



ARTIFICIAL INTELLIGENCE / MACHINE LEARNING

ROBOTICS / AUTONOMOUS VEHICLES

QUANTUM

CYBERSECURITY / PRIVACY

5G, WIRELESS SPECTRUM, NETWORKING & COMMUNICATIONS

CLIMATE CHANGE / GREEN ENERGY & IT

DIGITAL HEALTH

OTHER IT RELATED

STEM / WORKFORCE RESOURCES & OPPORTUNITIES

## 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](mailto:nco@nitrd.gov) and voilà they will receive the news brief with the cool technology articles each week!

### Artificial Intelligence / Machine Learning

#### **OMB Releases Implementation Guidance Following President Biden's Executive Order on Artificial Intelligence**

...President Biden signed a landmark Executive Order on the Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence. The federal government will lead by example and provide a model for the responsible use of the technology. As part of this commitment, today, ahead of the UK Safety Summit, Vice President Harris will announce that the Office of Management and Budget (OMB) is releasing for comment a new draft policy on Advancing Governance, Innovation, and Risk Management for Agency Use of Artificial Intelligence. This guidance would establish AI governance structures in federal agencies, advance responsible AI innovation, increase transparency, protect federal

workers, and manage risks from government uses of AI. Federal agencies have a distinct responsibility to identify and manage AI risks because of the role they play in our society. OMB's proposed guidance builds on the Blueprint for an AI Bill of Rights and the AI Risk Management Framework by mandating a set of minimum evaluation, monitoring, and risk mitigation practices derived from these frameworks and tailoring them to context of the federal government...  
The White House - Nov 1, 2023

### **DOD Releases AI Adoption Strategy**

...The Pentagon's 2023 Data, Analytics and Artificial Intelligence Adoption Strategy builds upon years of DOD leadership in the development of AI and further solidifies the United States' competitive advantage in fielding the emerging technology. The latest blueprint, which was developed by the Chief Digital and AI Office, builds upon and supersedes the 2018 DOD AI Strategy and revised DOD Data Strategy, published in 2020, which have laid the groundwork for the department's approach to fielding AI-enabled capabilities. The strategy prescribes an agile approach to AI development and application, emphasizing speed of delivery and adoption at scale leading to five specific decision advantage outcomes. The blueprint also trains the department's focus on several data, analytics and AI-related goals. Those goals will support the "DOD AI Hierarchy of Needs" which the strategy defines as: quality data, governance, insightful analytics and metrics, assurance and responsible AI...  
U.S. Department of Defense - Nov 2, 2023

### **Innovation, Safety, and Security: DOE Leads on AI**

...The U.S. Department of Energy (DOE) and its National Laboratories have invested in AI development and use since the early 1960s, developing cutting-edge AI tools, along with data science, high-performance computing, and more—for both open science and classified needs—and are ready to scale up efforts to meet this critical moment in history and secure U.S. leadership. DOE will play a crucial role in the government's approach to both the development and use of AI, and the executive order included several initiatives that will be led by DOE: \* Developing tools to understand and mitigate the risks of AI \* Collaborating with other agencies, the private sector, and academia. DOE will also serve as a partner to other agencies across the Federal Government on: \* Reducing risks at the intersection of AI and chemical, biological, radiological, and nuclear (CBRN) threats \* Developing guidelines, standards, and best practices for AI safety and security \* Setting technical conditions for models and computing clusters subject to reporting \* Managing sensitive data used to train AI for malicious uses \* Protecting privacy...  
Department of Energy - Oct 31, 2023

### **Advances in machine learning for nuclear power operations spell a brighter future for carbon-free energy**

...In an impressive combination of nuclear technology and machine learning (ML), a team of scientists at the U.S. Department of Energy's (DOE) Argonne National Laboratory has unveiled a significant finding in maintaining safety and efficiency in a type of next-generation nuclear reactor, known as a sodium-cooled fast reactor (SFR). There are challenges, such as maintaining the purity of their high-temperature liquid sodium coolant, that is crucial to prevent corrosion and blockages in the system. Argonne scientists designed a new ML system. Harnessing the power of machine learning to continuously monitor and detect anomalies will advance the state of the art in instrumentation control and create a breakthrough in the efficiency and cost-effectiveness of nuclear energy systems. The team created a ML model to continuously monitor the cooling system and is equipped to analyze data from 31 sensors. A comprehensive system enhanced with ML may facilitate more robust monitoring and prevent anomalies that could disrupt the functioning of an actual reactor. ... This research was supported by DOE...  
Argonne National Laboratory - Nov 2, 2023

