EXECUTIVE SUMMARY

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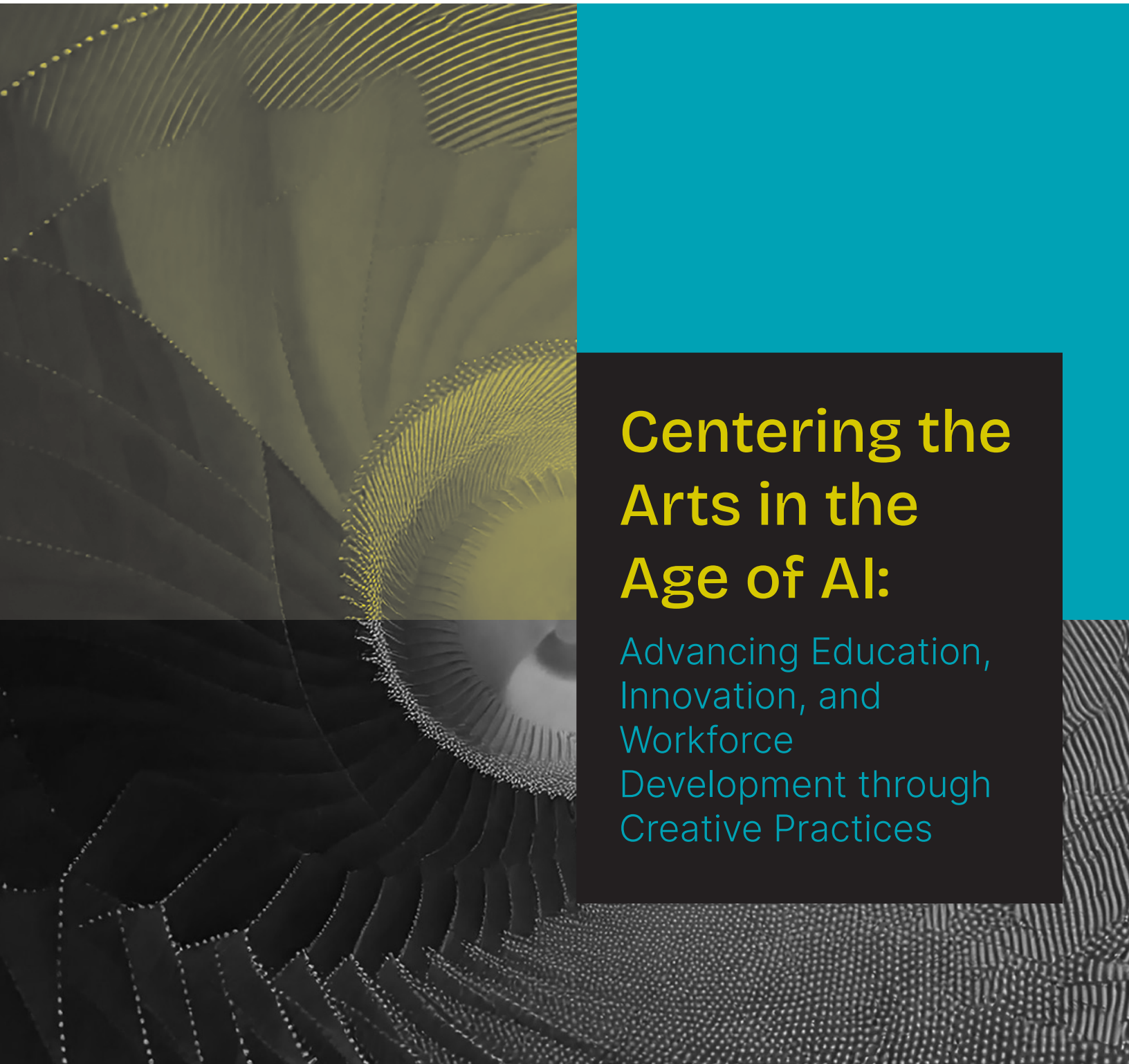

Centering the Arts in the Age of AI:

Advancing Education, Innovation, and Workforce Development through Creative Practices

“There are so many opportunities to do good work bringing the artistic perspective into business and technology. The future of innovation—and the future of humanity—lies at this intersection of arts and technology.”

Domhnaill Hernon, EY Global Metaverse Labs Lead & former VP of Research and Innovation at Nokia Bell Labs in Forbes (2020).

Wolff, Benjamin, (2020). Forbes. December 23 2020. https://bit.ly/42chShE

AI for What Purpose?

