

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

NREL Notice of Intent Invites US Manufacturers To Develop and Commercialize Distributed Wind Energy Technology

...The National Renewable Energy Laboratory (NREL) has issued a notice of intent under the Competitiveness Improvement Project (CIP) calling for U.S. manufacturers of small- and medium-sized wind turbine technology to develop project ideas and teams in preparation for a 2024 request for proposals. Managed by NREL on behalf of the U.S. Department of Energy's (DOE's) Wind Energy Technologies Office, CIP awards cost-shared subcontracts and national laboratory technical support to component suppliers and manufacturers of small- and medium-sized wind turbines...

National Renewable Energy Laboratory - Nov 20, 2023

HPC

Two SBU Research Projects Given DOE Supercomputer Access

...The Office of Science at the Department of Energy (DOE) has granted supercomputer access to two research projects led by Stony Brook University investigators as part of its Innovative and Novel Computational Impact on Theory and Experiment (INCITE) program. Both researchers along with their teams will be awarded a portion of the 60 percent available time on the supercomputers at DOE's Argonne and Oak Ridge National Laboratories. Part of the work involved in their projects will be completed with one of the DOE's computers at Oak Ridge called the Frontier, which currently is the fastest and most powerful computer in the world...

Stony Brook University - Nov 21, 2023

DOE funding and new computer software leads to 200-year-old geology mystery resolved

...For 200 years, scientists have failed to grow a common mineral in the laboratory under the conditions believed to have formed it naturally. The secret to finally growing dolomite in the lab was removing defects in the mineral structure as it grows. To simulate dolomite growth accurately, the researchers needed to calculate how strongly or loosely atoms will attach to an existing dolomite surface. The most accurate simulations require the energy of every single interaction between electrons and atoms in the growing crystal. Such exhaustive calculations usually require huge amounts of computing power, but software developed at U-M's Predictive Structure Materials Science (PRISMS) Center offered a shortcut. That shortcut made it feasible to simulate dolomite growth over geologic timescales. ... The research was funded by the U.S. Department of Energy...

University of Michigan News Service - Nov 23, 2023

Artificial Intelligence / Machine Learning

United States Endorses Responsible Al Measures for Global Militaries

...The Defense Department has led the world through publishing a series of policies on military AI and autonomy, most recently the Data, Analytics, and AI Adoption Strategy released on November 2. These guidelines include ensuring that military AI systems are auditable, have explicit and well-defined uses, are subject to rigorous testing and evaluation across their lifecycle, have the ability to detect and avoid unintended behaviors, and that high-consequence applications undergo senior-level review. The 10 measures are: (1) States should ensure their military organizations adopt and implement these principles for the responsible development, deployment, and use of AI capabilities. (2) States should take appropriate steps, such as legal reviews, to ensure that their military AI capabilities will be used consistent with their respective obligations under international law, in particular international humanitarian law. States should also consider how to use military AI capabilities to enhance their implementation of international humanitarian law and to improve the protection of civilians and civilian objects in armed conflict...

U.S. Department of Defense - Nov 22, 2023

Guidance for Securing Al Issued by NSA, NCSC-UK, CISA, and Partners

...The National Security Agency (NSA), UK National Cyber Security Centre (NCSC-UK), U.S Cybersecurity and Infrastructure Security Agency (CISA), and other partners have released "Guidelines for Secure AI System Development," a Cybersecurity Information Sheet (CSI). According to the CSI, AI systems are subject to security vulnerabilities that need to be considered alongside standard cyber threats. For example, AI systems are vulnerable to "adversarial machine learning" (AML) attacks, which exploit fundamental vulnerabilities in machine learning (ML) systems, including hardware, software, workflows, and supply chains. The CSI indicates that secure by design principles are applicable to AI systems...

National Security Agency/Central Security Service - Nov 27, 2023

How Many U.S. Businesses Use Artificial Intelligence?

