

TECHNOLOGY ROUNDUP

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- International Conference on Medical, Biological and Pharmaceutical Sciences
- International Conference on Environment and Natural Sciences
- International Conference on Education and Social Science
- International Conference on Rehabilitation Science
- International Conference on Computer Systems Engineering and Research
- International Conference on Science Engineering & Technology
- 3rd International Conference on Research in Science, Engineering & Technology
- International Congress on History of Science and Technology

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PASTIC DEVELOPS COVID-19 S&T INFORMATION PORTAL

PASTIC as per its mandate of catering the S&T information needs of academia, R&D, industry and general community has developed a “COVID-19 S&T Information Resource Portal” (an online National Scientific and Technological Information Source on Coronavirus).



<http://Covid.pastic.gov.pk.fundingcovid.aspx>

The portal provides latest information on national/international publications (research articles, books and book-chapters by various publishers); technologies/techniques (testing kits, ventilators, masks, gloves, medical clothing, disinfectants, sanitizers etc); calls for proposals announced by various funding agencies (to carryout R&D to cope with the crises); countries; dashboards showing various disease combating models adopted by different current statistics (confirmed & active cases, deaths and recovered); databases of local scientist/researchers, institutions and industry (available for R&D in domains of Microbiology, Biotechnology, Pharmaceutical, Health, Molecular Biology & Genetics, Biochemistry, Virology, Zoology, Epidemiology, Biomedical and Engineering, etc). Govt. guidelines are also covered to manage the current situations as well as the general information including symptoms, precautions and treatment etc.

The portal specifically highlights the availability of scientists to conduct research on infectious diseases, development of vaccines, drugs, and equipment, etc., particularly in the context of COVID-19 pandemic and its prevention by adopting Triple-Helix Model approach involving Government, Universities, R&D Institutes, Industries and Funding agencies (HEC, PSF, MoST, IGNITE (MoIT) & DOST, Government of Khyber Pakhtunkhwa) to cater to the S&T challenges.

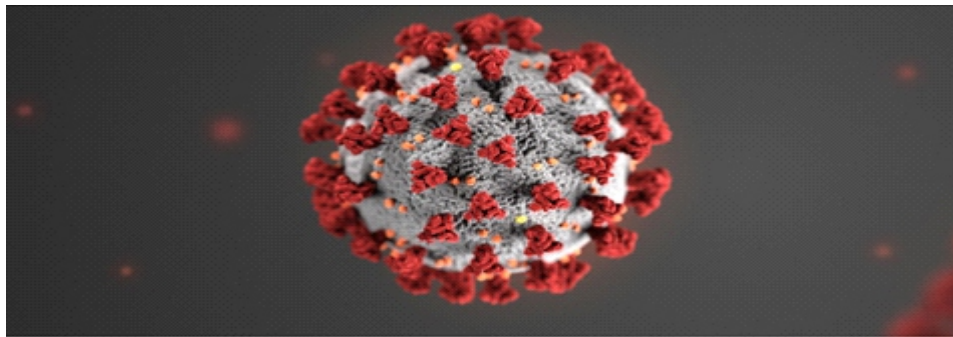
Source:

www.covid.pastic.gov.pk.fundingcovid.aspx

GIKI develops COVID-19 detector using Artificial Intelligence

Muhammad Aleem, a final year student at Ghulam Ishaq Khan Institute, (GIKI), KPK has come up with an AI-based solution for detecting Coronavirus using chest X-rays. He claims that his AI Corona detector provides results with 96% accuracy. This news comes as a ray of hope for people who cannot afford expensive tests for the deadly virus.

While it was found by American College of Radiology (ACR) that chest CT scans can be used to detect COVID-19, they are quite expensive for common people. However, chest X-rays can be done at any hospital or nearby dispensary.



