

# Newsletter

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*“sometimes the smallest step in the right direction ends up being the biggest step of your life tip toe if you must. but take the step.”*

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## Google is using AI to predict wind farm power output

**G**oogle is using AI to solve the problem of predicting the power output of a wind farm ahead of time. Wind farms are a fantastic source of renewable energy but their output can be hard to predict due to the nature of wind.

By improving the accuracy of predictions and providing more data, wind farm operators are better prepared to meet upcoming power demands. Google wrote:

**“Based on these predictions, our model recommends how to make optimal hourly delivery commitments to the power grid a full day in advance. This is important, because energy sources that can be scheduled (i.e. can deliver a set amount of electricity at a set time) are often more valuable to the grid.”**

Increased value helps to drive uptake of wind energy. While the algorithm is still being optimised, Google claims its AI has “boosted the value of our wind energy by roughly 20 percent”.

## How AI technologies are helping in the fight against cancer

**F**rom the invention of smartphones to digital assistants like Siri or Alexa breakthrough technology has been an extremely hot topic in recent years. Many aspects of life revolve around technology, but some of the most incredible innovations, however, are unseen by the majority of us in our daily lives.

Generally speaking, it was much more grim to receive a cancer diagnosis roughly 50 years ago than it is today. The 5-year survival rate for childhood leukemia was [just 14 percent from 1960 to 1963](#), for example, but has [more than quadrupled to 61.4 percent](#). There has been a number of significant advancements in the world of cancer care and more breakthroughs have been made since the start of the 21st century than any period of time prior.

In the world of healthcare, and more specifically cancer care, technology is being used in new and exciting ways. Several studies have been done in order to test the lengths to which we can take our care with artificial intelligence to aid in the fight against cancer – and hopefully eradicate it once and for all. Although there has certainly been progress and outcomes look better overall, cancer rates continue to rise. There has been an estimated 18.1 million new cancer cases and 9.6 million cancer deaths in 2018, according to a [recent report](#), which is a rapid progression compared to the 14.1 million cases and 8.2 million deaths reported in 2012. This places an immense amount of





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pressure on oncologists and researchers to get ahead, however, artificial intelligence may be a reputable solution to help relieve this burden.

In particular, there is a rising rate of people with occupational cancers due to the shift in working conditions of the 20th century. People who worked in factories, on shipyards or in close proximity to homes or buildings constructed with asbestos-containing materials (ACM) are at-risk of developing rarer cancers, including the often fatal mesothelioma. A cancer that develops in the mesothelium of the lungs, heart or abdomen following asbestos exposure, mesothelioma has a high rate of misdiagnosis. Its symptoms mimic common illnesses, including asthma, the pneumonia and Irritable Bowel Syndrome (IBS), which often leaves patients undiagnosed for decades. The incidence rate of mesothelioma has risen in recent years due to the 10-50 year latency period and many people who were exposed to the toxin at their workplace during the 1900s are now at risk.

As we continue into the 21st century, artificial intelligence could make a major impact for patients with mesothelioma because of the ['cancers especially poor prognosis'](#). The life expectancy of a mesothelioma patient is less than two years on average, so early detection and diagnosis could be lifesaving. Fortunately, a few studies are already being done with regard to malignant mesothelioma and artificial intelligence, despite the cancer's rarity.

## **TalentSprint announces women engineers program supported by Google**

**T**he participation of women engineers in the technology sector globally still only stands at 26%, as per the Bureau of Labor Statistics.

BENGALURU: TalentSprint has announced its Women Engineers Program (WE), supported by Google, to nurture 600 women software engineers from India over the coming three years, said a company statement issued today.

The programme is aimed at addressing the gender imbalance in technology by grooming promising talent among women engineering students to advance and contribute to the field. It is designed to support women engineers from underprivileged and disadvantaged backgrounds. As a part of this initiative, college students from varied socioeconomic backgrounds will be identified via a detailed selection process and groomed through a rigorous multi-step training programme, supported by 100% scholarships and annual stipends of Rs. 1 lakh each.

The participation of women engineers in the technology sector globally still only stands at 26%, as per the Bureau of Labor Statistics.

