| FEDERAL AGENCY FUNDING OPPORTUNITIES | HPC | ARTIFICIAL INTELLIGENCE / MACHINE LEARNING | ROBOTICS / AUTONOMOUS VEHICLES | QUANTUM | CYBERSECURITY / PRIVACY | 5G, WIRELESS SPECTRUM, NETWORKING & COMMUNICATIONS | ADVANCED MANUFACTURING | CLIMATE CHANGE / GREEN ENERGY & IT | DIGITAL HEALTH | OTHER IT RELATED | STEM / WORKFORCE & IT | STEM / WORKFORCE RESOURCES & OPPORTUNITIES | UPCOMING CONFERENCES / WORKSHOPS / WEBINARS |

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 Announces $47 Million to Develop Affordable Clean Hydrogen Technologies
...The Biden-Harris Administration, through the U.S. Department of Energy (DOE), today announced up to $47 million in funding to accelerate the research, development, and demonstration (RD&D) of affordable clean hydrogen technologies. Projects funded under this opportunity will reduce costs, enhance hydrogen infrastructure, and improve the performance of hydrogen fuel cells—advancing the Department's Hydrogen Shot goal of reducing the cost of clean hydrogen to $1 per kilogram within a decade. Clean hydrogen—which is produced with zero or near-zero emissions—is set to play a vital future role in reducing emissions from some of the hardest-to-decarbonize sectors of our economy, including industrial and chemical processes and heavy-duty transportation. This funding opportunity, which is administered by DOE's Hydrogen and Fuel Cell Technologies Office (HFTO), focuses on RD&D of key hydrogen delivery and storage technologies as well as affordable and durable fuel cell technologies. Fuel cell RD&D

projects will focus particularly on applications for heavy-duty trucks, to reduce carbon dioxide emissions and eliminate tailpipe emissions that are harmful to local air quality. The application process will include two phases: a Concept Paper phase and a Full Application phase. Concept papers are due on February 24, 2023, and full applications are due on April 28, 2023. ..
Department of Energy - Jan 26, 2023

Biden-Harris Administration Announces Availability of Nearly $1.7 Billion to Modernize Fleets and Deploy Clean Transit Buses Across America

...The U.S. Department of Transportation's Federal Transit Administration (FTA) announced the availability of nearly $1.7 billion to support state and local efforts to modernize aging transit fleets with low- and no-emission buses, renovate and construct bus facilities, and support workforce development. This Notice of Funding Opportunity (NOFO) is for two programs that help transit agencies replace old buses, provide good-paying jobs, improve transit affordability and reliability, invest in community health and environmental justice, and contribute to the President's goal of net-zero emissions by 2050. Complete proposals must be submitted electronically through the GRANTS.GOV "APPLY" function by April 13, 2023...
Department of Transportation - Jan 27, 2023

HPC

This Chilling Effect on Stacked Chips Could Ignite Computing at the Edge

...As the future of microsystems technology converges around three-dimensional heterogeneous integration (3HDI) microelectronics, the scientists, researchers, and engineers working to advance the state of the art – including at DARPA – are arriving at the same challenge: How can we pack the maximum computing into the smallest-possible space, and how can we manage the heat inherently generated by high-powered processing, especially in such a small space? There's increasing recognition that 3DHI – which integrates different circuit types and materials in a 3D stack of tiers – promises tremendous performance advantages. However, thermal management technologies currently limit implementation. While stacking chips will be a critical part of the future of computing, challenges in dissipating the heat of internal processing components remains a barrier to significant progress. In any high-functional computing system, particularly as you make them more compact, there is heat you must get rid of. In a stack today, heat is transmitted to the top and/or bottom, transported away, and ultimately rejected – typically to ambient air. High-powered 3D stacks are not currently possible, because the interior temperatures would become unacceptably high, and exterior heat rejection systems would be unacceptably large. MiniTherms3D aims to address this problem from multiple perspectives – and if successful, would enable countless high-powered, multi-tiered 3DHI applications. For the Department of Defense, that could include advanced, concurrent radar processing for unmanned aerial vehicle platforms, as well as high-speed, high-volume data analysis on the move and at the edge...
DARPA - Jan 25, 2023

ASU professor will develop new computer modeling framework for bio-nanotechnology with NSF CAREER award

...Petr Šulc at Arizona State University was awarded a Faculty Early Career Development (CAREER) award from the National Science Foundation to expand the scope of systems that we study and allow us to design a new class of nanodevices and nanomaterials that incorporate DNA, RNA and proteins, as well as other molecules. DNA and RNA have promising applications in the field of nanotechnology where designed DNA and RNA strands are used to assemble nanoscale structures and devices. The process is called self-assembly, and Šulc and his colleagues use computational modeling and design software to come up with the building blocks that reliably assemble into the shape one wants at nanoscale resolution. They are also interested in the application of machine learning methods to biological sequence ensembles and use neural networks to design DNA or RNA sequences that will specifically bind to a target protein of interest. Construction at the nanoscale, however, presents multiple challenges. As opposed to our macroworld, nanostructures are typically obtained by self-assembly, where individual components randomly diffuse until they meet and assemble into a target structure. In order to obtain more complex structures that will self-assemble in high yields, there is a need for a new simulation framework that can efficiently and accurately represent the assembly and function of the nanostructures. Šulc's lab will develop a new modeling framework that is capable of simulating self-assembled DNA nanostructures...
Arizona State University - Jan 25, 2023

