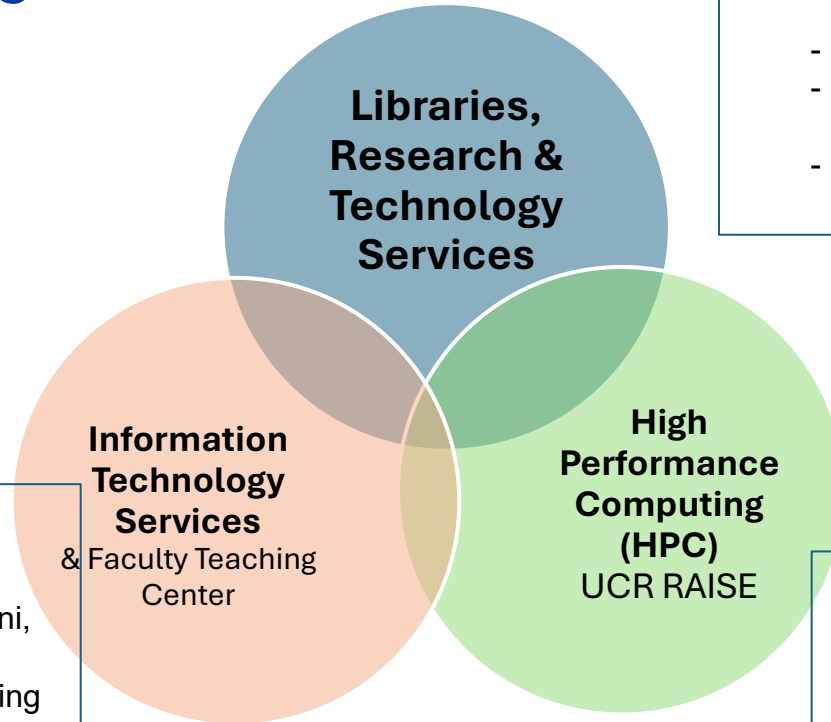


Presentations, Publications

<https://rayuzwyshyn.net>

<https://www.linkedin.com/in/rayuzwyshyn/>

Larger AI Infrastructure Support University of California, Riverside Three Main Areas



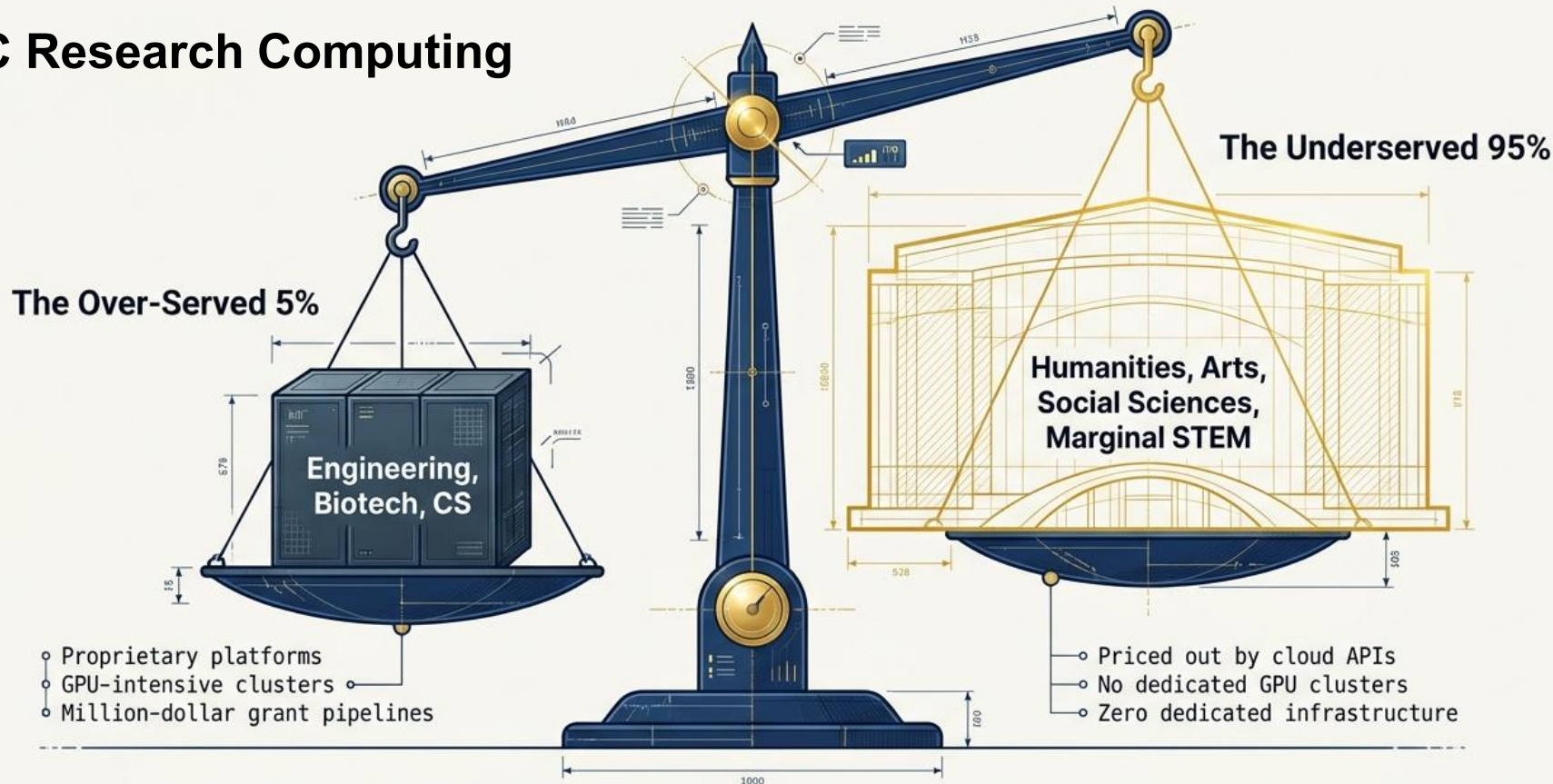
- **University System Wide AI Proprietary Licenses** (Google Gemini, Limited OpenAI, Anthropic, Vertex) Broad general training
- AI/Security

