



## 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!

## Cybersecurity Awareness Month

### [Cybersecurity Awareness Month 2023 Blog Series | Updating Software](#)

...In our Cybersecurity Awareness Month blog series, NIST's Michael Ogata (Computer Scientist) and Paul Watrobski (IT Security Specialist) discuss the importance of updating software. NIST's Applied Cybersecurity Division's core mission is to explore, measure, and evaluate both the cybersecurity guidance NIST provides as well as industry best practices. Many people think of updating software in the context of "that thing that happens randomly after I purchase a piece of software"...but today's continuous integration and continuous delivery (CI/CD) environments—and the rapid pace of software evolution—tightly couple software updates into the daily functionality of many systems. Over the past 40 years, software as a product has transformed from static and discrete to fluid and nebulous. People's relationship with software used be closer akin to the other physical tools in our lives. You bought them, brought them home, and used them. Now, with the ubiquity of the internet, software can change on a near constant basis. Security in the modern software supply chain landscape has likewise become increasingly complex...

National Institute of Standards and Technology - Oct 18, 2023

### [Cybersecurity Awareness Month 2023 Blog Series | Recognizing and Reporting Phishing](#)

...This blog, on the importance of recognizing and reporting phishing, wraps up our Cybersecurity Awareness Month 2023 blog series. They research the circumstances that make people more or less susceptible to clicking on a phishing email – whether that be the characteristics of the email itself or the context of the user receiving the email. Findings show that click rates do not provide a complete picture to understanding staff behaviors. NIST researchers created a metric, the NIST Phish Scale, to provide user context into clicking behaviors. The Phish Scale results in a human phishing detection difficulty metric that allows organizations to better tailor their phishing awareness training programs towards staff recognizing and reporting phishing more effectively...

National Institute of Standards and Technology - Oct 24, 2023

## Federal Agency Funding Opportunities

### **Notice of Intent for Rural and Municipal Utility Cybersecurity Program Advanced Cybersecurity Technology Funding Opportunity Announcement (RMUC Program ACT FOA)**

...The U.S. Department of Energy's (DOE) Office of Cybersecurity, Energy Security, and Emergency Response (CESER) announced its intent to issue a funding opportunity announcement (FOA) to enhance the cybersecurity posture of electric cooperative, municipal, and small investor-owned utilities. DOE CESER expects to issue federal funding for new awards, subject to the availability of funds. The funding opportunity is expected to include approximately \$70 million in federal funding. CESER anticipates awarding up to 10 awards in each of the three topic areas per round. The U.S. Department of Energy's (DOE) Office of Cybersecurity, Energy Security, and Emergency Response (CESER) announced its intent to issue a funding opportunity announcement (FOA) to enhance the cybersecurity posture of electric cooperative, municipal, and small investor-owned utilities...

Department of Energy - Oct 24, 2023

## HPC

### **NSF funds 12 projects to advance open and equitable research in the geosciences**

...The U.S. National Science Foundation is investing \$10.4 million to advance open and equitable research in the geosciences, in alignment with the goals of the federal 2023 Year of Open Science. Through its new Geosciences Open Science Ecosystem (GEO OSE) program, NSF is funding 12 new projects to support sustainable and networked open science activities. The program will foster an ecosystem of inclusive access to data, physical collections, software, advanced computing and other resources toward advancing research and education in the geosciences...

National Science Foundation - Oct 20, 2023

### **ORNL scientists close the cycle on recycling mixed plastics by using high-performance computing and neutron scattering**

...Little of the mixed consumer plastics thrown away or placed in recycle bins actually ends up being recycled. Nearly 90% is buried in landfills or incinerated at commercial facilities that generate greenhouse gases and airborne toxins. It's usually easier and less expensive to make new plastic products than reclaim, sort and recycle used ones. Conventional recycling of mixed plastics has previously meant manually or mechanically separating the plastics according to their constituent polymers. The Department of Energy's Oak Ridge National Laboratory used carefully planned chemical design, neutron scattering and high-performance computing to help develop a new catalytic recycling process. The catalyst selectively and sequentially deconstructs multiple polymers in mixed plastics into pristine monomers — molecules that react with other monomer molecules to form a polymer. Small-angle neutron scattering at ORNL's Spallation Neutron Source was used to help confirm the formation of deconstructed monomers from the waste plastics...