Artificial Intelligence / Machine Learning

Remarks of Dr. Alondra Nelson at the Launch of the NIST AI Risk Management Framework

...Almost a year ago, I had the opportunity to attend a workshop on the NIST AI Risk Management Framework and speak to the way OSTP and NIST were linking arms to accomplish our shared priorities to ensure U.S. leadership in AI research and development. That workshop was a testament to the inclusive character of this effort—a process that has lifted the voices and the values of people and companies from all backgrounds. And it was also an example of how NIST—and the Department of Commerce—and

OSTP have marched together throughout this Administration toward a shared and unified vision for technology. We know that artificial intelligence and other automated systems are shaping almost every part of our lives: The way we work, the way we learn, how we access healthcare, and how we find a good job. We know that data-driven tools do tremendous good, generating text or speech or images, or using data to help farmers or doctors or small businesses across the country. The potential of these tools is extraordinary. ... OSTP has provided extensive input and insight into the RMF as it's been under development to share perspectives and expertise on this framework, to collaborate on this vision, and lay out considerations for thinking about a wide variety of AI risks. It's why, at the same time, NIST was at the table as OSTP developed the Blueprint for an AI Bill of Rights...
The White House - Jan 26, 2023

Statement by National Security Advisor Jake Sullivan on the New U.S.-EU Artificial Intelligence Collaboration

...The United States and the European Union signed an administrative arrangement to bring together experts from across the U.S. and Europe to further research on artificial intelligence (AI), computing, and related privacy protecting technologies. his collaborative effort will drive responsible advancements in AI to address major global challenges with a joint development model and integrated research to deliver benefits to our societies through five key areas of focus: Extreme Weather and Climate Forecasting, Emergency Response Management, Health and Medicine Improvements, Electric Grid Optimization, and Agriculture Optimization...
The White House - Jan 27, 2023

DOD Updates Autonomy in Weapons System Directive

...The Defense Department just updated DoD Directive 3000.09, Autonomy in Weapon Systems, which governs the development and fielding of autonomous and semi-autonomous weapon systems. DOD updated the directive due to advances in technology, changes in the structure of the department and changes in the security environment. The updated directive is one part of a series of DOD policies that establish [good] governance surrounding military uses of autonomous systems and artificial intelligence. Among other things, the changes clarify which autonomous weapon systems will require an additional senior review prior to formal development and before fielding. The directive maintains the requirement that commanders and operators who authorize the use of, direct the use of, or operate autonomous and semi-autonomous weapon systems do so with appropriate care and in accordance with the law of war, applicable treaties, weapon system safety rules and applicable rules of engagement. While not all autonomous weapon systems will incorporate AI-enabled capabilities moving forward, AI is likely to play an increasing role in a range of systems and capabilities...
U.S. Department of Defense - Jan 25, 2023

A New Generation of AI Assistants

...The Perceptually-enabled Task Guidance (PTG) program aims to develop virtual "task guidance" assistants that can work with different sensor platforms to help military personnel perform complex physical tasks and expand their skillsets. Unlike today's AI assistants, PTG technology would be able to see what the user sees and hears what they hear by integrating with a microphone, a head-mounted camera, and displays like augmented reality headsets, to deliver accurate instructions. PTG performers recently demonstrated early successes of their prototypes by using the task of cooking recipes as a proxy for unfamiliar, more complex tasks, such as battlefield medical procedures, military equipment sustainment, and co-piloting aircraft...
DARPA - Jan 25, 2023

Robotics / Autonomous Vehicles

NSF/USDA's National Robotics Initiative 3.0 Funds $1 Million Grant to Develop Robotic System to Assist Poultry Processing

...Arkansas Agricultural Experiment Station researchers received a $1 million grant funded through a joint proposal between the National Science Foundation's National Robotics Initiative 3.0 and the United States Department of Agriculture's National Institute of Food and Agriculture. Researchers will soon begin designing robotics to help alleviate the potential strain on poultry processing plants. To create the automation system, the researchers will customize tactile sensory grippers and develop a high-resolution and high-speed 3D imaging system. The 3D imaging system will allow the robotic arms to differentiate between the topmost chicken and the rest of the pile and will indicate the predetermined key points for chicken grasping. A key challenge is developing a gripper that reliably grasps the chicken without damaging the meat quality...
News - University of Arkansas - Jan 27, 2023

NIH/NSF funded research shows probe can measure both cell stiffness and traction

...Scientists have developed a tiny mechanical probe that can measure the inherent stiffness of cells and tissues as well as the internal forces the cells generate and exert on one another. Their new "magnetic microrobot" is the first such probe to be able to quantify both properties. Most probes can either measure the forces actively generated by the tissues and cells themselves, a trait we call traction, or they can measure their stiffness – but not both. The team developed a precise method for embedding a magnetic

