The Role of WLMI and Research Entities Julia Lane New York University

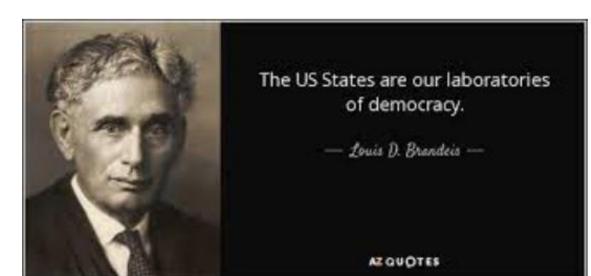
Outline

- Some context and lessons learned
- Current drivers
- Research
- Opportunities

Outline

- Some context and lessons learned
- Current drivers
- Research
- Opportunities

Key ideas





Reimagining Labor Market Information

A NATIONAL COLLABORATIVE FOR LOCAL WORKFORCE INFORMATION

Julia Lane MARCH 2023

AMERICAN ENTERPRISE INSTITUTE



// Census.gov > Business & Industry > Center for Economic Studies > Longitudinal Employer-Household Dynamics

Longitudinal Employer-Household Dynamics

Main Applications Data Learn More Research State Partners LED in Action

Applications

- J2J Explorer
- LED Extraction Tool
- OnTheMap
- OnTheMap for Emergency
 Management
- PSEO Explorer
- QWI ExplorerVEO Explorer

Useful Links

- Center for Economic Studies
- J2J Data
- LODES Data
- PSEO Data

What is LEHD?

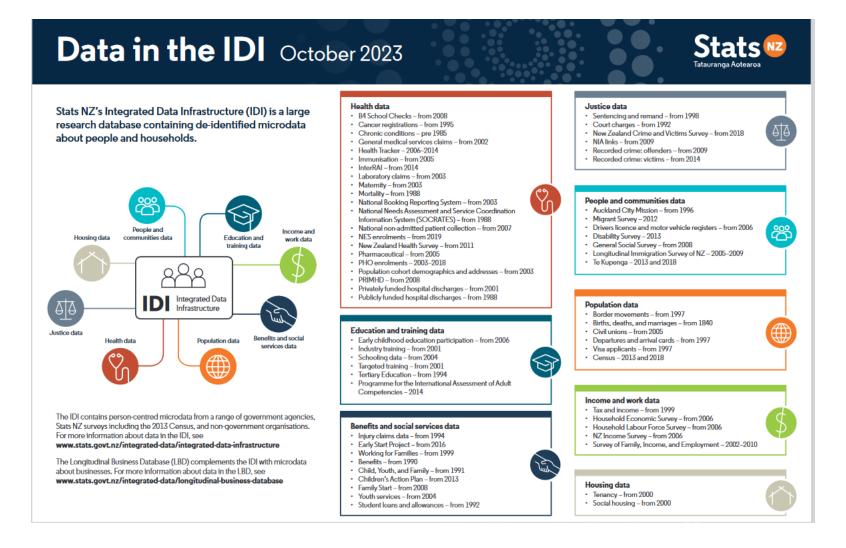
Since 1999 the Longitudinal Employer-Household Dynamics (LEHD) program at the U.S. Census Bureau has enhanced the nation's statistical infrastructure by exploring the interactions between workers and firms. By linking employer and household data, the LEHD program has built a comprehensive database of longitudinally linked jobs data. The potential uses of the LEHD jobs data are far-reaching, both for unraveling important economic questions and for the provision of new statistical products.

Learn more 📆 (293 KB)

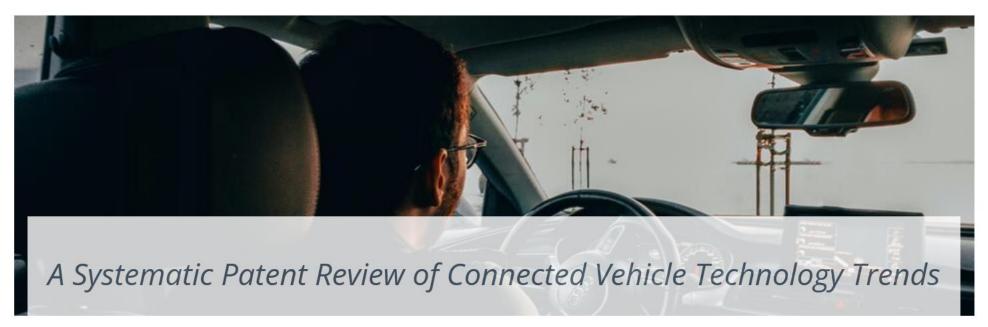
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Patent Search	Patent title or number		SEARCH		
View results by:	O Patent	O Inventor	Assignee		





IRIS is... a consortium of research universities using big administrative data to understand, explain, and improve higher education and research.

Industries of Ideas: Measuring the effects of research investments on firms and jobs

IRIS, the NSF, The Ohio State University, and the Social Science Research Council are partnering to create a new, people-centric way to measure the impacts of research investments on emerging industries.

