

Catalyzing an Ecosystem for Responsible AI Innovation

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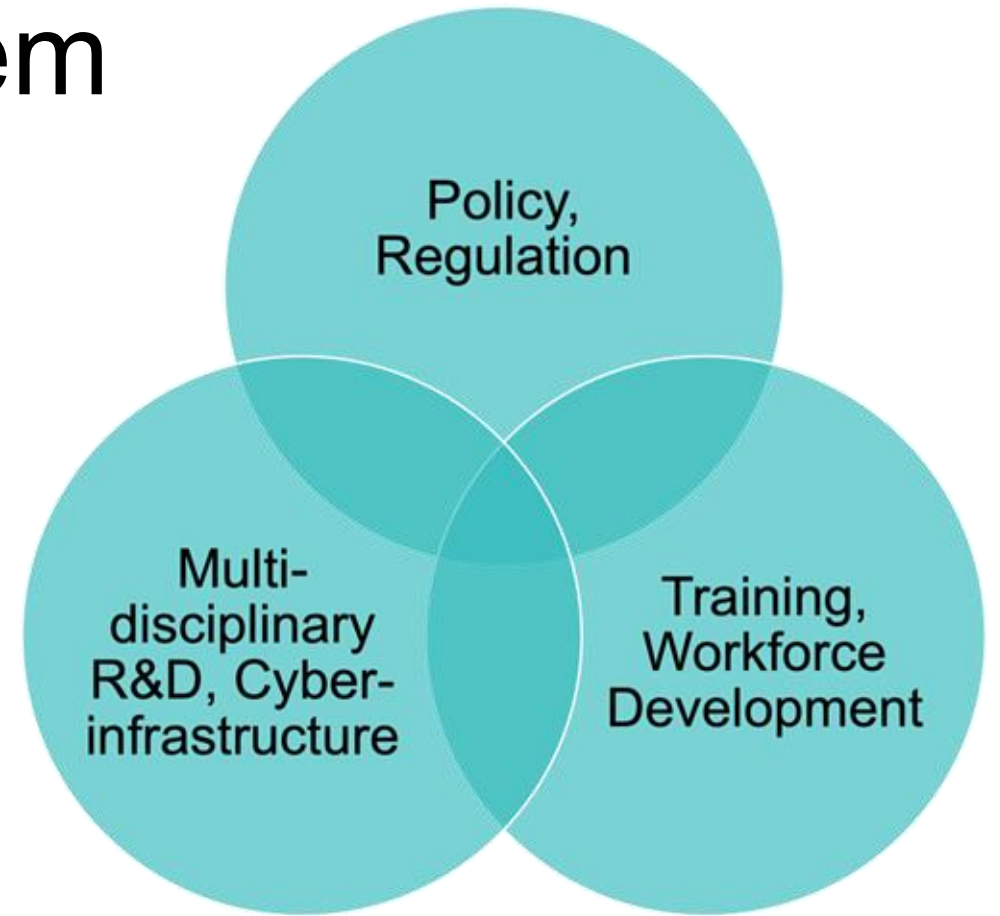
Digital Engineering Conference (DICE)

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Catalyzing a Responsible & Pro-Human AI Innovation Ecosystem

Transcendence of AI

- AI has become an essential engine of innovation, scientific discovery, and economic growth.
- AI has potential negative social, environmental, and economic consequences.
- It is imperative that we a Responsible & Pro-Human AI Innovation Ecosystem.



Parashar, Enabling Responsible Artificial Intelligence Research and Development Through the Democratization of Advanced Cyberinfrastructure, HDSR'24, doi.org/10.1162/99608f92.9469c089

Utah's AI Innovation Ecosystem

Utah is home to a top-ranked and increasingly influential AI ecosystem—built on coordinated governance, proactive regulatory engagement, scientific expertise, and advanced infrastructure. As the state's flagship research institution, the University of Utah anchors this ecosystem.



