| FEDERAL AGENCY FUNDING OPPORTUNITIES | HPC | ARTIFICIAL INTELLIGENCE / MACHINE LEARNING | QUANTUM | CYBERSECURITY / PRIVACY | 5G, WIRELESS SPECTRUM, NETWORKING & COMMUNICATIONS | MICROELECTRONICS | CLIMATE CHANGE / GREEN ENERGY & IT | DIGITAL HEALTH | OTHER IT RELATED | STEM / WORKFORCE & IT | STEM / WORKFORCE RESOURCES & OPPORTUNITIES | FEDERAL REGISTER: REQUEST FOR INFORMATION (RFI) |

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!

Federal Agency Funding Opportunities

Biden-Harris Administration Launches Artificial Intelligence Cyber Challenge to Protect America's Critical Software
...The Biden-Harris Administration launched a major two-year competition that will use artificial intelligence (AI) to protect the United States' most important software, such as code that helps run the internet and our critical infrastructure. The "AI Cyber Challenge" (AIxCC) will challenge competitors across the United States, to identify and fix software vulnerabilities using AI. Led by the Defense Advanced Research Projects Agency (DARPA), this competition will include collaboration with several top AI companies. This competition, which will feature almost $20 million in prizes, will drive the creation of new technologies to rapidly improve the security of computer code, one of cybersecurity's most pressing challenges...
The White House - Aug 9, 2023

DHS Announces Additional $374.9 Million in Funding to Boost State, Local Cybersecurity

...The Department of Homeland Security announced the availability of $374.9 million in grant funding for the Fiscal Year (FY) 2023 State and Local Cybersecurity Grant Program (SLCGP). State and local governments face increasingly sophisticated cyber threats to their critical infrastructure and public safety. Now in its second year, the SLCGP is a first-of-its-kind cybersecurity grant program specifically for state, local, and territorial (SLT) governments across the country to help them strengthen their cyber resilience. This year's funding allotment represents a significant increase from the $185 million allotted in FY22, demonstrating the Administration and Congress's commitment to help improve the cybersecurity of communities across the nation. State and local governments have until October 6 to apply for this FY23 grant opportunity...
Homeland Security - Aug 7, 2023

Biden-Harris Administration Announces Second Year of SMART Grants Funding Innovations in Transportation Data and Technology Systems
...The U.S. Department of Transportation (USDOT) announced today that it is accepting applications for the second year of its Strengthening Mobility and Revolutionizing Transportation (SMART) Grants Program. The SMART Grants Program was made possible by the Bipartisan Infrastructure Law. The program will fund up to $500 million in grants over five years to conduct demonstration projects focused on advanced smart community technologies and systems that improve transportation efficiency and safety. New technologies like connected vehicles, smart traffic signals, and more have the potential to make our transportation system dramatically safer and more efficient, yet many public sector agencies aren't equipped to harness the full potential of these innovations. This SMART Notice of Funding Opportunity (NOFO) will accept applications for Stage 1 Planning and Prototyping grants. During Stage 1, the SMART program seeks to fund innovation aimed at solving real-world transportation problems and focused on building data and technology capacity and experience for State, local, and Tribal governments. Applications must be submitted by 5:00 PM EDT on Tuesday, October 10, 2023, to the Valid Eval submission website...
Department of Transportation - Aug 8, 2023

HPC

US Army's Ground Vehicle Interface opens high-performance computing doors for a new set of users
...An interface developed at the U.S. Army Engineer Research and Development Center (ERDC) Information Technology Laboratory (ITL) is enabling members of the ground vehicle community to utilize high-performance computing (HPC) tools that were previously only available to scientists and engineers who had extensive knowledge of the underlying high-fidelity physics modeling and simulation codes. The Ground Vehicle Interface (GVI) serves as a user-friendly passageway into the Computational Research and Engineering Acquisition Tools and Environments – Ground Vehicles (CREATE-GV) software suite, allowing for wider use of this game changing toolset. GVI also provides a centralized database that promotes collaboration throughout the Department of Defense (DoD) GV userbase, allowing subject-matter experts to work together across diverse organizations to create and validate vehicle models that can be used by others within the application. Part of the High Performance Computing Modernization Program (HPCMP) CREATE-GV effort, a team of ITL employees created and continues to support GVI. GVI is currently hosted on the ERDC DoD Supercomputing Resource Center-Portal Appliance server, which allows external access to Defense Research and Engineering Network (DREN) resources via OpenID authentication. This environment is an HPCMP resource that also provides various other tools such as web shells and file manager access to HPC file systems...
U.S. Army Engineer Research and Development Center - Aug 7, 2023