### **Researcher awarded NSF grant for using machine learning to boost amorphous metals**

...Katharine Flores at Washington University in St. Louis, received a four-year \$475,000 grant from the National Science Foundation (NSF) to support collaborative work on simulation-informed models for additive manufacturing of amorphous metals. The project is part of the NSF's Designing Materials to Revolutionize and Engineer our Future (DMREF) initiative. Amorphous metals, also known as metallic glasses, are characterized by their ability to solidify without forming a crystalline structure, a desirable trait in manufacturing where crystallization typically leads to imperfections in traditional metals. However, the rapid cooling required to maintain the amorphous state during additive manufacturing — a 3D-printing technique where objects are produced by adding material layer by layer — can create challenges. Flores will use machine learning to derive essential measures of material structure. These insights will provide the foundation for simulation-informed models and tools designed to enable precise predictions of how processing affects the strength and toughness of amorphous metals during 3D printing...  
The Source - Washington University in St. Louis - Nov 3, 2023

### **UTSA MATRIX AI Consortium receives \$2 million NSF award to study lifelong learning AI**

...The National Science Foundation (NSF) has awarded a \$2 million grant through its Emerging Frontiers in Research Initiatives (EFRI) program to investigators at the UTSA MATRIX AI Consortium for Human Well-Being for research that will help bridge the gap between human brain processing efficiency and the limitations of current artificial intelligence (AI) models. The team will draw ideas from the Temporal Scaffolding Hypothesis, a theory that mirrors the human brain's ability to process temporal patterns during both wakefulness and sleep. Unlike contemporary AI models, the human brain is great at doing lots of different things and handling information relating to different time frames, all while exerting very little energy...

## Robotics / Autonomous Vehicles

### **MilliMobile is a tiny, self-driving robot powered only by light and radio waves**

...Researchers at the University of Washington have now created MilliMobile, a tiny, self-driving robot powered only by surrounding light or radio waves. Equipped with a solar panel-like energy harvester and four wheels, MilliMobile is about the size of a penny, weighs as much as a raisin and can move about 30 feet in an hour, even on a cloudy day. The robot can drive on surfaces such as concrete or packed soil and carry three times its own weight in equipment such as cameras or sensors. It uses a light sensor to move automatically toward light sources, so it can run indefinitely on harvested power. A U.S. National Science Foundation Graduate Research Fellow took inspiration from 'intermittent computing,' which breaks complex programs into small steps, so a device with very limited power can work incrementally, as energy is available...  
National Science Foundation - Nov 2, 2023

### **NASA's Curiosity Rover Clocks 4,000 Days on Mars**

...To study whether ancient Mars had the conditions to support microbial life, the NASA's Curiosity rover has been gradually ascending the base of 3-mile-tall Mount Sharp. The rover recently drilled its 39th sample then dropped the pulverized rock into its belly for detailed analysis. Scientists hope the sample will reveal more about how the climate and habitability of Mars evolved as this region became enriched in sulfates –minerals that likely formed in salty water that was evaporating as Mars first began drying up billions of years ago. Despite having driven almost 20 miles (32 kilometers) through a punishingly cold environment bathed in dust and radiation since 2012, Curiosity remains strong. Engineers are currently working to resolve an issue with one of the rover's main "eyes" – the 34 mm focal length left camera of the Mast Camera, or Mastcam...  
National Aeronautics and Space Administration - Nov 6, 2023