RESEARCH WITH REAL-WORLD IMPACT

Strategic support for translational research:

- Visionary efforts, e.g., **One-U Responsible AI Initiative**
- Interdisciplinary institutes (UU, USU, UVU, ...)
- Transdisciplinary collaborations

Broad AI research portfolio:

- Engineering & robotics
- Genomics & gene therapy
- Mental health
- Teaching & learning



NATIONAL-SCALE AI INFRASTRUCTURE

Center for High Performance Computing

- Supports 7,000+ researchers & educators statewide
- Manages the **statewide AI factory**

Foundational Data Assets

- Utah Population Database
- National Data Platform

Security, Compliance, & Responsible Use



PUBLIC-PRIVATE PARTNERSHIPS

State of Utah

- Pro-Human AI Initiative
- Office of AI Policy
- Nucleus Institute/Governors' AI Advisory Council

University of Utah

- National Lab & Security Office
- Technology Licensing Office

Corporations & Philanthropists

- Hewlett Packard Enterprise & NVIDIA
- Huntsman Family Foundation

One-U Responsible AI Initiative



University of Utah's \$100M AI Research Initiative Led by SCI

“As one of the nation’s leading research universities, we have an opportunity and responsibility to use our resources in ways that can impact and serve our community. From being the fourth node of the original internet to performing the world’s first artificial heart transplant, we hope to continue the U’s pioneering legacy by investing to become a national leader in responsible artificial intelligence. This research has the potential to unlock solutions to issues that affect Utah, the nation and the world.”

—Taylor Randall, President, University of Utah

Advance **translational AI to achieve societal good** while protecting privacy, civil rights and civil liberties, and promoting fairness, accountability, transparency, and equity.

Initial research focus on regionally important applications

- Environment
- Healthcare, societal wellness, and public services
- Future of teaching and learning

One-U RAI Foundations



- Ethical development of technology



- Interdisciplinary collaboration to address technical and societal challenges



- Knowledge and skill sharing to effectively navigate the AI world



- Community engagement for societal impact



- Advocating for policy and responsible AI practices

One-U RAI Approach and Outcomes

Catalyzing innovation in transdisciplinary, responsible AI

Advanced Cyberinfrastructure:

Acquire, deploy, and operate advanced AI cyberinfrastructure to leverage state of the art AI technologies and support AI researchers and students across the state.



Research Expertise: Attract and retain the best talent through the support of current and hiring of new faculty, with necessary support structures and infrastructure, in the initial thematic focus areas.

Community Engagement:

Engage diverse stakeholders across industry, government, and academia to foster collaborative discussions on best practices, ethics, and societal impacts.



Services and Support:

Establish the necessary support structures and services as well as the essential models for partnership, especially with research and industry across the state.



One-U RAI Research Activities



ONE-U RAI FACULTY FELLOW

Chenglu Li

Educational Psychology

PROJECT SPOTLIGHT

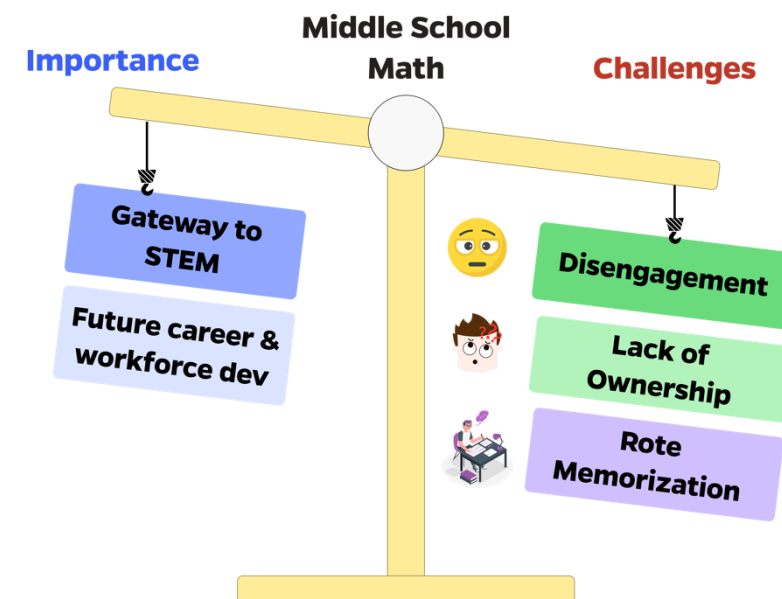
ALTER-Math: AI-augmented Learning by Teaching to Enhance and Renovate Math Learning