Offered as a one-year experiential programme for women college students entering their third and fourth years, TalentSprint WE is





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comprised of summer coding bootcamps, live online classes, ongoing mentorship, certification and team-based projects to enhance problem solving and computational thinking. The initiative builds upon TalentSprint's past experience with Women in Software Engineering (WISE), a diversity initiative.

The inclusion of women at every stage of the process to create universally relevant technology products is critical and we are committed to facilitating gender and socioeconomic diversity among software engineers worldwide. We look forward to creating a large pool of promising women engineers who can bring their engineering skills to the ecosystem, and to Google," said Anand Rangarajan, engineering director at Google India.

## Microsoft signals that Intel chip shortages could be over

**M**icrosoft reported strong results for its fiscal third quarter. Executives said the recent PC supply problems appear to have eased. A shortage in Intel microprocessors that affected Microsoft and the PC industry during late 2018 appears to have ended, helping spur sales of Microsoft's Windows and Surface products.

During Microsoft's earnings call on Wednesday, chief financial officer Amy Hood said the overall PC market was stronger than anticipated. "In Windows, the overall PC market was stronger than we anticipated, driven by improved chip supply that met both unfulfilled Q2 commercial and premium consumer demand as well as better-than-expected Q3 commercial demand," Hood said.

A quarter ago, Hood had taken a different tone, complaining on behalf of Microsoft that chip supply constraints had hurt the overall PC market. "The overall PC market was smaller than we expected primarily due to the timing of chip supply to our OEM partners, which constrained an otherwise healthy PC ecosystem and negatively impacted both OEM Pro and non-Pro revenue growth," Hood said then.

Hood didn't specifically detail what changes Intel had made, nor did she call out the chipmaker specifically. But Intel itself had acknowledged its manufacturing problems in January, and other PC vendors had addressed the issue. As far as Microsoft is concerned, though, Intel apparently has solved its problems. Hood said that as far as chip supply goes within commercial and the premium consumer segments, "we feel fine for Q4."

Microsoft topped analyst estimates in terms of revenue and profits for the third quarter of fiscal 2019, which it reported Wednesday. The company recorded net income of \$8.8 billion, up 19 percent from a year ago, on revenue of \$30.6 billion, up 14 percent from a year ago. Revenue

in More Personal Computing, which houses Windows, Surface, and Xbox gaming revenue, was \$10.7 billion and increased 8 percent from a year ago.

While sales of "non-Pro" Microsoft Windows were essentially flat, sales of Windows Pro software climbed 15 percent.

Surface revenue increased 21 percent year over year to \$1.32 billion, though it declined from a quarter ago, when Microsoft reported \$1.86 billion in sales during the





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traditionally strong fourth-quarter holiday season. Microsoft also apparently met its own aggressive Surface forecasts from a quarter ago. In January, Hood predicted that Surface would generate sales growth in excess of 20 percent—though without specifying whether she was referring to sequentially or year over year. To date, Microsoft's Surface line has exclusively used Intel processors.

## Google launches Anthos to accelerate multi-cloud adoption

**A**nthos will enable enterprises to create applications and run them seamlessly from anywhere, whether their own data centers or third party public cloud platforms including Google Cloud, AWS and Azure.

Google has announced a cloud platform service known as Anthos, which lets Google's open source cloud tools to work with rival companies such as Amazon's AWS and Microsoft's Azure. Google rolled out Anthos at its Cloud Next conference in San Francisco and it is set to heat up the already competitive cloud computing market.

Anthos is based on Google's Kubernetes, an open-source container management system for automating application deployment, scaling, and management. Anthos will enable enterprises to create applications and run them seamlessly from anywhere, whether their own datacenters or third party public cloud platforms including Google Cloud, AWS and Azure.

Google has also announced integrations with up to 30 hardware, software and system integration partners - including Cisco, VMware, Dell EMC, HPE, Intel, Lenovo and others. At the moment, Anthos only supports AWS and Azure cloud platforms and does not support integration with IBM Cloud, Oracle Cloud and Alibaba.