...Only 3.8% of businesses reported using AI to produce goods and services, according to the most recent Business Trends and Outlook Survey (BTOS). The BTOS provides a bi-weekly snapshot of AI and its use by businesses. It measures business conditions and projections on an ongoing basis and is representative of all nonfarm employer businesses in the 50 states, the District of Columbia and Puerto Rico. While it may seem like AI is everywhere, BTOS shows the opposite. Based on survey responses, only an estimated 3.9% of businesses used AI to produce goods or services between Oct. 23 and Nov. 5, 2023...

U.S. Census - Nov 28, 2023

Want Better AI? Get Input From a Real (Human) Expert

...Can AI be trusted? It's a question that even some AI systems ask themselves. Many machine-learning systems create what experts call a "confidence score," a value that reflects how confident the system is in its decisions. A low score tells the human user that there is some uncertainty about the recommendation; a high score indicates to the human user that the system, at least, is quite sure of its decisions. Scientists at the Department of Energy's Pacific Northwest National Laboratory have put forth a new way to evaluate an AI system's recommendations. They bring human experts into the loop to view how the ML performed on a set of data. The result of having a human look over the shoulder of the AI system? Humans predicted the AI system's performance more accurately...

Pacific Northwest National Laboratory (PNNL) - Nov 20, 2023

NSF and ARO fund project to defend your voice against deepfakes

...Recent advances in generative artificial intelligence have spurred developments in realistic speech synthesis. This technology has led to the emergence of deepfakes, in which synthesized speech can be misused to deceive humans and machines for nefarious purposes. Ning Zhang, at Washington University in St. Louis, developed a tool called AntiFake, a novel defense mechanism designed to thwart unauthorized speech synthesis before it happens. Unlike traditional deepfake detection methods, which are used to evaluate and uncover synthetic audio as a post-attack mitigation tool, AntiFake takes a proactive stance. It employs adversarial techniques to prevent the synthesis of deceptive speech by making it more difficult for AI tools to read necessary characteristics from voice recordings. The code is freely available to users. Currently, AntiFake can protect short clips of speech, taking aim at the most common type of voice impersonation. This work was supported by the National Science Foundation and Army Research Office.

The Source - Washington University in St. Louis - Nov 27, 2023

Robotics / Autonomous Vehicles

EM Worker Safety is Central to Wearable Robotics Team Efforts

...A team exploring the use of wearable devices to improve worker safety recently gathered at Florida International University (FIU) to discuss efforts to develop, evaluate and deploy the technology at EM cleanup sites. The wearable robotics program, which began in fiscal year 2020, is exploring the use of commercially available devices as well as custom solutions tailored to the unique needs of EM workers, such as compatibility with personnel protective equipment and operating in secure environments. In addition to FIU, the team includes representatives from Sandia National Laboratories, which leads the group's efforts, Los Alamos and Savannah River national laboratories, Georgia Institute of Technology, and Florida Institute for Human and Machine Cognition (IHMC)...

Department of Energy - Nov 21, 2023

Unmanned Ground Vehicles successfully demonstrated at PNTAX '23

...The Robotics for Engineer Operations (REO) team at the U.S. Army Engineer Research and Development Center (ERDC) successfully conducted demonstrations of their Unmanned Ground Vehicles (UGV) without the use of the Global Navigation Satellite System (GNSS) at the Position, Navigation, Timing Assessment Experiment (PNTAX). PNTAX is part of Army Futures Command's campaign of persistent experimentation and continuous learning, where participants field-test their technology to understand its operational effectiveness in a denied and degraded environment. This experiment provided the opportunity to run tests focused on localization and freedom of movement of an UGV on challenging roads and rugged combat trails, while access to standard navigation was not available. At PNTAX, the robotic platforms operated autonomously on combat trails, and the developed algorithms were minimally impacted by the active GPS jamming/spoofing signals present. Data from the experiment will also be utilized by AFC's Next Generation Combat Vehicles Cross-Functional Team, which is writing the requirements for the Army's Robotic Combat Vehicle program. As part of the Army's Human Machine Integrated Formations (HMIF) concept, RCVs will be fielded in Brigade Combat Teams and will deliver increased situational awareness, lethality, and tactical options for Army formations in support of multi-domain operations. Its operators will remotely control RCVs or task them to operate semi-autonomously. Variants will serve as "scouts" or "escorts" for manned fighting vehicles...