Artificial Intelligence / Machine Learning

NASA Helps Spot Wine Grape Disease From Skies Above California Using Remote Sensing and Machine Learning
...Using an airborne science instrument developed at NASA's Jet Propulsion Laboratory in Southern California, researchers have found that they can accurately spot the stealthy signs of a grape disease that inflicts billions of dollars in annual crop damage. The remote sensing technique could aid ground-based monitoring for this and other crops. NASA's JPL and Cornell University Researchers focused on a viral disease called GLRaV-3 (short for grapevine leafroll-associated virus complex 3) that is primarily spread by insects. GLRaV-3 costs the U.S. wine and grape industry some $3 billion in damage and losses annually. The research team used machine learning and NASA's next-generation Airborne Visible/InfraRed Imaging Spectrometer (AVIRIS-NG). The instrument's optical sensor, which records the interaction of sunlight with chemical bonds, has been used to measure and monitor hazards such as wildfires, oil spills, greenhouse gases, and air pollution associated with volcanic eruptions. AVIRIS-NG observed roughly 11,000 acres of vineyards in Lodi, California. The team fed the observations into computer models they developed and trained to distinguish infection. The researchers found that they were able to differentiate non-infected and infected vines both before and after they became symptomatic, with the best-performing models achieving 87% accuracy. Successful early detection of GLRaV-3 could help provide grape growers up to a year's warning to intervene...
National Aeronautics and Space Administration - Aug 4, 2023

RIT faculty member receives NSF award to develop new sensor and signaling technology by exploring harbor seal whiskers

...Qian Xue, associate professor of mechanical engineering at Rochester Institute of Technology, is exploring how the varied sizes, shapes, and directions of whiskers on harbor seals can correlate to better sensor technologies. Xue received a CAREER Award for "Hydrodynamic sensing mechanism of seal whiskers" from the National Science Foundation. Improvements to sensor technology based on bio-inspired designs have become a growing research area. "They distinguish prey by the type of movement and can navigate toward it. Even in low noise ranges, there is still significant detection. A single whisker will not provide much information. You have to rely on the entire architecture," said Xue, whose work involves developing a similarly engineered system and modeling the changing variables due to flow movements to determine sensing capabilities. She will focus on understanding the basic mechanical functions of the arrays. Secondly, she'll incorporate math modeling and artificial intelligence to "teach" her prototype system how vibrations, triggered by fluid dynamics and movement, are captured, interpreted, and identified...
Rochester Institute of Technology - Aug 4, 2023

Quantum

NASA's Space-Based Quantum Science Lab Keeps Getting Better

...A major hardware update for NASA's Cold Atom Lab lifted off aboard a Northrop Grumman Cygnus resupply spacecraft on its way to the International Space Station. About the size of a small refrigerator, the lab is sometimes called the coolest place in the known universe because of its ability to chill atoms to almost absolute zero. It enables dozens of scientists on Earth to do experiments in quantum science. The field of quantum science has led to the development of such everyday technologies as lasers, transistors (a key component in smartphones and computers), GPS satellites, and medical devices. Future advances in the field promise to improve space-based navigation and communications. The new hardware – which the team calls the Quantum Observer Module – incorporates some of the lessons learned over Cold Atom Lab's five years of operations...
National Aeronautics and Space Administration - Aug 4, 2023

With a Lithium-6 Test Case, Quantum Computing Comes to a Historic Nuclear Physics Problem

...In nuclear physics, quantum computing cannot yet solve problems better than classical computing. However, quantum computing hardware continues to advance. This progress makes it interesting to evaluate how these tools could be used to solve physics problems. This research applied quantum computing to determine different energy levels of the lithium-6 nucleus. Nuclear energy levels involve different configurations of protons and neutrons in a nucleus. To prepare the ground state of a nucleus—its lowest energy level—on a quantum computer, scientists must try out many different statistical operations to define that state. Scientists try these alternatives to see which trial order of operations produces an accurate description. This demonstrated how quantum computing can solve real physics problems...
Department of Energy - Aug 7, 2023

Cybersecurity / Privacy

NIST Drafts Major Update to Its Widely Used Cybersecurity Framework

...The world's leading cybersecurity guidance is getting its first complete makeover since its release nearly a decade ago. The National Institute of Standards and Technology (NIST) has released a draft version of the Cybersecurity Framework (CSF) 2.0, a new version of a tool it first released in 2014 to help organizations understand, reduce and communicate about cybersecurity risk. NIST is accepting public comment on the draft framework until Nov. 4, 2023. NIST does not plan to release another draft. A workshop planned for the fall will be announced shortly and will serve as another opportunity for the public to provide feedback and comments on the draft. The developers plan to publish the final version of CSF 2.0 in early 2024...
National Institute of Standards and Technology - Aug 8, 2023