"[R]esearch universities are educating the workforce of the future. This is particularly important in an era where, for example, the emergence of artificial intelligence promises to be as transformative as the Industrial Revolution was in its time. AAU member universities are among the world's leaders not only in conducting groundbreaking AI research, but also in teaching undergraduates about AI and AI-related skills that will benefit them in their future workplaces."

Association of American Universities (AAU) president, Barbara Snyder in blogpost January 27, 2025
"What Is a Research University?" https://www.aau.edu/newsroom/barbaras-blog/what-research-university

The recent ubiquity of Artificial Intelligence (AI) usage highlights the need for literacy, experimentation, and productive perspectives on these tools. As higher education prepares students to enter the workforce, we know an integrated curriculum with attention to informed use of AI will not only prevent the harms we know are inherent in the technology but will also ensure a human-centered, skilled workforce essential to our democracy and global citizenship. Interdisciplinary perspectives and skills are the only way to make this happen, and to develop elevated awareness in the development, use, and adoption of AI now urgently needed. That means integrated study and use – artists, engineers, technologists, humanists, scientists, and medical experts working together. This can be achieved through an integrated general curriculum and by offering pathways to connect disciplines and that integrate the arts for students. As industry leaders like Hernon reminds us (see quote), it is essential to integrate both arts and STEM specialists on teams in industry.

Leveraging this connected knowledge, researchers in higher education, along with the next generation of industry leaders they will shape, are poised to innovate and lead by example. The qualities of individualism, creativity, decentralization, and experimentation are qualities that define the ways in which this country operates. In an era of global competition, our competitors are not likely to value the role of the arts and free expression as national assets in the global contest. ***But we can and should.***

"[Our] nation needs some of the most fiercely competitive and proudly autonomous global institutions in the United States to coalesce around the national interests of economic prosperity and economic security."

(McLaughlin and Guile, Issues in Science and Technology, 9/22/21).

The AI zeitgeist has rapidly and continually oscillated between curiosity, skepticism, and outrage. In recent convenings, we've often heard the phrase, "when you invent the ship, you invent the shipwreck." Work generated with AI is extremely divisive. After two years of parsing the threats and opportunities in practice on our campuses we've developed this executive summary. The guidelines we offer here are meant to provide a productive way forward that embraces the promise of AI while recognizing its limitations in order to foster innovative ways to counter the bad and harness the good.

Why the Arts?

The arts are essential to productively harnessing AI for the same reason they have become siloed and distinct from other disciplines. Teaching, research, and methodologies in the arts are radically different. Closing the distance between STEM and the arts has exponential rewards, providing from the start "unfamiliar ways of thinking about concepts" (Stanich and Harp 2019), a catalyzing difference between modern historical modes of research and integrated approaches[1].

In the following, we summarize three main benefits of forging new partnerships between the arts and other fields leading in AI development:

"Taken together, the arts, science and technology form a triple anvil on which to forge a new kind of apprenticeship for a complex world"

- Jerome B. Wiesner
President of MIT 1971-1980

1 / Integrating the arts into the ways that we approach AI-related science, technology, and business will lead to a more holistic understanding of these and other fields of inquiry.

Doing so can generate an understanding that is informed by the deeply connective human and emotional component that animates the practice and experience of the performing, visual, and design arts.

History is full of examples of the arts impacting technological innovation by expanding potential. After WWII, the Massachusetts Institute of Technology (MIT) integrated the arts on campus to contextualize the "why" and "for whom" of new technologies to augment the "how." Former MIT president, Jerome B. Wiesner (1971-1980), noted that *"[t]aken together, the arts, science and technology form a triple anvil on which to forge a new kind of apprenticeship for a complex world"*. Indeed, the U.S. military-industrial complex and its Vietnam-era discontents went on to create unique circumstances that fostered Experiments in Art and Technology (E.A.T.) and MIT's Center for Advanced Visual Studies (CAVS), which served to *"put technology in the hands of artists and to reinvigorate the creativity and human values of scientists and engineers"* (Zacharias & Wisnioski, 2016).

Communities and students need integrated knowledge to understand the context in which science and technology solutions must be implemented. Arts-integrated education shapes more well-rounded and employable citizens that are better equipped to solve wicked, contemporary problems. The divide between STEM and the arts is artificial: students may be interested in and excel at both but are trained to think they must do one or the other. However, integration is needed to thrive in a hypercomplex world (Root-Bernstein, 2018).

2 / Involving the arts in AI development and use is essential for producing technologies that enhance human abilities and produce transformative results.