"microcross" into a rigid PEG hydrogel. The probes gave precise information about both the tissue stiffness and traction, revealing for the first time that while malignant tumors may become stiffer in response to surrounding tissues, the cancer cells do not alter their tractions, regardless of their proximity to soft or stiff materials. .... The National Institutes of Health and the National Science Foundation supported this research.
News Bureau - Jan 25, 2023

Quantum

DARPA Collaborates with Commercial Partners to Accelerate Quantum Computing
...DARPA has selected three industry corporations for the Underexplored Systems for Utility-Scale Quantum Computing (US2QC) program. US2QC seeks to determine whether an underexplored approach to quantum computing is capable of achieving utility-scale operation – meaning its computational value exceeds its cost – much faster than conventional predictions. The goal of US2QC is to reduce the danger of strategic surprise from underexplored quantum computing systems. In the initial phase of US2QC, these companies will each present a design concept describing their plans to create a utility-scale quantum computer. This design concept will guide a more rigorous system design focused on all of the components and sub-systems that — once constructed and tested — will show that the utility-scale quantum computer can be built as designed and operated as intended. A DARPA-led test and validation team comprising experts from government laboratories and federally funded research and development centers will evaluate the concepts. US2QC is envisioned to be a five-year program comprising four phases...
DARPA - Jan 31, 2023

Cybersecurity / Privacy

Phishing Resistance – Protecting the Keys to Your Kingdom
...Phishing refers to a variety of attacks that are intended to convince you to forfeit sensitive data to an imposter. These attacks can take a number of different forms; from spear-phishing (which targets a specific individual within an organization), to whaling (which goes one step further and targets senior executives or leaders). How do you keep your keys from falling into the wrong hands? What constitutes a phishing resistant authenticator? NIST Special Publication DRAFT 800-63-B4 defines it as "the ability of the authentication protocol to detect and prevent disclosure of authentication secrets and valid authenticator outputs to an impostor relying party without reliance on the vigilance of the subscriber." To achieve this, phishing resistant authenticators must address the following attack vectors associated phishing: *Impersonated Websites *Attacker-in-the Middle *User Entry *Replay ... Phishing resistant authenticators should be paired with a comprehensive phishing prevention program that includes user awareness and training, email protection controls, data loss prevention tools, and network security capabilities.
National Institute of Standards and Technology - Feb 1, 2023

NSA, CISA, and MS-ISAC Release Guidance for Securing Remote Monitoring and Management Software
...The Cybersecurity and Infrastructure Security Agency (CISA), National Security Agency (NSA), and Multi-State Information Sharing and Analysis Center (MS-ISAC) released the "Protecting Against Malicious Use of Remote Monitoring and Management Software" Cybersecurity Advisory (CSA) today to help network defenders protect against the malicious use of legitimate remote monitoring and management (RMM) software. RMM software is commonly used by managed service providers (MSPs) and help desks to provide security and/or technical support. The software is intended to enable network management, endpoint monitoring, and remote interaction with hosts for IT-support functions. Malicious use of RMM software allows cybercriminals and advanced persistent threat (APT) actors to bypass anti-virus/anti-malware defenses. In October, CISA identified a widespread cyber campaign in which cybercriminal actors leveraged RMM software to gain command and control of devices and accounts. Malicious cyber actors could leverage these same techniques to target National Security Systems (NSS), Department of Defense (DoD), and Defense Industrial Base (DIB) networks and use legitimate RMM software on both work and home devices and accounts. CISA, NSA, and MS-ISAC encourage network defenders to apply mitigations...
National Security Agency/Central Security Service - Jan 25, 2023

NIST's Cybersecurity Insights - Data Analytics for Small Businesses: How to Manage Privacy Risks
...Data security is certainly one aspect of privacy risk, but privacy risks can also arise by means unrelated to cybersecurity incidents. People can experience problems or adverse effects simply from the way organizations use data for business purposes. These "privacy events" can result in a range of problems from customer embarrassment if information is revealed that they didn't anticipate, to more tangible harms, such as discrimination or economic loss. The NIST Privacy Framework's Learning Center has several resources that can help. The Quick Start Guide addresses some key issues when considering what your business needs are when it comes to identifying privacy risks, such as when doing

data analytics. It is laid out in a "Ready, Set, Go" format which makes it easy to approach developing or improving a privacy program. The Learning Center also has helpful videos...
National Institute of Standards and Technology - Jan 27, 2023

DHS sponsorship leads to two Lincoln Laboratory software products honored with national Excellence in Technology Transfer Awards