DOD Releases Plan for Implementing Cyber Workforce Strategy

...In February, Deputy Defense Secretary Kathleen H. Hicks signed the DOD Cyber Workforce Strategy, which sets the foundation for how DOD will foster a cyber workforce capable of executing the department's complex and varied cyber missions. Now, the department released a plan for how it will go about implementing that strategy — the "DOD Cyber Workforce Strategy Implementation Plan." The Four Goals in the Cyber Workforce Strategy: (1) Executing consistent capability assessment and analysis processes to stay ahead of force needs. (2) Establishing an enterprise-wide talent management program to better align force capabilities with current and future requirements. (3) Facilitating

a cultural shift to optimize department-wide personnel management activities. (4) Fostering collaboration and partnerships to enhance capability development, operational effectiveness and career broadening experiences...
U.S. Department of Defense - Aug 3, 2023

CISA, NSA, FBI and International Partners Issue Advisory on the Top Routinely Exploited Vulnerabilities in 2022

...In 2022, malicious cyber actors continued exploiting known software vulnerabilities to target unpatched systems and applications, including some vulnerabilities that have been known for more than five years, according to a newly released joint Cybersecurity Advisory (CSA) from U.S. and foreign partner intelligence agencies. The U.S. Cybersecurity and Infrastructure Security Agency (CISA) has released the CSA in partnership with the National Security Agency (NSA), the Federal Bureau of Investigation (FBI), the Australian Signals Directorate's Australian Cyber Security Centre (ACSC), the Communication Security Establishment's Canadian Centre for Cyber Security (CCCS), the New Zealand National Cyber Security Centre (NZ NCSC), and the United Kingdom's National Cyber Security Centre (NCSC-UK). To improve cybersecurity posture, the co-authoring agencies recommend organizations implement the mitigations listed in the advisory primarily by prioritizing scanning for and patching of vulnerable software...
National Security Agency/Central Security Service - Aug 3, 2023

A Call to Action: Bolster UEFI Cybersecurity Now

...Unified Extensible Firmware Interface (UEFI) is a critical software standard in modern computing, yet most people have never heard of it. UEFI is essential to most computers; it replaces the legacy BIOS format, serving as an interface between hardware and operating systems. Attackers have exploited UEFI implementation flaws to gain persistence – that is, the ability to maintain access to a compromised system despite system resets and defensive actions. Based on recent incident responses to UEFI malware such as BlackLotus, the cybersecurity community and UEFI developers appear to still be in learning mode. In particular, UEFI secure boot developers haven't all implemented public key infrastructure (PKI) practices that enable patch distribution (the Linux ecosystem implements it well). The Cybersecurity and Infrastructure Security Agency (CISA) is sharing this information with the community regarding the challenges in responding to UEFI attacks to drive solutions that will provide value to system owners who will benefit from UEFI firmware that can be properly updated...
CISA - Aug 3, 2023

National Cryptologic Museum Exhibit Features Early Atomic Age, Oppenheimer Letter

...Visitors to the National Security Agency's National Cryptologic Museum (NCM) in Annapolis Junction, Maryland, can view artifacts from the early Atomic Age, including rubble from Hiroshima, a piece of the first-ever nuclear reactor, and more. Historical accounts show how thousands of scientists working on the project had to first prove that a chain reaction would work and lead to detonation. Codes and ciphers were vital to describing the scientists' progress. In 1945, a call transferred from Chicago to Boston saying, "The Italian explorer has reached the new world." This coded message informed leaders that Edward Fermi, one of the scientists behind the Manhattan Project, had successfully tested the first-ever nuclear reactor. NCM's Atomic Age exhibit opened earlier this year to memorialize the Trinity Test and the anniversary of Hiroshima, and runs through September...
National Security Agency/Central Security Service - Aug 5, 2023

5G, Wireless Spectrum, Networking & Communications

NASA/NOAA Satellite Captures Data that Shows Fierce Surface Temperatures During Phoenix Heat Wave

...Researchers at NASA's Jet Propulsion Laboratory have created a series of maps showing land-surface temperatures in the Phoenix area in July 2023, when the city experienced a record-breaking run of hot weather. The images reveal the cumulative effect – overnight and across the month – of relentless daytime heating. The data was captured during overnight hours (around 2 a.m.) on several days in July by an instrument called the Visible Infrared Imaging Radiometer Suite (VIIRS) aboard the NOAA-NASA Suomi National Polar-orbiting Partnership (Suomi NPP) satellite managed by the National Oceanic and Atmospheric Administration and NASA. The images show how built surfaces – roads, buildings, airport runways, and the like – retain heat, sometimes hovering around 100 degrees Fahrenheit (38 degrees Celsius) for hours after sunset. VIIRS is one of five instruments aboard the NOAA-NASA Suomi NPP satellite. Short for Suomi National Polar-orbiting Partnership, the spacecraft is one of several in the Joint Polar Satellite System. The images were produced from the VNP21IMG Land Surface Temperature product, which is available at NASA's Land, Atmosphere Near-real-time Capability for EOS (LANCE)...
National Aeronautics and Space Administration - Aug 8, 2023

