



NITRD News Brief

We are pleased to continue NITRD's News Brief that offers insight into the activities NITRD's member agencies are conducting to achieve the Nation's priorities through the lens of the public-facing news sources. These are divided into networking and information technology topics that have been identified as of great importance for improving Americans' daily lives.

For ease of access, under NITRD's logo, the title of each section is listed as a link to that section. The titles of the articles under the section's heading are links that provide immediate access to the news article listed. We hope you find this informative and helpful in your daily activities.

Do you know someone who would like to receive NITRD's weekly news brief? They can email NITRD's IT aficionados at nco@nitrd.gov and voilà they will receive the news brief with the cool technology articles each week!

WOMEN'S HISTORY MONTH: Women in STEM & IT

A Proclamation on Women's History Month, 2024

... During Women's History Month, we celebrate the courageous women who have helped our Nation build a fairer, more just society. Throughout history, the vision and achievements of powerful women have strengthened our Nation and opened the doors of opportunity wider for all of us. Though their stories too often go untold, all of us stand on the shoulders of these sung and unsung trailblazers — from the women who took a stand as suffragists, abolitionists, and labor leaders to pioneering scientists and engineers, groundbreaking artists, proud public servants, and brave members of our Armed Forces. If we want to have the strongest economy in the world, we cannot leave women — half of our workforce — behind. As we implement major pieces of legislation like the Bipartisan Infrastructure Law, the CHIPS and Science Act, and the Inflation Reduction Act, we are ensuring that women get their fair share of opportunities. We are increasing their access to new jobs in sectors where women have been historically underrepresented, like manufacturing, construction, and clean energy. We are championing equal pay, including issuing new regulations that advance pay equity and pay transparency for Federal workers and employees of Federal contractors...

The White House - Feb 29, 2024

FACT SHEET: On Equal Pay Day, the Biden-Harris Administration Announces Actions to Continue Advancing Pay Equity and Women's Economic Security

...On Equal Pay Day, we celebrate how far we have come—and how far we have yet to go—in closing the gender pay gap. Under the Biden-Harris Administration, America has seen an unprecedented—and equitable—economic recovery, building back an economy that is the strongest in the world. Women's labor force participation is the highest it has been in decades, and the gender pay gap is the narrowest it has ever been on record. Women workers are still paid on average only 84 cents for every dollar paid to men. And the disparities are even greater for many women of color. These inequities cost women more than \$1 trillion every year, and add up to hundreds of thousands of dollars lost over the course of a career for individual workers. This Equal Pay Day, the Biden-Harris Administration reaffirms its commitment to tackling pay gaps and announces new efforts to continue to build our understanding of pay disparities, address inequities, and support women's economic security...

The White House - Mar 12, 2024

Navy Scientist Helped Develop GPS

...Gladys West was among a small group of women who did computing for the U.S. military during the early days of the Cold War, including Defense Department work that eventually became the basis for the Global Positioning System. In the early 1960s, she participated in an award-winning, astronomical study that proved the regularity of Pluto's motion relative to Neptune. From the mid-1970s through the 1980s, West used complex algorithms to account for variations in gravitational, tidal and other forces that distort Earth's shape. She programmed the IBM 7030 computer, also known as Stretch, to deliver increasingly refined calculations for an extremely accurate model of the Earth's shape, optimized for what ultimately became the GPS orbit used by satellites. ... Despite having helped to develop GPS, West told the Atlanta Black Star news website that she still prefers using a paper map when she drives...

U.S. Department of Defense - Mar 8, 2024

The Impact of Women Breaking Digital Access Barriers

...For women and girls, achieving digital equity is more than gaining access to the devices and connectivity that empower them – it is also about safeguarding their journey. Digital equity ensures equitable access to education and workforce opportunities. By providing women and girls with access to online learning platforms, educational resources, and digital skills training programs, they get the tools they need to thrive in a technology-driven society. Online spaces provide women and girls with platforms to connect, collaborate, and amplify their voices on issues that matter to them. Digital equity ensures that women and girls have a seat at the table and a voice in online discussions, allowing them to advocate for their rights, share their experiences, and mobilize support for social change. Together with the White House Gender Policy Council (GPC), NTIA recognizes the paramount importance of protecting women and girls as they harness online tools to drive monumental change offline. NTIA's Digital Equity Act Grant Programs provide funds that U.S. States and Territories can use to support digital equity efforts, which may include the integration of safety measures into digital equity training, skills, devices, etc. The GPC works in coordination with the other White House policy councils and across all federal agencies to drive a strategic, whole-of-government approach to advance gender equality and gender equity, as part of the implementation of the first-ever National Strategy on Gender Equity and Equality in the U.S...