Experts at the Institute for the Future created a "transformation map" to analyze trends in AI based on discussions from the World Economic Forum in Davos (Hollister, 2025). Their rubric showed that discussion trends mirrored many global AI concerns: generative AI+; bias and fairness in AI algorithms; AI, diversity, and inclusion; operationalizing responsible AI; geopolitical impacts of AI, and AI and jobs. In a brief related to the project, one of the experts writes: *"[I]t will be critical to involve people and experts from the most diverse backgrounds possible in guiding this technology in ways that enhance human capabilities and lead to positive outcomes* (Hollister, 2025)." The impacts and possibilities of AI are complex, interdependent, and systemic, and our solutions must reflect this complexity.

As we develop future leaders to recognize and meet these trends and challenges, training in the arts offers modes of inquiry and expression that better enable our graduates to meet these challenges. The arts introduce and strengthen skills in critical thinking, comfort in ambiguity, and novel approaches to problem-solving. In higher education, it is vital to include arts training as an asset students can take into our shared future.

1. As explored by organizations such as the International Network of Science of Team Science (INSciTS); the National Science Foundation's (broader impacts criterion and its Advancing Research Impact on Society (ARIS); a2ru, the Center for Interdisciplinary Research, Collaboration, Learning, and Engagement (CIRCLE) at Michigan State University, among many others. On the industry side companies from Apple to Pixar to Electronic Arts to the Movie and Entertainment industry, have innovated because of the leadership of both artists and STEM employees. Therefore, for the US to lead the world in AI innovation, we must continue to advance this necessary partnership in ways that we can only imagine.

3 / Emphasizing human intelligence, creativity, and critical thinking that art and artists foster is and will be critical in the age of AI.

Recent convenings by a2ru reflect the topics discussed in Davos, focusing primarily on higher education, industry, and civic life in the US. Specifically, *Creativity, Empathy, and AI* (2024 Virginia Tech, CMU, and Penn State), *Generate I Integrate* (Rochester institute of Technology), and *Teaching the Arts in the Age of AI* (2025, University of Maryland) brought together artists, engineers, technologists and experts in many disciplines to explore how the arts are central to grappling with and leveraging the promise of AI.

These convenings and their related publications explored the dichotomy of a higher education culture that is both wary and energized by the promise of AI tools. Conversations have sought to understand the best way to teach it, to leverage it, to enhance creativity, and to use it to show the value of critical thinking in sharp relief. A main takeaway of the convenings was clear — that despite the proliferation of AI and even because of it, intelligence and creativity reside with the human user. AI cannot create anything of impact, because human use creates the context for meaning and purpose. Equipped with this knowledge, students can examine ways that AI can bolster creative potential. Arts-integration elevates integrated knowledge and holistic understanding that can expand their productivity, imagination, and critical examination of AI.

Harp, G., & Stanich, V. (2019). New Perspective, Understanding, Awareness: Impacts of Arts Integration and Interdisciplinary Practice. https://doi.org/10.3998/mpub.11660546.
Hollister, M. (2025) Published, 2025. "Strategic Foresight: AI and Machine Learning" World Economic Forum. https://intelligence.weforum.org/topics/a1Gb0000000pTDREA2
Root-Bernstein, Robert. "STEMM education should get "HACD"" Science. 6 Jul 2018. https://doi.org/10.1126/science.aat8566
Zacharias, K. and Wisnioski, M. Land-Grant (2016) Hybrids: From Art and Technology to SEAD. Leonardo, 52(3), The MIT Press. 2016.

National Summit

Strengthening Arts, Creativity, and AI Integration

On April 11 and 12, 2024, Virginia Tech's Institute for Creativity, Arts and Technology (ICAT) hosted ***Creativity, Empathy, and AI: A National Summit on the Human-AI Creative Partnership***, in collaboration with a2ru, Carnegie Mellon University, and Penn State. The summit drew together practitioners and educators at the nexus of creativity and AI, representing higher education, the media, industry, and federal agencies to focus on advancing human-computer creative partnerships to transform participatory teaching, learning, and creative practice. All told, the group convened 65 delegates from 17 states, representing 18 universities, schools, and colleges, 5 industry organizations, and 9 non-profit organizations or government agencies.

A full description of the 2-day proceedings can be found in the main report[2]. Here, we distill the insights gleaned from the many panels, conversations, and workshops into broad commitments and actionable recommendations that all stakeholders can take to strengthen education and support for work at the intersection of the arts, creativity and AI.

[2] The report can be found at https://a2ru.org/working-group/ai-in-the-arts/

Call to Action for Campus Leaders

Campus leaders must commit to advancing education, research, and policy at the intersection of the arts and AI. This initiative aims to develop AI-literate artists, integrate arts perspectives into all AI discourse. *Recommendations, key commitments, and corresponding actions developed in the 2-day summit are next offered.*

Recommendation 1. Cultivating Artists as Leaders

AI is transforming knowledge, creativity, and expertise. As the emerging workforce for AI, arts students must be equipped to engage creatively, skillfully, and critically with AI technologies.