NOAA, NASA spearheading a massive air quality research campaign this summer with satellites and other technologies

...Scientists from NOAA, NASA and 21 universities from three countries are deploying state-of-the-art instruments in multiple, coordinated research campaigns this month to investigate how air pollution sources have shifted over recent decades. The levels of two of the most harmful types of pollution, ground-level ozone and fine particulates, have decreased only modestly in recent years. Using multiple satellites, seven research aircraft, vehicles, dozens of stationary installations — even instrumented backpacks — scientists will measure air pollution from sources that include transportation, industrial facilities, agriculture, wildfires and consumer products such as paint, pesticides and perfumes. The data will be scrutinized, analyzed and run through sophisticated chemical and weather models by scientists and the U.S. Environmental Protection Agency (EPA) in an effort to improve air pollution forecasts. The data will also be used to evaluate the first observations made by NASA's groundbreaking TEMPOoffsite link instrument — the first geostationary space-borne sensor to continuously measure air pollution across North America. Lessons learned will aid the development of the new GeoXO satellites being jointly developed by NOAA and NASA...
National Oceanic and Atmospheric Administration - Aug 3, 2023

NASA's Deep Space Communications to Get a Laser Boost
...Set to launch this fall, NASA's Deep Space Optical Communications (DSOC) project will test how lasers could speed up data transmission far beyond the capacity of current radio frequency systems used in space. What's known as a technology demonstration, DSOC may pave the way for broadband communications that will help support humanity's next giant leap: when NASA sends astronauts to Mars. The DSOC near-infrared laser transceiver (a device that can send and receive data) will "piggyback" on NASA's Psyche mission when it launches to a metal-rich asteroid of the same name in October. During the first two years of the journey, the transceiver will communicate with two ground stations in Southern California, testing highly sensitive detectors, powerful laser transmitters, and novel methods to decode signals the transceiver sends from deep space. NASA is focused on laser, or optical, communication because of its potential to surpass the bandwidth of radio waves. High-bandwidth laser communications for near-Earth orbit and for Moon-orbiting satellites have been proven, but deep space presents new challenges...
National Aeronautics and Space Administration - Aug 7, 2023

NSF-funded project to increase network bandwidth for data communication
...Texas A&M University researchers have received a grant from the National Science Foundation's (NSF) Advanced Chip Engineering Design and Fabrication program. The three-year project aims to advance the bandwidth and energy efficiency of circuits used to communicate in high-performance computing systems. The research team intends to co-design and integrate electronic and photonic systems, combining custom-designed high-speed electronic front-end transceivers that interface with advanced photonic devices and materials, to increase the data distribution's bandwidth and energy efficiency. Co-designing and co-optimizing these electronic and photonic integrated circuits will allow for scaling in data center traffic capacity to support the always-increasing demand for networked devices driven by emerging applications in artificial intelligence, communications, computing and sensing...
Texas A&M University College of Engineering - Aug 3, 2023

Microelectronics

FACT SHEET: One Year after the CHIPS and Science Act, Biden-Harris Administration Marks Historic Progress in Bringing Semiconductor Supply Chains Home, Supporting Innovation, and Protecting National Security
...One year ago, President Biden signed into law the CHIPS and Science Act (CHIPS), which makes a nearly $53 billion investment in U.S. semiconductor manufacturing, research and development, and workforce. In the one year since CHIPS was signed into law, companies have announced over $166 billion in manufacturing in semiconductors and electronics, and at least 50 community colleges in 19 states have announced new or expanded programming to help American workers access good-paying jobs in the semiconductor industry. This week alone, the Department of Commerce announced the first round of grants under CHIPS to support the development of open and interoperable wireless networks, and the National Science Foundation and Departments of Energy, Commerce, and Defense announced progress toward establishing the National Semiconductor Technology Center, which will help advance America's leadership in semiconductor research and development. Key milestones in the Administration's implementation of CHIPS include...
The White House - Aug 9, 2023

Climate Change / Green Energy & IT

Tracking the impact of ships' icy paths amid climate change using satellite and GPS vessel tracking data