National Telecommunications and Information Administration - Mar 8, 2024

Federal Agency Funding Opportunities

Notice of Special Interest (NOSI): Validation of Digital Health and Artificial Intelligence/Machine Learning Tools for Improved Assessment in Biomedical and Behavioral Research

...The purpose of this Notice of Special Interest (NOSI) is to encourage grant applications to support the evaluation of the utility and validity of digital health and artificial intelligence/machine learning (AI/ML) tools and technologies in biomedical and behavioral research. The intent is to support the addition of new measurement modalities to evaluate existing and recently developed but not yet validated digital health and AI tools such as sensor technologies, smartphone applications, software as a medical device (SaMD), and AI/ML algorithms. The range of health research and practice affected by the technological revolution is quite broad, including use in disease surveillance and public health research as well as for medical screening and diagnostic purposes where they can provide tools that can reach diverse users including individuals living in rural and underserved areas and low- and middle-income countries. However, many of these recently released tools are unregulated and their analytical validity, clinical validity, and/or reliability, utility for research, practice, and clinical care have not been examined. Research supported by this NOSI is expected to provide support for analytical and/or clinical validation of recently developed digital health and AI/ML technologies. Digital health and AI/ML technologies are defined broadly to include any health technology leveraging mobile health, health information technology, wearable devices, sensors, telehealth and telemedicine, internet of things (IoT), SaMD and/or related AI/ML algorithms and tools to monitor and manage health across the life course. This notice applies to due dates on or after April 05, 2024, and subsequent receipt dates through July 06, 2025. This NOSI expires on July 06, 2025...

HPC

NASA uses ORNL supercomputers to plan smooth landing on Mars

...Although the space agency has successfully landed nine robotic missions on Mars since its first surface missions in 1976 with the Viking Project, safely bringing humans to Mars will require new technologies for flight through the Martian atmosphere. Since 2019, a team of NASA scientists and their partners have been using NASA's FUN3D software on supercomputers located at the Department of Energy's Oak Ridge Leadership Computing Facility, or OLCF, to conduct computational fluid dynamics, or CFD, simulations of a human-scale Mars lander. Unlike in recent Mars missions, parachutes are not part of the operation. Instead, the leading candidate for landing humans on Mars is retropropulsion — firing forward-facing rockets built into the craft's heat shield to decelerate. The team conducted CFD simulations on the Summit supercomputer at resolutions up to 10 billion elements to characterize static vehicle aerodynamics at anticipated throttle settings and flight speeds ranging from Mach 2.5 down to Mach 0.8, conditions in which the vehicle's rocket engines will be required for initial deceleration. For the 2022 campaign, the team took a major step forward by incorporating the state-of-the-art NASA flight mechanics software known as the Program to Optimize Simulated Trajectories II, or POST2, into the workflow. Moving beyond simulations that assume a static flight condition, the team now sought to "fly" the vehicle in the virtual supercomputing environment. With exascale computing power (a quintillion or more calculations per second) now a reality, the team could afford to reintroduce the desired physical modeling and other lessons learned over the life of the project. In 2023, the team focused on the ultimate simulation they had hoped for years earlier: a truly autonomous, closed-loop test flight leveraging the world's most powerful supercomputing system...

Oak Ridge National Laboratory - Mar 7, 2024

Artificial Intelligence / Machine Learning

FACT SHEET: President Biden's Unity Agenda for the Nation

...President Biden has signed into law more than 400 bipartisan bills to support his Unity Agenda. President Biden believes that the American tech industry is the most innovative in the world. Although tech platforms can help share ideas, stay connected, and access new products and services, they can also divide us and wreak serious real-world harms. The President also recognizes that recent advancements in artificial intelligence (AI), while carrying enormous promise, also exacerbate these risks, introduce new ones, and threaten to increase the influence that some tech companies wield over our lives. President Biden has acted to address the compelling and growing evidence that social media and other tech platforms harm mental health and wellbeing of all Americans especially our kids. President Biden has called for strong federal protections for Americans' privacy. Last month, President Biden took the most significant federal action any President has ever taken to protect Americans' data security. His Executive Order begins a process that will stop the large-scale transfer of this data—which includes intimate insights into Americans' health, location, and finances—to countries like China and Russia. Since taking office, President Biden has moved swiftly to seize the promise and manage the risks of AI. Last year, he issued a landmark Executive Order on AI to ensure that America leads the way toward responsible AI innovation. The Order directed federal agencies to establish new high standards for AI safety and security, protect Americans' privacy, advance equity and civil rights. These actions included using the Defense Production Act to compel developers of the most powerful AI systems to report vital safety information, assessing the risks from AI's use in every critical infrastructure sector, and launching a pilot of the National AI Research Resource...

The White House - Mar 8, 2024

UTSA professors receive NSF/NIST funding for work using AI to improve disaster recovery

...Assistant professors Ao Du and Jiannan Cai in the UTSA Department of Civil & Environmental Engineering, and Construction Management received a \$400,000 grant from the National Science Foundation (NSF) and National Institute of Standards and Technology (NIST) for their research using artificial intelligence (AI) to rebuild transportation infrastructure after an earthquake. The grant is part of the \$7.1 million Disaster Resilience Research Grant program, which is funding research to improve the ability of communities, infrastructure, and buildings to withstand severe natural disasters. This research will introduce risk-aware and explainable AI techniques such that stakeholders will be offered more transparent and risk-informed explanations of the AI-derived policies for trustworthy post-earthquake restoration planning. They will integrate AI models with civil engineering domain knowledge to make sure it reflects the characteristics of the transportation infrastructure network for reliable decision making...