Oak Ridge National Laboratory - Oct 23, 2023

### **NSF grant will benefit faculty and students with latest technology for high-performance computing cluster**

...The College of New Jersey has been awarded a \$935,000 National Science Foundation Major Research Instrumentation grant to enhance the college's nationally recognized engagement of undergraduate student research. The funds from the grant will be used to purchase and upgrade equipment in the Electronic Laboratory for Science and Analysis (ELSA) High Performance Computing cluster. Science faculty incorporate ELSA in their teaching, exposing 800-1000 TCNJ undergraduates to advanced computing each year. The grant also will allow TCNJ to continue to be part of a larger NSF initiative called the Open Science Grid Consortium, which builds and operates a set of pools of shared computing and data capacity for distributed high-throughput computing and the advancement of open science...

The College of New Jersey - Oct 20, 2023

# Artificial Intelligence / Machine Learning

## Verbal nonsense reveals limitations of AI chatbots

...Artificial intelligence chatbots use large language models to generate responses that seemingly mimic the way humans use and understand language, but a new study shows that these models remain vulnerable to mistaking nonsense for natural language. U.S. National Science Foundation funded scientists presented hundreds of pairs of sentences to nine different language models, asking people who participated in the study which sentences in each pair they thought was more likely to be read or heard in everyday life. The researchers then presented the sentences to the models to see how they would rate each sentence pair. In head-to-head tests, more sophisticated AI language models tended to perform better than simpler recurrent neural network models and statistical models that just tally the frequency of word pairs found on the internet or in online databases. But all the models made mistakes...

National Science Foundation - Oct 24, 2023

## Human brain's 'temporal scaffolding' inspires new AI approaches funded by NSF

...Scientists believe a recent hypothesis about how the human brain uses sleep and awake periods to learn over time could be the key to overcoming artificial intelligence's limitations with lifelong learning. The team received \$2 million in funding from the National Science Foundation (NSF) to use the "temporal scaffolding" hypothesis to produce AI that rapidly learns, adapts, and operates in uncertain conditions. While conventional methods of reinforcement learning led to AI models that can beat professional players at games such as StarCraft 2 and Dota 2, the AI models needed enormous amounts of experience to acquire those skills. The temporal scaffolding hypothesis proposes that the brain reactivates wake experiences during sleep in an accelerated manner, enabling the brain to detect important patterns within those experiences. Mimicking this process, the team will develop deep-learning networks with the ability to swiftly adapt and operate under resource constraints, much like the human brain does. The researchers envision applying their new approach in critical areas such as health care, autonomous systems, and national security...

University of Rochester School of Nursing - Oct 24, 2023

# Robotics / Autonomous Vehicles

## A New Take on Modeling & Simulation for Improved Autonomy

...Multiple factors limit the potential of modern autonomous systems (e.g., self-driving vehicles and uncrewed aircraft and watercraft). Autonomy is learned through modeling and simulation, given the expense of training in the real world. Training models in high-fidelity environments for Defense Department platforms can sometimes take months to even years. Furthermore, autonomy becomes vulnerable when faced with unknown situations/observations in the real world. This brittleness is known as the simulation-to-real (sim-to-real) gap. For example, a drone moving from a dense city to a coastal environment would encounter a dramatically different observation space. Unlike commercial autonomous systems, such as warehouse robotics or autonomous vehicles operating in a controlled environment using geofencing, military systems have far more unknown variables. DARPA experts theorize that learning and transferring autonomy across diverse, low-fidelity simulations leveraging their shared semantics (e.g., rules of engagement) instead can lead to a more rapid transfer of autonomy from simulation to reality – perhaps even as early as the same-day versus weeks/months with traditional approaches. The Transfer from Imprecise and Abstract Models to Autonomous Technologies program seeks proposals that put this theory to the test. The program will feature sim-to-sim and sim-to-real competitions at the end of Phases 1 and 2, respectively...