Talking about his detector he said, “With certificates in Artificial Intelligence from Stanford, IBM, and DeepLearning.ai. He intends to apply engineering to the medical field . He used this to diagnose COVID-19 since Pakistan doesn't have proper resources for that. Neural Networks, a sub-branch of Artificial Intelligence, was used to develop the detector. He used a dataset of X-ray images of COVID-19 positive from Dr. Joseph Paul Cohen's GitHub repository and normal cases from Kaggle to train the system. Neural networks learn to make decisions by assigning weights to different factors and correcting them on the basis of wrong decisions made in the process.

Using the mentioned dataset, he has been able to achieve 85-90% accuracy. More data will be required to make the predictions more accurate. Government agencies and medical authorities have been contacted for the provision of data. The huge X-rays the systems has, the better it will be able to predict positive or negative cases of COVID-19.

Source:

www.techjuice.pk/a-student-from-giki-develops-covid-19-detector-using-artificial-intelligence

Do COVID-19 apps Protect your Privacy?

Many mobile apps that track the spread of COVID-19 ask for personal data but don't indicate the information will be secured or not.



<https://www.scmagazine.com/home/security-news/news-archive/coronavirus/global-covid-19-apps-found-suffering-from-flaws-malicious-copycats/>

Mobile apps are helping track the spread of COVID-19 to contain the outbreak, but the apps also raise concerns about personal privacy. Scientists at the University of Illinois at Urbana-Champaign analyzed 50 COVID-19-related apps available in the Google Play store for their access to users' personal data and their privacy protections. They found that most of the apps required access to users' personal data, but only a handful indicated the data would be anonymous, encrypted and secured. "What is disconcerting is that these apps are continuously collecting and processing highly sensitive and personally identifiable information, such as health information, location and direct identifiers (e.g., name, age, email address and voter/national identification)," they wrote in the journal article. "Governments' use of such tracking technology -- and the possibilities for how they might use it after the pandemic -- is chilling to many. Notably, surveillance mapping through apps will allow governments to identify people's travel paths and their entire social networks."

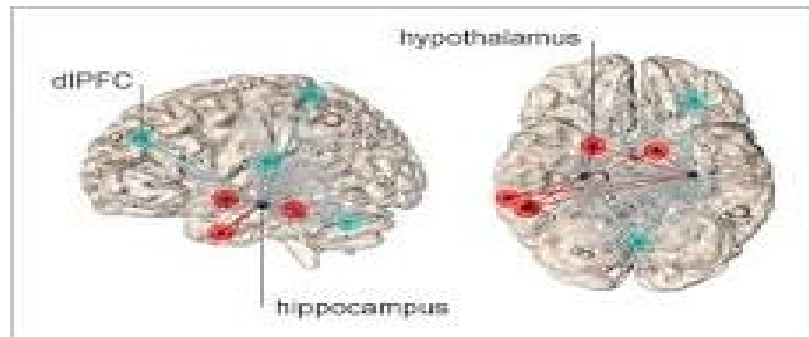
The functionalities of the COVID-related apps developed around the world include live maps and updates of confirmed cases, real-time location-based alerts, systems for monitoring home isolation and quarantine, direct reporting to the government of symptoms and education about COVID-19. Some also offer monitoring of vital signs, virtual medical consultations and community-driven contact tracing. Of the 50 apps the researchers evaluated, 30 require users' permission to access data from their mobile devices such as contacts, photos, media, files, location data, the camera, the device's ID, call information, Wi-Fi connection, microphone, network access, the Google service configuration and the ability to change network connectivity and audio settings. Some of the apps state they will collect users' age, email address, phone number and postal code; the device's location, unique identifiers, mobile IP address and operating system; and the types of browsers used on the device. Only 16 of the apps indicated such data will be anonymous, encrypted, secured and reported only in aggregate form. Of the apps sampled, 20 were issued by governments, health ministries and other such official sources. It is not clear if the data collected by the apps is protected by laws such as the Health Insurance Portability and Accountability Act, and the U.S. doesn't have a structured privacy framework in place as Europe does, the researchers wrote. They acknowledged that mass surveillance measures may be necessary to contain the spread of the virus. "Health care providers must absolutely use whatever means are available to save lives and confine the spread of the virus," they wrote. "But it is up to the rest, especially those in the field of information privacy and security, to ask the questions needed to protect the right to privacy."