The University of Texas at San Antonio - Mar 5, 2024

Robotics / Autonomous Vehicles

Unmanned Aerial Systems Propel Atmospheric Science Forward

...Unmanned aerial system are aircraft that people can operate remotely from the ground. Building on years of testing, researchers working with the Atmospheric Radiation Measurement (ARM) Department of Energy Office of Science user facility are now gaining access to these helpful tools. To understand our atmosphere's complex processes, researchers must take data in the field – a lot of data. UASs expand the options for data collection. UASs are particularly good for gathering data in hard-to-reach places, like over ice or the ocean. A more recent research campaign was the Evaluation of Routine Atmospheric Sounding Measurements using Unmanned Systems (ERASMUS) campaign. Researchers from the University of Colorado, Sandia National Laboratories, National Oceanic and Atmospheric Administration (NOAA), NASA, and DOE tested a type of small aircraft called the DataHawk. At just under three pounds each, these planes were downright tiny! Researchers managed to fit sensors for taking data on location, altitude, pressure, temperature, humidity, and windspeed...

Department of Energy - Mar 1, 2024

National Science Foundation Funding and Drones to Assess a Cleaner Fertilizer

...A \$4 million National Science Foundation award will utilize biopolymer beads encapsulated by the biofertilizer for controlled release, replacing traditional ammonium nitrate-based fertilizer for a more environmentally friendly microbial fertilizer. The project will also utilize drones photograph the fields where the tests are being conducted. The mechanical engineering department will develop sensors that can measure the performance of the soil, the new fertilizer, its impact on soil and the gasses released by the fertilizer. Students have already started working on the drones and the sensors in addition to machine learning to comb through all of this information. Through what they develop, team will be able to assess the impact of the fertilizers and see how it's affecting the soil health and the plant health in the future...

South Dakota School of Mines and Technology - Mar 5, 2024

New NSF-funded discovery significantly expands the potential that future robots could be made of liquid crystals

...Robots and cameras of the future could be made of liquid crystals, thanks to a new discovery that significantly expands the potential of the chemicals already common in computer displays and digital watches. Liquid crystal molecules flow like a liquid, but they have a common orientation like in solids, and this orientation can change in response to stimuli. They are useful in LCD screens, biomedical imaging instruments, and other devices that require precise control of light and subtle movements. The team discovered they could manipulate the three-dimensional orientation of liquid crystals by controlling light exposures of a photosensitive material deposited on glass. The team used the method to create a microscopic lens of liquid crystals able to focus light depending on the polarization of light shining through it. The findings could lead to the creation of programmable tools that shapeshift in response to stimuli, like those needed in soft, rubberlike robots to handle complex objects and environments. Funding was provided by the U.S. National Science Foundation...

Hub - Johns Hopkins University - Mar 4, 2024

Quantum

Voices from DARPA Podcast Episode 76: The Quantum Logician

...In this episode we hear from quantum physicist Dr. Mukund Vengalattore, a program manager in DARPA's Defense Sciences Office, who oversees a portfolio of fundamental research programs aimed at unlocking new quantum insights and overcoming challenges to enable revolutionary capabilities for defense. We're also joined by Dr. Mikhail Lukin, professor of physics at Harvard University, who led a team on Vengalattore's Optimization with Noisy Intermediate-Scale Quantum devices (ONISQ) program that made a major quantum breakthrough. You'll also hear about "optical tweezers" – which use laser beams that can be controlled to precisely grab and move around individual qubits without destroying their quantumness — and how they helped enable the breakthrough. We suggest starting with our recent Quantum Mechanic episode before you take a deep technical dive to the subatomic level for a fascinating window on the vast frontiers of quantum exploration... and potential applications in the real world...

DARPA - Feb 29, 2024

NSF-Funded Researchers' Approach May Protect Quantum Computers from Attacks

...A team of University of Texas at Dallas researchers and an industry collaborator have developed an approach to give quantum computers an extra layer of protection against adversarial attacks. Their solution, Quantum Noise Injection for Adversarial Defense (QNAD), counteracts the impact of attacks designed to disrupt inference — AI's ability to make decisions or solve tasks. One of the challenges of quantum computers is their susceptibility to "noise," or interference, due to factors including temperature fluctuations, magnetic fields or imperfections in hardware components. Quantum computers also are prone to "crosstalk," or unintended interactions between qubits. The

researchers' approach leverages intrinsic quantum noise and crosstalk to counteract adversarial attacks. The method introduces crosstalk into the quantum neural network (QNN), a form of machine learning in which large datasets train computers to perform tasks, including detecting objects such as stop signs or other computer vision responsibilities. The researchers demonstrated that, during an attack, an AI application was 268% more accurate with QNAD than without it. The research was funded by the National Science Foundation...

The University of Texas at Dallas - Mar 6, 2024

Cybersecurity / Privacy

Sixth Industry Partner – Rockwell Automation – Signs on to the Department of Energy's Cyber Testing for Resilient Industrial Control Systems (CyTRICS™) Program

...The U.S. Department of Energy (DOE) Office of Cybersecurity, Energy Security, and Emergency Response (CESER) announced a collaboration with Rockwell Automation to test multiple critical infrastructure components for cybersecurity vulnerabilities. Rockwell joins five other private sector companies actively participating in DOE's Cyber Testing for Resilient Industrial Control Systems (CyTRICS™) program. Testing will take place at the Idaho National Laboratory. CyTRICS is the testing arm of Energy Cyber Sense, an initiative of President Biden's Bipartisan Infrastructure Law, to build cybersecurity risk management capabilities and resources for the energy sector supply chain at a national scale. The CyTRICS program tests critical system components to identify vulnerabilities before they are exploited, improving the integrity and reliability of the energy system. DOE connects equipment manufacturers, vendors, and utilities with state-of-the-art, intelligence-informed analytic capabilities at its National Laboratories. As testing expands, CyTRICS is working to understand key components used in energy infrastructure and striving to identify systemic supply chain vulnerabilities and to help engineer out cyber weaknesses in next-generation systems...