...The Federal Laboratory Consortium (FLC) has awarded 2023 Excellence in Technology Transfer Awards at the national level to two MIT Lincoln Laboratory software products developed to improve security: Keylime and the Forensic Video Exploitation and Analysis (FOVEA) tool suite. Keylime increases the security and privacy of data and services in the cloud, while FOVEA expedites the process of reviewing and extracting useful information from existing surveillance videos. * Keylime is an open-source software that enables customers with sensitive data to continuously verify the security of cloud machines, and edge and internet-of-things (IoT) devices. To enact its constant security checks, Keylime leverages a piece of hardware called a trusted platform module (TPM). The TPM generates a hash (a string of characters representing data) that will change significantly if data are tampered with. Keylime was designed to make TPMs compatible with cloud technology and reacts to a TPM hash change within seconds to shut down a compromised machine. Keylime also enables users to securely bootstrap secrets without divulging these secrets to the cloud provider. The team worked under a pilot program funded by the U.S. Department of Homeland Security to mature the technology in the open-source community. * FOVEA dramatically reduces the time required for such forensic video analysis. With FOVEA, security personnel can review hours of video in minutes and perform complex investigations in hours rather than days, translating to faster reaction times to in-progress events and a stronger overall security posture. No pre-analysis video curation or proprietary server equipment are required; the add-on suite of video analytic capabilities can be applied to any video stream in an on-demand fashion and support both routine investigations and unforeseen or catastrophic circumstances such as terrorist threats. This suite includes capabilities for jump back, which automatically rewinds video to critical times and detects general scene changes; video summarization, which condenses all motion activity from long raw video into a short visual summary; multicamera navigation and path reconstruction, which tracks activity over place and time and camera to camera in chronological order; and on-demand person search, which scans neighboring cameras for persons of similar appearance. Lincoln Laboratory began developing FOVEA under sponsorship from the U.S. Department of Homeland Security...
MIT News - Jan 26, 2023

5G, Wireless Spectrum, Networking & Communications

America's First Responders Give NIST Their Communications Tech Wish Lists

...An extensive research project conducted by experts at the National Institute of Standards and Technology (NIST) reveals what our country's police, fire, emergency medical and 911 dispatch responders think about the communications technology they use on a regular basis and how they would like developers to improve it in the future. More than five years in the making, the Voices of First Responders project reflects the input of 7,182 respondents to a survey NIST conducted of first responders. The team distilled the study data into six guidelines for future technology development...
National Institute of Standards and Technology - Jan 30, 2023

Treasury Announces Four Additional Capital Projects Fund Awards to Increase Access to Affordable, High-Speed Internet

...The U.S. Department of the Treasury announced the approval of broadband projects in four additional states under the American Rescue Plan's Capital Projects Fund in President Biden's American Rescue Plan. The Capital Projects Fund (CPF) provides $10 billion to states, territories, freely associated states, and Tribal governments to fund critical capital projects that enable work, education, and health monitoring in response to the public health emergency. In addition to the $10 billion provided by the CPF, many governments are using a portion of their State and Local Fiscal Recovery Funds (SLFRF) toward meeting the Biden-Harris Administration's goal of connecting every American household to affordable, reliable high-speed internet. Treasury began announcing state awards in June of last year. To date, 30 states have been approved to invest approximately $4.5 billion of CPF funding in affordable, reliable high-speed internet, which those states estimate will reach more than 1.2 million locations. Treasury will continue approving state and Tribal plans on a rolling basis...
U.S. Department of the Treasury - Jan 26, 2023

Biden-Harris Administration Invests $2.7 Billion to Improve and Expand Rural Electric Infrastructure

...USDA is investing in 64 projects through the Electric Loan Program. This funding will benefit nearly 2 million rural people and businesses. The loans include $613 million to help rural utilities and cooperatives install and upgrade smart grid technologies. Smart grid can be a catalyst for broadband and other telecommunications services in unserved and underserved rural areas in addition to improving grid security and reliability. Nearly half of the awards will help finance infrastructure improvements in underserved communities. USDA's Electric Loan Program can help finance wind, solar and natural gas plants, as well as improvements to produce cleaner energy from coal-fired plants. Local utilities also use the loans to invest in infrastructure to deliver affordable power to millions of residential, commercial and agricultural consumers...
USDA APHIS - Jan 30, 2023

AFRL partners with NASA in CubeSat navigation, communication mission

...The Air Force Research Laboratory's (AFRL) newest sensor, Gridded Retarding Ion Drift Sensor, experiment deployed from the International Space Station Dec. 29, 2022, hosted on NASA's six-unit cube satellite named petitSat, or Plasma Enhancements in the Ionosphere-Thermosphere Satellite. The CubeSat's mission is to study a layer in Earth's upper atmosphere known as the ionosphere to provide insight into space weather disturbances and their impact on navigation and communication systems. The GRIDS sensor is a low size, weight and power sensor built in-house over the past two years that will measure various ions in the ionosphere. The GRIDS sensor is designed to measure how much plasma is present in the atmosphere and in what direction it is moving. This should allow us to detect the presence of plasma bubbles and globs and give us information into how they are formed...