### **NSF/AFOSR/ONR/ARO supports research using language to give robots a better grasp of an open-ended world**

...Inspired by humans' ability to handle unfamiliar objects, a group from MIT's Computer Science and Artificial Intelligence Laboratory (CSAIL) designed Feature Fields for Robotic Manipulation (F3RM), a system that blends 2D images with foundation model features into 3D scenes to help robots identify and grasp nearby items. The method could assist robots with picking items in large fulfillment centers with inevitable clutter and unpredictability. In these warehouses, robots are often given a description of the inventory that they're required to identify. Fulfillment centers of major online retailers can contain millions of items, many of which a robot will have never encountered before. To operate at such a scale, robots need to understand the geometry and semantics of different items, with some being in tight spaces. With F3RM's advanced spatial and semantic perception abilities, a robot could become more effective at locating an object, placing it in a bin, and then sending it along for packaging. F3RM begins to understand its surroundings by taking pictures on a selfie stick. The mounted camera snaps 50 images at different poses, enabling it to build a neural radiance field (NeRF), a deep learning method that takes 2D images to construct a 3D scene. This collage of RGB photos creates a "digital twin" of its surroundings. ... The team was supported, in part, by the National Science Foundation, the Air Force Office of Scientific Research, the Office of Naval Research's Multidisciplinary University Initiative, and the Army Research Office...  
MIT News - Nov 2, 2023

## Quantum

### **Researchers advance topological superconductors for quantum computing**

...To make qubits robust and tailor them for applications, researchers from the Department of Energy's Oak Ridge National Laboratory sought to create a new material system. The work was supported in part by the U.S. National Science Foundation and it pursued a new route to create quantum computers using novel materials. The researchers coupled a superconductor with a topological insulator and the result is a sharp interface between crystalline thin films with different symmetric arrangements of atoms...  
National Science Foundation - Nov 7, 2023

### **DOE-supported researchers suggest imperfections may affect quantum materials' unusual behavior more than we realize**

...Every material has some amount of disorder, and for some, disorder may explain why they exhibit their exciting properties in the first place. Herbert Fotso, at University of Buffalo, received a \$225,967 grant from the Department of Energy to study quantum materials and how disorder affects their behavior. Fotso and Hanna Terletska, at Middle Tennessee State University, will create computational models to better understand the role of disorder in quantum materials that also have strong interactions between their electrons when driven away from equilibrium. Fotso and Terletska's computational models will be released as open-source tools, allowing other research groups to take

advantage and enable studies of quantum materials that were previously inaccessible.  
University at Buffalo - Nov 3, 2023

## Cybersecurity / Privacy

### **FACT SHEET: Biden-Harris Administration Convenes Third Global Gathering to Counter Ransomware**

...The Biden-Harris Administration remains committed to taking bold actions to combat ransomware. Ransomware is a global scourge requiring international cooperation to disrupt. The White House convened International Counter Ransomware Initiative (CRI) for its third meeting in Washington, D.C., bringing together 50 members, including 48 countries and representatives from the European Union and INTERPOL, to discuss new operational projects and develop concrete policy commitments. CRI's Policy Pillar spearheaded efforts to undercut the business model that underpins the ransomware ecosystem by building the CRI's resources on cyber insurance, victim behavior, seizure and confiscation of virtual assets, ransom payments, and best practices for incident reporting and information sharing. They focused on launching capabilities to disrupt attackers and the infrastructure they use to conduct their attacks, improving cybersecurity through sharing information; and fighting back against ransomware actors...  
The White House - Nov 1, 2023

### **OP TEMPO Explores Bio-Based Tools to Predict, Optimize Team Performance**

...DARPA's Objective Prediction of Team Effectiveness via Models of Performance Outcomes program aims to provide DOD instructors with data-driven capabilities to support real-time assessment, after-action review, performance diagnostics, and objective prediction of teaming proficiency and mission readiness. If the 2.5-year program is successful, these capabilities will translate to training for myriad DOD use cases requiring highly coordinated team performance, such as tactical squads, squadron-level air crews, cyber defense teams, and medical teams, among others. The effort will lay the groundwork for future teaming exercises to optimize coordination and overall performance...  
DARPA - Nov 2, 2023

### **DHS Releases Governance Guide for Creating a Connected Community Strategy**

...As urbanization accelerates, community planners are rapidly turning to digital technology to modernize municipal services and improve the standard of living for their residents. These "connected communities" offer an opportunity to build safer and more resilient cities, but they also create new targets of opportunity for cybercriminals. DHS released its first Connected Community Governance guide, "How to Write a Connected Community Strategy." The guide will help local leaders to set a clear vision for their connected community, define smart service areas, articulate metrics of performance, and address cybersecurity risk and privacy needs...  
Homeland Security - Nov 3, 2023