Department of Energy - Feb 29, 2024

DARPA Selects Small Businesses to Compete in the AI Cyber Challenge

...As part of the AI Cyber Challenge's Small Business Track, DARPA awarded seven companies \$1 million each to develop AI-enabled cyber reasoning systems that automatically find and fix software vulnerabilities at scale. Through the AI Cyber Challenge (AlxCC), DARPA intends to redefine software security by using a competition model to drive innovation among the security and AI communities. DARPA received a robust response of competitive submissions from small businesses for this opportunity. An independent judging panel of government subject matter experts from institutions such as the U.S. Air Force Research Lab, the Office of the Under Secretary of Defense, Research and Engineering and the Advanced Research Projects Agency for Health, reviewed submissions that explained the cyber reasoning system concept for each business...

DARPA - Mar 11, 2024

Information Integrity Research & Development

Department of Homeland Security Grant Diminishing Damage in the Disinformation Age

...The distribution and consumption of misinformation and disinformation poses a threat to many aspects of a free society, and the emergence of generative artificial intelligence multiplies this threat due to the sheer volume it can produce. Kai Shu received a United States Department of Homeland Security grant through the Center for Accelerating Operational Efficiency to create new techniques that will combat the effects of misinformation and disinformation. Existing misinformation detection models that are heavily trained using human-written misinformation may be less effective when identifying misinformation generated by large language models. People will act based on the misinformation that they absorb in areas such as health care, finance, politics, and more. Large language models (LLMs) could compound the issue due to the ease of generating misinformation and the vast scale it can produce. Shu's research could result in new techniques that advance misinformation detection and improve the attribution of misinformation from human-written and LLM-generated sources. The research will also emphasize explainability, ensuring that the developed models are transparent and understandable to facilitate public adoption...

Chicago-Kent College of Law - Mar 6, 2024

5G, Wireless Spectrum, Networking & Communications

Biden-Harris Administration announces new NOAA-NASA agreement to advance North Atlantic right whale conservation technologies as part of Investing in America agenda

...NOAA Fisheries announced a new \$500,000 agreement with NASA's Center of Excellence for Collaborative Innovation (CoECI) to assist NOAA in identifying, advancing the development of and selecting technologies to support endangered North Atlantic right whale recovery efforts. Under this agreement, and in partnership with the private sector, NOAA Fisheries will seek to identify, advance and develop new technologies for satellite tags and improve whale detection to reduce the risk of vessel strikes — one of the primary threats to the survival of North Atlantic right whales. By developing new technologies, NOAA Fisheries can improve the understanding of where whales are located to allow ocean users to respond when right whales are detected. NASA's Center of Excellence for Collaborative Innovation works across NASA and other federal agencies to educate and facilitate the use of open innovation and crowdsourcing. Open innovation provides a unique tool to further technology development and scientific discovery for the benefit of all...

National Oceanic and Atmospheric Administration - Mar 4, 2024

Joint Statement Endorsing Principles for 6G: Secure, Open, and Resilient by Design

...The Governments of the United States, Australia, Canada, the Czech Republic, Finland, France, Japan, the Republic of Korea, Sweden, and the United Kingdom concur on shared principles for the research and development of 6G wireless communication systems; and recognize that by working together we can support open, free, global, interoperable, reliable, resilient, and secure connectivity. Collaboration and unity are key to resolving pressing challenges in the development of 6G, and we hereby declare our intention to adopt relevant policies to this end in our countries, to encourage the adoption of such policies in third countries, and to advance research and development and standardization of 6G networks that fulfill the following shared principles: 1. Trusted Technology and Protective of National Security 2. Secure, Resilient, and Protective of Privacy 3. Global Industry-led and Inclusive Standard Setting & International Collaborations...

U.S. Department of State - Feb 28, 2024

NTIA Unveils Next Steps for National Spectrum Strategy

...The Department of Commerce's National Telecommunications and Information Administration (NTIA) released the National Spectrum Strategy Implementation Plan, a public roadmap to meet the goals of the National Spectrum Strategy. The Implementation Plan details, among other things, the timeline, milestones and responsible agencies for in-depth study of the 2,786 megahertz of spectrum identified in the Strategy to determine suitability for potential new uses. That includes studying the potential for repacking, compression and relocation of airborne radars and other federal systems in the Lower 3 GHz to allow for commercial use. The National Spectrum Strategy identified a pipeline of spectrum bands to study for potential repurposing, called for an improved framework for collaboration on spectrum policy, urged improved spectrum access, and called for the development of a National Spectrum Workforce Plan...