• AI Literacy, Faculty, Student & Researcher Onboarding AI Support

- [Use of AI tools in research](#) and teaching e.g., research design, data collection analysis
- [Research Data management](#)
- AI Model onboarding, Training for regular size datasets, AI Applications
- Dedicated Staff Support and Integration

- **High Performance Computing** GPU Clusters), Research Compute (Top 2-5%, Major Grant Support Costs Recovery Involved) Instructor Development,

HPC Research Computing



The question for smaller institutions is not whether to engage AI, but how to do so without the budgets or grant infrastructure that proprietary models presuppose.

Library Workshops for AI Literacy (FY25/26 Samples)

- Introduction to Machine Learning
- Introduction to Gemini API: How to customize AI models
- Exploring AI Literature Mapping Tools (Natural Language Processing)
- Finding and Using Imagery in a GIS, Arc GIS and AI, Drones & GIS
- Data Cleaning for Machine Learning with Python
- AI Computational Methods with Text Analysis
- AI Deep Research Models/AI Video
- Introduction to Deep Learning with PyTorch
- Open scholarship / open access publishing

Contact:

Raymond Uzwysyn, *Director of Research Services/Acting Assistant University Librarian for Research and Technology, UCR Library*

The question is no longer who gets to use AI, but what our institutions will discover when everyone can.

Early 2027 (Curriculum Expansion)

Integration of disciplinary AI workshops spanning Humanities, Social Sciences, and STEM.

Late 2027+ (Institutional Impact)

Serving the Other 95% at scale, driving workforce development, and establishing a national ARL prototype.

Fall 2026 (Soft Launch)

Activation of Orbach Rm 148, baseline open-source model deployment, initial grad student pilot testing.

Mid 2027 (Ecosystem Growth)

Launch of the Women in AI Colloquia and expansion into AI-enhanced humanoid robotics.