Source:

www.sciencedaily.com/releases/2020/06/200608192334.htm

Researchers Find Where Stress Lives

Yale researchers have found a neural home of the feeling of stress people experience, an insight that may help people deal with the debilitating sense of fear and anxiety that stress can evoke.



Brain scans of people exposed to highly stressful and troubling images — such as a snarling dog, mutilated faces or filthy toilets — reveal a network of neural connections emanating throughout the brain from the hippocampus, an area of the brain that helps regulate motivation, emotion and memory. The brain networks that support the physiological response to stress have been well studied in animals. Activation of brain areas such as the hypothalamus triggers production of steroid hormones called glucocorticoids in the face of stress and threats. But the source of the subjective experience of stress experienced by people during the COVID-19 pandemic, for instance, has been more difficult to pinpoint. Scientists conducted a series of fMRI scans of subjects who were asked to quantify their stress levels when presented with troubling images.

The study reveals that neural connections emanating from the hippocampus when viewing these images reached not only areas of the brain associated with physiological stress responses, but also the dorsal lateral frontal cortex, an area of the brain involved in higher cognitive functions and regulation of emotions. Scientists found that when neural connections between the hippocampus and frontal cortex were stronger, subjects reported feeling less stressed by the troublesome images. Conversely, subjects reported feeling more stressed when the neural network between the hippocampus and hypothalamus was more active. These findings may help us tailor therapeutic intervention to multiple targets, such as increasing the strength of the connections from the hippocampus to the frontal cortex or decreasing the signaling to the physiological stress centers.

Source:

www.laboratoryequipment.com/564731-Researchers-Find-Where-Stress-Lives

Geophysicists Find a Much Earlier Birth Date for Tectonic Plates

Yale geophysicists reported that Earth's ever-shifting, underground network of tectonic plates was firmly in place more than 4 billion years ago—at least a billion years earlier than scientists generally thought.



Tectonic plates are large slabs of rock embedded in the Earth's crust and upper mantle, the next layer down. The interactions of these plates shape all modern land masses and influence the major features of planetary geology—from earthquakes and volcanoes to the emergence of continents. Understanding when plate tectonics started on Earth has long been a fundamentally difficult problem. As we go back deeper in time, we have fewer geological records. One promising proxy for determining if tectonic plates were operational is the growth of continents. This is because the only way to build up a continent-sized chunk of land is for surrounding surface rock to keep sinking deeply over a long period—a process called subduction that is possible only through plate tectonics.

An evidence of continental growth was found starting as early as 4.4 billion years ago. Scientists devised a geochemical simulation of the early Earth based on the element argon—an inert gas that land masses emit into the atmosphere. Argon is too heavy to escape Earth's gravity, so it remains in the atmosphere like a geochemical ledger. Because of the peculiar characteristics of argon, we can deduce what has happened to the solid Earth by studying this atmospheric argon. This makes it an excellent bookkeeper of ancient events.” Most of the argon in Earth's atmosphere is ^{40}Ar —a product of the radioactive decay of ^{40}K (potassium), which is found in the crust and mantle of continents. The researchers said their model looked at the atmospheric argon that has gradually accumulated over the history of the planet to determine the age of continental growth.