DARPA - Oct 17, 2023

## Robot Range Enhancements Unveiled at the Fall DoD EODT&T Program Board Meeting

...Naval Surface Warfare Center Indian Head Division's (NSWC IHD) Explosive Ordnance Disposal (EOD) Technology Center's new facility, deemed "The Robot Building," not only showcases a static exhibition of the evolution of robots and robotic platforms dating from the 1980s to present day, but also houses a space that allows for growth as state-of-the-art test methodologies continue to evolve. It is adjacent to the robot test range, which has been used to test capabilities of robotic platforms for legacy EOD robots including the Man Transportable Robotic System (MTRS) and Remote Ordnance Neutralization System (RONS) platforms, and houses various terrains and scenarios including grass, gravel, sand, dirt, rubble, mud, water, slopes, and indoor environments...

Navy.mil - Oct 19, 2023

# Quantum

## **MIT receives major National Science Foundation grant for quantum science**

...The U.S. National Science Foundation's Physics Frontiers Centers program renewed a grant to the MIT-Harvard Center for Ultracold Atoms (CUA). They will conduct experiments involving quantum gases of atoms and molecules; arrays of exotic atoms in Rydberg states containing a single, highly excited electron; atom-like impurities in semiconductors; and an "unusual" linking of light and matter known as "strong coupling" with the potential for new applications in measurement, sensing and networking. The NSF Physics Frontiers Centers program brings together large teams of researchers for projects that will require years of concentrated effort, a range of scientific and technical expertise, and new types of equipment. NSF now actively supports eight physics centers...

MIT News - Oct 18, 2023

## **ARO/AFOSR/NSF-funded researchers who demonstrate how to electronically alter the direction of electron flow in promising materials for quantum computing**

...A new electrical method to conveniently change the direction of electron flow in some quantum materials could have implications for the development of next-generation electronic devices and quantum computers. Penn State researchers developed and demonstrated the method in materials that exhibit the quantum anomalous Hall (QAH) effect — a phenomenon in which the flow of electrons along the edge of a material does not lose energy. The researchers fabricated a QAH insulator with specific, optimized properties. They found that applying a 5-millisecond current pulse to the QAH insulator impacts the internal magnetism of the material and causes the electrons to change directions. The ability to change direction is critical for optimizing information transfer, storage and retrieval in quantum technologies. ... The Army Research Office, the Air Force Office of Scientific Research and the National Science Foundation (NSF) funded this research.

Pennsylvania State University - Oct 19, 2023

## **NIST Research Group Find that Quantum Computers Run on Just the Right Amount of Connectivity**

...NIST researcher Alexey Gorshkov and his group, in collaboration with researchers at the University of Chicago, have found a partial answer to the conundrum of what powers quantum complexity. In their new theoretical work, they considered a particular arrangement of many particles and found that the key to knowing whether this group of particles requires a quantum computer to simulate does indeed depend on entanglement; but simply increasing the connections between particles doesn't do the trick. They showed that quantum complexity needs just the right amount of connectivity—not too little, not too much...

UMIACS - Oct 19, 2023

## **NSF-funded LIGO surpasses the quantum limit as researchers achieve a landmark in quantum squeezing.**

...The Laser Interferometer Gravitational-Wave Observatory, or LIGO, is funded by the National Science Foundation. At the heart of LIGO's success is its ability to measure the stretching and squeezing of the fabric of space-time on scales 10 thousand trillion times smaller than a human hair. Now LIGO researchers report a significant advance in a quantum technology called "squeezing" that allows them to skirt around this limit and measure undulations in space-time across the entire range of gravitational frequencies detected by LIGO. This new "frequency-dependent squeezing" technology, in operation at LIGO since it turned back on in May of this year, means that the detectors can now probe a larger volume of the universe and are expected to detect about 60 percent more mergers than before. The results have ramifications for future quantum technologies such as quantum computers and other microelectronics as well as for fundamental physics experiments...