U.S. Army Engineer Research and Development Center - Nov 21, 2023

NSF-funded project uses drones and found that slash-and-burn agriculture can increase forest biodiversity

...The slash-and-burn agriculture practiced by many Indigenous societies across the world can actually have a positive impact on forests. Researchers found that in areas of the rainforest in which Indigenous farmers using slash-and-burn techniques created intermediate-sized farm patches – neither too small nor too large – there were increases in forest plant diversity. This contradicts what had long been the standard view in the past. The researchers used a variety of techniques, including remote sensing from drones and mapping on the ground, to estimate the number of plant species in specific areas and link that to landscape disturbance in the primary swidden use areas of both villages in the study. During April 2018, the researchers used long-range drones flying at 1,500 feet and fitted with a 5-band multispectral sensor to scan the study area. The sensors picked up small variations in the light reflected from trees and other plants that make up the overstory of the forests – what scientists call spectral diversity. Because the drones flew so close to the top of the overstory, the sensors were able to capture high-resolution imagery that is not available by satellites. The study was funded by the National Science Foundation...

Quantum

DOE/NSF/AFOSR funding provides direct evidence of a 'strange metal' that is strangely quiet in noise experiment

...A "strange metal" quantum material proved strangely quiet in recent quantum noise experiments at Rice University. The measurements of quantum charge fluctuations known as "shot noise" provide the first direct evidence that electricity seems to flow through strange metals in an unusual liquid-like form that cannot be readily explained in terms of quantized packets of charge known as quasiparticles. The experiments were performed on nanoscale wires of a quantum critical material with a precise 1-2-2 ratio of ytterbium, rhodium and silicon. The material contains a high degree of quantum-entanglement that produces a very unusual ("strange") temperature-dependent behavior that is very different from the one in normal metals such as silver or gold. ... The research was supported by the Department of Energy's Basic Energy Sciences program, the National Science Foundation, and the Air Force Office of Scientific Research...

RICE NEWS - Nov 23, 2023

Cybersecurity / Privacy

The Department of the Navy releases inaugural Cyber Strategy

...Secretary of the Navy Carlos Del Toro released the inaugural Department of the Navy Cyber Strategy. The strategy features seven distinct lines of effort focused on enhancing the naval services' cyber posture in alignment with the National Defense Strategy and Department of Defense Cyber Strategy. The seven lines of effort in this strategy are improve and support the cyber workforce; defend enterprise IT, data and networks; secure Defense Critical Infrastructure and weapon systems; conduct and facilitate cyber operations; partner to secure the Defense Industrial Base; and foster cooperation and collaboration. The Office of the Principal Cyber Advisor and Office of the Chief Information Officer jointly developed the strategy, ensuring it covers all facets of the Department of the Navy's cyberspace activities...

Department of the Navy Chief Information Officer - Nov 21, 2023

5G, Wireless Spectrum, Networking & Communications

Biden-Harris Administration Awards \$13M from Wireless Innovation Fund

...The Department of Commerce's National Telecommunications and Information Administration (NTIA) awarded \$13 million in the second round of grants from the Public Wireless Supply Chain Innovation Fund's first Notice of Funding Opportunity. The \$1.5 billion Wireless Innovation Fund supports the development of open and interoperable wireless networks as part of the Biden-Harris Administration's Investing in America agenda. Open and interoperable wireless equipment will help drive competition, strengthen global supply chain resilience and lower costs for consumers and network operators. The funding totals \$13,008,526 and was awarded to seven projects across six states. NTIA previously awarded nearly \$5.5 million in the first round of funding in August, bringing the total of Wireless Innovation Fund awards to more than \$18 million...

