AI project aims to diagnose COVID-19 using voice analysis

Researchers from Carnegie Mellon University are developing an AI-powered voice analysis system for diagnosing COVID-19.

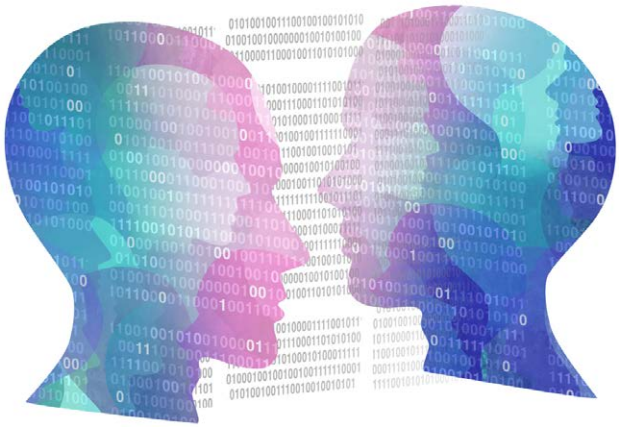
Governments around the world are racing to obtain sufficient and effective testing kits to diagnose COVID-19. The current widely-used test requires a thin cotton swab to be put up the nasal cavity and reach to the back of the throat. It's not a painful procedure, but it's invasive and uncomfortable.

COVID-19 tests which only require a finger prick are starting to be rolled out but obtaining sufficient numbers of any test is proving difficult. On Tuesday, British cabinet minister Michael Gove said the UK was being hindered by the global shortage of chemical reagents needed for testing.

If the researchers from Carnegie Mellon are successful, a test that could be taken at home instantly could be rolled out. While it's unlikely to ever be as accurate as a full test, it could help to prioritise where limited resources should be allocated and determine which households are more likely to be suffering from seasonal flu.

Benjamin Striner, a graduate working on the project, said: "I've seen a lot of competition for the cheapest, fastest diagnosis you can have."
"And there are some pretty good ones that are actually really cheap and pretty accurate, but nothing's ever going to be as cheap and as easy as speaking into a phone."

Coronavirus is a respiratory illness and therefore affects breathing patterns and other vital parameters.



The AI system analyses a person's voice and provides a score on the likelihood that the individual has coronavirus based on markers observed from known sufferers.

The researchers are currently asking both healthy and infected people to share a recording of their voice to help improve the algorithm.

