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# TECHNOTRENDS<sup>®</sup> NEWSLETTER

*The biggest ideas that are  
changing everything*

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## Control Your New Normal With A Focus On Significance

By Daniel Burrus, CEO of Burrus Research

Since the start of the coronavirus pandemic, I have been busy talking with executives from Fortune 500 companies, small startups, mom-and-pop shops, nonprofit organizations, individual entrepreneurs, friends, relatives, and so many professionals in so many walks of life. They all have the same question: what do we do now?

A global pandemic and economic downturn have left many speechless, many without work, and several businesses closing their doors after decades (even some over a century), all seemingly overnight.

Those who remained open, or those essential employees, all wonder what's next and, more importantly, what we can be certain of.

### Certainties in an Uncertain World

The answers I have given people have really helped. So, I have decided to dive deep into some of that advice and share what is helping each individual and organization that has been trying to piece back together the broken shards of glass that were once a booming stock market and flourishing economy at the start of this unbelievable year.

What I discovered is that during this time of great uncertainty, you have more

control than you realize. So let's focus on certainty, and start by asking ourselves, "What are we certain about?"

We can be certain about a lot, actually! An Anticipatory Leader knows that the very term "certainty" is a core element of my

“ *One major certainty that we are all sure of is that, regardless of when, this pandemic will end.* ”

Hard Trend Methodology, in which we use Hard Trends, or future certainties we know will happen, to pre-solve problems we will face before they occur.

One major certainty that we are all sure of is that, regardless of when, this pandemic will end. We will get a vaccine, and life will slowly transition back to a world devoid of social distancing and masks.

Yet in the meantime, an equally important certainty for all organizations to recognize is that we are all going through this together. No one is necessarily enjoying the pandemic; we are all suffering in one way or another.

*continued on page 8*

TECHNOLOGY NEWS HIGHLIGHTS

# Color-Changing Ink

A silk-based ink that changes color when exposed to certain chemicals could be used to create a whole new generation of “wearables” for health and environmental monitoring.

The first step was to create inks that respond predictably to various reactive substances. Silk was used as a base because of its ability to protect the compounds and prevent them from losing function when added to the ink.

Sodium alginate was then added to thicken the mix and make it suitable for screen printing. When printed on a fabric garment, the reactive molecules can be used to indicate a variety of factors.

For example, pH sensitive compounds could

provide a measure of dehydration, while lactate oxidase indicators could measure fatigue.

The compounds can also be adapted to react to bacteria or to track dangerous gases in the environment.

Further studies will focus on quantifying color changes to provide clinically actionable information based on ambient lighting conditions and the types of cameras used.

Regardless, the new technology has the potential to revolutionize wearable sensors by replacing today's rigid and bulky designs.

*For information: Fiorenzo Omenetto, Tufts University, SilkLab; Web site: <https://ase.tufts.edu/biomedical/unolab/home.html>*

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# Low-Energy Desalination



# Fire Sensor

A team of researchers has developed a new technology that can transform seawater into potable drinking in less than 30 minutes, a development that could provide clean water for millions of people throughout the world.

The new system utilizes a special metal organic framework (MOF) that is synthesized by introducing poly (spiropyran acrylate) (PSP) into a special MOF known as MIL-53.

The resulting membrane can remove harmful particles using very little energy. Per kilogram, PSP-MIL-53 yielded nearly 140 liters of fresh drinking water with a total dissolved solids (TDS) level of less than 500 parts per million. The adsorbent can then be regenerated simply by exposing it to sunlight for less than five minutes.

The method could also be used to extract minerals from waste water generated by mining operations in a low-energy, environmentally friendly manner.

*For information: Huanting Wang, Monash University, Department of Chemical Engineering, Room 222, Green Chemical Futures, Wellington Road, Clayton, Victoria 3800, Australia; phone: +61-3-990-53449; email: [huanting.wang@monash.edu](mailto:huanting.wang@monash.edu); Web site: <https://www.monash.edu/engineering/departments/chemical>*

An inexpensive paper sensor could help detect deadly wildfires sooner than watchtower observers, foot patrols and satellites can spot them. It's composed of ionic liquids – molten salts that are printed onto ordinary paper at a cost of about 40 cents per sensor.

The sensors generate an electrical signal whenever an abrupt temperature change is detected. The heat also provides power, eliminating the need for batteries.

A network of sensors could be placed at the bases of trees to send signals wirelessly to nearby receivers. The network is one component of the complex and highly coordinated effort involved in fighting these fires; the developers hope that saving critical time at the onset will translate into better overall outcomes.

In addition to further testing, the next step will be to expand the wireless range, which is now limited to about 100 meters, as well as to develop a protective shield for the devices.

*For information: Yapei Wang, Renmin University of China, 59 Zhongguancun Street, Haidian District, China 100872; phone: +86-10-625-11081; Web site: <https://www.ruc.edu.cn/en>*

# Next Generation AI?

An artificial intelligence (AI) research lab recently released what is quickly becoming known as the most dangerous AI algorithm in history.