### Anthos Migrate- a unique VM migration technology

One feature of Anthos, known as Anthos Migrate automatically migrates virtual machines (VMs) from the cloud, whether private or public, to containers in Google Kubernetes, without any VM modifications.

Anthos Migrate, which is a beta service, is expected to make cloud migration much simpler for organizations that have a big VM presence for their legacy applications.

"This unique migration technology lets you migrate and modernize your infrastructure in one streamlined motion, without upfront modifications to the original VMs or applications," stated Google.

### Cisco will integrate its technologies with Anthos

One of Google's important partners for Anthos - Cisco has announced that it will soon integrate its broad set of technologies with it including Cisco HyperFlex and HyperFlex Edge; Cisco ACI, Cisco Stealthwatch Cloud, Cisco SD-WAN, and Cisco Intersight.

According to Cisco, its integration with Anthos will help customers build and manage multi-cloud and hybrid applications across their on-premises data centers and public clouds. "What customers need is a seamless environment across on-premises and public clouds so they can deliver business results despite the complexity. That's why our partnership with Google Cloud makes so much sense – Cisco's networking, security, and data center portfolio, combined with Google's platform, as well as the latest and greatest from the open source community, make a powerful set of capabilities available to our customers, said Kip Compton, SVP of Cisco's Cloud Platform in Cisco's official [blog post](#).





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## Microsoft will ship the Windows 10 May 2019 Update in late May, giving you power over updates

Microsoft announces a prolonged testing period for what is now the Windows 10 May Update, including more powerful Windows Update controls that allow everyone to delay patches for up to 35 days.

Remember the [Windows 10 April 2019 Update](#)? Microsoft has now officially dubbed it the Windows 10 May 2019 Update, and plans to roll it out to Insiders next week alongside more permissive user controls than ever before.

The Windows 10 May 2019 Update (also code-named “19H1,” or version 1903) will begin deploying to all PCs in late May, on a day that hasn't yet been determined. But there's something brand new: The update will specifically call out the feature release, and allow users to delay it—and *any* update, including security patches—for up to 35 days. Even better, Windows won't decide when to install updates—you will, with an exception or two.

“We will provide notification that an update is available and recommended based on our data, but it will be largely up to the user to initiate when the update occurs,” Michael Fortin, the Microsoft corporate vice president in charge of Windows, wrote in a blog post that was provided to PCWorld.

Microsoft has at least two priorities for the May 2019 Update rollout: Put control over updates in the hands of the user, and minimize bugs. Microsoft plans to go slowly and carefully to avoid a repeat of the [disastrous rollout](#) of the [October 2018 Update](#), which was re-released in November after the original update overwrote files on a small number of PCs. The severity of the bug prompted Microsoft to issue a public *mea culpa* and pledge to improve its testing procedures, the fruits of which Microsoft says you'll see with the Windows 10 May 2019 Update.

What this means to you: A combination of a cautious deployment and built-in features mean that Microsoft's bending over backwards to ensure a smooth rollout. Known informally by some as the “updater's update,” the Windows 10 May 2019 Update also includes specific features to help you manage Windows, which we'll call out in our review. For example, intelligent Active Hours figure out when you're not using your PC, and push updates then. One long-awaited feature simply puts an icon on your taskbar, quietly notifying you when a Windows update is ready to install.



## Engineers develop first method for controlling nanom

In a breakthrough for nanotechnology, engineers at The University of Texas at Austin have developed the first method for selecting and switching the mechanical motion of nanomotors among multiple modes with simple visible light as the stimulus.

The capability of mechanical reconfiguration could lead to a new class of controllable nanoelectromechanical and nanorobotic devices for a variety of fields including drug delivery, optical sensing, communication, molecule release, detection, nanoparticle separation and microfluidic automation. The finding, made by Donglei (Emma) Fan, associate professor at the Cockrell School of Engineering's Department of Mechanical Engineering, and Ph.D. candidate Zexi Liang, demonstrates how, depending on the intensity, light can instantly increase, stop and even reverse the rotation orientation of silicon nanomotors in an electric



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field. This effect and the underlying physical principles have been unveiled for the first time. It switches mechanical motion of rotary nanomotors among various modes instantaneously and effectively.