GOALS

Learning-by-teaching that transforms students from passive learners to active instructors to encourage learning.

A Large Language Model (LLM)-powered AI system that simulates fictional students with realistic educational needs, then asks real students to tutor them.



ONE-U RAI POSTDOCTORAL FELLOW Pablo Maldonado

PROJECT SPOTLIGHT

Toward Scalable Precision Psychiatry: Pretraining Models on Speech, Expression, and Language

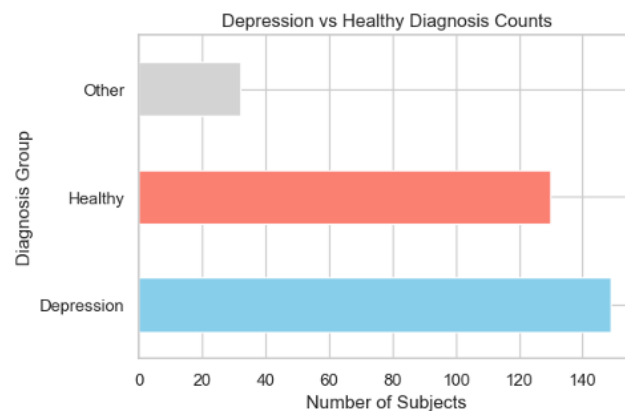


GOALS

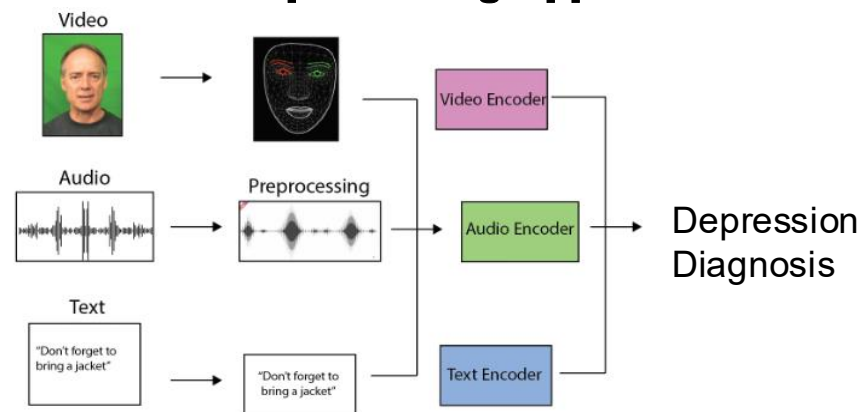
Develop a scalable and accessible tool to predict depression across populations in Utah using facial and vocal information from smartphone-based videos.

- Clinical Interviews**
- Simple**
Patients answer video questions on their own phone anywhere, at any time.
- Scalable**
Removes time costs and access. Provides continuous patient access.
- Cleaner Data**
The highest quality and most valuable data.
- Richer Data**
5 minutes of video captures 100,000X more data than current tools.
- Flexible**
Every use case and assessment.