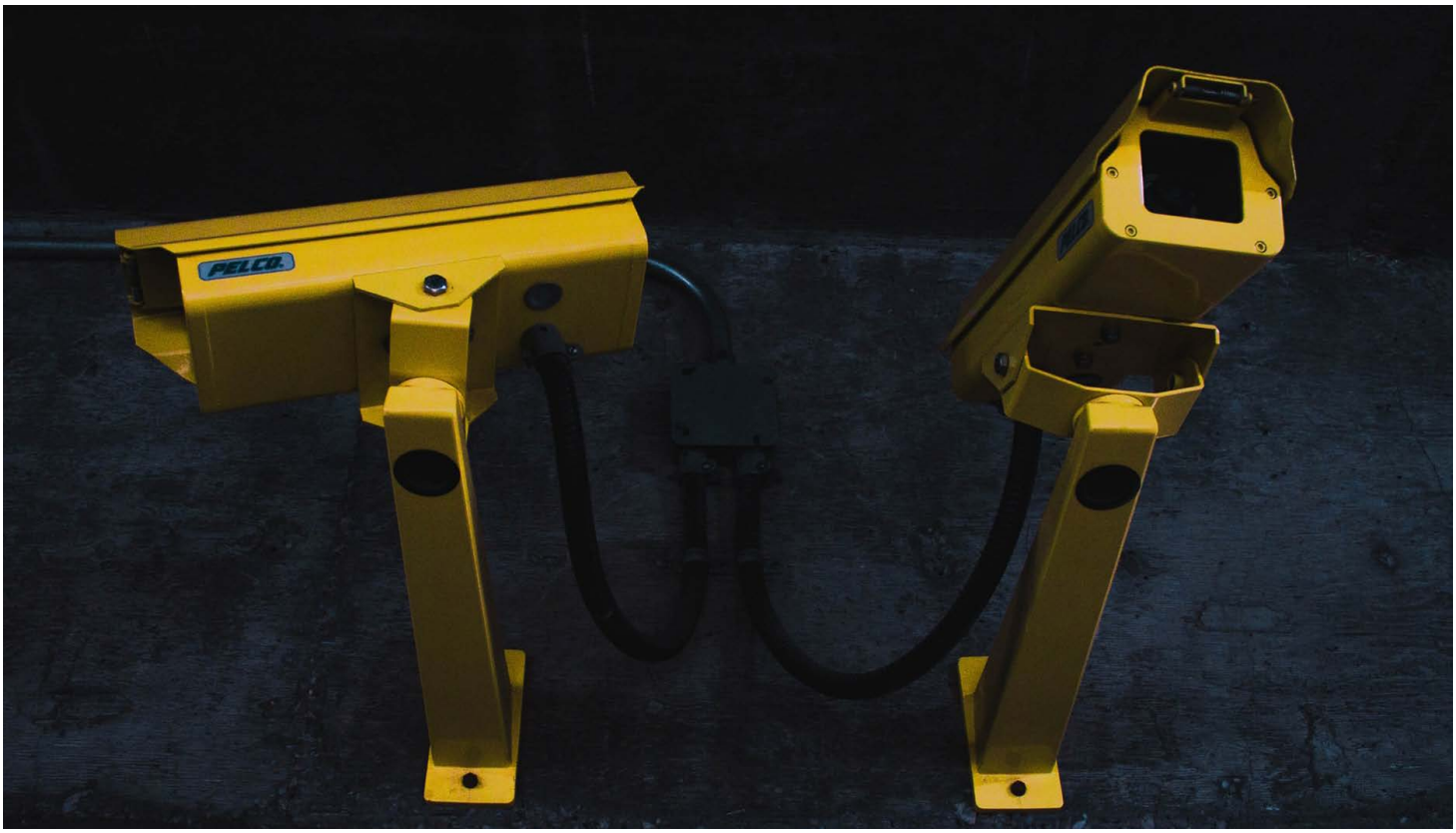
Yours truly has already submitted his voice. The process takes around five minutes and requires the following seven steps:

- Submit basic demographic information.
- Cough three times.
- Say 'a' for as long as you can.
- Say 'o' for as long as you can.
- Say 'e' for as long as you can.
- Count to 20.
- Say the alphabet.

Be aware the app is still in its early stages and is not yet approved by agencies like the FDA or CDC. The app should also not be used as a substitute for a proper medical test or examination if you're concerned you may have COVID-19.

Source:https://artificialintelligence-news.com/2020/04/01/ai-project-diagnose-covid-19-voice-analysis/

AI exposed Brits ignoring advice
to stay home and socially distance



An AI system exposed the shameful number of Brits who ignored advice to stay home, socially distance, and only travel if essential amid the coronavirus outbreak.

British PM Boris Johnson said he wanted to avoid the draconian measures in place in other countries if possible. However, if coronavirus cases and deaths continue to climb – as people fail to follow advice - then he'd be left with no option.
Images of Brits continuing to hit the pub and other large gatherings, putting the lives of themselves and others at risk, were rightly condemned and led to a national lockdown in the UK this week.

Research conducted by Vivacity Labs, a startup focused on traffic surveillance systems, sought to determine whether more people were staying at home last week compared to the week commencing February 3rd.

Vivacity Labs observed just a 30 percent drop in pedestrians. Car and motorcycle traffic dropped even less, at just a pitiful 15 percent. The number of cyclists declined a mere 13 percent.

The company's findings were based on its network of 200 sensors installed across 10 UK cities.

So, did people at least space themselves further apart? The company's findings in Oxford suggest nowhere near enough.

Using a network of 78 sensors owned by Oxford Council, Vivacity Labs noted a drop in pedestrians of 48 percent. This is better than the relatively small drop in traffic, but the firm only noted 28 percent fewer interactions between pedestrians over two meters apart.

With a police-enforced lockdown now in place and many venues closed, it seems fellow Brits are

finally getting the message to stay home wherever possible.

Hopefully, enough people will now listen to "flatten the curve" of the coronavirus spread to save lives and start lifting restrictions. If not, the UK could end up seeing much stricter measures seen in other countries like requiring written permission to leave their households and military personnel on the streets for enforcement.