National Telecommunications and Information Administration - Mar 12, 2024

Advanced Manufacturing

NIST to Launch Competition for AI-Focused Manufacturing USA Institute

...The U.S. Department of Commerce's National Institute of Standards and Technology (NIST) plans to announce an open competition for a new Manufacturing USA institute focused on using artificial intelligence (AI) to improve the resilience of U.S. manufacturing. NIST anticipates that \$70 million in federal funds will be invested in this new institute over five years, with an equal or greater contribution from private and other nonfederal funding sources. NIST published a Notice of Intent (NOI) in the Federal Register today to allow potential applicants sufficient time to develop meaningful collaborations among industry, academia, federal laboratories, and state and local government agencies. In addition, NIST expects to open the AI for Resilient Manufacturing competition in early spring 2024...

National Institute of Standards and Technology - Mar 12, 2024

Enabling a New Paradigm for Flexible, Point of Need Design and Manufacturing

...DARPA's new Rubble to Rockets (R2) program aims to overcome current limitations to manufacturing in supply chain-denied environments by developing production and design approaches that can accommodate widely variable input materials. Performers will focus on creating an inexpensive, flexible, and robust platform for the production and characterization of raw material for use in structural fabrication. They will then seek to apply that platform to adaptively update a sounding rocket's structural design. R2 will also look to leverage material informatics and innovative processing and manufacturing techniques to dramatically drive down the timeframes and scale needed for production. DARPA hypothesizes that the analytical framework R2 aims to develop would allow for rapid upgrades to incorporate the growing number of new material developments and fabrication methods. An R2 Industry Day is scheduled for Mar. 18, 2024, to provide information to potential proposers on the objectives of the program...

Microelectronics

DARPA funds new chip built for AI workloads

...The Defense Department's largest research organization has partnered with a Princeton-led effort to develop advanced microchips for artificial intelligence. The new hardware reimagines AI chips for modern workloads and can run powerful AI systems using much less energy than today's most advanced semiconductors. The kinds of chips that power today's most advanced models are too bulky and inefficient to run on small devices, and are primarily constrained to server racks and large data centers. DARPA has announced it will support Verma's work, based on a suite of key inventions from his lab, with an \$18.6 million grant. The DARPA funding will drive an exploration into how fast, compact and power-efficient the new chip can get...

Princeton University - Mar 6, 2024

Climate Change / Green Energy & IT

Biden- Harris Administration Supports Local Projects to Save Energy and Tackle the Climate Crisis as part of Investing in America Agenda

...The U.S. Department of Energy (DOE) announced its fourth round of award recipients through the Energy Efficiency and Conservation Block Grant (EECBG) Program. The EECBG Program will distribute \$17.28 million to reduce carbon emissions and lower overall energy use to help save residents money on energy in the long run. This is the fourth tranche of formula awards granted to EECBG Program eligible entities. This month, grantees will use EECBG Program funds to solarize schools, develop electric transportation incentive programs, provide funding for energy retrofits on low-income homes, make essential energy efficiency upgrades on municipal buildings and facilities, install renewable energy systems at schools, and more. View the full list of EECBG Program-funded projects to date on the website. Additionally, the deadline for Tribes to apply for EECBG Program formula funds has been extended to May 31, 2025. The deadline for local governments – including Puerto Rican municipios – is April 30, 2024.

Department of Energy - Feb 28, 2024

Renewable Energy Is Green, but We Can Make It Greener

...Dozens of researchers at the National Renewable Energy Laboratory (NREL) have spent decades studying the life cycles and environmental impacts of renewable energy technologies. This work—called life cycle assessment—is crucial for making sure energy technologies are as clean as they can be. Life cycle assessment uses a "cradle-to-grave" evaluation of the environmental impacts of a product over three phases of its life. Because renewable energy technologies like wind or solar do not produce emissions during use, most of their environmental impacts occur before and after operation. Life cycle assessment can track manufacturing materials and processes, model supply chain impacts, and evaluate circular economy strategies. These data can inform decisions about research, design, development, and deployment of renewable energy technologies. NREL is the only U.S. Department of Energy (DOE) national laboratory with a dedicated team of researchers working in code-based life cycle assessment, which scales traditional life cycle assessment to accommodate greater amounts of life cycle data, processes, and technologies. This approach creates a more comprehensive picture of a technology's impact across time and location...

National Renewable Energy Laboratory - Feb 29, 2024

DOE-funded researchers work to make algal fuel more efficient, affordable

...A UB-led research project — funded by a \$2 million U.S. Department of Energy grant — is tackling this problem using polyculture farming, artificial intelligence, microscopy and other techniques. The algal cultures are always growing. When the system gets contaminated, the algae get completely wiped out. Many biomass harvesters wait until an infiltration from pests occurs and add chemicals or use other methods to remedy the infection. Bradley's team will examine environmental conditions like temperature, sunlight and wastewater treatment, and track changes in the algae's metagenomes and transcriptomes — DNA and RNA — before and after the organisms are infected. The team at Georgia Tech will use artificial intelligence and deep learning to analyze data and try to develop predictive correlations between algal responses and environmental conditions...