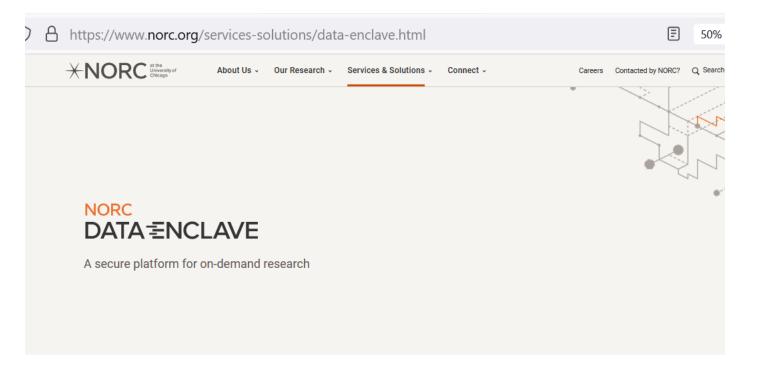
Happening @ IRIS

Owen-Smith: Congress' failure to deliver on research funding threatens America's long-term economic health

In a piece published by The Conversation, IRIS Executive Director Jason Owen-Smith makes the case that Congress is failing to keep its promises on increase research funding, thus threatening the long-term health of the American economy. <u>Read more...</u>

Webinar: Greater Than The Sum of Our Parts: The Collective Impact of University Research





NORC's trusted and future-ready research infrastructure provides secure access, management, and sharing of sensitive and confidential data to empower data-driven results.

NORC is a recognized innovator in secure data management, linkage, and sharing. The NORC Data Enclave® is an integral part of the <u>Advanced Data Solutions</u> <u>Center</u>. The Enclave's high-performance computational environment and virtual desktop infrastructure provide users with convenient access to database, statistical, analytical, visualization, and reporting tools that enable evidence-based discovery.

Launched in 2006, the NORC Data Enclave® is the preferred solution for clients, analysts, and researchers to securely store, access, and analyze sensitive data. Clients include federal, state, and local governments, research institutions,

Contact Us





○ A https://coleridgeinitiative.org



Administrative Data Research

Applied Data Analytics Training

Capabilities ^

Programs

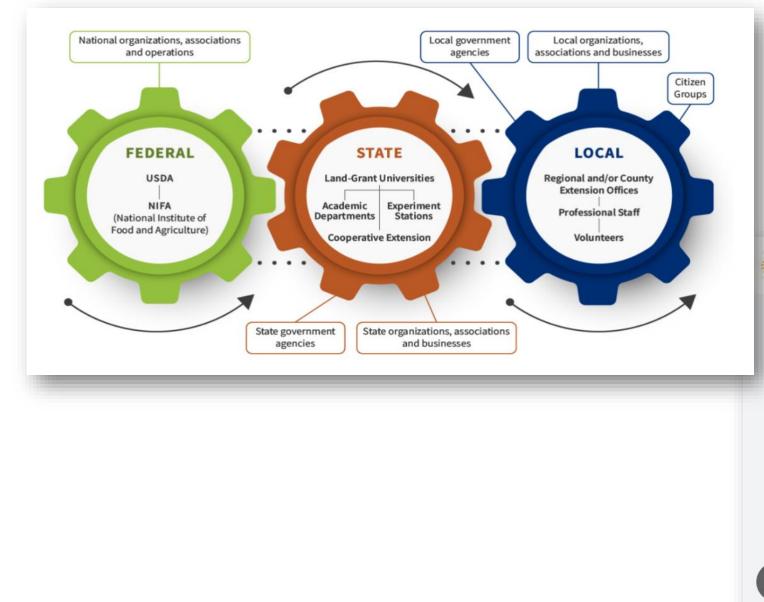
Facility (ADRF) Researcher Enclaves About 🗸

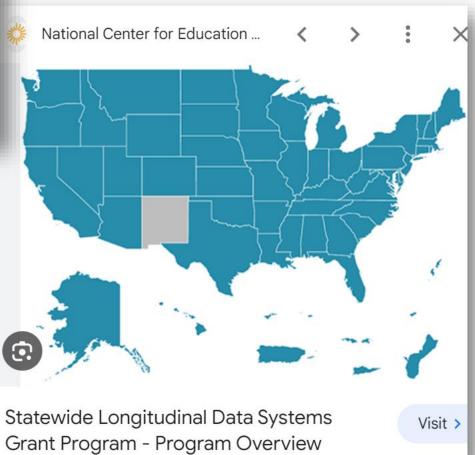
News & Events ~

MARCH 18TH - 20TH, 2024

Building Brites Breaking Barriers: Data Collaboration for the Public Good

Join us for the Coleridge Initiative's 4th Annual National Convening on **March 18th - 20th, 2024** at the Crystal Gateway Marriott in Arlington, VA. Discover how leaders in the field are pushing the boundaries of traditional governance, forging data partnerships, and reshaping the future of public administration. Please note that March 18th will be reserved for meetings with state employees and the Multi-State Data Collaboratives. Contact ~







Home / About



Multi-State Data Collaboratives

State agency leaders across the country are driving the emergence and sustainability of multi-state data collaboratives, beginning with the Midwest Collaborative, the Southern Regional Data Collaborative, and the Eastern States Longitudinal Data Collaborative. This work is being supported by NASWA as the administering organization, the Coleridge Initiative as the platform organization, the State Higher Education Executive Officers Association (SHEEO), and other partners and funders. This webpage is directed by state agency leaders to provide public information about the collaboratives, including their activities and products.



About

Across the country, state workforce, higher education, human services, and other agencies are responding to the needs and desire of policymakers and practitioners to leverage timely administrative data to better respond to labor market needs, improve programs and services, and address racial and geographic disparities.