Source:https://artificialintelligence-news.com/2020/03/27/ai-exposed-brits-ignoring-advice-stay-home-socially-istance/

Google's

latest AI could prevent deaths caused by incorrect prescriptions

A new AI system developed by researchers from Google and the University of California could prevent deaths caused by incorrect prescriptions. While quite rare, prescriptions that are incorrect - or react badly to a patient's existing medications - can result in hospitalisation or even death.

In a blog post today, Alvin Rajkomar MD, Research Scientist and Eyal Oren PhD, Product Manager, Google AI, set out their work on using AI for medical predictions.

The AI is able to predict which conditions a patient is being treated for based on certain parameters. "For example, if a doctor prescribed ceftriaxone and doxycycline for a patient with an elevated

temperature, fever and cough, the model could identify these as signals that the patient was being treated for pneumonia," the researchers wrote.

In the future, an AI could step in if a medication that's being prescribed looks incorrect for a patient with a specific condition in their current situation. "While no doctor, nurse, or pharmacist wants to make a mistake that harms a patient, research shows that 2% of hospitalized patients experience serious preventable medication-related incidents that can be life-threatening, cause permanent harm, or result in death," the researchers wrote.

"However, determining which medications are appropriate for any given patient at any given time is complex - doctors and pharmacists train for years before acquiring the skill."

The AI was trained on an anonymised data set featuring around three million records of medications issued from over 100,000 hospitalisations.
In their paper, the researchers wrote:

> *Patient records vary significantly in length and density of data points (e.g., vital sign measurements in an intensive care unit vs outpatient clinic), so we formulated three deep learning neural network model architectures that take advantage of such data in different ways: one based on recurrent neural networks (long short-term memory (LSTM)), one on an attention-based TANN, and one on a neural network with boosted time-based decision stumps.*
>
> *We trained each architecture (three different ones) on each task (four tasks) and multiple time points (e.g., before admission, at admission, 24 h after admission and at discharge), but the results of each architecture were combined using ensembling.*

Source:https://artificialintelligence-news.com/2020/04/03/google-latest-ai-prevent-deaths-incorrect-prescriptions/

AI vs COVID-19:

Here are the AI tools and services fighting coronavirus

AI tools and services are being used or offered by companies around the world to help fight the coronavirus pandemic.

In a best-case scenario, whereby the virus transmission is massively mitigated, researchers from Imperial College London predict "there would still be in the order of 250,000 deaths in GB, and 1.1–1.2 million in the US" resulting from the coronavirus.

Imperial College London's analysis landed in Washington over the weekend and it's said to be the reason behind the US stepping up its response. British PM Johnson warned that further measures in the UK will likely be introduced in the coming days and a coronavirus bill for emergency powers is making its way to the House of Commons.

Much like in wartime, technologies and social experiments that under normal circumstances would take years or decades to be tested and implemented will be rushed into use in days or weeks.

Some AI assistance

China's Tianhe-1 supercomputer is offering doctors around the world free access to an AI diagnosis tool for identifying coronavirus patients based on a chest scan. The supercomputer can sift through hundreds of images generated by computed tomography (CT) and can give a diagnosis in about 10 seconds.

Alibaba Cloud has launched a series of AI technologies including the International Medical Expert Communication Platform on Alibaba Group's enterprise chat and collaboration app, DingTalk. The platform allows verified medical personnel

around the world to share their experiences through online messaging and video conferencing.

Another solution from Alibaba estimates the trajectory of a coronavirus outbreak in a specific region using a machine learning algorithm based on public data gathered from 31 provinces in China. Within China, it has a 98 percent accuracy rate. For researchers and institutions working hard towards a vaccine, Alibaba has opened its AI-powered computational platform to accelerate data transfer and computation time in areas such as virtual drug screening.

Several of the other leading cloud players in China – including Baidu and Tencent – have opened up specific parts of their solutions for free to qualifying medical personnel. In the US, Microsoft and Google have also done the same.

Last month, scientists from South Korea-based firm Deargen published a paper with the results from a deep learning-based model called MT-DTI which predicted that, of available FDA-approved antiviral medication, the HIV drug atazanavir is the most likely to bind and block a prominent protein on the outside of the virus which causes COVID-19. In early trials, coronavirus sufferers are reportedly improving significantly using HIV drugs.

Hong Kong-based Insilico Medicine also published a paper in February which, instead of seeking to repurpose available drugs, detailed the use of a drug discovery platform which generated tens of thousands of novel molecules with the potential to bind a specific SARS-CoV-2 protein and block the virus's ability to replicate. A deep learning filtering system helped Insilico narrow down the list and the company has synthesised two of the seven molecules and plans to test them in the next two weeks with a pharmaceutical partner.