## 5G, Wireless Spectrum, Networking & Communications

### **NOAA and NASA researchers use satellites to find 2023 ozone hole that ranks 16th largest on record**

...The 2023 Antarctic ozone hole reached its maximum size at 10 million square miles on September 21, which ranks as the 12th largest since 1979, according to annual satellite and balloon-based measurements made by NOAA and NASA. Declining levels of human-produced chlorine compounds, along with help from active Antarctic stratospheric weather slightly improved ozone levels this year. NOAA and NASA researchers monitor the ozone layer over the pole and globally using instruments aboard NASA's Aura, NOAA-NASA Suomi NPP and NOAA-20 satellites. Aura's Microwave Limb Sounder also estimates levels of ozone-destroying chlorine. Scientists also track the average amount of depletion by measuring the concentration of ozone inside the hole...  
National Oceanic and Atmospheric Administration - Nov 1, 2023

### **Mapping our water reserves for the future with NASA GRACE satellites**

...For more than a quarter-century, ASU Professor Jay Famiglietti and his research team have been working on a satellite system that he says can track groundwater supply changes and depletion from space via the NASA GRACE (Gravity Recovery and Climate Experiment) satellite mission. These satellites can map out regions of the world that are gaining or losing water on a monthly basis, as well as reveal long-term wetting or drying trends...  
Arizona State University - Nov 2, 2023

# Climate Change / Green Energy & IT

## **Bringing More Clean Energy to Our Electric Grid**

...Having a secure, reliable, and resilient electric grid is essential to the success of clean energy like solar and wind because in many cases, where this power is generated is often not where it is immediately used. The Department of Energy (DOE) is making critical investments in the nation's electric grid to lower the cost of energy, all while enabling cleaner energy sources, less pollution, and an easier time installing solar panels or plugging in an electric vehicle at home. DOE projects will leverage more than \$8 billion in federal and private investments as part of the Grid Resilience and Innovation Partnerships (GRIP) Program...

Department of Energy - Nov 3, 2023

## **NASA Flights Link Methane Plumes to Tundra Fires in Western Alaska**

...In Alaska's largest river delta, tundra that has been scorched by wildfire is emitting more methane than the rest of the landscape long after the flames died. Methane release could accelerate climate warming and lead to more frequent wildfires in the tundra. The new study was conducted by a team of scientists working as part of NASA's Arctic-Boreal Vulnerability Experiment (ABOVE), a large-scale study of environmental change in Alaska and Western Canada. Researchers found that methane hot spots were roughly 29% more likely to occur in tundra that had been scorched by wildfire in the past 50 years compared to unburned areas. Researchers used NASA's next-generation Airborne Visible/Infrared Imaging Spectrometer (AVIRIS-NG). Mounted on the belly of a research plane, the instrument has an optical sensor that records the interaction of sunlight with molecules near the land surface and in the air, and it has been used to measure and monitor hazards. They uncovered a very clear and strong relationship between fire history and the distribution of methane hot spots. Using satellites and airborne remote sensing is a really powerful way to better understand the carbon intensity of fire emissions from burning tundra...

National Aeronautics and Space Administration - Nov 1, 2023

# Digital Health

## **NIH-funded researchers using AI to optimize for rapid neural imaging**

...Connectomics, the ambitious field of study that seeks to map the intricate network of animal brains, is undergoing a growth spurt. Unlike traditional electron microscopy, the integrated AI serves as a "brain" that learns a specimen while acquiring the images, and intelligently focuses on the relevant pixels at nanoscale resolution similar to how animals inspect their worlds. "SmartEM" assists connectomics in quickly examining and reconstructing the brain's complex network of synapses and neurons with nanometer precision. The research team embedded a GPU into the support computer connected to their microscope. This enabled running machine-learning models on the images, helping the microscope beam be directed to areas deemed interesting by the AI. For the task of reconstructing a human brain segment of about 100,000 neurons, achieving this with a conventional microscope would necessitate a decade of continuous imaging and a prohibitive budget. However, with SmartEM, by investing in four of these innovative microscopes at less than \$1 million each, the task could be completed in a mere three months. The method should also allow synapse-level circuit analysis in samples from patients with psychiatric and neurologic disorders. The research was supported by the NIH BRAIN Initiative...