MIT News - Oct 23, 2023

# Cybersecurity / Privacy

## **Voices from DARPA Podcast Episode 73: The AI Cyber Challenge**

...Ahead of the AI Cyber Challenge (AlxCC) Open Track registration period, which begins December 1, 2023, this episode of Voices from DARPA features Perri Adams, DARPA's program manager for the competition. Over the next two years, AlxCC will challenge teams to develop AI-driven systems to automatically find and correctly fix the critical code that underpins daily life. Adams shares the backstory for the AlxCC...

DARPA - Oct 20, 2023

## **NSA Shares Recommendations to Advance Device Security Within a Zero Trust Framework**

...The National Security Agency (NSA) has released a Cybersecurity Information Sheet (CSI) to enable federal agencies, partners, and organizations to assess devices in their

systems and be better poised to respond to risks associated with critical resources. The “Advancing Zero Trust Maturity Throughout the Device Pillar” CSI provides recommendations to effectively ensure all devices meet an organization’s access criteria and security policies. The NSA advises National Security System (NSS), Department of Defense (DoD), and Defense Industrial Base (DIB) network owners and operators to implement the recommendations in the CSI to increase maturity levels of the device pillar capabilities. The NSA Zero Trust security framework adheres to the President’s Executive Order of Improving the Nation’s Cybersecurity (EO 14028) and National Security Memorandum 8 (NSM-8), which direct Federal Civilian Executive Branch (FCEB) agencies and NSS owners and operators to develop and implement strategic plans to adopt a Zero Trust cybersecurity framework...

National Security Agency/Central Security Service - Oct 19, 2023

### **CISA, NSA, FBI, MS-ISAC Publish Guide on Preventing Phishing Intrusions**

...The Cybersecurity and Infrastructure Security Agency (CISA), National Security Agency (NSA), Federal Bureau of Investigation (FBI) and Multi-State Information Sharing and Analysis Center (MS-ISAC) today published “Phishing Guidance, Stopping the Attack Cycle at Phase One” to help organizations reduce likelihood and impact of successful phishing attacks. It provides detailed insight into malicious actor techniques, as well as technical mitigations and best practices to help prevent successful phishing attempts. This joint phishing guide is intended to be a one-stop resource to help all organizations protect their systems from phishing threats. All organizations, from small- and medium-sized businesses to software manufacturers, are encouraged to review this joint guide to better understand evolving phishing techniques and implement tailored cybersecurity controls and best practices to reduce the risk of compromise...

CISA - Oct 18, 2023

### **NSA and Partners Issue Additional Guidance for Secure By Design Software**

...The Cybersecurity and Infrastructure Security Agency (CISA), National Security Agency (NSA), Federal Bureau of Investigation (FBI), and international partners released an updated Cybersecurity Information Sheet (CSI), “Shifting the Balance of Cybersecurity Risk: Principles and Approaches for Secure by Design Software” report. The new guidance provides more detail on the three secure by design and default principles as they apply to both software manufacturers and their customers. The agencies recommend software manufacturers implement the strategies outlined in the CSI to take ownership of the security outcomes of their customers through secure by design and default principles. The agencies also advise that recommendations in this CSI apply to manufacturers of artificial intelligence (AI) software systems and models...