storyline



Multimodal Deep Learning Approach



ONE-U RAI FACULTY FELLOW

Brian Coddling
Anthropology

PROJECT SPOTLIGHT

Sustaining and Restoring Indigenous Socioenvironmental Systems

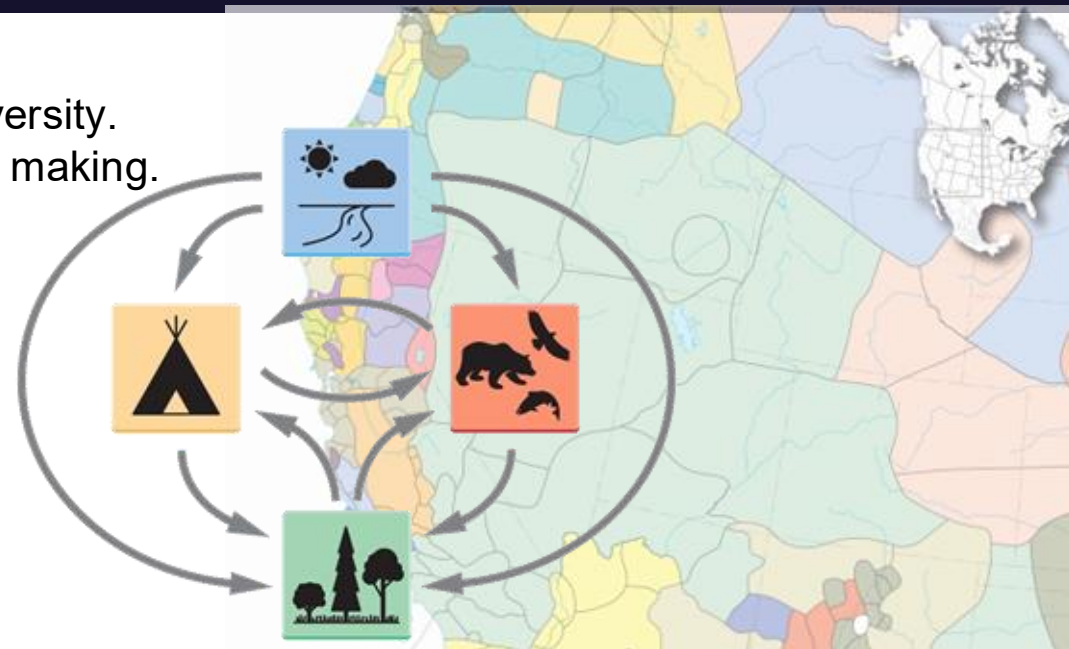


GOALS

- Quantify the impact of invasive species removal on hydrology and biodiversity.
- Develop an AI-based framework for soil-moisture modeling and decision making.
- Model potential for cultural keystone species reintroduction under future climate.



A satellite view of the Great Salt Lake captured in September 1987. EOS Center, U.S.G.S. The Great Salt Lake in May 2021. EOS Center, U.S.G.S.



COLLABORATORS





One-U RAI Cyberinfrastructure

Investing \$15M spread over three \$5M installments

FIRST \$5M UPGRADE

CHPC

9X high-end GPUs

4X mid-range GPUs

+3PB storage

SCI

3X GPU compute

4X storage

10X networking speed

FUTURE UPGRADES

2–4X capability increase every two years
as new generations of GPUs become available

UofU-State-HPE partnership

Catalyzing Utah's AI Innovation Ecosystem



- \$50 million, 5-year shared investment; first-of-its-kind HPE-NVIDIA-University partnership.
- Advances Utah as a national AI research and innovation leader.
- State-of-the-art compute resource for challenging AI and computational projects for researchers at the U and across the state.
- Student training, workforce development, and entrepreneurship.
- Deployed at commercial data center connected via high-speed links.
- **CHPC will manage operations and user access.**

Details

- 33 Nvidia HGX nodes, each comprising 8 H200 SXM5 GPUs each with 141 GB memory, 112 CPU cores, and 2TB RAM (Totaling 264 GPUs)
- 96 cores of Intel Xeon Platinum 8568Y+ CPUs (3696 total), 66 TB RAM and 1 PB storage
- Optimal GPU to GPU connectivity (900 GB/s bidirectional in each host, 3.2 Tbit/s internal non-blocking Infiniband connectivity - 8 400Gbit/s links, one per each GPU.) for efficient multi-node projects.