National Telecommunications and Information Administration - Nov 28, 2023

Researchers employ state-of-the-art NASA technologies to measure biodiversity across the U.S.—with space lasers

...Currently, more than one million species are on the verge of extinction due primarily to habitat destruction, especially the conversion of forests to agriculture, and overexploitation like hunting and fishing. NAU research professor Chris Hakkenberg illustrates how state-of-the-art technologies can be used to mitigate the impact of global biodiversity loss: by monitoring biodiversity across the United States using NASA's Global Ecosystem Dynamics Investigation (GEDI) space-borne lidar—a safe, invisible laser that can detect 3D forest structure from the International Space Station. This study was inspired by coordinated international efforts, including the Convention on Biological Diversity's plea to scientists to explore using satellite remote sensing to monitor trends in global biodiversity. "We are using NASA's Global Ecosystem Dynamics Investigation (GEDI) space-borne lidar to estimate the entire 3D structure of forests which we can then use to predict the biodiversity contained within," Hakkenberg said. GEDI emits invisible laser pulses toward the Earth's surface, and like radar, tracks the time difference between when the laser is emitted and when it returns to measure how far those sensed objects are. Hakkenberg and colleagues were able to use these 3D waveform profiles of forest structure to model a relationship between tree structure and tree biodiversity measured

with field data from the National Ecological Observation Network across the United States. The researchers hope this study moves the needle on continental-scale biodiversity research by employing state-of-the-art NASA technologies...

Northern Arizona University - Nov 27, 2023

NSF funds WVU researchers who aim to cut through radio interference that obscures signal detection

...With \$510,000 in funding support from the National Science Foundation, a West Virginia University research team is working on ways to eliminate the rampant human-made radio interference from cell phones, televisions and radar systems that can block the detection of radio signals by astronomers. New methods driven by the project's results will be made freely available to the astronomical community and could also be used in other fields such as radar imaging, satellite communication, sound navigation ranging and other sensor applications. Due to the transient nature of fast radio bursts, removing radio interference is vital for survey sensitivity as it can prevent astronomers from observing parts of the universe...

WVU - Nov 27, 2023

Advanced Manufacturing

CHIPS for America Releases Vision for Approximately \$3 Billion National Advanced Packaging Manufacturing Program

...The Biden-Harris administration announced its vision to boost U.S. capabilities for advanced packaging, a key technology for manufacturing state-of-the-art semiconductors. The approximately \$3 billion in funding for the National Advanced Packaging Manufacturing Program will be used to drive U.S. leadership in advanced packaging. To outline the vision, CHIPS for America published "The Vision for the National Advanced Packaging Manufacturing Program" (NAPMP), which details the vision, mission and objectives for the advanced packaging program created by the bipartisan CHIPS and Science Act. The NAPMP is one of four CHIPS for America R&D programs that together are establishing the innovation ecosystem needed to ensure that American semiconductor fabrication facilities, including those funded by the CHIPS Act, produce the world's most sophisticated and advanced technologies. Advanced packaging is a cutting-edge design and manufacturing method that places multiple chips with a variety of functions in a densely interconnected two- or three-dimensional "package." This design paradigm can help the sector achieve the ever denser, smaller dimensions that the most advanced semiconductors require...

National Institute of Standards and Technology - Nov 20, 2023

3D-food printing for healthy eating and delicious desserts

...Advances in the science of 3D-food printing have enabled researchers to print novel foods. And by experimenting with texture and taste, this new frontier of customized food science taps into the national interest of healthy cooking and foodie culture. Food printing technology has existed since 2005. But to date, food printing has been limited to a small number of uncooked ingredients, which in turn produce what many call "unappetizing" dishes. U.S. National Science Foundation's AI Institute for Dynamical Systems funded researchers to explore a future where 3D-food printing takes its place alongside grills, cooktops, stoves and microwaves as a way to prepare food. 3D-printing food may also allow for customization of lab-grown meats. Further developing the technology behind already existing 3D-printed burgers...