...Even with climate change, sea ice is still a substantial barrier to Arctic vessel traffic. Understanding when and where ships are entering areas of sea ice can help us to better understand potential impacts of vessel traffic in the region. U.S. National Science Foundation-supported researchers point out the difference between what ships could do as ice changes and what they will do can be vastly different. Combining satellite pictures of ice cover with GPS vessel tracking data, the Michigan State University led team was able to analyze how the ships have been behaving as the shipping passages change. What they've found is that many ships are following the ice, fishing close to the edge of ice packs. The researchers also found marked overlap between areas with vessels traveling in sea ice and the overwintering areas for bowhead whales. Noise from large boats can disrupt marine mammals. Ships equipped to break ice potentially could strand both animals and people traveling across the frozen expanses. Increased traffic also raises fear of accidents and oil spills. The new pathways are far away from rescue or clean-up crews. The new analysis points to a growing threat to wildlife species using the receding ice as they travel and breed.
National Science Foundation - Aug 8, 2023

DOE/ORNL/NASA/USDA support improving wildfire predictions with Earth-scale climate models

...Wildfires have shaped the environment for millennia, but they are increasing in frequency, range and intensity in response to a hotter climate. The phenomenon is being incorporated into high-resolution simulations of the Earth's climate by scientists at the Department of Energy's Oak Ridge National Laboratory. The impacts are being incorporated into large-scale simulations of the Earth's climate, such as DOE's Energy Exascale Earth System Model that reflects land processes like the carbon cycle for better predictions of the future climate. E3SM runs on the world's fastest supercomputers, including the Frontier exascale system at ORNL, providing highly advanced simulations to better predict environmental change that could affect the energy sector. ORNL scientist Jiafu Mao focuses on Earth system modeling, improving simulations of land surface responses and feedbacks to environmental change. His machine learning algorithms have supported better projections of wildfire and associated socioeconomic risk that can guide adaption and mitigation strategies. ... Support for the projects comes from the DOE Office of Science's Biological and Environmental Research Program, the U.S. Department of Agriculture Forest Service, the U.S. National Aeronautics and Space Administration, and ORNL Laboratory Directed Research and Development.
Oak Ridge National Laboratory - Aug 4, 2023

MSU receives $4 million in NSF EPSCoR funding to study Mississippi Delta climate impacts, resilience

...Mississippi State University is leading a $4 million, five-year National Science Foundation-funded effort to study climate change impacts in the Mississippi Delta and increase resilience among vulnerable populations. This is part of NSF's Established Program to Stimulate Competitive Research (EPSCoR) Track-2 funding. MSU's capabilities in spatial modeling, computational meteorological modeling, climate smart agriculture, health studies and community engagement will enhance project impacts, while Mississippi Valley State University brings experience working with community organizations on sustainable agriculture and health disparities and USC will conduct ethnographic research studies on vulnerabilities to climate change...
Mississippi State University - Aug 7, 2023

Digital Health

Cell atlases give detailed views of human organs

...To better understand the inner organization of organs, NIH launched a large-scale collaborative project called the Human BioMolecular Atlas Program (HuBMAP). Since its creation five years ago, the project has supported development of research tools and techniques that can map individual cells within organs. Resulting methods and datasets are then shared with the scientific community to enable collaboration and discovery. The project's latest advances include the creation of cellular reference maps for three human organs: the kidney, intestine, and placenta...
National Institutes of Health - Aug 7, 2023

Unlocking the Future of API Security in Healthcare: Collaborative Advancements and Opportunities Post APIsecure 2023

...With Health Level Seven Fast Healthcare Interoperability Resources application programming interfaces (APIs) now widely available across the United States, health IT developers and application developers should keep up-to-date on API security work and practice good API security hygiene when implementing applications and tools that leverage FHIR APIs. The health IT community passed a major milestone on December 31, 2022, when more than 95 percent of certified Health IT developers met the compliance deadline to update and provide their customers with new technology. This included requirements to enable access to information through FHIR APIs. In March 2023, API security professionals from around the world gathered virtually for the 2023 APIsecure conference for two days of wall-to-wall presentations on modern hacking and defense of APIs. Cybersecurity experts, researchers, and senior API leaders described lessons learned and strategies from other industries that can be leveraged in healthcare API security...
Health IT - Aug 7, 2023

DOE's National Labs Together with DOD's DTRA, US Army, and Academic Institutions Guide Vaccine Development with Machine Learning

...People are discovering a vast array of applications for natural language processing tools like generative artificial intelligence (AI) engines. Researchers from Pacific Northwest National Laboratory (PNNL) and Harvard Medical School (HMS) are using this same kind of technology to build a knowledge base in order to guide decision-makers on vaccine development. Through the Rapid Assessment of Platform Technologies to Expedite Response (RAPTER) project, the scientists leverage machine learning and AI to search the scientific literature for knowledge on how to build effective vaccines against new infectious viruses and bacteria. With RAPTER, researchers figure out which strategy would work best for a specific virus or bacteria to maximize the value of immune responses from the host. The tool aims to help produce new vaccines more rapidly and with a reduced timeline and cost. PNNL and HMS scientists define the key terms that connect mechanisms of immunity to experimental measurements. Once the terms are defined, the RAPTER tool can identify the relationships between terms across different scientific publications. This information feeds into the Knowledge Extraction for Strategic Threat Response using Evidence from the Literature (KESTREL) database to build an extensive graph of relationships in the immune response. To help protect us against future pandemics, the Department of Defense's Defense Threat Reduction Agency (DTRA) supports a consortium of research institutes, led by Los Alamos National Laboratory (LANL), in the development of the RAPTER tool. Researchers from Lawrence Livermore National Laboratory, Sandia National Laboratories, U.S. Army Medical Research Institute of Infectious Diseases, Northern Arizona University, Tulane University, University of California San Diego, University of New Mexico and University of Nevada at Reno also contribute to the project...
Pacific Northwest National Laboratory (PNNL) - Aug 9, 2023