Digital Scholarship & Scholarly Communication

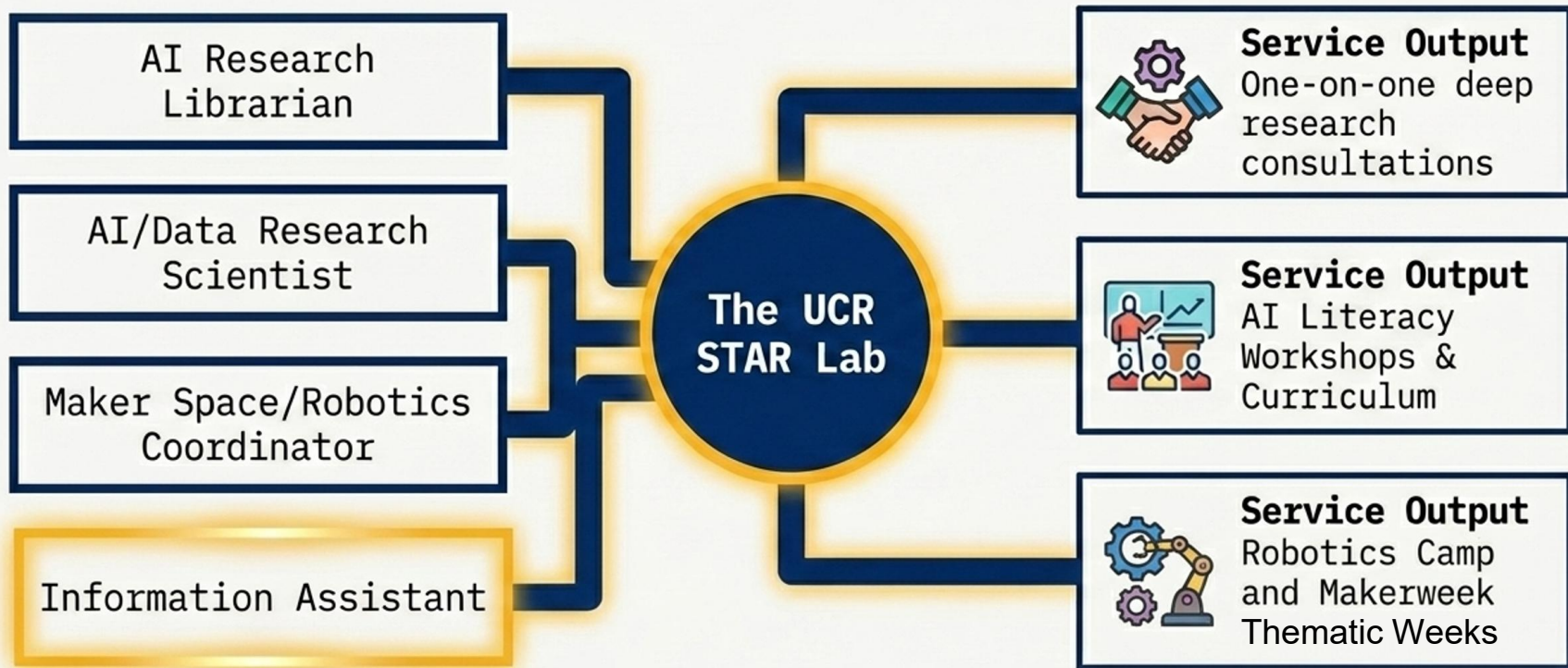
- AI Computational & Qualitative Text Analysis
- Data Analysis & Visualization
- Web Scraping & Digital Archiving
- Open Access publishing support

Learn more about the UCR Library [digital scholarship](#) & [scholarly communication](#) services

The Paradigm Shift in Academic Computing

Dimensions	<u>Traditional HPC Model</u>	<u>Library-Led AI Model</u>
Target User	Top 5% Grantees	The Other 95% Campus-wide ✓
Funding Model	Grant-dependent (Cost recovery)	Institutional / Library core budget ✓
Technology	Proprietary / Cloud APIs	Open-Source / Local Execution ✓
Disciplines	CS & Hard Sciences	Humanities, Arts, Social Sciences, Business ✓
Support Architecture	IT-driven provisioning	Librarian & Data Scientist literacy ✓

Staffing & Service Architecture



The Value Proposition for Smaller Institutions

Affordable Scale

Dropping recurring software fees and API tokens to zero via local open-weights.

True Inclusion

Bridging the gap for the 95% of researchers outside traditional HPC fields.

Transferable Blueprint

A proven hardware, software, and staffing matrix that scales to any budget.

Resources & Contact

AI Literacy
Curriculum



UCR Digital
Scholarship
Canvas



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