National Science Foundation - Nov 20, 2023

Climate Change / Green Energy & IT

Biden-Harris Administration Finalizes Greenhouse Gas Emissions Reduction Tool, Moves Climate Change Performance Measure Forward

...The U.S. Department of Transportation's Federal Highway Administration (FHWA) announced a finalized performance measure that will provide State Departments of Transportation (DOTs) and Metropolitan Planning Organizations (MPOs) a national framework to track transportation-related greenhouse gas emissions (GHG). FHWA is taking two important steps toward addressing the impacts of climate change with today's announcement: (1) Adding a new greenhouse gas performance management measure to the existing FHWA national performance measures to establish a national framework to help states track performance and make more informed investment decisions. (2) Creating a flexible system under which state DOTs and MPOs will set their own targets for reducing greenhouse gas emissions from roadway travel...

Department of Transportation - Nov 22, 2023

Using supercomputers to help companies advance clean energy technologies

...The U.S. Department of Energy (DOE) announced funding for a new round of industry partnerships through its High Performance Computing for Energy Innovation (HPC4EI) program. These projects are aimed at linking DOE's high performance computing (HPC) resources with private industry to help them improve manufacturing efficiency and explore new materials for clean energy applications. DOE's Argonne National Laboratory is supporting four of the projects, which include partnerships with Ford Motor Company, Capstone Green Energy, Lakril Technologies Corporation and Power Systems Manufacturing...

Argonne National Laboratory - Nov 22, 2023

Digital Health

Robotic prosthetic ankles improve 'natural' movement, stability

...Robotic prosthetic ankles controlled by nerve impulses allow amputees to move more "naturally," thereby improving their stability, according to U.S. National Science Foundation-funded researchers at North Carolina State University and the University of North Carolina at Chapel Hill. The research focused on 'postural control,' where our bodies are constantly making adjustments to keep us stable when we are standing still. Study participants were fitted with a prototype robotic prosthetic ankle that responds to muscular signals picked up by sensors on the leg. Study participants were significantly more stable when using the robotic prototype...

National Science Foundation - Nov 21, 2023

NIH's BRAIN Initiative funds an innovative design that achieves tenfold better resolution for functional MRI brain imaging

...An intense international effort to improve the resolution of magnetic resonance imaging (MRI) for studying the human brain has culminated in an ultra-high resolution 7 Tesla scanner that records up to 10 times more detail than current 7T scanners and over 50 times more detail than current 3T scanners. The NexGen 7T scanner is a new tool that allows us to look at the brain circuitry underlying different diseases of the brain with higher spatial resolution. This could lead to better ways of diagnosing brain disorders. The improved resolution could finally help connect the dots between observed changes due to Alzheimer's that occur in the brain — abnormal clumps of protein called beta amyloid and tau — and changes in memory. The breakthrough came about through an initial \$13.4 million in funding from the Brain Research through Advancing Innovative Neurotechnologies (BRAIN) Initiative of the U.S. National Institutes of Health (NIH). The initiative aims to develop new technologies that will produce a dynamic picture of the brain showing how individual cells and complex neural circuits interact across the brain and over time...

Berkeley News - Nov 27, 2023

NIH-Supported Research Used AI to Determine How to Avoid a Knee Replacement - Build Up Your Thighs

...It's been unclear whether people benefit more from stronger extensor muscles like the quadriceps, which extend the leg, or stronger flexor muscles like hamstrings that bend the leg. Researchers evaluated thigh muscles of 134 participants in the Osteoarthritis Initiative, a nationwide study sponsored by the National Institutes of Health. Al analysis of knee MRIs from the participants revealed that a higher ratio of quadriceps to hamstring volume was significantly associated with lower odds of total knee replacement. Higher volumes of hamstrings and gracilis – a long, thin muscle on the inside of the thigh – also were linked to lower odds of knee replacement. The results suggest that training programs that focus on quad strength in relation to the hamstrings could be beneficial...