Outline

- Some context and lessons learned
- Current drivers
- Research
- Opportunities

Administration Priorities The Record

Initiatives

Current Opportunities

UPDATED FACT SHEET: Bipartisan Infrastructure Investment and

O A https://www.naswa.org/partnerships/multi-state-data-collaboratives/about

Multi-State Data Collaboratives

F/

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From Projects to Products to Impact

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Q MEMBERSI

Multi-State Da

Collaborative

023 National Meetin

Convening Synopsis

Joint Presentation on the Multi-State Data

Collaboratives

round \$550 bil

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In President Biden's first year in office, the Biden-Harris Administration has implemented an industrial strategy to revitalize domestic manufacturing, create good-paying American jobs, strongthen American supply chains, and accelerate the industri of the future. These policies have spurred an historic recovery in manufecturing, adding 642,000 manufacturing jobs since 2021. Companies are in esting in America again, bringing good-payi manufacturing jobs back home. The construction of new manufacturing facilities has increased 110, orcent over last year.

Industries of Ideas: Mapping the Economic Impacts , the Presiden of Research Investments in of a once-in-a Emerging Technologies liately taken

Our Work

s, water infras In the mid-1990s, the National Science Foundation (NSF) funded two graduate students in computer science at Stanford University. These graduate students, Larry Page and Sergey Brin, would later cite NSF funding support in the patent application leading to the 1998 founding of Google, Inc. in Menlo Park. , resilient, ai



\P	National Security		Climate Change	e Growing	Growing the Middle Class	
	Issues	Experts	Events	Press	Take Action	About U

News & Events

About

REPORT SEP 14, 2022

The Inflation Reduction Act Provides Pathways to High-Quality Jobs

Incorporating labor and workforce training standards into this historic climate policy will ensure that the transition to a clean energy economy is built with good jobs.

Evidence Act

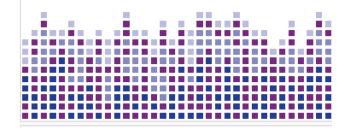


• Signed into law by President Donald Trump on 01/14/2019

ACDEB Adv/sory Committee on Data for Evidence Building

Advisory Committee on Data for Evidence Building: Year 2 Report

October 14, 2022



Model 2. Midwest Collaborative

Background

The <u>Midwest Collaborative</u> (MWC) is a regional collaborative of Midwest states that joined together to share education, training, and workforce data through a <u>value-driven approach to building data</u> <u>infrastructures</u>. The MWC governance structure consists of an executive committee that oversees an Administrative Data Research Facility (ADRF). The ADRF consists of a secure, cloud-based platform, a policymaking body, and a technical advisory body. The interim administering organization is the National Association of State Workforce Agencies (NASWA), and the interim platform organization is the Coleridge Initiative.

Governance structure. The key components and features of the MWC governance structure include the following:

- MWC Executive Committee. The MWC Executive Committee determines final approval on all policy recommendations and project proposals and consists of state representatives from the MWC Council and MWC Data Stewards Board.
- *MWC Council.* The MWC Council is the policymaking body for the collaborative. The goal of the Council is not to prevent states from doing what they wish with their own data but instead to provide a set of rules of engagement to allow states to work with one another more easily. The Council provides a means for states to focus on the core questions for educational workforce needs by providing a request for proposal approval process and standardized disclosure forms and by helping manage the review process for expedited access for states and researchers.



CRITICAL AND EMERGING TECHNOLOGIES LIST UPDATE

A Report by the FAST TRACK ACTION SUBCOMMITTEE ON CRITICAL AND EMERGING TECHNOLOGIES

of the

NATIONAL SCIENCE AND TECHNOLOGY COUNCIL

February 2022

change

CRITICAL AND EMERGING TECHNOLOGIES LIST UPDATE

Advanced Nuclear Energy Technologies

- Nuclear energy systems
- Fusion energy
- Space nuclear power and propulsion systems

Artificial Intelligence (AI)

- Machine learning
- Deep learning
- Reinforcement learning
- Sensory perception and recognition
- Next-generation Al
- Planning, reasoning, and decision making
- Safe and/or secure AI

Autonomous Systems and Robotics

- Surfaces
- Air
- Maritime
- Space

Biotechnologies

- Nucleic acid and protein synthesis
- Genome and protein engineering including design tools
- Multi-omics and other biometrology, bioinformatics, predictive modeling, and analytical tools for functional phenotypes
- Engineering of multicellular systems
- Engineering of viral and viral delivery systems
- Biomanufacturing and bioprocessing technologies

Communication and Networking Technologies

- · Radio-frequency (RF) and mixed-signal circuits, antennas, filters, and components
- Spectrum management technologies
- Next-generation wireless networks, including 5G and 6G
- Optical links and fiber technologies
- Terrestrial/undersea cables
- Satellite-based communications
- Hardware, firmware, and software
- Communications and network security
- Mesh networks/infrastructure independent communication technologies

Directed Energy

- Lasers
- High-power microwaves
- Particle beams

AEI

The Industry of Ideas: Measuring How Artificial Intelligence Changes Labor Markets

Julia Lane

Key Points

- Federal investments in new and emerging technologies—such as in artificial intelligence have transformed the labor market. New "idea industries" that don't fit neatly into traditional measures of industries and scientific fields have emerged.
- This report describes a new, rapidly implementable, conceptual, and empirical approach to tracing how ideas move from investments in research to the marketplace and developing early warning indicators of potential workforce and education impacts.
- This report proposes a new evidence-based foundation to support US national growth strategies and ensure investments have the greatest chance of success for workers and employers.