British AI startup Benevolent AI has also been active in seeking to identify approved drugs that might block the viral replication of COVID-19. The company's AI system examined a large repository of medical information to identify six compounds that effectively block a cellular pathway that appears to allow the virus into cells to make more virus particles. Baricitinib, used for treating rheumatoid arthritis, looks to be the most effective against the virus.

For its part, the White House has urged AI experts to analyse a dataset of 29,000 scholarly articles about coronavirus and use them to develop text and data-mining techniques to help scientists answer the following key questions about COVID-19:

- What is known about transmission, incubation, and environmental stability?
- What do we know about COVID-19 risk factors?
- What do we know about virus genetics, origin, and evolution?
- What has been published about ethical and social science considerations?
- What do we know about diagnostics and surveillance?
- What do we know about non-pharmaceutical interventions?
- What has been published about information sharing and inter-sectoral collaboration?
- What do we know about vaccines and therapeutics?

The entire COVID-19 Open Research Dataset (CORD-19) has been made available on SemanticScholar and will be updated whenever new research is published.

While the outlook around the world is currently grim, some of these AI-powered tools and developments offer a glimmer of hope we may be to reduce the virus's spread, improve treatment for patients, and ultimately conquer the coronavirus sooner than otherwise would have been possible.

Source:https://artificialintelligence-news.com/2020/03/23/ai-vs-covid-19-here-are-the-ai-tools-and-services-fighting-coronavirus/

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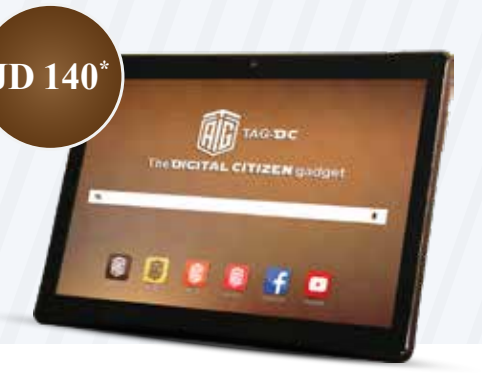

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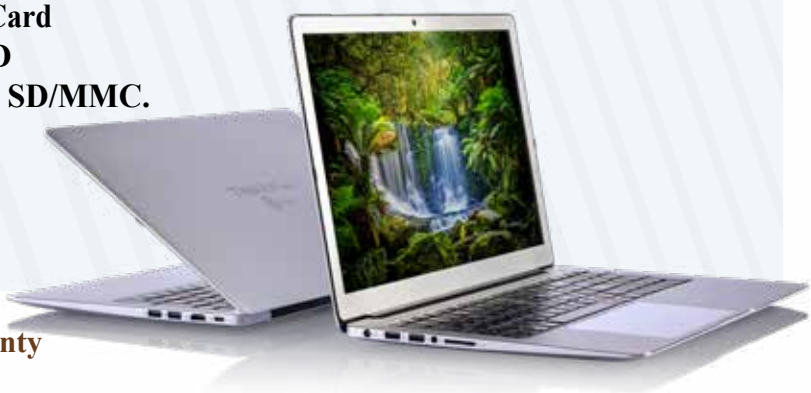

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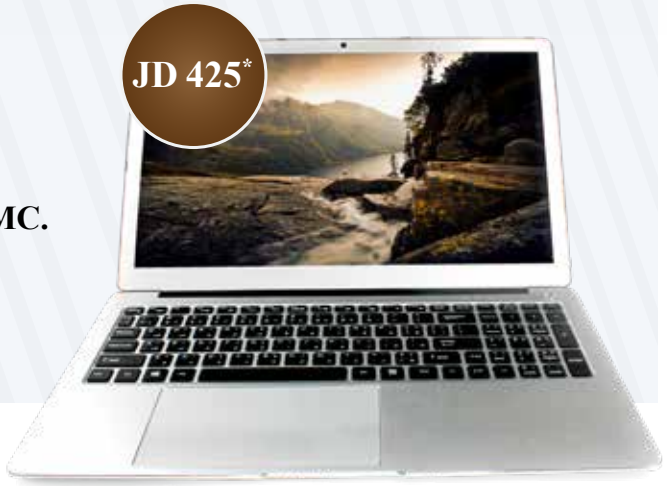

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