UC San Diego Health - Health Library - Nov 27, 2023

Other IT Related

FACT SHEET: President Biden Announces New Actions to Strengthen America's Supply Chains, Lower Costs for Families, and Secure Key Sectors

...President Biden is announcing nearly 30 new actions to strengthen supply chains critical to America's economic and national security. The Administration has made historic investments to strengthen supply chains and prevent future disruptions by expanding production capacity in key sectors and building infrastructure through the CHIPS and Science Act. Additional actions will support stronger supply chains and access to affordable, reliable energy and critical technology. DOE announced \$275 million in grant selections for its Advanced Energy Manufacturing and Recycling Grant Program. DOE also announced up to \$10 million of funding for a "critical material accelerator" and a \$5.6-million prize to develop circular clean energy supply chains. These efforts build on action by President Biden to authorize DOE's use of the DPA to increase domestic production of five key clean energy technologies. DOD, building on the \$714 million in DPA investments it has made in 2023 to support defense-critical supply chains, will publish the first ever National Defense Industrial Strategy (NDIS). The NDIS will guide engagement, policy development, and investment in the defense industrial base over the next three to five years. DOE's Office of Energy Efficiency and Renewable Energy (EERE) Advanced Materials and Manufacturing Technologies Office (AMMTO) is sponsoring a study by the National Academies of Science, Engineering, and Medicine to develop a nationwide plan for smart manufacturing. The report will establish key priorities for investment to support new digital and artificial intelligence technologies...

STEM / Workforce & IT

U.S. Department of State 2023 TechWomen Mentorship Program Engages Global Women Leaders in Science, Technology, Engineering and Math (STEM) in Washington, D.C., Chicago, and San Francisco

...The U.S. Department of State recently hosted the annual TechWomen mentorship program and cultural exchange of global emerging leaders in science, technology, engineering and math (STEM), in Washington D.C., Chicago, and San Francisco. Through mentorships with U.S. women leaders in STEM, the TechWomen participants strengthened business ties and built stronger professional networks to advance their work and benefit their communities, with an aim to encourage more women and girls to pursue STEM careers. Since its inception in 2012, across three presidential administrations and five Secretaries of State, TechWomen has expanded beyond the Middle East and North African region to include Southeast Asian and Sub-Saharan African nations...

U.S. Department of State - Nov 20, 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 - Sep 20, 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; relevant publications; fellowship and training opportunities; and technology transfer, licensing, and industry engagement opportunities. The High End Computing (HEC) Interagency Working Group (IWG) agencies provide the information contained in this portal. HEC IWG agencies are involved in various Federal activities in the HEC area including R&D and providing infrastructure and application. Take a look at it!

The Networking and Information Technology Research and Development (NITRD) Program - Sep 13, 2023

Department of the Air Force students find resources with new Student Success Center

...The Air Force Learning Professionals' Program recently launched the Student Success Center, a new feature on the website that provides additional academic resources and fosters academic achievement for Airmen and Guardians. The new page provides a curated list of resources to support students' academic journey including academic preparation, studying and writing techniques, and overall well-being through a holistic approach. The content includes information appropriate for initial skills training as well as for seasoned students aiming for excellence and can be accessed anytime to assist with academic and learning challenges. Included in the Student Success Center is evidence-based information to promote effective study habits, tools for better writing, and techniques and resources that assist in student resilience...

Air Force Link - Nov 27, 2023

Summer Undergraduate Research Fellowship (SURF)

...The SURF 2024 application is open! It will close on January 31, 2024! NIST summer interns have improved MRI technology, studied medications, and more. Spend your summer with us for 11 weeks of hands-on lab experience with world-class mentors in one of NIST's six labs or other offices...

National Institute of Standards and Technology - Aug 2, 2023

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Innovation Through NITRD Coordination

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

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