University at Buffalo - Mar 12, 2024

DOE Funds Research that Aims to Improve Efficiency of Solar Cells

...Researchers from the University of Central Florida and the University of Delaware's Institute of Energy Conversion have received a \$1.5 million grant from the U.S. Department of Energy Solar Technologies Office to develop a novel metallization process that could improve the efficiency and lower the cost of solar cells, making solar energy more

accessible to consumers. The metallization process produces the metal contacts that are placed on the surface of silicon solar cells to harvest electrical currents. Researchers will use lasers to heat the copper nanoparticles and reduce the possibility of oxidation. This approach has the potential to increase the efficiency of heterojunction solar cells and dramatically reduce their manufacturing costs lowering the cost barriers that exist for some consumers...
UCF Today - Mar 7, 2024

Digital Health

Improving Cancer Care Through Better Electronic Health Records: Voluntary Commitments and Call to Action

...Electronic health record systems can vary between different doctors, clinics, and labs, and information like test results and disease status often is not accessible across systems. This makes it harder for doctors to make critical treatment and care decisions. That's why the Biden-Harris Administration has kick-started the adoption of United States Core Data for Interoperability Plus Cancer (USCDI+ Cancer), a recommended minimum set of key cancer-related data elements to be included in a person's electronic health record. This important step forward for USCDI+ Cancer builds on another Biden Cancer Moonshot initiative, the Enhancing Oncology Model (EOM). The EOM is a new cancer care model developed by the Centers for Medicare and Medicaid Services (CMS) to lower costs, bring effective patient-centered care, and improve outcomes for those facing a cancer diagnosis. In coordination with the Department of Health and Human Services' Office of the National Coordinator for Health Information Technology (ONC), the National Institutes of Health (NIH), and CMS, the Biden Cancer Moonshot worked with electronic health record developers who have voluntarily committed to adopt and accelerate a set of cancer data elements needed for the EOM...
The White House - Mar 5, 2024

Readout of White House Rare Disease Forum

...The White House Office of Science and Technology Policy hosted the White House Rare Disease Forum to recognize Rare Disease Day and bring together the rare disease community of leaders and innovators to deliver progress. The Advanced Research Projects for Health (ARPA-H) announced a new \$48 million project that invests in a novel, AI-driven platform to repurpose existing drugs to address rare and other diseases currently lacking treatment options. Director of the Advanced Research Projects Agency for Health (ARPA-H) Dr. Renee Wegrzyn spoke at the forum to announce Machine Learning/Artificial Intelligence-Aided Therapeutic Repurposing in Extended Uses (MATRIX), a machine learning platform to rapidly pinpoint and validate existing medications to treat rare diseases...
The White House - Feb 29, 2024

Cancer Research in 3D

...A team of researchers at the Department of Energy's Oak Ridge National Laboratory (ORNL) is working to standardize a process for staining and seeing cancer in a whole new perspective – in 3D (three dimensions). They constructed a breast cancer cell tissue in a special microplate to view it in 3D. A confocal microscope was used to snap Z-stack images - a type of photography that combines several images taken slice by slice over a set spatial interval. Lastly, these images were compiled into a single 3D image that provides a glimpse into the inner workings of this cancer spheroid. A nanobody - a specific part of an antibody - is known to identify a breast cancer-creating receptor, called HER2. Scientists are interested in this receptor because it is overexpressed in certain types of breast cancer. It may be used to deliver therapeutics directly to cancer cells. Cancer cells often have specific surface receptors, thus some cancer treatments have the potential to be more precise...
Department of Energy - Mar 7, 2024

NIH-funded scientists to study real-world eating behaviors using wearable sensors and artificial intelligence

...A new National Institutes of Health-funded project by three scientists at the University of Rhode Island and The University of Texas at Austin aims to shed light on real-world eating behaviors, using AI-enabled wearable technology. The study employs two devices: a typical smart watch and a discreet, custom-made sensor that sits on a participant's jawline. The smart watch will capture the movement of arms and wrists when participants make typical eating gestures, measuring speed and frequency. It will be coupled with data captured by a small, button-sized sensor that will record jaw movements associated with chewing, recording the speed and intensity of the motion...
University of Rhode Island - Mar 4, 2024

ARO/NIH/NSF support AI-powered transfer learning paving the way for new disease treatments

...Northwestern University researchers developed an AI-powered transfer learning approach that repurposes publicly available data to predict combinations of gene perturbations that can transform cell type or restore diseased cells to health. Since the completion of the human genome project 20 years ago, scientists have known that human DNA comprises more than 20,000 genes. However, it has remained a mystery as to how these genes work together to orchestrate the hundreds of different cell types in our body. Researchers train their AI to learn how gene expression gives rise to cell behavior using publicly available gene expression data. The predictive model generated by this learning

process is transferred to specific cell reprogramming applications. In each application, the approach finds the combination of gene manipulations that is most likely to induce the desired cell type transition. Some network models comprise many genes but only say whether a relationship is present or absent. Other models are quantitative and experimentally validated but necessarily involve a small number of genes and relationships. Northwestern's new work retains the strengths of both types of models: it is inclusive of all genes in the cell and quantitative in representing their expressions. The AI-powered approach can be thought of as a platform into which data pertaining to a specific disease in a specific patient may be inserted. The approach may be applied whenever curing the disease can be conceived as a reprogramming problem, as in the case of cancers, diabetes, and autoimmune diseases, which all result from cell dysfunction. The study was supported by the Army Research Office, National Institutes of Health, and the National Science Foundation...