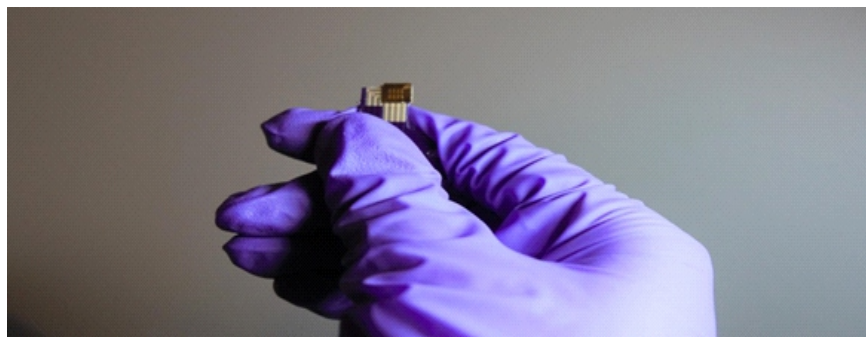
Part of the challenge in creating their simulation was incorporating the effects of a geological process called “crustal recycling.” This refers to the cycle by which continental crust builds up, then is eroded into sediments, and eventually carried back underground by tectonic plate movements—until the cycle renews itself. The simulation thus had to account for argon gas emissions that were not part of continental growth. “The making of continental crust is not a one-way process

Source:

www.laboratoryequipment.com/564732-Geophysicists-Find-A-Much-Earlier-Birth-Date-for-Tectonic-Plates

Artificial Intelligence (AI) is Energy-Hungry-new Hardware could Curb its Appetite

A team of engineers has created hardware that can learn skills using a type of AI that currently runs on software platforms. Sharing intelligence features between hardware and software would offset the energy needed for using AI in more advanced applications such as self-driving cars or discovering drugs.



Credit: Purdue University image/Qi Wang. <https://www.eurekalert.org/multimedia/pub/231005.php>

AI hardware development is still in early research stages. Researchers have demonstrated AI in pieces of potential hardware, but haven't yet addressed AI's large energy demand. The hardware is made of a so-called quantum material. These materials are known for having properties that cannot be explained by classical physics. Software uses tree-like memory to organize information into various "branches," making that information easier to retrieve when learning new skills or tasks.

The team introduced a proton to a quantum material called neodymium nickel oxide. They discovered that applying an electric pulse to the material moves around the proton. Each new position of the proton creates a different resistance state, which creates an information storage site called a memory state. Multiple electric pulses create a branch made up of memory states.

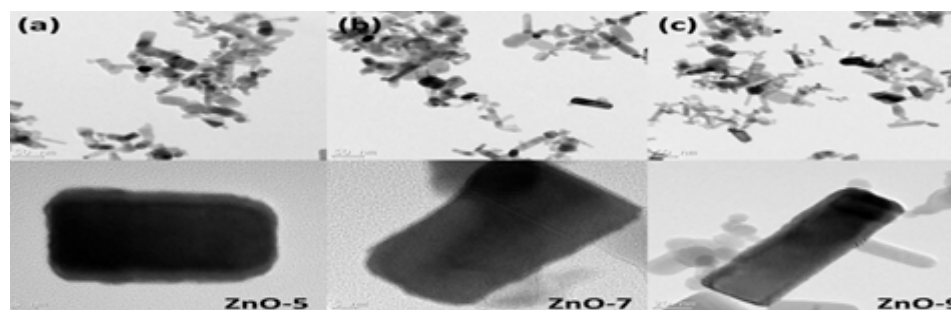
The material is capable of learning the numbers 0 through 9. The ability to learn numbers is a baseline test of artificial intelligence. Protons also are natural information transporters in human beings. A device enabled by proton transport may be a key component for eventually achieving direct communication with organisms, such as through a brain implant.

Source:

www.sciencedaily.com/releases/2020/05/200507094744.htm

Engineers find neat way to turn waste Carbon Dioxide into useful Material

Making catalysts to convert waste carbon dioxide into useful industrial products has been expensive and complicated -- until now. Engineers show it's as easy as playing with Lego.