NIH & DOD fund new cancer treatment that could get a boost from machine learning

...Thanks to machine learning algorithms, short pieces of DNA floating in the bloodstream of cancer patients can help doctors diagnose specific types of cancer and choose the most effective treatment for a patient. National Institutes of Health and the Department of Defense funded a new analysis technique, created by University of Wisconsin–Madison researchers, that is compatible with "liquid biopsy" testing equipment already approved in the United States and in use in cancer clinics. Liquid biopsies rely on simple blood draws instead of taking a piece of cancerous tissue from a tumor with a needle. Cancerous tumors shed genetic material, called cell-free DNA, into the bloodstream as they grow. But not all parts of a cancer cell's DNA are likely to tumble away. Cells store some of their DNA by coiling it up in protective balls called histones. The scientists used one group of samples to train a machine-learning algorithm to identify patterns among the fragments of cell-free DNA, relatively unique fingerprints specific to different types of cancers. They used the other portion to test the trained algorithm. The algorithm topped 80 percent accuracy translating the results of a liquid biopsy into both a cancer diagnosis and the specific types of cancer afflicting a patient. Liquid biopsies have advantages, in that you don't have to know which tumor site to biopsy at, and it is much easier for the patient to get a standard blood draw.
University of Wisconsin - Madison News - Aug 3, 2023

NIH funds a tiny, flexible spinal probe system that could lead to better therapies

... National Institutes of Health gives a $6.25 million grant to Rice University engineers to work with collaborators optimizing an array of nanoelectronic threads, or NETs for use in the spine. NET probes can provide tunable, localized stimulation of adjacent neurons. Rice neuroengineers also hope to maximize NETs' functional bandwith by integrating them into a larger-scale, data-processing system. The new tool could help neuroscientists crack the secrets of spinal cord function and bring new hope to patients dealing with injuries and other associated medical conditions. The scientists plan to develop a probe design that is small enough to be implanted at different sites on the spine yet has greater depth coverage and enough channels to capture data from neurons in a spinal cord cross section. Scientists plan to not only optimize probe design, but also to incorporate spinal NETs into an extremely miniaturized, integrated data-processing and stimulation-feedback system...
RICE NEWS - Aug 7, 2023

NIH funds an AI model that can help determine where a patient's cancer arose

...In 3 to 5 percent of cancer patients, particularly in cases where tumors have metastasized throughout the body, oncologists don't have an easy way to determine where the cancer originated. These tumors are classified as cancers of unknown primary (CUP). This makes it much more difficult to choose a treatment for those patients, because many cancer drugs are typically developed for specific cancer types. A new approach developed by researchers at MIT and Dana-Farber Cancer Institute may make it easier to identify the sites of origin for those enigmatic cancers. Using machine learning, the researchers created a computational model that can analyze the sequence of about 400 genes and use that information to predict where a given tumor originated in the body. The researchers trained a machine-learning model on data from nearly 30,000 patients who had been diagnosed with one of 22 known cancer types. The researchers then tested the resulting model on about 7,000 tumors that it hadn't seen before, but whose site of origin was known. The model, which the researchers named OncoNPC, was able to predict their origins with about 80 percent accuracy. Another indication that the model's predictions could be useful came from looking at the types of treatments that CUP patients analyzed in the study had received. Those patients who received a treatment consistent with the type of cancer that the model predicted for them fared better than patients who received a treatment typically given for a different type of cancer than what the model predicted for them. The research was funded by the National Institutes of Health...
MIT News - Aug 7, 2023

NIH-Funded Study Looks at How Good Is That AI-Penned Radiology Report?

...AI tools that quickly and accurately create detailed narrative reports of a patient's CT scan or X-ray can greatly ease the workload of busy radiologists. Instead of merely identifying the presence or absence of abnormalities on an image, these AI reports convey complex diagnostic information, detailed descriptions, nuanced findings, and appropriate degrees of uncertainty. In short, they mirror how human radiologists describe what they see on a scan. The team tested various scoring metrics on AI-generated narrative reports. The researchers also asked six human radiologists to read the AI-generated reports. In an effort to design better scoring metrics, the team designed a new method (RadGraph F1) for evaluating the performance of AI tools that automatically generate radiology reports from medical images. They also designed a composite evaluation tool (RadCliQ) that combines multiple metrics into a single score that better matches how a human radiologist would evaluate an AI model's performance. Support for this work was provided by the National Institutes of Health...