National Security Agency/Central Security Service - Oct 17, 2023

### **DOE Cybersecurity Training for the Utility Workforce**

...DOE’s Office of Cybersecurity, Energy Security, and Emergency Response (CESER), in partnership with Idaho National Laboratory (INL), will launch its first event in a series of unique cybersecurity training sessions for electric utility staff. It is a training program that was designed to quickly train utility staff to defend against cyber-attacks in areas of conflict. The 3-day training curricula is designed for technical practitioners in electric utilities that require a hybrid set of skills across information technology (IT), industrial control systems and operational technology (ICS/OT), cybersecurity, and electric grid operations...

Department of Energy - Oct 17, 2023

## **5G, Wireless Spectrum, Networking & Communications**

### **New Research Uses Satellite Information to Explain "Atlantification" of the Arctic Ocean**

...New National Science Foundation-supported research by an international team of scientists describes the causes for the stalled trend in Arctic Ocean sea-ice loss since 2007. The findings indicate that stronger declines in sea ice will occur when an atmospheric feature known as the Arctic dipole reverses itself in its recurring cycle. A wealth of data, including direct instrumental observations, reanalysis products and satellite information going back several decades, show that the Arctic dipole alternates in an approximately 15-year cycle and that the system is probably at the end of the present period...

National Science Foundation - Oct 24, 2023

### **New Collaborative Research Will Use Modeling and Satellite Data to Improve Stock Assessments and Ecosystem Science**

...NOAA’s Southeast Fisheries Science Center is involved in two new projects funded through the NOAA RESTORE Science Program. For the first project, a team of researchers will study red tide and reef fish modeling. The team will update and improve an ecosystem model of the West Florida Shelf to account for red tide mortality when assessing Gulf of Mexico reef fish. The project will develop new approaches to map red tides using satellites, and map oxygen concentrations in relation to red tides. These products will be incorporated into a fisheries ecosystem model to estimate red tide mortality on valuable commercial and recreational species. The second project will focus on building next-generation fishery forecasting capacity...



### **DOD awards ASU \$10M to advance future-generation wireless networks**

...The U.S. Department of Defense has awarded Arizona State University \$10 million to establish a Center of Excellence in Future Generation Wireless Technology, which seeks to advance wireless communications technology to bolster national security. Researchers will address a wide spectrum of network challenges and opportunities, including signal processing technologies, distributed control and machine learning algorithms, and innovative security mechanisms. The Center of Excellence in FutureG is strategically positioned to enhance ASU's research and educational capabilities while positioning the university as a critical contributor to preserving the military's technological edge in future-generation wireless, or FutureG, technology. FutureG networks, such as 6G and beyond, are designed to seamlessly incorporate artificial intelligence and machine learning into integrated sensing, communication and computation. FutureG networks are distinct from existing networks like 5G due to various advances, including global coverage, faster data rates, lower delays, high-precision positioning, improved network reliability, greater energy efficiency and better security...

Arizona State University - Oct 19, 2023

### **A team with NASA's Arctic Boreal Vulnerability Experiment uses satellite imagery to find surprising effects of fire in North America's boreal forests**

...A new study, using a first-of-its-kind approach to analyze satellite imagery from boreal forests over the last three decades, found that fire may be changing the face of the region in a way researchers did not previously anticipate. Researchers found that the abrupt loss of coniferous forests caused by wildfire was offset by the gradual increase in coniferous forests in areas that had not recently burned, so there was no overall shift toward deciduous cover. As the climate continues to get warmer and drier, that also will affect how forests burn and how they recover. The team conducted the research as part of NASA's Arctic Boreal Vulnerability Experiment (ABoVE). As part of their project within ABoVE, they used high-resolution satellite imagery of the boreal forests across Alaska and Canada captured by the Landsat series of satellites to quantify changes in forest composition, both in areas that have burned and those that haven't. They also quantified the effects of changing forests using satellite measurements of surface reflectivity and calculated the feedback effects on climate...