The launch of ChatGPT has captured the world's imagination about the potential of artificial intelligence (AI): In just its first two months, over 30 million people used the tool, and roughly five million visited it per day. As Nobel laureate Daniel Kahneman said, "Clearly AI is going to win... How people adjust is a fascinating problem.ⁿ1

How AI will transform businesses, workers, and jobs is not just fascinating but also a looming practical problem. ChatGPT alone could affect the jobs of 80 percent of workers to some degree and almost 20 percent to a large degree.² The massive change in technology investments through targeted legislation such as the CHIPS and Science Act3 will necessitate that American training and education infrastructure be significantly more nimble to realize the promised rewards of quality jobs.

The costly lessons of the past, including "deaths of despair,"4 make clear that vulnerable workers displaced by AI—or by other critical and emerging technologies should not be relegated to the unemployment slag heap; rather, these workers can find work in quality jobs if the right training opportunities are available. Firms should be able to find the right workers to respond to changing conditions and pay them well. American labor, education, and training institutions must be armed with evidence to respond to rapidly changing needs.⁵ Academic literature⁶ and practical guidance will be screly needed to answer many practical questions.

On the demand side, those questions include:

- Which sectors of the economy are at the cutting edge of AI?
- How are AI capabilities changing jobs?
- Does AI increase inequality or impede access to services?
- What new career trajectories does AI create?

AMERICAN ENTERPRISE INSTITUTE

(Original Signature of Member)

12

13

14

118TH CONGRESS 1ST SESSION

To amend and reauthorize the Workforce Innovation and Opportunity Act.

H.R.

IN THE HOUSE OF REPRESENTATIVES

Ms. FOXX (for herself and Mr. SCOTT of Virginia) introduced the following bill; which was referred to the Committee on

1 (29 U.S.C. 3224) is further amended by adding at the end the following:

"(d) Workforce Data Quality Initiative.—

"(1) GRANT PROGRAM.—Of amount made available pursuant to section 132(a)(2)(A) for any program year, the Secretary shall use 5 percent of such amount, and may also use funds authorized for purposes of carrying out this section, to award grants to eligible entities to create workforce longitudinal data systems and associated resources for the purposes of strengthening program quality, building State capacity to produce evidence for decision making, meeting performance reporting requirements, protecting privacy, and improving transparency.

Outline

- Some context and lessons learned
- Current drivers
- Research (with Jason Owen Smith and Bruce Weinberg)
- Opportunities

"People-centric" data infrastructure & descriptive work

- 1. Identify emerging & critical research fields through investigators, not topics
- 2. Expand beyond faculty to focus on <u>students & trainees</u>
- 3. Use careers of research-trained people to <u>identify jobs & employers</u>

How do

- research investments in
- critical & emerging fields have
- concrete, documentable effects on
- jobs, workers, employers & innovation ecosystems in
- specific regions?

Flexibly & reliably address the needs of many stakeholders

Accommodate widely varying fields to provide timely, granular information

CHIPS & Science : 10 Key Technology Areas

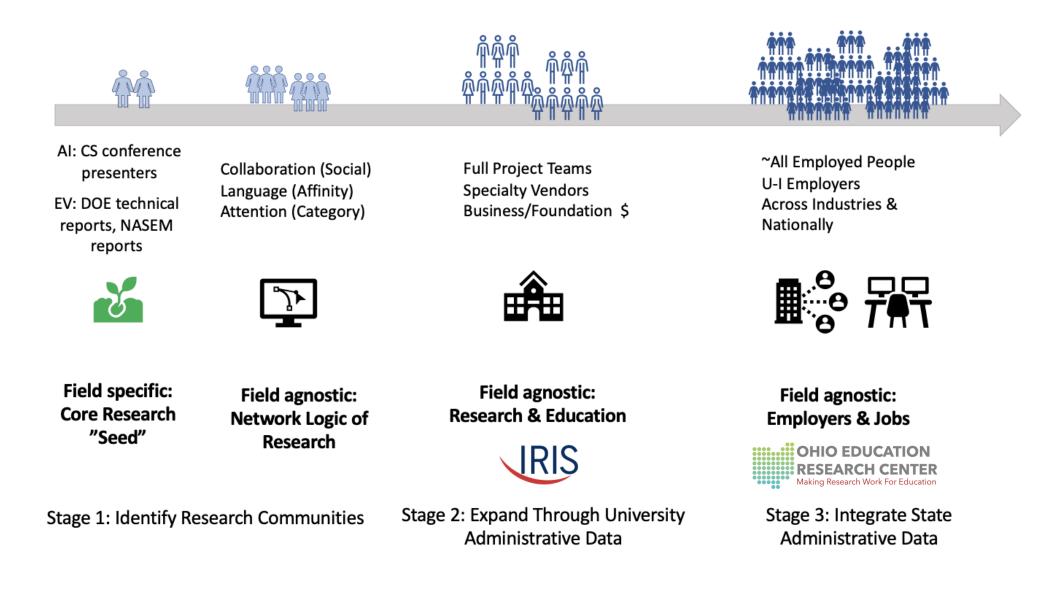
- Artificial Intelligence
- High Performance Computing
- Quantum Technology
- Advanced Manufacturing
- Cybersecurity
- Biotech
- Advanced Energy Efficiency
- Material Science

For constituencies far beyond academia

The critical next steps in AI development should . . . improve workers' lives, positively augment human work, and help all people safely enjoy the gains and opportunities from technological innovation.