Northwestern University - Mar 4, 2024

Other IT Related

President proposes \$1.6 billion FY 2025 budget for USGS

...The Biden-Harris administration today submitted to Congress the President's budget request for fiscal year 2025, including \$1.6 billion for the U.S. Geological Survey to deliver publicly accessible science that informs the responsible stewardship of our nation's lands, waters and biological resources, and contributes to the safety and security of the American people and the economy. Investments requested in the budget proposal focus on several key aspects of the USGS science portfolio, including: Landsat Next Satellite Mission which has the capability to unlock new applications for sustainable water use and crop production and provide critical information to assess habitat change, climate and snow dynamics, soil health and other variables. The Landsat satellite program, a joint USGS-NASA venture, is the world's longest running space-based Earth observation program. The proposed \$12 million increase for Landsat Next would support the satellite's ground system development in partnership with NASA...

USGS - Mar 11, 2024

NOAA's FY 2025 budget request supports Biden-Harris Administration goals

...NOAA's fiscal year (FY) 2025 budget request proposes \$6.6 billion in discretionary appropriations, an increase of \$187.9 million from the FY 2024 annualized continuing resolution level. The request prioritizes investments in the critical operational and infrastructure activities that support NOAA's ability to carry out its mission. NOAA satellites are critical for NOAA's mission, as well as the security, safety and prosperity of the nation. Data from these satellites provide essential support to all segments of the U.S. economy. Concurrent investments in the current and next generation of environmental satellites, such as continuing the development of the GeoXO satellite program, will provide sustained observations from geostationary orbit to provide improved weather forecasting, real-time monitoring of air quality conditions and improved ocean forecasting and fisheries management...

National Oceanic and Atmospheric Administration - Mar 12, 2024

Statement by Secretary Granholm on the President's Fiscal Year 2025 Budget

...In the President's Budget for Fiscal Year 2025, the Department of Energy's (DOE) Budget makes historic investments that will help the country lay the foundation to build a clean and equitable energy economy and ensure the U.S. reaches net-zero emissions by 2050. The DOE Budget requests \$51 billion in discretionary budget authority for 2025, a \$3.6 billion or 7.5 percent increase from the 2023 level. At DOE, the Budget will: * Make the United States the leading nation for investing in clean energy. * Invest in foundational research and laboratory infrastructure to support innovation across multiple disciplines from Artificial Intelligence and advance computing to nuclear fusion and microelectronics...

Department of Energy - Mar 11, 2024

Justice Department Fiscal Year 2025 Funding Request Budget Proposal to Uphold the Rule of Law, Keep America Safe, and Protect Civil Rights

...The President today submitted to Congress his Budget for Fiscal Year (FY) 2025, which requests a total of \$37.8 billion in discretionary resources, an increase of \$467 million over an FY 2024 Annualized Continuing Resolution, and a total of \$10.5 billion in mandatory funding for the Justice Department. Over \$20.6 billion to expand the capacity of the Department's law enforcement and U.S. Attorneys' Offices to combat a wide range of complex and evolving threats. This includes \$11.3 billion for the FBI and \$2.8 billion for U.S. Attorneys' Offices to carry out their complex missions, including keeping our country safe from violent crime, cybercrime, hate crimes. \$7.7 billion for programs to protect national security, enhance cybersecurity, and combat cybercrime to counter terrorism and keep pace with rising national security threats, while protecting civil rights and civil liberties...

The United States Department of Justice - Mar 11, 2024

Statement by Acting Secretary Su on President Biden's Fiscal Year 2025 Budget

...The Biden-Harris administration today released the President's Budget for Fiscal Year 2025. The budget makes critical, targeted investments in the American people that will promote greater prosperity for decades to come. At the Department of Labor, the budget supports worker empowerment and equity, enhances labor-management collaboration; protects workers' wages, safety and retirement security; and provides high-quality education and training for well-paying jobs. The budget includes investments focused on building infrastructure for responsible artificial intelligence. The budget proposes a new AI policy office within the department to oversee AI initiatives, foster innovation and help mitigate risks associated with AI utilization in the department's programs...

U.S. Department of Labor - Mar 11, 2024

NASA Pi Day Challenge Serves Up a Mathematical Marvel

...March 14 marks the annual celebration of the mathematical constant pi, aka the Greek letter π . Its infinite number of digits is usually rounded to 3.14, hence the date of Pi Day. For some people, the occasion marks an annual excuse to eat pizza or pie (or both), but to truly honor this wondrously useful number, a serving of mathematics is in order, too. NASA is here to help. With the NASA Pi Day Challenge, students can use the mathematical constant to: * determine where the DSOC (Deep Space Optical Communications) technology demonstration aboard NASA's Psyche spacecraft should aim a laser message containing a cat video so that it can reach Earth. * calculate the distance a small rover must drive to map a portion of the lunar surface as part of NASA's CADRE (Cooperative Autonomous Distributed Robotic Exploration) technology demonstration that's headed to the Moon...