Commitment 1a. Commit to improving art students' competencies and capacities with AI by:

- Expanding funding for undergraduate AI-focused arts learning, exploration, and research.
- Integrating AI concepts, as well as technical and creative competencies) into arts curricula through experiential learning.
- Developing standards and guidelines for responsible AI use as it meets the arts for research and teaching.

Commitment 1b. Commit to improving all students' competencies and capacities with AI through the Arts by:

- Establishing foundational AI course(s) with an arts perspective.
- Expanding general education to the campus to prioritize the arts and arts-integrated knowledge.
- Developing pathways to internships focused on arts-integration for AI.

Commitment 1c. Commit to incubating AI research and creative practice for arts faculty:

- Providing faculty development opportunities to build capacity for teaching AI through the arts.
- Providing seed grants for AI-related creative research and interdisciplinary projects.
- Fostering knowledge exchange, cross-training and cross-teaching between arts and technical disciplines.

Recommendation 2. Center the Arts in AI in campus activities and initiatives.

As the complexity of AI grows and the effect on work, society, and culture rise, the arts are vital. A fundamental commitment to interdisciplinary exchange in AI development and governance will be essential for socially responsible development, for a prepared workforce and for innovation.

Commitment 2a. Commit to Catalyzing & Resourcing Interdisciplinary Exchange, where the expertise, craft and knowledge of the arts in AI is central by:

- Creating arts-focused research centers and collaborative hubs.
- Funding faculty fellowships that embed arts expertise in AI research.
- Incentivizing cross-disciplinary grant opportunities where the arts is valued and central.

Commitment 2b. Commit to appointing arts faculty to campus leadership roles in AI by:

- Allocating resources for dedicated leadership positions in AI and the arts.
- Establishing AI leadership training programs for arts faculty.
- Ensuring arts faculty are represented in campus, national and international conversations.

Commitment 2c. Commit to participation with a national networks of higher education institutions to develop leadership, professional pipelines, and engage broader communities by:

- Building partnerships across institutions to leadership development and training in the arts.
- Leveraging arts-based community engagement to address local AI challenges.
- Forming industry and policy advisory groups to guide higher education AI initiatives.

Recommendation 3. Commit to Realizing the Potential by Building the Case

Collective advocacy and shared effort are essential to ensure the arts shape AI policy, education, and innovation.

Commitment 3a. Commit to take part in national benchmarking of university efforts to center the arts in the age of AI by:

- Tracking and comparing institutional AI-arts integration efforts.

Commitment 3b. Commit to share open resources between institutions by:

- Developing and distributing arts-based AI curricula and case studies.
- Participating in and/or establishing collaborative resource-sharing networks.

Commitment 3c. Commit to cultivating and deploying arts expertise to advocate for the arts in AI by:

- Enabling government relations teams to train and cultivate arts experts to contribute to policy requests.
- Ensuring representation and involvement of arts faculty in government AI policy discussions and decision making.

Call to Action for Industry and State Leaders

We understand the vital contribution that industry partners and state-level leadership make and the key role they play in forging our future with AI. Representatives from a range of industries, including the financial, entertainment, digital recording, gaming, design, and manufacturing sectors spoke about the importance of partnering and collaborations with art faculty and campus leadership to shape how AI is remaking culture, the economy, and the workforce.

Drawn from these discussions at the event, three recommendations are offered (see over), along with commitments and corresponding actions, that will be key to realizing these partnerships.

Recommendation 4. Strengthen State, Regional and Cross-sector Partnerships.

Coordination between state and regional peer institutions, as well as relevant cultural, community and industry organizations, will only strengthen innovation, develop pipelines into training opportunities, and broaden participation in AI.

- Develop guidelines for AI's impact on creative practices.
- Establish AI consultation practices that include artists and designers.

Recommendation 5. Expand Funding for AI and the Arts.

- Ensure AI-related funding calls explicitly include artists and designers.
- Require funding proposals to disclose AI's impact on creative fields.
- Develop workforce programs that integrate artists into AI innovation.

Recommendation 6. Develop K-16 pipelines into Industry and Profession.

Educational pipelines must prepare students for AI-integrated careers in creative industries. **Industry** should:

- Fund AI-Arts learning communities for K-16 educators.
- Develop internship programs focused on the arts integration for AI to create pathways to workplace opportunities.
- Embed artists in AI research & development settings.
- Ensure learning standards and curricular regulations like the ISTE Standards include participation from arts education professionals in their formation.
- Actively contribute to building relationships between industry and education that can support workforce development through the arts.
- Provide seed grants for AI-related creative research and interdisciplinary projects that support K-16 pipelines.
- Foster knowledge exchange, cross-training and cross-teaching between arts and technical disciplines across the K-16 range.