– President Biden (Executive Order on Al <u>10/3/2023</u>

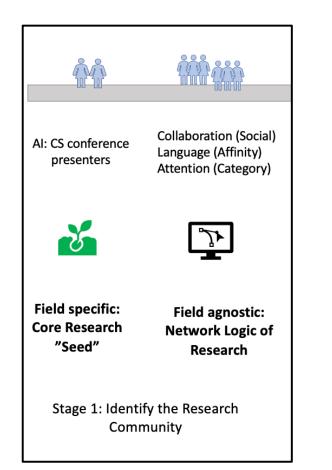
Built Around Existing Data Infrastructures & Network Theory



The Industries of Ideas Project will

- 1. <u>Build</u> a prototype measurement system for AI and Electric Vehicles (EV) in Ohio
- 2. <u>Describe</u> associations among research investments, jobs, employers, and innovation ecosystems in specific regions
- 3. <u>Report</u> findings via prototype dashboards developed with academic, state and federal stakeholders
- 4. <u>Plan</u> for expansion in
 - Scale more universities, states, fields
 - Scope additional domains and types of data
 - Usability data/findings access, research use, training needs etc.

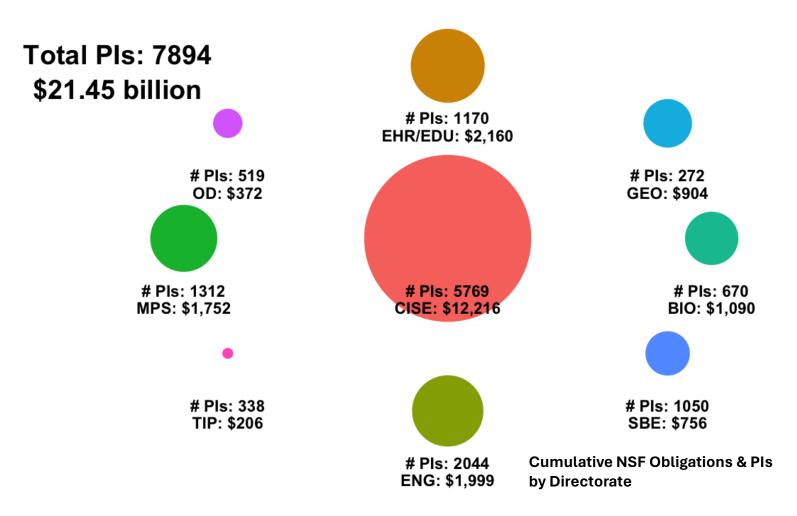
US researchers are a minority, but author most AI papers. 8.6% were PIs on NSF grants totaling \$21.5 billion.



- 248,460 Global Researchers
- 91,379 (36.8%) w/ US Affiliations
- 1.96 million papers
- 1.17 million (59.4%) w. US Authors
- 35,127 NSF Awards
- \$21.5 billion
- 7,894 (8.6% of US, 3.2% of Total) Unique PIs

Preliminary Findings: Data are about 2 weeks old

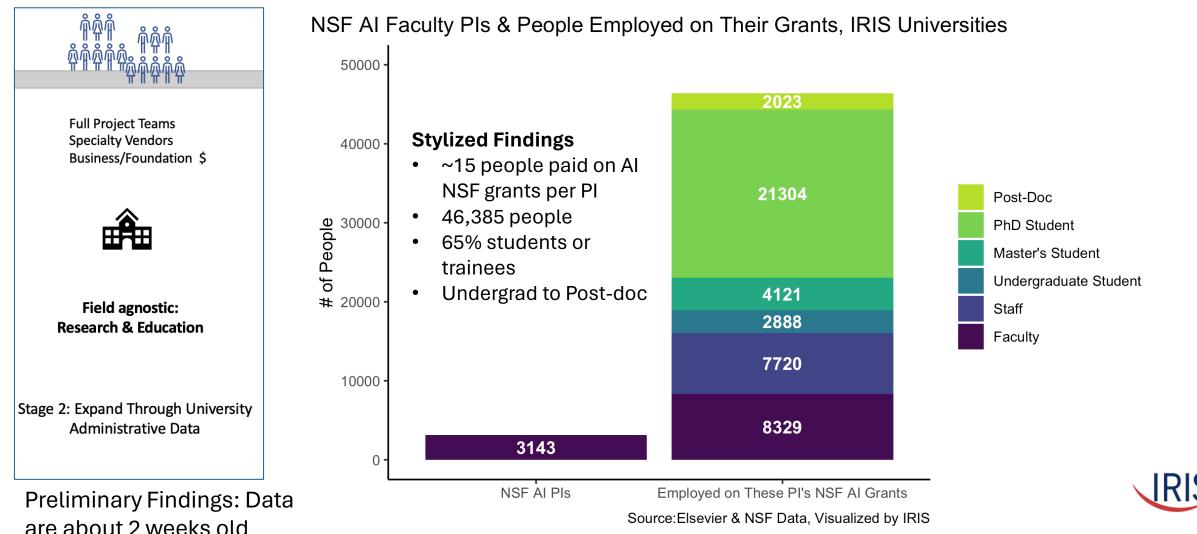
AI-Related NSF Funding is Highly Interdisciplinary



- CISE dominates in terms of \$ and PIs
- Every directorate is involved
- SBE & EHR both play important roles
- Nearly Half (48.4%) of PIs have been funded by 2+ directorates

Preliminary Findings: Data are about 2 weeks old

About 3100 PIs Employed More than 46,000 People on Their AI-Related NSF Grants at Universities with Data in



Employers "bid into" critical & emerging fields by hiring research trained people, their industries are "touched" by relevant research investments.



Our key assumption:

Companies employ people to develop AI research programs because

- they have a pressing business interest in AI and its applications.
- their (costly) signals of interest also indicate possible directions for their industries and competitors

Assessing the workforce characteristics of industries where company affiliates are publishing can provide early, orienting signals.