National Aeronautics and Space Administration - Mar 7, 2024

DHS Deploys Wildfire Sensors to Mitigate and Manage Fires in Hawai'i, Keep Communities Safe and Resilient

...The Department of Homeland Security (DHS) Science and Technology Directorate (S&T) announced the planned deployment of 80 wildfire sensors and 16 wind sensors across the Hawaiian Islands. The initiative reflects the Department's continued commitment to supporting long-term recovery efforts following the unprecedented August 2023 wildfires on Maui, Hawai'i and driving innovative responses to extreme weather events. They are deploying dozens of state-of-the-art fire and wind sensors in strategic locations across the Hawaiian Islands to enable local officials and firefighters to quickly target an initial blaze and initiate evacuation procedures. As wildfires and other climate change-driven challenges increase in frequency and severity. Hawai'i will be the first location to receive the new Beta wildfire sensors developed by DHS S&T and USFA in coordination with small business N5 Sensors Inc. These wildfire detection sensors identify changes in conditions before wildfires start, providing 24-hour sensing and alerting capabilities. The sensors continuously transmit information and send an email or text notification to a pre-programmed contact when these components are detected. The system housing the sensors is small and compact, able to sit on a utility pole or a traffic light and can work in all weather conditions. Those sensors continue to provide fire alerts and warnings and have collected over 1,000,000 hours of data in the field to enhance the Artificial Intelligence (AI) learning algorithms now being deployed in the Beta version, which requires less solar power to recharge, is equipped with wind sensors to increase the accuracy of wildfire location prediction, and has better ability to operate in areas with limited cellular coverage...

Homeland Security - Mar 8, 2024

STEM / Workforce & IT

NSF names 9 winners of VITAL Prize Challenge

...The U.S. National Science Foundation announced the winners of the Visionary Interdisciplinary Teams Advancing Learning (VITAL) Prize Challenge. Launched in the fall of 2022, the VITAL Prize Challenge takes a novel approach to bringing new, emerging innovations to K-12 learning, with a focus on rapid and continuous learning assessment and mathematical literacy to promote a future science, technology, engineering and mathematics workforce, and other innovative concepts and technologies to support diverse communities of K-12 student learners and teachers. The competition began with 100 teams in the Discovery Round; 54 teams advancing to the semi-final round and 18 teams further advancing to the final round. Earlier this month, the teams presented their minimum viable prototypes in live pitch sessions to a judging panel, resulting in a first-, second- and third-prize team for each track, with grand prize winnings of up to \$250,000 per team...

National Science Foundation - Feb 29, 2024

STEM / Workforce Resources & Opportunities

Biden-Harris Administration Announces the Application Period for Fall Session of the White House Internship Program

...The White House Internship Program is a public service leadership and development program that provides emerging leaders with an opportunity to gain valuable skills while supporting the work of the White House and furthering the priorities of the Biden-Harris Administration. This program provides paid internships across the Executive Office of the President (EOP). Interns participating in the White House Internship Program will support the White House Office and the Office of the Vice President. The application period for the Fall 2024 session will open on Monday, March 11th and will close on Friday, April 5th. Interested candidates can find the Program's online application at [WH.gov/intern](https://www.whitehouse.gov/intern). The website also features additional information about the Program...

The White House - Mar 5, 2024

R&D WORKFORCE TRAINING: FEDERAL AGENCIES' STEM INTERNSHIPS, SCHOLARSHIPS, AND TRAINING OPPORTUNITIES

...Increasing the availability of STEM opportunities is a priority in the Biden Harris Administration. To help facilitate this, the team at NITRD developed a STEM Portal that allows anyone to search for internships and other training opportunities at Federal agencies. The NITRD STEM PORTAL is a searchable database that includes a description, link, and contact information for each program listing. Government sponsored internships and training programs are competitive, but there are many Federal opportunities and the NITRD STEM Portal is here to help.

The Networking and Information Technology Research and Development (NITRD) Program - Jan 1, 2024

FEDERAL HIGH END COMPUTING INFORMATION PORTAL

...Networking and Information Technology Research and Development (NITRD) has a portal that provides information about U.S. Federal government high performance computing activities, including available computing resources; relevant publications; fellowship and training opportunities; and technology transfer, licensing, and industry engagement opportunities. The High End Computing (HEC) Interagency Working Group (IWG) agencies provide the information contained in this portal. HEC IWG agencies are involved in various Federal activities in the HEC area including R&D and providing infrastructure and application. Take a look at it!

Networking and Information Technology Research and Development - Dec 19, 2023

Federal Register: Request for Information (RFI)

Notice of Request for Information (RFI) Related to DOE's Responsibilities on Safe, Secure, and Trustworthy Development and Use of Artificial

...The Department of Energy (DOE) is seeking information to assist in carrying out certain responsibilities under an Executive order (E.O.) titled "Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence" issued on October 30, 2023. Among other things, the E.O. directs DOE to issue a public report within 180 days of the E.O. "describing the potential for Artificial Intelligence (AI) to improve planning, permitting, investment, and operations for electric grid infrastructure and to enable the provision of clean, affordable, reliable, resilient, and secure electric power to all Americans." Comments containing information in response to this notice must be received on or before April 1, 2024...

Federal Register - Mar 1, 2024

Note: Any mention in the text of commercial, non-profit, academic partners, or their products, or references is for information only; it does not imply endorsement or recommendation by any U.S. Government agency.

Innovation Through NITRD Coordination

Networking and Information Technology Research and Development - National Coordination Office, Washington, DC USA

To unsubscribe from this newsletter reply to news-brief@nitrd.gov with the subject unsubscribe