Policy Recommendations

The *Creativity, Empathy, and AI* closing session reflected on perspectives across industry, the academy and federal agencies. Our discussion focused on the needs to increase the arts' involvement in AI developments and spur continued innovation, the demands of an AI-ready creative workforce, and the opportunities that this would present.

This conversation was synthesized into the following policy recommendations for the government to ensure American competitiveness in AI through the Arts.

[3] This would: 1) Build on current NEA efforts (integrating arts methodologies a part of the National Science Foundation's Directorate for Technology, Innovation, and Partnerships (TIP); and 2) create greater awareness of ongoing NSF/NEA technology collaborations such as Algorithmic Arts workshops and NSF funded Innovation, Culture, and Creativity convenings at UCLA add new programs to the NEA's portfolio that make strategic investments in innovation and creativity around AI and the Arts.

Organize Expert Advisors in the Arts:

Compile a database of experts and early adopters at leading research universities and in industry that have been collaborating at the nexus of arts, design, and technology; whose practices are at the vanguard of exploring generative AI technologies; are helping to create campus policies, and impacting instruction for students and colleagues; and who are actively addressing issues with AI such as bias, environmental impact, and intellectual property. Utilize this expert pool to inform Congressional caucuses, federal funding policies, and national media.

Activate National Caucuses:

From the database, inform a national caucus to convene these arts and AI experts to organize policy recommendations that keep pace with the rapidly evolving technology and its use.

Foster Arts Representation in Funding and Policy:

Incentivize and encourage the inclusion of expert advisors in the arts to ensure the representation of artists, designers, and creative practitioners in funding review panels, policy decisions that concern AI and workforce development and innovation.

Dedicate Stronger Federal Funding Streams:

Allocate additional appropriations to strengthen federal grant programs in research, arts education, and media to fund practice and research at the intersection of arts and AI. Explore feasibility to add new NEA programs that make strategic investments in innovation and creativity around AI and the Arts[3]. Additionally, build budget and incentivize non-arts focused funding agencies, like the NSF, to foster the role of the arts in creating innovation across disciplines in AI. To bolster this effort, connect and convene research institutions, federal agencies and entities such as CreativIT.

Model disclosure of AI Use for government-supported work:

Make grant funding guidelines require an AI disclosure. Empower federal agencies, including the NEA and NSF, to expect that proposals disclose what forms of AI is used within the work; the implications for artists, designers, creative practitioners; and how responsible practices will be used and ensure that they protect artists' work, and the economic prosperity of America's creative economies. This will give the government an actionable tool to safeguard innovation and the American creative economies.

Model Responsible Practice:

Industry is more successful with the arts present and valued[4]. Share information about the implications of AI for artists, designers, creative practitioners, and other community members, and how responsible practices that protect artistic labor and creative economies can be deployed.

Incentivize Workforce Development:

In 2022, the arts and cultural sector in the United States employed nearly 5.2 million workers[5]. The same year, this sector contributed approximately $1.1 trillion to the U.S. economy, accounting for 4.3% of the gross domestic product (GDP)[5]. The arts and entertainment sectors are growing at a rate often over 5% per annum. To incentivize workforce development in technical and creative industries around AI, provide a refundable tax credit for workforce development at the intersection of AI and the Arts, to include: recruiting interns from arts undergraduate and graduate programs; artist-in-residency programs; fellowship programs that support artists (and other creative practitioners)

Incentivize Arts-Integrative Partnerships on AI:

To further strengthen these activities, provide a refundable tax credit for industry investment in regional arts partnerships to incentivize cross-sector and cross-institutional partnerships to address regional and national issues in AI through and with the Arts.

Promote AI Literacy:

As a public service, create ways to train students, citizens, and workers on ethical and productive use of AI tools; and the useful role of AI in creative practice, research, writing, etc. in partnership with government, education and industry sectors prompt and foster discussions about AI literacy in education requirements and standards.

[4] Arts and Cultural Production Satellite Account, U.S. and States, 2022: New statistics for 2022; 2017—2021 Updated (March 2024) https://www.bea.gov/news/2024/arts-and-cultural-production-satellite-account-us-and-states-2022

[5] Arts & Cultural Sector Hit All-Time High in 2022 Value Added to U.S. Economy. www.arts.gov/news/press-releases/2024/arts-cultural-sector-hit-all-time-high-2022-value-added-us-economy

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