Dubbed GPT-3 (for Generated Pretrained Transformer), it's the latest in a series of automated text-generating neural networks.

Basically, it's a language model that has been trained on the largest dataset of text to ever be fed into an AI system, including digital books, articles, religious texts and anything else you can imagine - a reported 175 billion parameters.

To put it in perspective, the entirety of English Wikipedia entries (an estimated 6 million articles) makes up less than 1 percent of the information used to train GPT-3.

The result is a system that can take a few sentences and expand them into a full-length story - or poetry, or computer code, or meme - and do it fairly convincingly.

The fear is that tools like this could be used to spread fake news faster than ever. But the downside of such a huge system is that

it requires a lot of computing power to actually use it.

So, while it's interesting, it may not be practical. We'll see...

*For information: OpenAI, 3180 18th Street, San Francisco, CA 94110; Web site: <https://openai.com/>*



## Dueling Fighter Jets

Last month, DARPA's Air Combat Evolution (ACE) project hosted a virtual competition in which artificial intelligence (AI) algorithm teams tested their flying ability against an experienced Air Force fighter pilot in what's commonly known as a dogfight (i.e., combat maneuvers within visual range).

The trials were designed to build trust in the ability of AI to achieve effective human-machine interaction in air combat applications.

Eight companies participated in the event, but only one could be selected for the ultimate challenge - and it performed even better than expected, outmaneuvering the human pilot 5-0.

The goal of ACE is to demonstrate that a collaborative relationship is possible where AI performs tactical tasks, while an onboard pilot manages higher-level strategies. But convincing the pilots is no easy task.

This contest represented a big step forward in gaining that confidence.

*For information: Defense Advanced Research Projects Agency (DARPA), 675 North Randolph Street, Arlington, VA 22203; phone: 703-526-6630; Web site: <https://www.darpa.mil/> or <https://www.darpa.mil/news-events/2020-08-26>*

The new batteries could even enable electric vertical take-off and landing (eVTOL) aircraft for short urban helicopter runs.

But they also estimated that it would only require about a 10 percent increase in energy density to make electric planes a reality.

For the moment, the bigger hurdle is to increase the useful life of the battery from the current 200 cycles to 800 or 1,000 that would be expected for commercialization.

But developers are confident that will be achieved in roughly four to five years.

*For information: Jeff Dahn, Tesla, Inc., Palo Alto, CA; phone: 877-798-3752; Web site: <https://www.tesla.com/>*

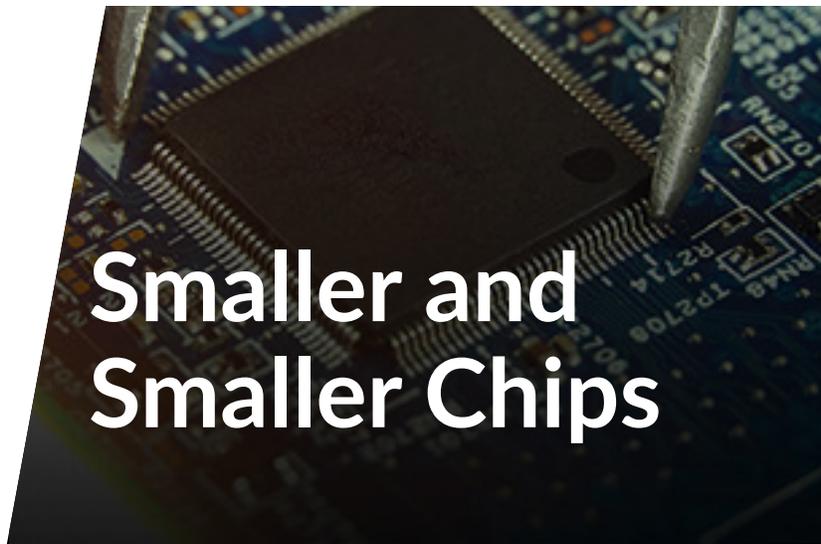


## Electric Planes

Battery researchers recently published a paper on a new technology that could pave the way for electric aircraft in the not-too-distant future.

The new anode-free lithium-metal design achieved an energy density of 360 kilowatt-hours per kilogram and a volumetric energy density of 1,000 kilowatt-hours per liter.

At these levels, the range of electric vehicles could be improved by up to 280 kilometers (175 miles).



## Smaller and Smaller Chips

For years now, many people have thought that we had reached the limit of Moore's Law - the idea that the number of transistors on a chip would double every two years.

But that number has continued to increase steadily to the point where some chips now contain 50 billion transistors...and still

counting...with the smallest components about the size of a red blood cell.

The problem is that, when things get that small and close together, electrons more easily leak from one component to another, causing interference.

So a group of researchers has developed a way to insulate them using what's called thin-film amorphous boron-nitride (also known as white graphene).