Nanomotors, which are nanoscale devices capable of converting energy into movement at the cellular and molecular levels, have the potential to be used in everything from drug delivery to nanoparticle separation.

Using light from a laser or light projector at strengths varying from visible to infrared, the UT researchers' novel technique for reconfiguring the motion of nanomotors is efficient and simple in its function. Nanomotors with tunable speed have already been researched as drug delivery vessels, but using light to adjust the mechanical motions has far wider implications for nanomotors and nanotechnology research more generally.

"The ability to alter the behavior of nanodevices in this way -- from passive to active -- opens the door to the design of autonomous and intelligent machines at the nanoscale," Fan said.

Fan describes the working principle of reconfigurable electric nanomotors as a mechanical analogy of electric transistors, the basic building blocks of microchips in cellphones, computers, laptops and other electronic devices that switch on demand to external stimuli.

"We successfully tested our hypothesis based on the newly discovered effect through a practical application," Fan added.

"We were able to distinguish semiconductor and metal nanomaterials just by observing their different mechanical motions in response to light with a conventional optical microscope. This distinction was made in a noncontact and nondestructive manner compared to the prevailing destructive contact-based electric measurements."

The discovery of light acting as a switch for adjusting the mechanical behaviors of nanomotors was based on examinations of the interactions of light, an electric field and semiconductor nanoparticles at play in a water-based solution.

This is Fan and her team's latest breakthrough in this area. In 2014, they developed the smallest, fastest and longest-running rotary nanomotors ever designed.

The research was funded by Fan's National Science Foundation Faculty Early Career Development Award and the Welch Foundation.

## **Diagnosing urban air pollution exposure with new precision**

**A** new review of studies on levels of urban exposure to airborne pollutants and their effects on human health suggests that advanced instrumentation and information technology will soon allow researchers and policymakers to gauge the health risks of air pollution on an individual level.

In New York City alone, the economic impact of premature death from causes related to air pollution, including asthma and other respiratory conditions and cardiovascular complications, exceeds \$30.7 billion a year. Globally, 4.2 million deaths per year are attributable to airborne pollution, making it the fifth-ranking mortality risk factor according to a 2015 study published in the Lancet.

An interdisciplinary research team from New York University, led by Masoud Ghandehari, an associate professor in NYU Tandon's Department of Civil and Urban Engineering and the Center for Urban Science and Progress (CUSP), published a comprehensive review of recent efforts to assess the impact of air pollution exposure in cities.



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Ghandehari's co-authors are Andrew Caplin, Silver Professor in the NYU Department of Economics; Paul Glimcher, Silver Professor and professor of neural science and psychology; George Thurston, NYU School of Medicine professor in the Departments of Environmental Medicine and Population Health; and Chris Lim, a recent Ph.D. graduate of the School of Medicine.

Their paper, published in *Nature Communications*, explains how data gleaned from environmental sensors mounted on buildings and lamp poles, as well as mobile and wearable sensors, were combined with information on socioeconomic status, commuting patterns, and lifestyle habits such as outdoor exercise to develop models of pollution exposures at the neighborhood level. Such studies were conducted in major urban centers, including New York City, Hong Kong, and San Francisco, and informed public policy on air pollution limits and climate action strategies.

Yet the authors argue that advanced sensing and information technologies can be used to even greater advantage, offering the potential for far more granular assessments -- at the level of the individual. "One of the questions we want to answer is how different people experience pollution, and why?" Ghandehari said.

He explained that population-level assessments overlook factors such as personal mobility -- including commuting by car, bus, bicycle, or on foot, and often do not consider

indoor climate control conditions or life stage. For example, students and working adults are more mobile than older people and are therefore more exposed, while children experience lifelong adversities.

Socioeconomic status is also a known factor for increased exposure to airborne pollutants as well as increased risk of asthma and cardiovascular disease. "People from all points on the economic spectrum live in polluted areas, yet they often have different health outcomes," Ghandehari said. "Using technology to study individual associations between air pollution and health outcomes -- rather than group associations -- will yield evidence-based arguments for change that would particularly impact individuals at higher risk of negative health impacts."



*"From next issue, the Technical newsletter will publish Fortnightly."*