HR-TEM images for (a) ZnO-5, (b) ZnO-7 and (c) ZnO-9. Credit: *Advanced Energy Materials* (2020). DOI: 10.1002/aenm.202001381. <https://phys.org/news/2020-06-neat-carbon-dioxide-material.html>

The researchers in the Particles and Catalysis Research Laboratory show that by making zinc oxide at very high temperatures using a technique called flame spray pyrolysis (FSP), they can create nanoparticles which act as the catalyst for turning carbon dioxide into 'syngas' -- a mix of hydrogen and carbon monoxide used in the manufacture of industrial products. The researchers say this method is cheaper and more scalable to the requirements of heavy industry than what is available today.

In an industrial setting, an electrolyser containing the FSP-produced zinc oxide particles could be used to convert the waste CO₂ into useful permutations of syngas.

"Waste CO₂ from say, a power plant or cement factory, can be passed through this electrolyser, and inside we have our flame-sprayed zinc oxide material in the form of an electrode. After passing the waste CO₂ in, it is processed using electricity and is released from an outlet as syngas in a mix of CO and hydrogen. The researchers are closing the carbon loop in industrial processes that create harmful greenhouse gases. And by making small adjustments to the way the nanoparticles are burned by the FSP technique, they can determine the eventual mix of the syngas building blocks produced by the carbon dioxide conversion.

A one to one ratio between the carbon monoxide and hydrogen lends itself to syngas that can be used as fuel. But a ratio of four parts carbon monoxide and one part hydrogen is suitable for the creation of plastics. In choosing zinc oxide as their catalyst, the researchers have ensured that their solution has remained a cheaper alternative to what has been previously attempted in this space. This method appealing is using the FSP flame system to create and control these valuable materials. While the duo have already built an electrolyser that has been tested with waste CO₂ gas that contains contaminants, scaling the technology up to the point where it could convert all of the waste carbon dioxide emitted by a power plant is still a way down the track.

Source:

www.sciencedaily.com/releases/2020/06/200610152016.htm

Forthcoming Tech Events

Pakistan

International Conference on Medical, Biological and Pharmaceutical Sciences

28-29 October, 2020

Rawalpindi Pakistan

www.iastem.org/Conference2020/Pakistan/1/ICMBPS/

International Conference on Environment and Natural Sciences

28-29 October, 2020

Rawalpindi Pakistan

www.iastem.org

International Conference on Rehabilitation Science

28-29 November, 2020

Rawalpindi Pakistan

[www.iser.co/conference 2020](http://www.iser.co/conference%2020)

World Congress on Information Technology

19-20 January, 2021

Sargodha

www.conferencealert.com/conf-detail.php?ev_id=368372

International

International Conference on Computer Systems Engineering and Research

7-8 January, 2021

Tokyo Japan

www.waset.org/computer-system

International Conference on Science Engineering & Technology

28-29 January, 2021

Singapore

www.icest.net

3rd International Conference on Research in Science, Engineering & Technology

11-13 March, 2021

Oxford UK

www.icrset.org

International Congress on History of Science and Technology

25-31 July, 2021

Czech Republic Prague

www.ichst2021.org

Tech & Trade Offers

Ghazi Engineering

Ghazi Engineering established in 2009 with the core aim to provide best quality services to its clients. Through restless efforts to achieve success the team of Ghazi Engineering left no stone unturned to achieve its targets. Today Ghazi Engineering is known for excellence and dedication. This has only been possible by our team. Today numerous multinationals and local companies look to Ghazi Engineering for quality and reliability. With the passage of time, Ghazi Engineering increased its scope of work. Now we offer installation and maintenance for:

- ✍ Lifts and Escalators
- ✍ Automatic Gates & Doors
- ✍ Surveillance Systems
- ✍ Fire Alarm Systems
- ✍ Burglar Alarm Systems
- ✍ Road Safety Barriers
- ✍ Networking Solutions &
- ✍ Automation

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About PASTIC

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