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The Development of AI in Medicine during COVID-19

So I start without slides and then show a short video; articulation Europe's become more acute to starting in March or so. And the German federal government has joined forces to face the challenge of the Coronavirus outbreak; there has been a budget committee of the German Bundestag and so additional money has to be in put into research on the Coronavirus.

And I think it's quite interesting to see what the measures of the federal ministry of education and research to fight the pandemic are at the moment, or in other words, what is BMBF doing? So there are three things to be pointed out. The first one is to strengthen research. The second one is to strengthen digital education. And the third one is supporting university students with strength, and broader application for scholarships and the like.

So in terms of research Germany is among the funding members of an international coalition for epidemic preparedness innovation, CEPI, and be in best supports this organization over the past with about 100 million euros. And now for the pandemic with additional 140 million euros, then there are other hospitals in Germany, which receive 150 million euros directly at German medical schools to fight the pandemic over the next six months. So this is really money for acute circumstances, and there are the major German research organizations such as Helmholtz association, Leibniz association, Fraunhofer and Max Planck Society, which have their own budgets to be put on this.

Most interestingly, the bundesministerium also announced a 3 billion Euro initiative on artificial intelligence, and now the current applications and proposals are reevaluated in order to make more money for project funding on the short term basis for COVID-19.

Okay, against this background, let's say something about AI in medicine. So, you know, at DFKI we do a lot of automatic data processing, but what's interesting in this specific area, it's the intelligent, interactive monitoring of patients and why humans and needs intelligence supporting access to health care services, patient

tailored decision support, just to name a few. And in the future decision support systems, let it be your medical images or the like, will have a big influence on how diseases, especially diseases such as pandemics, which are based on images in the end, or can also be diagnosed on images, can be treated.

Okay. So there are two main points, the use of AI methods to a larger extent, which needs a systematic collection of patient information, medical literature and the like, and the medic in a digital format, intelligence, interactive monitoring systems of patients as mentioned before, and machine learning solutions for end users. And the future, the silver hope together with initiatives together with the BMG, that's the ministry of health in Germany, that we can share digital records across different healthcare settings, store data accurately, and capture the state of a patient across time. And this should also help fight the pandemic.

Towards this way the bundesministerium has now made way for a specific app. And I'm going to share this app to you, which is about monitoring. So how does this app share work here? Share screen.

Can you see it? Not yet. It's working.

So this is still official Corona app from the German bundesministerium and the point is it's of course, to interrupt the infection change with minimal effort, maximal data, privacy and protection. So what does the app do? So the app does not know who you are, but it can go along with you, accompanying you and via Bluetooth technology, it detects other people. And there are a cryptid codes amongst the people there, which are shared, and there are three types of information. The first one is the identifier, which is encrypted. The second one, the second thing is to time duration. And the third one is distance. But of course there are no names and no positions and locations, and as I've said before this works with Bluetooth technology, but also it has drawbacks in terms of sensitivity and specificity.

However, the data is kept anonymously for 14 days and the user can erase it at any time. And as soon you have an infection in the sense that you went through testing, you can evolve or inform the other users. And this works by sharing this code again. And if you have the same code on your mobile phone, you'll get this push message that you should also go for testing. And in this way, maximum security it's being preserved because we don't have a global data storage here. So all the data is being stored only on the mobile devices and the app itself doesn't do GPS location management, and the Robert Koch Institute brought it out together with German Telekom and Fraunhofer Institute the technical implementation over the last three months.

So there are two other applications or apps on its way for data donation and also a Corona advice app. So we can go into this later.

What I wanted to point out is that in our investigations before normally in industrial project and so on, the machine learning methods for use are normally only for experts. And we have now a very keen interest in engaging end users into the loop of machine learning. So who are end users in the respect here? So it could be doctors. So doctors could get image processing based recommendations of whether or not COVID-19 is on a chest Ray image, or it could also be the end users in terms of the patients to see, okay, we put together everything which is in your medical health record together with a heavy medical health records, which are collected by a stationary health insurance companies, and then if there are any anomalies, according to the patterns, you get something like an information or a warning. So that does help people prepare for that in the future. And we called it interactive machine learning.

So having said that, just two or three more specifics on the Corona app, which has been installed there. So we have like more than 109,000 visitors who viewed the code and 7,000 community and project members participated in going through the code to see if it meets the requirements of what we talk before, of the EU data privacy regulations.

So last week, 15% of the population have installed the app and 85% can potentially use it according to the smartphone capabilities. Interestingly, only Huawei, might have a problem because it needs access to the play store and Google services in order to do that, what's very positive is that you only can inform people with a QR code and to get this QR code, you have to get tested. So it's either via a hotline or a direct testing station where you can get this QR code. And yes, we will not observe how many times it was only downloaded, but also how many alerts can be done over the next period of time.

Okay. Thank you.