Northern Arizona University - Oct 23, 2023

## **Advanced Manufacturing**

### **NSF funds researchers to develop 'revolutionary' multi-material for light-based 3D printing**

...The U.S. National Science Foundation (NSF) is looking for materials that "revolutionize and engineer our future." Researchers at Iowa State University and the University of California, Santa Barbara think they can do just that by fundamentally changing Digital Light Processing – a type of 3D printing that uses light rather than heat to quickly cure and harden liquid resin into plastic layers – to enable multi-material printing. The researchers are using their expertise in materials chemistry, computational science, machine learning and materials characterization to find resins that, when exposed to different wavelengths of light, will solidify with different properties. The project is one of 37 that NSF announced in September as part of a four-year, \$72.5 million investment to "create novel materials to address grand societal challenges and develop the scientific and engineering workforce of tomorrow." The effort is part of the federal, multi-agency Materials Genome Initiative that's focused on quickly advancing materials invention and use. NSF awarded Iowa State researchers \$800,000 to use artificial intelligence and machine learning algorithms to help develop new resins which can be printed with different properties. NSF also awarded UCSB researchers \$1.1 million for their share of the project.

Iowa State University News Service - Oct 18, 2023

## **Climate Change / Green Energy & IT**

### **DOE awards \$5 million to use AI and modeling to develop technology to convert atmospheric nitrogen into fertilizer**

...Washington University in St. Louis will lead one of 29 new projects under the Department of Energy's (DOE) Energy Earthshots Initiative, which aims to advance clean energy technologies over the next decade. The three-year \$5 million effort is to develop technology that can convert atmospheric nitrogen into fertilizer, taking aspects of biology, modeling and AI, and then using that knowledge to create new biological parts to be put into a photosynthetic chassis, so that these organisms can produce novel compounds and material. The team will look at how cyanobacteria can convert nitrogen from the atmosphere into usable nitrogen-rich compounds, namely guanidine, ammonia and urea. The Energy Earthshot Initiative aims to help achieve the Biden administration's climate and clean energy goals, which include a 50% reduction in carbon emissions by 2030 and a net-zero carbon economy by 2050...

The Source - Washington University in St. Louis - Oct 20, 2023

### **FSU mathematicians explore geothermal energy, carbon sequestration climate solutions in DOE's Earthshots initiative**

...FSU associate professors Sanghyun Lee and Feng Bao are members of a multi-institutional team that will use a three-year, \$4.9 million grant from the Department of Energy (DOE) to explore use of geothermal energy to generate electricity and to identify techniques for removing carbon dioxide from the atmosphere and storing it underground. Lee and Bao will build a computational model that provides a comprehensive understanding of the physical, geomechanical and geochemical processes that occur in subsurface energy storage and recovery systems. Lee and Bao will focus on the machine learning and data analytics aspects of the research, key components to answering questions about how emerging clean energy technologies can be improved upon and expanded for more widespread use. The team's computational model will help scientists understand what is occurring at multiple scales in subsurface energy storage and recovery systems and facilitate more accurate predictions and the ability to optimize and manage enhanced geothermal and carbon sequestration systems...

Florida State University News - Oct 20, 2023

## **Digital Health**

### **New smartphone app quickly analyzes human motion to aid physical rehabilitation**

...A research team funded by the National Institutes of Health has developed a smart phone app that can track and analyze a person's ability to move from one place to another, known as locomotion, and other types of movements. Human motion analysis is used to evaluate patients with movement difficulties, to help clinicians plan surgery, and to assess the results of treatment procedures. The research team believes that using the app costs about 1% of conventional motion analysis techniques and works 25 times faster. Researchers tested their app, called OpenCap, with 100 participants. Using two or more smart phones, the app recorded sufficient quality videos to allow for web-based, artificial intelligence analysis of muscle activations, joint loads and joint movements...