Air Force Link - Feb 1, 2023

NTIA calls for Changes to Boost Competition in Mobile App Markets

...The Department of Commerce's National Telecommunications and Information Administration (NTIA) said in a new report, "Competition in the Mobile Application Ecosystem," that the current mobile app store model – Apple and Google act as gatekeepers over the apps that people and businesses rely on – is harmful to consumers and developers, and recommended policy changes to fix it. The companies' policies have the potential to harm consumers by inflating prices and reducing innovation. As President Biden wrote in his Wall Street Journal op-ed, "we need to bring more competition back to the tech sector." This report identifies important ways we can promote competition and innovation in the app market, which will benefit consumers, startups, and small businesses. The report notes that new legislation and additional antitrust enforcement actions are likely necessary to boost competition in the app ecosystem. The measures identified in the report will help open the app ecosystem to greater competition, innovation and potential benefits for users and developers. NTIA developed the report at the direction of President Biden's 2021 Executive Order on Competition...

U.S. Department of Commerce - Feb 1, 2023

Advanced Manufacturing

NASA Validates Deep Space Missions' Revolutionary Propulsion Design Made By Additive Manufacturing

...A team of propulsion development engineers at NASA have developed and tested NASA's first full-scale rotating detonation rocket engine, or RDRE, an advanced rocket engine design that could significantly change how future propulsion systems are built. The RDRE differs from a traditional rocket engine by generating thrust using a supersonic combustion phenomenon known as a detonation. This design produces more power while using less fuel than today's propulsion systems and has the potential to power both human landers and interplanetary vehicles to deep space destinations, such as the Moon and Mars. The RDRE achieved its primary test objective by demonstrating that its hardware – made from novel additive manufacturing, or 3D printing, designs and processes – could operate for long durations while withstanding the extreme heat and pressure environments generated by detonations. While operating at full throttle, the RDRE produced over 4,000 pounds of thrust for nearly a minute at an average chamber pressure of 622 pounds per square inch, the highest pressure rating for this design on record. The RDRE incorporates the NASA-developed copper-alloy GRCop-42 with the powder bed fusion additive manufacturing process, allowing the engine to operate under extreme conditions for longer durations without overheating...

National Aeronautics and Space Administration - Jan 26, 2023

DOE Announces a Request for Information to Strengthen and Catalyze Place-Based Regional Innovation

...The U.S. Department of Energy (DOE) Office of Technology Transitions and Office of Science jointly released a request for information (RFI) to strengthen place-based innovation activities. DOE is interested in gathering input on how initiatives that promote and strengthen regional ecosystems can power the next wave of American innovation and economic prosperity by leveraging its national laboratory system. Feedback is being sought by March 28, 2023 about how DOE could potentially stimulate innovation in these regions surrounding its national laboratories and sites by: * Accelerating commercialization of breakthrough technologies * Driving development in the industrial and technology sectors of the future, such as innovations in advanced manufacturing...

Department of Energy - Jan 27, 2023

Climate Change / Green Energy & IT

Readout: OSTP Stakeholder Listening Sessions on Climate Services

...In response to the Executive Order (EO) on "Tackling the Climate Crisis at Home and Abroad", and building on prior federal activities in this space, the White House Office of Science and Technology Policy (OSTP), the National Oceanic and Atmospheric Administration (NOAA), and the Federal Emergency Management Agency (FEMA) launched a Fast Track Action Committee on Climate Services (FTAC) under the auspices of the National Science and Technology Council (NSTC). The FTAC is facilitating the development of a national framework for climate services in collaboration with other federal partners. OSTP held a series of listening sessions in December 2022 to meaningfully engage stakeholders on the Biden Administration's efforts to advance the accessibility, usability, and usefulness of federal climate information and services. Participants were asked to provide feedback on the appropriate scope of federal climate services, gaps and limitations of existing services, opportunities for enhancing federal climate services, best practices for co-production of climate information, and training and workforce development needs. The feedback from these listening sessions will inform development of the national framework for climate services report responsive to the EO. OSTP, NOAA, and FEMA are actively developing this report in collaboration with federal partners...
The White House - Jan 27, 2023

Readout of the Executive Meeting of the National Academy of Sciences' Roundtable on Macroeconomic and Climate-related Risks and Opportunities

...Council of Economic Advisers Member Heather Boushey, Office of Management and Budget Chief Economist Zach Liscow, and other officials from across the Biden-Harris Administration attended the Executive Meeting of the Roundtable on Macroeconomic and Climate-related Risks and Opportunities convened by the National Academies of Sciences, Engineering, and Medicine. The President's Executive Order on Climate-Related Financial Risk called on the Council of Economic Advisers and the Office of Management and Budget to "identify the primary sources of Federal climate-related financial risk exposure and develop methodologies to quantify climate risk within the economic assumptions and the long-term budget projections of the President's Budget." New analytic tools to accurately model the macro-economic effects of climate change and the energy transition will enable policymakers to better anticipate, plan for, and manage these emerging risks. While the Interagency Technical Working Group is working in the near-term to further develop methodologies for the integration of climate risks into the President's budget using the existing expertise and resources of the Federal Government, discussions with the NAS Roundtable will provide guidance on longer-term work and development of new tools and models to improve on these near-term approaches...
The White House - Jan 25, 2023

Digital Health

NIH launches intramural bioengineering center to foster technology collaboration across the agency