Like carbon, boron and nitrogen can crystallize into a single layer of atoms. But unlike graphene, boron-nitride has properties that make it an excellent insulator as well as thermally stable.

It can be fabricated using chemical vapor deposition with no need for manufacturing retooling. And at a thickness of only three nanometers, it could definitely pave the way for yet another generation of smaller and smaller chips.

*For information: Manish Chhowalla, University of Cambridge, Department of Materials Science and Metallurgy, 27 Charles Babbage Road, Cambridge CB3 0FS, United Kingdom; phone: +44-1223-334300; fax: +44-1223-334567; email: [mc209@cam.ac.uk](mailto:mc209@cam.ac.uk); Web site: <https://www.msm.cam.ac.uk/>*

# Quantum Communications

Verizon recently announced plans to roll out an expanded pilot project of quantum key distribution (QKD) – a technology that will provide enhanced security for network connections.

With QKD, two parties share an encryption key, which allows them to communicate with each other, and also can detect if a third party is trying to gain access.

The keys are continuously created using a random number generator. In trials, video was encrypted and streamed in real time over a fiber network.

As the quantum keys were exchanged between two locations, hackers could be detected instantly, since any interruption of the channel will break the quantum state.

The system was successfully tested in Washington, DC, and will now be extended across the United States.

*For information: Verizon; Web site: <https://www.verizon.com/about/news/verizon-achieves-milestone-future-proofing-data-hackers>*



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# Control Your New Normal With A Focus On Significance

*continued from page 1*

So what are some ways for you and your organization to take control of the certainty that, for now, we are all going through this pandemic together?

## Significance over Success

In past articles, I have discussed the importance of shifting your focus from success to significance in order to leverage new, profound opportunities in your industry and beyond.

This method holds true now more than ever.

Prior to COVID-19, many companies I spoke with all focused on having a successful company with a strong bottom line, especially in a flourishing economy.

Truth be told, we all focus on being successful at whatever we do; however, it is often overlooked that success is merely about us.

It is all about our company, our organization, our team, how much money you make, the accolades on our wall: all of those things that show our personal and organizational success.

What COVID-19 did was level the playing field in many ways. Suddenly, none of us, whether a Fortune 500 company or small startup, could function successfully the

same way. Many lost money by having to shut their doors, such as bars and restaurants, and others were affected by their customers having to close due to being deemed nonessential in the early days of the lockdown. Either way, the status quo was disrupted in remarkable ways.

How does one feel successful when many professional creature comforts have been stripped from us and we are operating with a skeleton crew? By making a shift to significance from a focus on success in order to take control of the new normal we are moving into.

Significance is not about you; significance is about all the people whom you help and all the people you serve. If you can elevate your significance as an individual, leader, or an organization, success will follow as a byproduct and you will reach stratospheric heights never before thought possible.

## The Silver Lining

Truth be told, we all have tremendous opportunity right now with the new normal the world is moving towards.

I'm certainly not diminishing the fact that this virus we face is indisputably detrimental, but what I want to do is ignite the fire in you to recognize the opportunity to be significant and help the world using the skills you or your organization have in these perilous times.

Opportunity has transformed. Opportunity is no longer solely for monetary gain; it is now for the greater good of humanity. We are in a period of transition from "I can sell you this" to "What do you need?"

Let's take, for example, the education industry. A hotly debated issue as we head into our new normal is whether or not schools open to full capacity, open in phases, or stay completely virtual. Many districts across the country are sticking to hybrid or fully virtual as we move into the fall of this year.

While older students, in many cases, have taken to virtual education much better than younger students both developmentally and in a self-directed fashion due to their age, the younger students are still part of those districts staying remote. What happens to those younger students when the fall sets in and their parents are back at work during the school day?

Believe it or not, there is an answer, and it is in part thanks to individuals banding together and moving beyond success to significance.

A group of medical students considered the issue of students having to learn remotely and, more importantly, the kids of those working on the front lines during this pandemic, such as healthcare workers, doctors, nurses, and the like.

What did they decide to do? They banded together to launch a website designed to advertise their ability to babysit the children of those frontline workers while they do their schoolwork virtually.

To expand, they are coordinating other medical students who are looking to volunteer as babysitters as well, and it is growing quickly.

As you can see, those medical students aren't trying to be successful; they are moving beyond success to significance and finding success in doing so!

### **New Normal and Beyond**

Ask yourself: if your company, organization, or career ended tomorrow, as abruptly as the world was shut down at the start of the coronavirus pandemic, what would you be remembered for: how much success you had, or your significant impact when the world needed it most?

There is far more longevity during traditional times in chasing significance than chasing success, and now even more in this new normal.

You can control your new normal with a shift in focus from success to significance, and even better, you can improve the world as we know it.

Think of the coming new normal as a fresh start. In many ways, the world hit the reset button, though Hard Trends are still prevalent, and an anticipatory mindset helps tremendously in paying attention to these future certainties that will impact the world in new ways in the coming months and into next year.

# Burrus Research®

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