MIT News - Nov 6, 2023

# Other IT Related

## **FACT SHEET: President Biden Hosts Inaugural Americas Partnership for Economic Prosperity Leaders' Summit**

...President Biden and Leaders of the eleven other inaugural Americas Partnership countries announced their plan to drive inclusive growth and to strengthen critical supply chains, with an initial focus on clean energy, semiconductors, and medical supplies the inaugural Americas Partnership for Economic Prosperity Leaders' Summit. President Biden announced a number of initiatives in support of the Americas Partnership: Helping develop a robust regional workforce in the digital technology sectors of the future...

The White House - Nov 3, 2023

## **NSF 101: America's Seed Fund**

...NSF grants funding to nearly 400 startups and small businesses across numerous technology areas annually to research and develop a proof-of-concept or prototype. Through

the America's Seed Fund: Small Business Innovation Research/Small Business Technology Transfer program, these companies can take their idea or their research discovery and create products or services for broader use. From artificial intelligence to energy, medical devices to semiconductors, NSF is funding budding companies to make a big impact. America's Seed Fund encourages technological innovation, transforming scientific and engineering discoveries into products and services with commercial pull and societal impact. The program reviews startups with technology solutions based on intellectual merit, societal benefit and commercial impact. Each startup can possibly receive up to \$2 million to support translational research and development. Companies must first submit a written Project Pitch to see if their idea would be a good fit for the program. After receiving an official invitation, they can submit a Phase I proposal...

National Science Foundation - Nov 2, 2023

### **DARPA Transitioning Technology to Help Protect Largest US Metropolitan Region**

...DARPA's SIGMA+ program concluded a three-week capstone event with the Port Authority of New York and New Jersey (Port Authority) this past summer, demonstrating through realistic exercise scenarios the ability to detect a wide spectrum of weapons of mass destruction (WMD) threats. The July exercises, which spanned all 15 Port Authority commands, culminated a five-year effort to develop and deploy an automated, high-performance, networked and mobile system that provides continuous city-scale monitoring of chemical, biological, radiological, nuclear and explosive (CBRNE) threats. SIGMA+ expanded to include development of advanced chemical, biological, and explosive sensors, integrated vehicle designs, real-time monitoring networks, and advanced analytics for threat detection and interdiction. The SIGMA+ networked systems approach leverages all these technologies to provide a comprehensive ability for law enforcement and first responders to quickly detect, localize, and track threats with easy-to-interpret results to support situational awareness and decision making...

DARPA - Nov 6, 2023

### **Argonne researchers to present cutting-edge work at SC23 conference**

...Researchers from the U.S. Department of Energy's (DOE) Argonne National Laboratory will highlight their most recent accomplishments in simulations, algorithm development, artificial intelligence (AI) and software at SC23, the International Conference for High Performance Computing, Networking, Storage and Analysis, taking place in Denver Nov. 12-16. They will talk about Nexus, a pioneering approach to connecting experimental, computing, and storage facilities at Argonne and beyond into an interconnected scientific infrastructure, in a featured talk at the DOE's exhibit booth. Argonne researchers will also spotlight the Aurora exascale supercomputer at the Intel exhibit booth. The Energy Exascale Earth System Model (E3SM) team ran an unprecedented high-resolution global atmosphere model on the Frontier exascale supercomputer. Called the Simple Cloud Resolving E3SM Atmosphere Model, it provides a more accurate representation of cloud processes and their impact on climate change and weather patterns. Argonne researchers will present several sessions at this workshop that evaluate the performance portability of a SYCL implementation of a large-scale cosmology application running on GPUs from three different vendors. The Extreme-Scale Experiment-in-the-Loop Computing (XLOOP) workshop focuses on the intersection of HPC and large-scale experimental science...

Argonne National Laboratory - Nov 6, 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 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; 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 14, 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

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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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