Harvard Medical School - Aug 3, 2023

Other IT Related

President Biden Signs Executive Order on Addressing United States Investments In Certain National Security Technologies And Products In Countries Of Concern

...President Joe Biden signed an Executive Order on Addressing United States Investments In Certain National Security Technologies And Products In Countries Of Concernthat authorizes the Secretary of the Treasury to regulate certain U.S. investment ... involving sensitive technologies critical to national security in three sectors: semiconductors and microelectronics, quantum information technologies, and artificial intelligence. The Department of the Treasury simultaneously released an Advanced Notice of Proposed Rulemaking (ANPRM), with proposed definitions to elaborate the scope of the program, which will be subject to public notice and comment, before it goes into effect...

The White House - Aug 9, 2023

Baseball, Baldrige, and Change Management

...The Baldrige Program has observed the attributes and behaviors (attributes) of the leaders of role-model organizations for over 30 years. These attributes, much like the Baldrige Excellence Framework®, have evolved as the internal, external, and competitive environments have evolved. These attributes have been aligned with the 11 Baldrige Core Values. Some of the leadership attributes are...

National Institute of Standards and Technology - Aug 8, 2023

NSF uses Rules of Life research to address societal challenges, from clean water to climate change

...The U.S. National Science Foundation has announced funding for 12 projects under the Using the Rules of Life to Address Societal Challenges program. Totaling over $27 million in investment, this funding supports the use of knowledge learned from studying the Rules of Life — the complex interactions within and between a broad array of living systems across biological scales, and time and space — to tackle pressing societal challenges, including clean water, planet sustainably, carbon capture, biosecurity and antimicrobial resistance to antibiotics. This use-inspired research will be translated into societal impact through engagements with resource managers and community representatives, as well as through education, training and outreach efforts. The awards are: (1) Biosensors for Field Detection of Aqueous Heavy Metals: A Collaboration With Native American Communities; (2) Using Rules of Life to Capture Atmospheric Carbon: Interdisciplinary Convergence to Accelerate Research on Biological Sequestration. Researchers will combine environmental DNA, artificial intelligence and Indigenous knowledge to enhance biological carbon capture over a five-county area of Oregon. (3) AI-Supported Bionic Bivalves for Surface Water Monitoring based on Freshwater Mussel Response to Environmental Change. Researchers will combine environmental sensors on freshwater mussels and artificial intelligence to monitor water quality and identify possible contaminants...

National Science Foundation - Aug 8, 2023

DOE Awards $135 Million For Groundbreaking Research By 93 Early Career Scientists

...The U.S. Department of Energy (DOE) announced the selection of 93 early career scientists from across the country who will receive a combined $135 million in funding for research covering a wide range of topics, from artificial intelligence to astrophysics to fusion energy. The 2023 Early Career Research Program awardees represent 47 universities and 12 DOE National Laboratories across the country. These awards are a part of the DOE's long-standing efforts to develop the next generation of STEM leaders to solidify America's role as the driver of science and innovation around the world...

Department of Energy - Aug 4, 2023

STEM / Workforce & IT

Biden-Harris Administration Launches New Efforts to Strengthen America's K-12 Schools' Cybersecurity

...In the 2022-23 academic year alone, at least eight K-12 school districts throughout the country were impacted by significant cyberattacks. According to a 2022 U.S. Government Accountability Office report, the loss of learning following a cyberattack ranged from three days to three weeks, and recovery time can take anywhere from two to nine months. Further, the monetary losses to school districts following a cyber incident ranged from $50,000 to $1 million. The Administration is taking additional action and committing resources to strengthen the cybersecurity of the nation's K-12 school systems, including: * The U.S. Department of Education and the Cybersecurity and Infrastructure Security Agency (CISA) jointly released K-12 Digital Infrastructure Brief: Defensible & Resilient, the second in a series of guidance documents to assist educational leaders in building and sustaining core digital infrastructure for learning. * CISA is committing to providing tailored assessments, facilitating exercises, and delivering cybersecurity training for 300 new K-12 entities over the coming school year...

The White House - Aug 7, 2023

Young. Female. Scientist. Meet 4 of the Army's Rising Civilian Stars

...More and more women are working for the federal government in the fields of science, technology, engineering and math. According to a 2019 U.S. Equal Employment Opportunity Commission report supplement, women account for only 29.3% of STEM federal workers, with significantly fewer women in technology and engineering fields than expected. As military technology and processes continue to develop, the Defense Department would like to continue growing that number...