National Institutes of Health - Oct 19, 2023

### **Telehealth supports retention in treatment for opioid use disorder**

...In Kentucky, 48% of those who started buprenorphine treatment via telehealth remained in treatment for 90 continuous days, compared to 44% of those who started treatment in non-telehealth settings. In Ohio, 32% of those who started buprenorphine treatment via telehealth remained in treatment for 90 continuous days, compared to 28% of those who started treatment in non-telehealth settings. The study suggests that telehealth may increase treatment access and retention, strengthening the evidence that receiving addiction care through telehealth is to be safe and beneficial. After the onset of the COVID-19 pandemic, the United States government implemented prescribing flexibilities to facilitate buprenorphine access for patients with opioid use disorder. These updated policies allowed clinicians to remotely prescribe buprenorphine to new patients via telehealth...

National Institutes of Health - Oct 18, 2023

### **Preventing collateral damage in cancer treatment: Using a sensor, scientists create patch to detect and stop misplaced radiation**

...Using a simple concept and a patented Sandia sensor that detects radioactive materials, a team at Sandia National Laboratories has developed a patch to stop damage to healthy tissue during proton radiotherapy, one of the best tools to target certain cancerous tumors. Proton radiation therapy is used to send a high dose of radiation into a specific area of the body to disrupt and destroy tumor cells, but the radiation also kills nearby healthy cells. The goal is to be as precise as possible when targeting the radiation. Current systems prompt the radiation to stop when movement is sensed through cameras, but they can't sense how much radiation was misplaced or at what dosage. The patch, called an Electronic Polymer Dosimeter for Radiotherapy, or EPDR, can do both. The idea stemmed from nuclear detection work, which is part of Sandia's core mission. The main component of this patch is a neutron/proton sensor that Sandia patented...

Sandia National Laboratories - Oct 23, 2023

### **NSF funds project that will use VR goggles to treat teens with anxiety and depression**

...Sarah Ostadabbas, an associate professor in the electrical and computer engineering department, is leading a National Science Foundation grant with the University of Pittsburgh to develop technology that'll use augmented reality (AR) to help treat teens with anxiety and depression. The proposed system would use hardware — specifically AR goggles — and machine learning software to create an immersive 3D environment to help patients confront their fears in a more realistic way while an EEG cap monitoring their brain activities...

Northeastern Global News - Oct 23, 2023

## Other IT Related

### **FACT SHEET: Biden-Harris Administration Announces 31 Regional Tech Hubs to Spur American Innovation, Strengthen Manufacturing, and Create Good-Paying Jobs in Every Region of the Country**

...Regional Innovation and Technology Hubs (Tech Hubs), in 31 communities across the country, will catalyze investment in technologies critical to economic growth, national security, and job creation, and will help communities across the country become centers of innovation critical to American competitiveness. The 31 Tech Hubs will focus on developing and growing innovative industries in regions across the country, including semiconductors, clean energy, critical minerals, biotechnology, precision medicine, artificial intelligence, quantum computing, and more. Tech Hubs bring together private industry, state and local governments, institutions of higher education, labor unions, Tribal communities and nonprofit organizations to compete for up to \$75 million implementation grants to further develop these fields and make transformative investments in innovation, supply chain resilience, and job creation...

The White House - Oct 23, 2023

### **New report identifies pathways to strengthen U.S. competitiveness in key technology areas**

...A network of universities funded by the U.S. National Science Foundation completed a yearlong, nearly \$4 million pilot effort with the release of a report – Securing America's Future: A Framework for Critical Technology Assessment – on how to enable timely situational awareness of global technology and production capabilities, rigorous methods to quantify the potential value of innovations, and tools for quantifying opportunities across national objectives. The National Network for Critical Technology Assessment brought together leading scholars from across the country to pilot analytical approaches to assessing technology maturity, trajectories and impact that can drive development of data-driven options for future government investments. The network looked at four technologies at varying levels of maturity: artificial intelligence, semiconductors, biopharmaceuticals and energy and critical materials...