...The National Institute of Biomedical Imaging and Bioengineering (NIBIB) has established the Center for Biomedical Engineering Technology Acceleration (BETA Center), a new intramural research program to solve a range of medicine's most pressing problems. The center will incorporate a focused engineering approach to accelerate the development, validation and dissemination of cutting-edge technologies. Areas of emphasis will include biomedical imaging, biosensing, engineered and synthetic biology, nanomaterials and biomaterials, artificial intelligence, modeling, computation and informatics. A unique feature of the center will be its ability to rapidly assemble expert teams for purpose-driven technology development to address urgent national and global health needs...
National Institutes of Health - Jan 25, 2023

Berkeley Lab's Ushizima Honored with PMWC Pioneer Award

...Approximately 6.5 million Americans are living with Alzheimer's disease, a disorder that accounts for about 50-60% of all diagnosed neurodegenerative diseases. Because Alzheimer's can only be definitively diagnosed via autopsy, these estimates may not be comprehensive. A new computational pipeline developed by researchers at Berkeley Lab and UCSF use a variety of computer vision techniques, modern deep learning algorithms, and high-performance computing capabilities to process images of large-scale histological datasets — samples captured via autopsy and processed for microscopic examination — to generate quantitative 3D maps of abnormal protein deposits in whole human brains. Abnormal deposits of proteins, like tau inclusions, are hallmarks of Alzheimer's disease and predictors of clinical decline. Abnormal tau protein deposits form tangles inside the brain's neurons; these deposits will cause cell death and brain shrinkage over time. The experts believe that understanding the position of these protein deposits in the brain and how they change over time is critical for gaining insights into how Alzheimer's progresses. Ushizima led an effort to determine a metadata and curation schema for these datasets and developed ways to annotate abnormalities consistently so that computer algorithms could learn to identify deposits of tau proteins...
Berkeley Lab - Jan 25, 2023

Other IT Related

FACT SHEET: United States and India Elevate Strategic Partnership with the initiative on Critical and Emerging Technology (iCET)

...President Biden and Prime Minister Modi announced the U.S.-India initiative on Critical and Emerging Technology (iCET) in May 2022 to elevate and expand our strategic technology partnership and defense industrial cooperation between the governments, businesses, and academic institutions of our two countries. Two National Security Advisors led the inaugural meeting of the iCET in Washington, DC. to discuss opportunities for greater cooperation in critical and emerging technologies, co-development and coproduction, and ways to deepen connectivity across our innovation ecosystems. They noted the value of establishing "innovation bridges" in key sectors, including through expos, hackathons, and pitch sessions. They also identified the fields of biotechnology, advanced materials, and rare earth processing technology as areas for future cooperation...

The White House - Jan 31, 2023

Request for Information: Digital Assets Research and Development

...The White House Office of Science and Technology Policy (OSTP)—on behalf of the Fast Track Action Committee (FTAC) on Digital Assets Research and Development of the Subcommittee on Networking and Information Technology Research and Development (NITRD) of the National Science and Technology Council, the National Science Foundation, and the NITRD National Coordination Office—requests public comments to help identify priorities for research and development related to digital assets, including various underlying technologies such as blockchain, distributed ledgers, decentralized finance, smart contracts, and related issues such as cybersecurity and privacy, programmability, and sustainability as they relate to digital assets. Interested individuals and organizations are invited to submit comments on or before 5 p.m. ET on March 3, 2023...

NITRD - Jan 26, 2023

How does radiation travel through dense plasma?

...In addition to the well-known states of matter — solid, liquid and gas — a fourth state of matter, called plasma, is the most abundant form in the universe. Plasmas are found throughout the solar system in the sun and other planetary bodies. Because dense plasma, a hot soup of atoms with free-moving electrons and ions, usually forms only under extreme pressures and temperatures, scientists are still working to comprehend the fundamentals of this state of matter. Researchers at the University of Rochester studied how radiation travels through dense plasma. The research provides first-of-its-kind experimental data about the behavior of atoms at extreme conditions. The data will be used to improve plasma models, which allow scientists to better understand the evolution of stars and may aid in the realization of controlled nuclear fusion as an alternative energy source. The research was supported by grants from the U.S. National Science Foundation...

National Science Foundation - Jan 31, 2023

DOD Modernization Relies on Rapidly Leveraging Commercial Technology

...The Defense Innovation Unit focuses on leveraging technology from six areas: artificial intelligence/machine learning, autonomy, cyber, energy, human systems and space. The 2022 National Defense Strategy stated that the department must act because market forces are driving new capabilities that could prove useful, particularly in a confrontation with China. In 2022, DIU assisted in transitioning 17 commercial solutions to Defense Department users. Dual-use commercial technologies play an increasingly important role in how DOD solves problems. At DIU, transitioning means going from when a prototype successfully completes and results in a production or service contract with a DOD or U.S. Government partner. This process that typically takes from 12 to 24 months, which is extremely fast in the world of government acquisition. Transitioning commercial technologies includes such innovations as delivering enhanced visibility of cyber threats; using AI to optimize talent discovery; and creating scalable, resilient and responsive communications infrastructure for ground and space systems...