CHPC secure enclaves for research with sensitive data

Protected Environment (PE): For projects involving Protected Health Information (PHI) or Personally Identifiable Information (PII) (HIPAA compliance).

Regulated Environment (RE): For projects and data requiring NIST SP 800-171 Rev 2/3 compliance e.g. for human genetics data – dbGaP.

- **Citadel** is the current Rev 2 RE platform. Migration to new Rev 3 RE platform this summer.

Services in the PE and RE: High Performance Computing (CPUs and GPUs), Windows server for analytics, Virtual Machines, data spaces (home/group, project, scratch, archiving).

- All projects require PI completion of a Needs Assessment, training, and (for Citadel/RE) background checks. The Research Security Office (RSO) is involved in RE onboarding.

Building a Trusted AI Data Ecosystem

National Data Platform



A **federated** and **extensible** data ecosystem to promote collaboration, innovation and customizable use of data on top of existing national infrastructure capabilities

www.nationaldatapatform.org/

Finding data that you can trust



A community-based approach

- Who is using the data and for what research?
- What is the impact of research using the data?
- What data sets are used together, how are they used, and for what research?
- What tools/codes are used for the data?

Utah's Partnership with NVIDIA

- Public-private partnership to equip universities, community colleges, and adult education programs across Utah with the resources to develop skills in generative AI
 - Utah's educators can gain certification through the [NVIDIA Deep Learning Institute University Ambassador Program](#)

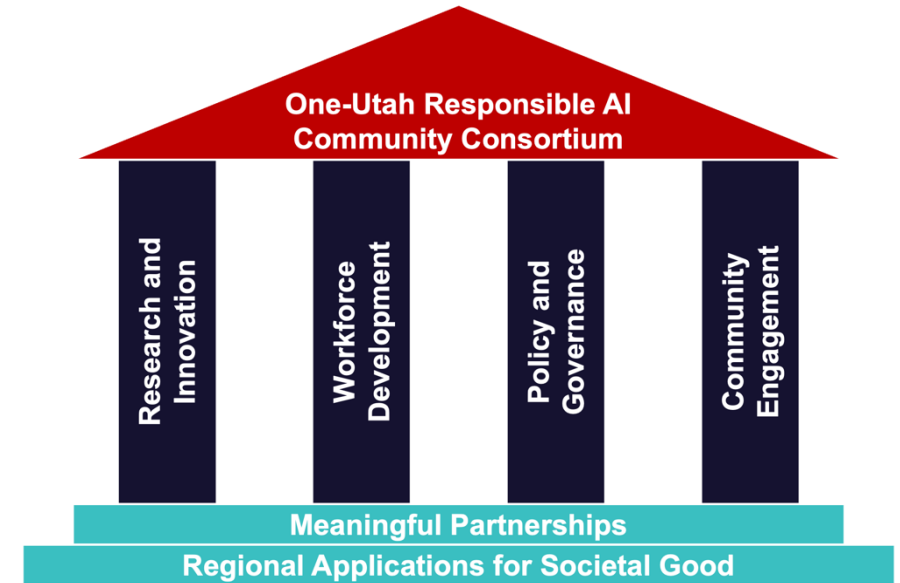
“AI will continue to grow in importance, affecting every sector of Utah’s economy. We need to prepare our students and faculty for this technological revolution.”
-- Spencer Cox, Utah Governor