U.S. Department of Defense - Aug 8, 2023

Innovative Intern Goes from Mixed Reality Research to Human-Machine Interface to Draw From Latest Technologies to Advance DOE's Idaho Site Mission

...In just a few years, an intern has taken his interest in computer science to the next level in the EM program supporting contractors at DOE's Idaho National Laboratory (INL) Site with virtual reality and other technologies. Rajit Nilkar, a 19-year-old student at Idaho State University, is currently supporting the Calcine Retrieval Project (CRP), one of the most high-profile missions of EM and cleanup contractor Idaho Environmental Coalition at the INL Site. The role of virtual reality, robotics and other technologies will continue to grow in the EM cleanup program across the DOE complex. Nilkar worked with mixed reality, which includes the merging of virtual reality with real-world surroundings. That role positioned him well for his current job with the CRP where he works on human-machine interface (HMI) for a 40-foot-tall bin mockup at the Idaho Nuclear Technology and Engineering Center...

Department of Energy - Aug 8, 2023

Defense Department CIO Signs 2023-2027 DoD Cyber Workforce Strategy Implementation Plan

...The Department of Defense (DoD) Chief Information Officer (CIO) Hon. John Sherman released the 2023-2027 Cyber Workforce (CWF) Strategy Implementation Plan on Aug. 3. The CWF Workforce Strategy Implementation Plan will assist the Department in advancing talent management initiatives aimed at fostering an agile, flexible and responsive cyber workforce. This Implementation Plan sets the foundation for how the Department will successfully execute the 22 objectives and 38 initiatives aligned with the four overarching goals in the CWF Strategy...

Department of the Navy Chief Information Officer - Aug 7, 2023

STEM / Workforce Resources & Opportunities

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 facilita te 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 - Jun 21, 2023

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; HEC relevant publications; fellowship and training opportunities; and technology transfer, licensing, and industry engagement opportunities. The HEC IWG (Interagency Working Group on High End Computing) 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 - Jun 14, 2023

NASA Software Catalog Offers Free Programs for Earth Science, More

...Each year, NASA scientists, engineers, and developers create software packages to manage space missions, test spacecraft, and analyze the petabytes of data produced by agency research satellites. As the agency innovates for the benefit of humanity, many of these programs are now downloadable and free of charge through NASA's Software Catalog. The 2023-2024 Software Catalog contains more than 1,000 programs, including dozens of new packages added this year. NASA scientists and software experts, who use satellite data and more to better understand Earth, will be available to answer questions about free agency resources at 12 p.m. EDT, Wednesday, Aug. 16, during a Reddit "Ask me Anything." Join or follow the discussion online using the /r/AskScience subreddit. The Software Catalog is a product of NASA's Technology Transfer program, managed for the agency by STMD. NASA routinely makes improvements to the Software Catalog website...
National Aeronautics and Space Administration - Aug 9, 2023

AI Researchers Portal

...Our Nation's AI innovation begins with the inspirational ideas of researchers from all across the country. To make it easier for researchers to locate and explore the many Federal resources and funding programs available to support and investigate novel ideas in AI, the National AI Initiative Office, in partnership with Federal departments and agencies and the Networking and Information Technology Research and Development coordination office, established an AI Researchers Portal. This portal connects AI researchers to Federal resources that can support their research, including data, computing, and testbeds, as well as AI-relevant grant funding programs. It also provides searchable repositories of approximately 140 current Federal grant programs relevant to AI, and around 40 Federally-funded testbed resources, in addition to a wide variety of data and computing resources useful for AI research...
National Artificial Intelligence Initiative - Jul 6, 2023

Federal Register: Request for Information (RFI)

Request for Information on Open-Source Software Security: Areas of Long-Term Focus and Prioritization

...The Office of the National Cyber Director (ONCD), the Cybersecurity Infrastructure Security Agency (CISA), the National Science Foundation (NSF), the Defense Advanced Research Projects Agency (DARPA), and the Office of Management and Budget (OMB) invite public comments on areas of long-term focus and prioritization on open-source software security. The security and resiliency of open-source software is a national security, economic, and a technology innovation imperative. Because open-source software plays a vital and ubiquitous role across the Federal Government and critical infrastructure,[1] vulnerabilities in open-source software components may cause widespread downstream detrimental effects. The Federal Government recognizes the immense benefits of open-source software, which enables software development at an incredible pace and fosters significant innovation and collaboration. In light of these factors, as well as the status of open-source software as a free public good, it may be appropriate to make open-source software a national public priority to help ensure the security, sustainability, and health of the open-source software ecosystem. Comments must be received in writing by 5 p.m. ET October 9, 2023...
Federal Register - Aug 11, 2023

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