U.S. Department of Defense - Jan 25, 2023

NASA Selects Nine Technologies for Commercial Flight Tests

...NASA's 2022 TechFlights technologies will fly aboard commercial suborbital vehicles such as high-altitude balloons, aircraft following parabolic flight profiles, suborbital rocket-powered systems as well as commercial payload-hosting platforms in orbit, such as spacecraft. By readying these technologies in an environment similar to what they will experience in space, NASA, industry, and universities can help reduce the potential cost and risk before deploying the technologies on longer, more expensive missions in Earth orbit or to the Moon, Mars, and beyond. For the first time, the 2022 TechFlights solicitation included access to test opportunities hosted on commercial platforms and spacecraft in orbit in collaboration with the agency's Small Spacecraft Technology program. The organizations developing the selected technologies will receive a grant or cooperative agreement allowing them to purchase flights from a U.S. commercial flight vendor that best meets their needs. The 2022 solicitation included options for researchers to fly automated technology experiments unattended or to have one or more researchers fly alongside their technology payload on parabolic flights or suborbital rockets. The three topic areas focused on supporting infrastructure and capabilities for a robust lunar economy, services and infrastructure ranging from low-Earth orbit to geosynchronous Earth orbit, and Earth observation architectures, as well as systems to monitor and address climate change...

National Aeronautics and Space Administration - Jan 27, 2023

High-performance visible-light lasers that fit on a fingertip

...Integrated photonics has been revolutionizing the way we control light for applications such as data communications, imaging, sensing and biomedical devices. By routing and shaping light using microscale and nanoscale components, integrated photonics shrinks full optical systems into the size of tiny chips. Despite its success, integrated photonics has been missing a key component to achieve complete miniaturization: high-performance chip-scale lasers. While some progress has been done on near-infrared lasers, the visible-light lasers that currently feed photonic chips are still benchtop and expensive. Since visible light is essential for a wide range of applications, including quantum optics, there is a need for tunable and narrow-linewidth chip-scale lasers emitting light of different colors. NSF-supported researchers have created visible lasers of very pure colors from near-ultraviolet to near-infrared that fit on a fingertip...
National Science Foundation - Feb 1, 2023

Innovation Industry Days 2023 fosters partnerships, delivers solutions to I&MS challenges
...Innovation Industry Days is a networking and educational event designed to foster partnerships and identify solutions to Department of the Air Force problems. With a focus on emerging technologies, Innovation Industry Days included training sessions, speakers and panels, and an expo hall with more than 150 vendors offering a glimpse into successful industry innovation projects helping Air Force or other Department of Defense agencies better execute their missions...
Air Force Link - Jan 27, 2023

STEM / Workforce & IT

NSF's NCSES releases report on diversity trends in STEM workforce and education
...The National Center for Science and Engineering Statistics, or NCSES — part of the U.S. National Science Foundation — released Diversity and STEM: Women, Minorities, and Persons with Disabilities 2023, the federal government's latest and most complete analysis of diversity trends in STEM employment and education. The new report shows more women, as well as Black, Hispanic, American Indian, and Alaska Native people collectively, worked in STEM jobs over the past decade, diversifying that workforce, and are earning more degrees in science and engineering fields at all levels compared to previous years. However, those groups — as well as people with disabilities — broadly remain underrepresented in science, technology, engineering and mathematics when compared to their overall distribution in the U.S. population, reflecting the larger equity challenges our nation faces. The Diversity and STEM report is the first in this series to look beyond careers that require a bachelor's degree. For the first time, all groups whose work requires a high level of technical knowledge, regardless of their degree, are counted in the STEM statistics. Women make up much smaller proportions of the college-educated workforce in the computer and mathematical sciences, biological sciences, physical sciences and engineering compared to the social sciences. About 3% of the STEM workforce are people with disabilities and their representation in the STEM workforce has remained unchanged from a decade ago...
National Science Foundation - Jan 30, 2023

29th US Air Force ATKS Airmen officiate Mescalero Apache Schools drone competition
...The first Aerial Drone Competition at Mescalero Apache High School was sanctioned by the Robotics Education and Competition Foundation and locally organized by Mescalero Apache School teacher, mentor, and coach, Nate Raynor. Airmen from the 29th Attack Squadron volunteered to participate as judges and referees. Native Americans are seriously underrepresented in STEM fields, and partnering with the Air Force will help jumpstart state-wide expansion, providing so many students with opportunities they may have thought they didn't have. Cultivating a connected community is a priority among the entire Air Force, and remains to be an integral part of the mission. One of the many ways the 29th ATKS leads and develops multi-capable Airmen is through volunteer efforts. These efforts foster leadership qualities throughout the squadron such as relationship-building, garnering credibility, empowering others and becoming role models for others...
Air Education and Training Command - Jan 26, 2023