OHIO EDUCATION RESEARCH CENTER Making Research Work For Education

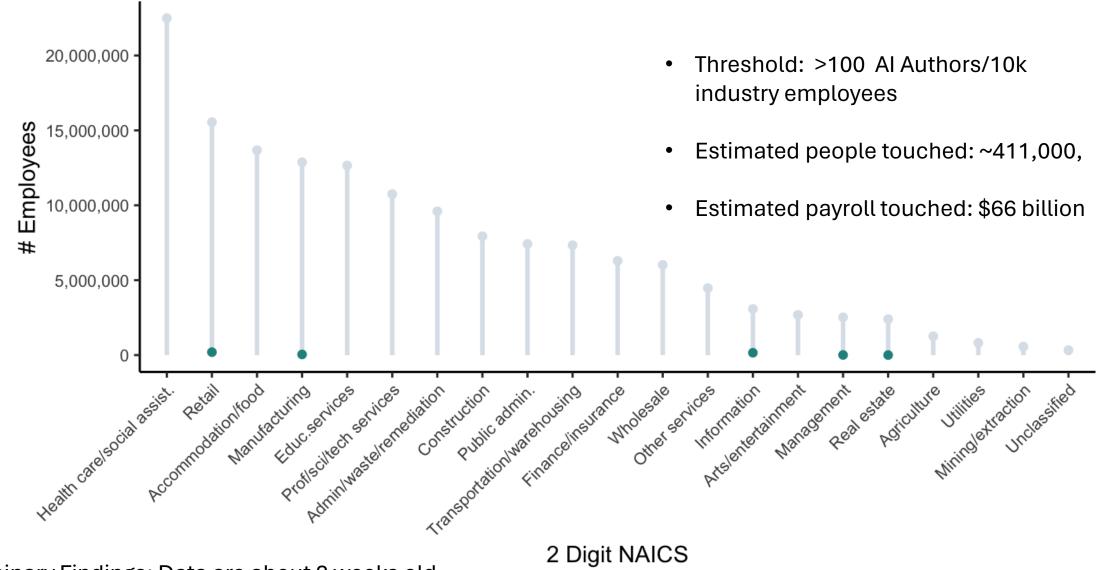
Preliminary Findings: Data are about 2 weeks old

Companies that employ AI authors are an initial "tracer condition" for describing workforce implications.

Sector	Specialized Industry	AI Authors	Most Author Intense Firm
Administrative Support	Other business service centers (including copy shops)	297	Accenture
Information	Web search portals and all other information services	8955	Alphabet Inc.
Information	Wired telecommunications carriers	979	Yahoo Research Labs
Information	Television broadcasting stations	314	The Walt Disney Company
Management	Offices of bank holding companies	491	Raytheon
Manufacturing	Manufacturing and reproducing magnetic and optical media	6925	Microsoft USA
Manufacturing	Semiconductor and related device manufacturing	1943	Intel
Manufacturing	Electronic computer manufacturing	612	Apple
Manufacturing	Computer terminal and other computer peripheral equipment manufacturing	475	Hewlett-Packard
Prof/Sci/Tech Services	Computer systems design services	4111	IBM
Prof/Sci/Tech Services	Research and development in the social sciences and humanities	521	SRI International
Prof/Sci/Tech Services	Custom computer programming services	299	Kitware, Inc
Prof/Sci/Tech Services	Research and development in the physical, engineering, and life sciences	259	Battelle
Retail	All other miscellaneous retailers	2246	Amazon.com, Inc.

Preliminary Findings: Data are about 2 weeks old

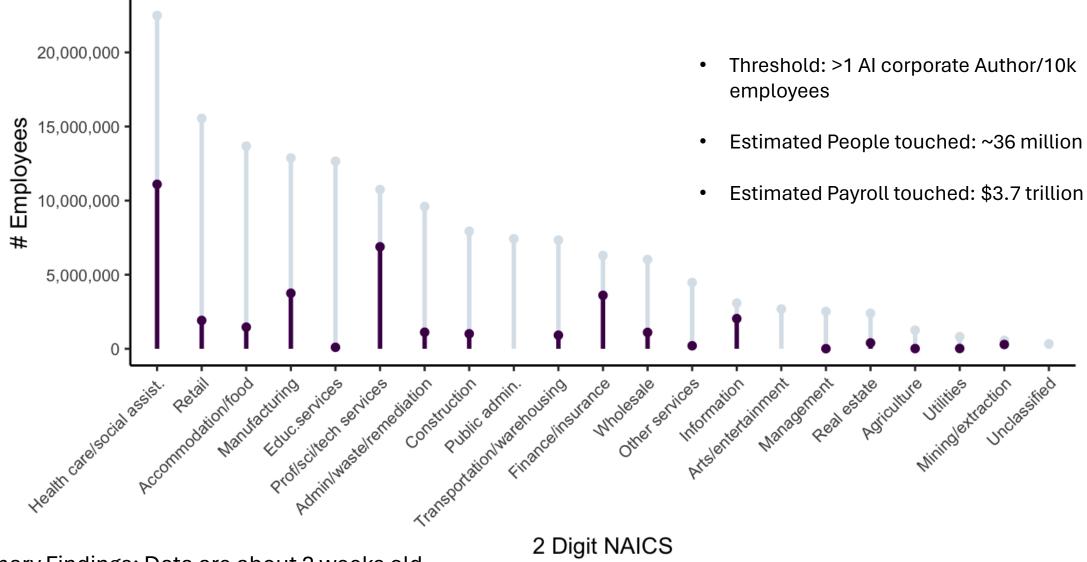
Al touches ~ 411,000 workers in 5 major sectors (Narrow



Preliminary Findings: Data are about 2 weeks old

Source: QCEW & Elsevier Data Compiled & Visualized by IRIS

Al touches ~ 36 million workers in 18 major sectors (Broad



Preliminary Findings: Data are about 2 weeks old

Source: QCEW & Elsevier Data Compiled & Visualized by IRIS



The Project

- In response to CHIPS Act, measure the footprint of research investments
- Focus on AI & electric vehicles (EV), but use a technology-agnostic, person-based, community-driven approach
- Use UI wage data from the State of Ohio
- Demonstrate potential and then scale to other technologies and states



Measure Construction in Progress!