National Science Foundation - Oct 24, 2023

### **NIH revises grant review process to improve focus on scientific merit, reduce reputational bias**

...The National Institutes of Health is taking steps to simplify its process to assess the scientific merit of research grant applications and mitigate elements that have the potential to introduce bias into review. The changes will help reviewers focus on the potential for proposed research to advance scientific knowledge and improve human health. NIH has been gathering significant feedback from the extramural community on the grant application review process and the agency proposed revisions to the process through a Simplified Framework for NIH Peer Review Criteria initiative...

National Institutes of Health - Oct 19, 2023

### **NASA-funded Research Project Launches using a Mapping Tool to Understand Biodiversity**

...A research project funded by NASA is launching this week in South Africa is aimed at better understanding the biodiversity of the region and providing new mapping tools that could be used on a global scale. BioSCape is a unique opportunity to advance international scientific collaboration using state-of-the-art technology to tackle one of the greatest challenges facing us today: conserving biodiversity to sustain life on Earth. BioSCape will help reveal new insights about the biodiversity of one of the most diverse regions on Earth and provide new tools for mapping and monitoring it...

UC Merced News - Oct 18, 2023

## STEM / Workforce & IT

### **AI research robots key to 'democratizing and revolutionizing science,' world-class AFRL researcher says**

...An Air Force Research Laboratory team is seeking industry and academic partners to help them transition open-source autonomous experimentation software, known as Educational ARES OS, to public school classrooms across the nation to help foster the next generation of young scientists. Educational ARES OS, a self-driving research platform, combines automated robotics with artificially intelligent, or AI, algorithms to run its own experiments, record results and design and execute the next best steps to try to solve problems or find answers to research questions. Getting AI research robots into educators' hands at a low cost is crucial to support AFRL's ongoing efforts to multiply human research efforts by a thousandfold and to send the message that science is for everyone. Autonomous experimentation can effectively lower students' barriers to entry into scientific fields by exponentially decreasing the cost of doing research. Students are conducting market research and using cost-benefit analysis to determine where the most reliable, cost-effective 3D printer parts can be purchased. Ultimately, they want to find a way to affordably package a dependable hardware solution alongside ARES software and offer it to teachers as a contained kit to make it easier for them to learn how to implement the technology. The students working on this project have already identified some reasonable hardware solutions [to enable autonomous 3D printing] and are now focused primarily on developing curriculum to support moving this into schools...



Air Force Link - Oct 22, 2023

### **DHS S&T Awards Nearly \$1.8M to 18 Faculty Members at Minority Serving Institutions to Further Summer Research Team Program Projects**

...The Department of Homeland Security (DHS) Science and Technology Directorate (S&T) announced the recipients of nearly \$1.8 million in follow-on funding for 18 project teams from Minority Serving Institutions (MSIs). This funding will go towards supporting these 18 project teams in extending their 2023 Summer Research Team (SRT) Program projects, which operate in collaboration with DHS S&T Centers of Excellence. Each team was chosen based on their excellence in research, innovative ideas, leadership qualities and dedication to advancing homeland security-focused research. Faculty and students at these institutions collaborated with S&T-supported Centers of Excellence to create Homeland Security course content and actively participated in research addressing the complex challenges confronting DHS...

Homeland Security - Oct 23, 2023

### **NSF-Funded Project is Harnessing Virtual Reality and Machine Learning to Teach Quantum Computing**

...Researchers from the University of Central Florida, University of Texas at Dallas and Vanderbilt University have received a three-year, \$927,203 grant for advancing future quantum education by using virtual reality (VR) and machine learning to identify and address misconceptions regarding quantum information science (QIS). The U.S. National Science Foundation-funded project leverages QubitVR, a quantum-education VR application previously developed at UCF. UCF will be responsible for the iterative development of QubitVR — including the machine-learning-based intelligent tutoring versions, conducting the lab-based studies and evaluating QubitVR through an undergraduate QIS course. By using VR, educators can provide tangible, visual understandings of quantum mechanics that empower students and professionals to harness the power of quantum computing...

UCF Today - Oct 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 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

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## **Innovation Through NITRD Coordination**

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