Clarkson Undergraduate Student Receives NASA Award for Satellite Testbed Research
...Megan Michaud, undergraduate researcher in Clarkson's Astronautics and Robotics Laboratory (ASTRO Lab), received the NASA New York Space Grant Women in STEM Fellowship to design a satellite testbed for emulation of small spacecraft orbital motion. Various facilities and equipment have been designed to test satellite orbits; however, there are still limitations, such as emulating full satellite motion in a single system. Mobile robotic systems have the potential to be adapted into a single system capable of simulating all functions of satellite motion. The goal of the satellite testbed is to simulate and experimentally test a nine-degree of freedom mobile manipulator system for emulation of a small spacecraft in a relative motion frame with attitude control capabilities. Once completed, this research will be integrated into research projects conducted by other students in ASTRO Lab who are looking at close-proximity operations in space, such as debris capture and on-orbit object mapping...
Clarkson University - Jan 26, 2023

Howard's Historic $90 Million US Air Force Contract as a University Affiliated Research Center Spotlights STEM and R1 Opportunity

...Howard's recent contract award to be a University Affiliated Research Center (UARC) provides opportunities to advance more Black students in STEM and propel Howard toward a R-1 research status. Howard's UARC will focus on advanced battle management systems (ABMS) and tactical autonomy which the Air Force defines as autonomous systems acting with delegated and bounded authority of humans in support of tactical, short-term actions associated with a longer-term strategic vision in war. The $90 million contract over five years is with the United States Air Force and Department of Defense. Howard is the first HBCU and 15th overall university to participate in the UARC program...
The Dig at Howard University - Jan 26, 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 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 31, 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 - Jan 9, 2023

EPA: Research Training Programs for College and University Students Request for Applications
...The U.S. Environmental Protection Agency's (EPA) Office of Research and Development (ORD) seeks to support a Research Training Program for college and university students. The objective of this Request for Applications (RFA) is to support the training of undergraduate and graduate students on site at EPA's research facility located in Cincinnati, Ohio. Solicitation Closing Date: March 9, 2023.
US EPA - Feb 2, 2023

NIST: Summer High School Intern Program - CLOSING SOON!
...The Summer High School Intern Program (SHIP) is a NIST-wide summer intern program for students who will have finished their junior or senior year of high school by the start of the program and are interested in scientific research only. Students selected for this competitive volunteer program will participate in cutting-edge research at NIST, and will work closely with NIST staff scientists and engineers on a specific research problem. The 8-week program is tentatively scheduled to start on Tuesday, June 20, 2023 to August 14, 2022. The on-line application, including letters of recommendation, is accepting applications only between December 01 and February 13, 2023.
National Institute of Standards and Technology - Jan 31, 2023

NSF 101: High school students, undergraduate and post-baccalaureate scholar funding opportunities
...The U.S. National Science Foundation supports multiple programs for high school, undergraduate and post-baccalaureate students to help fund research opportunities. High school students: * High School Student Research Assistantships (MPS-High) * Research Assistantship for High School Students (RAHSS) | Undergraduate students: * Research Experience for Undergraduates (REU) and Supplemental Awards * Robert Noyce Teacher Scholarship Program | Post-baccalaureate: * Computer and Information Science and Engineering Graduate Fellowships (CSGrad4US) * Geoscience Research Experiences for Post-Baccalaureate Students (GEO-REPS) Supplemental Funding Opportunity * Research and Mentoring for Post-Baccalaureates in Biological Sciences (RaMP) * Post-Baccalaureate Research Experiences for LSAMP Students (PRELS) Supplemental Funding Opportunity...
National Science Foundation - Jan 20, 2023

MSU-USDA Summer Research Experience program now accepting applications: CLOSES Feb 17

...Mississippi State University's Geosystems Research Institute and College of Veterinary Medicine are accepting applications for the 2023 Summer Research Experience program. The program is part of the MSU-USDA Advancing Agricultural Research through High-Performance Computing project and is for masters and Ph.D. students interested in applying high-performance computing within agriculture research. Selected students will spend nine weeks of the summer at MSU working side-by-side with project faculty conducting research in a high-performance computing environment. Applications will be accepted through Feb. 17
Mississippi State University - Jan 31, 2023

Upcoming Conferences / Workshops / Webinars

NIST Innovative Technology Showcase #2: Mar 13

...The NIST Technology Partnership Office (TPO) oversees the technology transfer processes that NIST researchers use to develop collaborative relationships with regional, national, and global partners. This results in fostering entrepreneurship, small business growth, and economic strength. TPO will present the "NIST Innovative Technologies Showcase 2". This event will include: * Select presentations by NIST researchers describing cutting-edge technologies * Panel Discussion to discover how to collaborate or license a NIST technology. VIRTUAL EVENT March 13, 2023 3:00 - 4:30pm EDT
National Institute of Standards and Technology - Feb 2, 2023

NIST: 3rd High-Performance Computing Security Workshop Mar 15-16

...NIST HPC Security Working Group (WG) has been leading the effort to create a comprehensive and reliable security guidance for HPC systems. As part of the Working Group mission and to reach greater HPC scientific community, NIST, in collaboration with National Science Foundation (NSF), will host the 3rd High-Performance Computing Security Workshop on March 15-16, 2023. The workshop aims to listen to community's needs and feedbacks, report and reflect on the ongoing activities at HPC Security WG, and define and discuss future directions with stakeholders from industry, academia, and government.
National Institute of Standards and Technology - Jan 9, 2023

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