One-U RAI Building Community

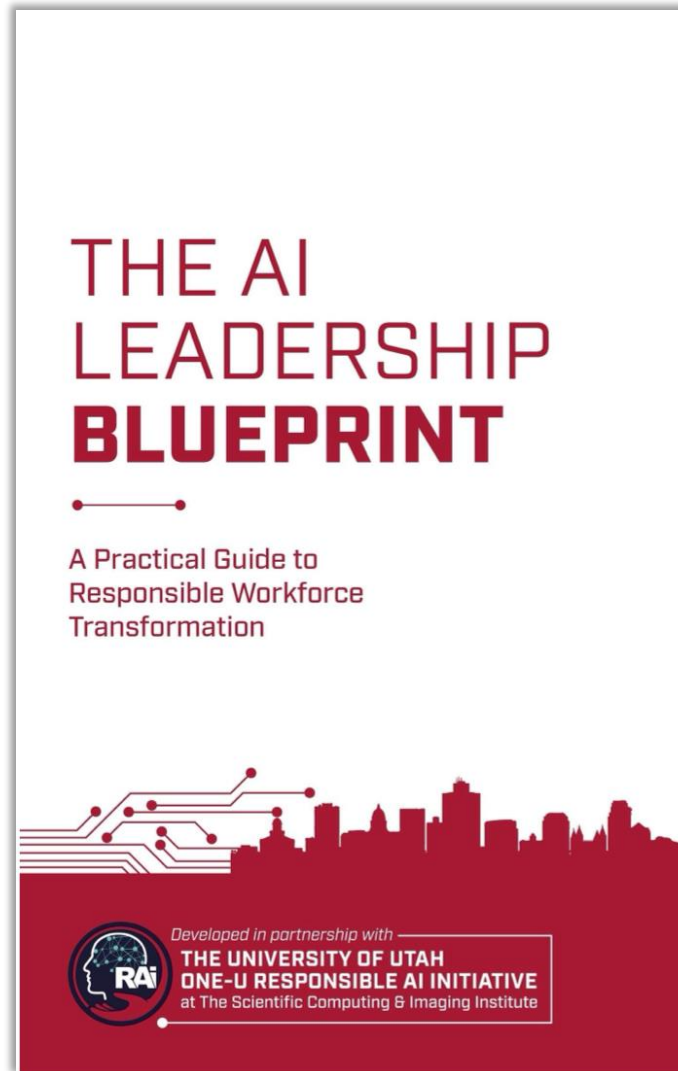
The **Responsible AI Community Consortium (RAI-CC)** aims to create a framework where academia, government, industry, and the community collectively and symbiotically engage in the responsible development and use of AI to advance discoveries, drive innovation, create an AI-savvy workforce, increase AI literacy, and foster societal good across Utah and the region, as well as nationally and globally.

One-U RAI Special Interest Groups create a community around topics of common interest in responsible AI and provide a forum for an open and thoughtful exchange of ideas and sharing of experiences, best practices, and effective solutions.



RAI-CC: Enabling our Community

- **AI Leadership Blueprint** provides a practical, step-by-step guide developed specifically for organizations to adopt and manage AI responsibly.
- The **Portrait of an AI-Ready Company** is a one-page resource designed to help organizations reflect on their readiness for responsible AI adoption.



Thank you!

 scientific-computing-
and-imaging-institute

 @uusci

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2025 By the Numbers

Campus-Wide Support



55 faculty members involved, including faculty fellows, postdoctoral mentors, & committee members



14 University of Utah colleges represented



77 applicants for distinguished visitors & faculty & postdoctoral fellowships

State-of-the-Art Resources



6^x high-end, AI-specific GPUs added, jumping from 16 to 96 in summer 2025



80% utilization of the new GPUs, meeting researchers' growing needs for computing power



2.4^x AI-driven research enabled since 2024, transforming the pace of discovery at the U

Building a Foundation of Impactful, Translational Research



22 research papers submitted



28 new interdisciplinary collaborations at the U born out of One-U RAI



15 external funding proposals submitted } **\$5.7M** requested



34 conference presentations & talks plus 10 research lightning talks at the One-U RAI Symposium



6 awards & nominations, including best papers & best poster



8 public events hosted or sponsored, including distinguished lectures, symposium, hackathon, AI Humanities Summer Institute, & Utah's Responsible AI Community Consortium Kickoff