- Using Ohio UI wage data, measure firm
- Employment, Hires / turnover churn All, full-year, growth...
- Earnings / payroll
 - Total, Average, Median, 25th, 75th, 90th percentile
- For business that are hiring AI and EV-trained workers
- Develop code that can be widely applied, so that the work can be scaled to other states
- And other technologies
- Inform workers about where good jobs are



Outline

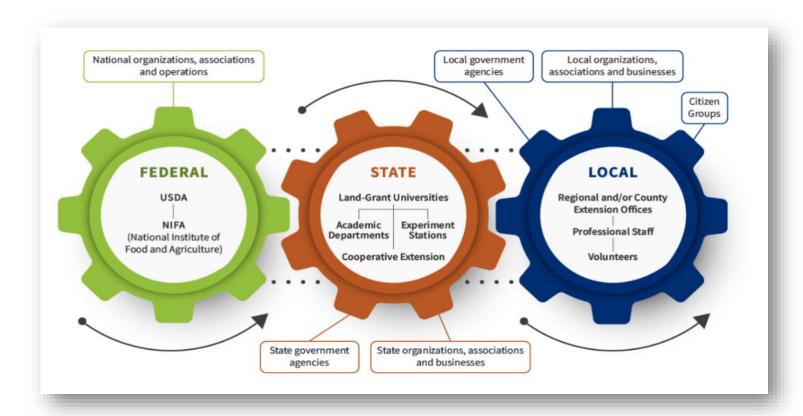
- Some context and lessons learned
- Current drivers
- Research
- Opportunities

YEARS SOCIAL YEARS COUNCI

Industries of Ideas: Mapping the Economic Impacts of Research Investments in Emerging Technologies

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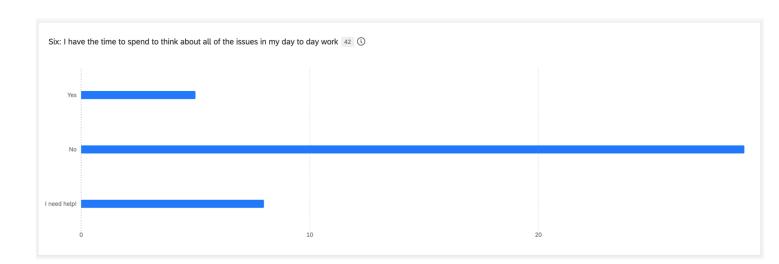


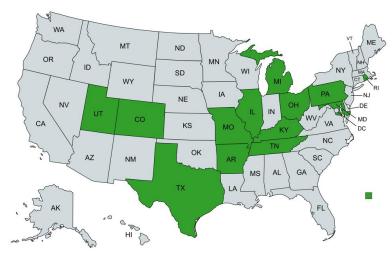
DATA LITERACY & EVIDENCE BUILDING

NYU Wagner | Accenture | University Of Maryland | KYStats | Coleridge Initiative

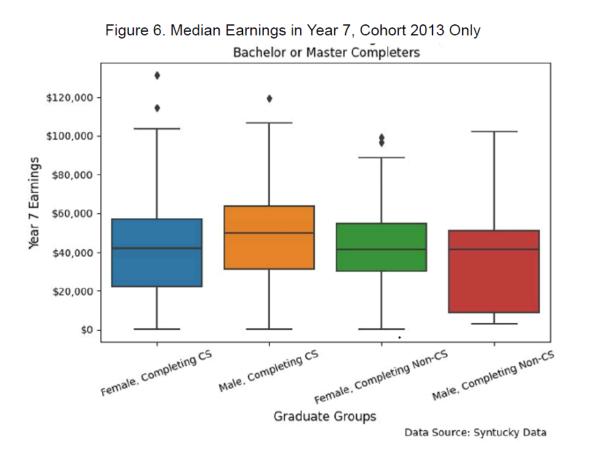


I have the time to spend to think about all of the issues in my day to day work

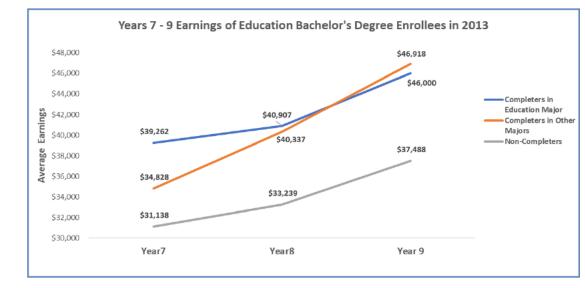




Job quality is relative to other options



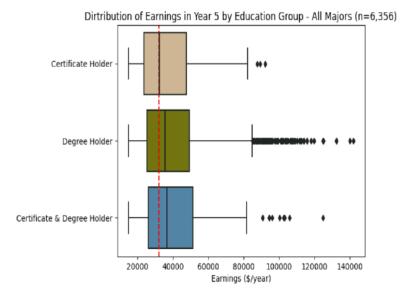
Average earnings by year and completion status for 2013 education bachelor's degree enrollees. n = 2,767 after excluding non-bachelor's degree recipients:

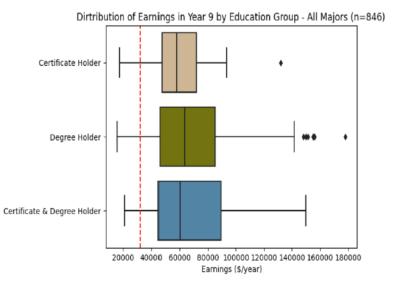


Team 2: The Leaky Computer Science Pipeline

Team 3: KY Teacher shortages

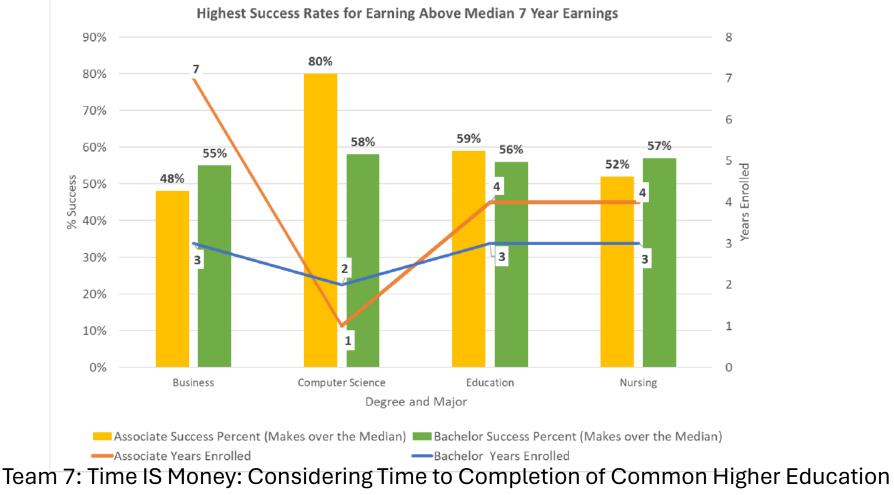
Job quality is not just one number in one year Earnings distribution





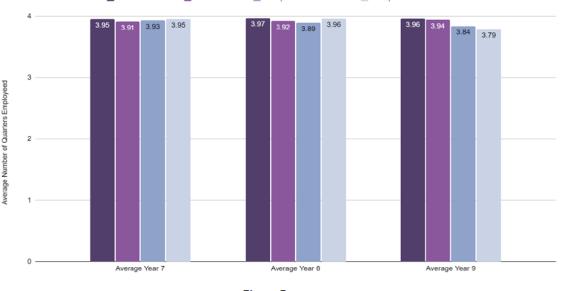
Team 6: Credentials and earnings

Job quality relative to time to completion



Degrees in Relationship to Salary Outcomes

Quality jobs have an employment dimension



Men and Women Have Comparable Average Number of Quarters Employed in Both Business and Computer Science

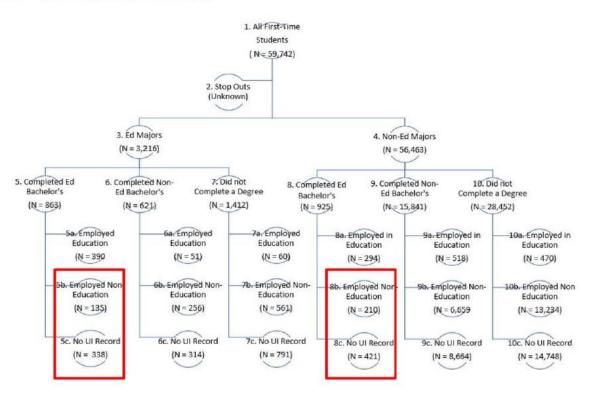
📕 Business Female 📲 Business Male 📕 Computer Science Female 📄 Computer Science Male

Figure 7.

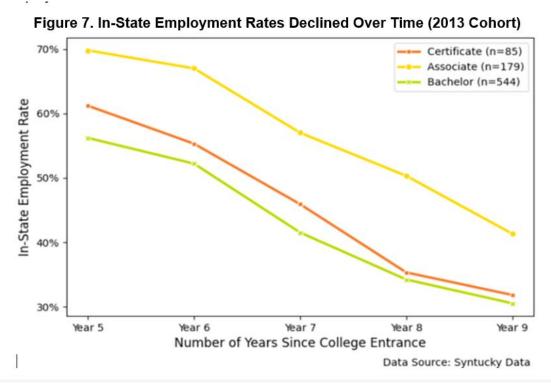
Team 8: Comparing Outcomes and the Gender Wage Gap: Business versus Computer Science Majors

Workers move to different industries and states

Figure 5: In the 2013 Syntucky cohort, 1,104 out of 1,788 (61.7%) First-Time, Bachelor's Degree Graduates in Education were not employed in the Education industry in Syntucky 7 years after starting their training.



Team 4: Complexity of Pathways



Team 5: How much education in Computer Science do I need to succeed?

Key ideas

O A https://www.naswa.org/partnerships/multi-state-data-collaboratives/about

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Our Work **Current Opportunities** Initiatives News & Events

About

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Collaboratives 2023 National Meeting Convening Synopsis

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Postsecondary Repor

Julia Lane MARCH 2023

AMERICAN ENTERPRISE INSTITUTE

Questions?

- Julia.lane@nyu.edu
- <u>https://www.linkedin.com/in/julia-lane/</u>