Importance of 5G and AI for Pandemics (COVID-19)

ITU Webinar: New e-health solutions to combat pandemics with ICT
6 July 2020

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Agenda

- **Intel's Covid-19 Response and 2030 Strategy&Goals**
- **Importance of 5G**
- **Importance of AI**

Intel's COVID-19 Response

Intel is committed to accelerating access to technology that can combat the current pandemic and enable scientific discovery that better prepares and enable society for future crises.

- **In addition to $10 million in donations for global COVID-19 relief efforts, Intel Commits $50 Million with Pandemic Response Technology Initiative to Combat Coronavirus.**

More information about Intel's COVID-19 response (including solutions, community support and focus areas) can be seen at;

https://www.intel.com/content/www/us/en/corporate-responsibility/covid-19-response.html

Intel's 2030 Strategy and Goals

Intel's purpose is to create world-changing technology that enriches the lives of every person on earth.

Accelerating Progress Against the World's Critical Challenges: Our world is facing challenges unlike any we have seen before. The urgent need for action on issues like climate change, the deep digital divide, lack of inclusion, and global pandemics calls for a new era of shared responsibility.

Revolutionize Health and Safety: We will work with others to accelerate cures for diseases; improve healthcare access and affordability; and build smarter, safer workplaces. Our Pandemic Response Technology Initiative, for example, aims to improve the diagnosis and treatment of COVID-19.

https://www.intel.com/2030goals

Importance of 5G for pandemics (Covid-19)

- COVID-19 shows the importance of widespread, high-speed broadband infrastructure and connectivity.
- 5G and Wi-Fi are two complementary technologies. Most of the people in the world working and learning from home and there is a massive increase in Wi-Fi data use. The sufficient spectrum for Wi-Fi connectivity is much more important than ever before. Therefore, it is important to consider Wi-Fi 6 (next-generation Wi-Fi) at 6 GHz band (5.925–7.125 GHz) like the USA, Brazil, Korea, UK.
- High-speed, high-quality broadband infrastructure and connectivity are key for teleworking, e-health, e-learning, e-commerce, etc. and economic recovery.
- 5G can meet requirements for new innovative health applications (high-speed intelligent broadband connectivity, QoS, low latency etc.).
- According to UNESCO, 826 million students kept out of the classroom by the COVID-19, do not have access to a household computer and 43% (706 million) have no internet at home.
- High-speed broadband need for staying at home healthy during pandemics.

United States

- **FCC made additional spectrum temporarily available for operators to meet the increased demand for broadband.**
- **The COVID-19 Telehealth Program provides $200 million in funding, appropriated by Congress to help health care providers provide connected care services to patients at their homes or mobile locations in response to the COVID-19 pandemic.** https://www.fcc.gov/covid-19-telehealth-program
- **San Diego's Mayor and Verizon Launched the citywide expansion of next generation 5G Network as Virtual Health and Online Working Surge. The deployment of 5G comes as the healthcare system has experienced a dramatic surge in telehealth requests as a result of COVID-19 (nearly 4,000 percent when compared to pre-COVID-19 metrics).** https://www.sandiego.gov/mayor/news/releases/mayor-and-verizon-launch-fast-5g-network-as-virtual-health-and-online-working-surge
- **In response to the COVID-19 pandemic, FCC's "Keep Americans Connected Pledge". In order to ensure that Americans do not lose their broadband or telephone connectivity. More than 800 companies and associations have signed the pledge.** https://www.fcc.gov/keep-americans-connected
- **FCC adopted rules that make 1,200 megahertz of spectrum in the 6 GHz band (5.925–7.125 GHz) available for unlicensed use. COVID-19 has demonstrated the importance of Wi-Fi systems for staying at home. These new rules will usher in Wi-Fi 6, the next generation of Wi-Fi, and play a major role in the growth of the Internet of Things and e-health.** https://docs.fcc.gov/public/attachments/DOC-363945A1.pdf

Italy

5G connected ambulance

Live remote-operated surgery

Data on The Go: Using 5G, specialist technicians and doctors are able to work together from different locations during and after radiological examinations. Sharing high-resolution video and images, they can examine patients whilst on the move and in real time.

Healthcare to Homecare: Using the 5G and IoT, vulnerable patients, such as those with heart disease, can have their data gathered using continuously active wearable sensors. This data is then sent to a system that uses artificial intelligence to monitor the patient's health in real time. Any abnormalities can trigger a notification for a healthcare professional to intervene immediately.

https://www.vodafone.com/business/news-and-insights/blog/gigabit-thinking/remote-surgery-robotics-and-more-how-5g-is-helping-transform-healthcare

Thailand

5G Robots for Hospitals

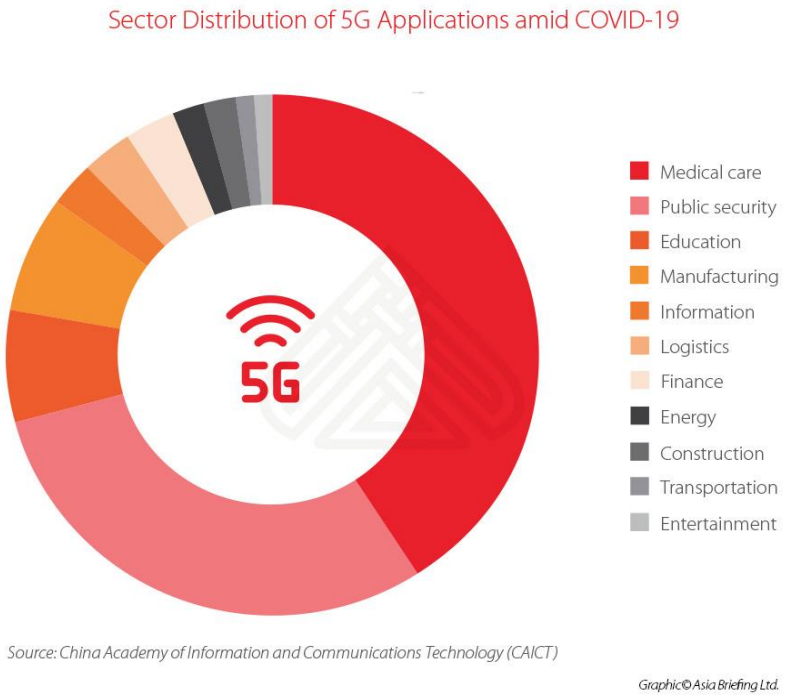
5G Robot has been delivered to many hospitals by AIS for COVID-19. The robot is qualified for taking care and monitoring the symptoms in the patient room alternatively of doctors and nurses, which helps to reduce the load, reduce the risk, reduce the physical contact, and save the doctors and nurses.

5G Robots: Covid-19 measures at CentralWorld

Advanced Info Service (AIS) and CentralWorld department store have jointly marshalled two 5G-controlled AIS robots to ensure shoppers' hygiene and safety at the department store as part of their efforts to further contain the Covid-19 outbreak

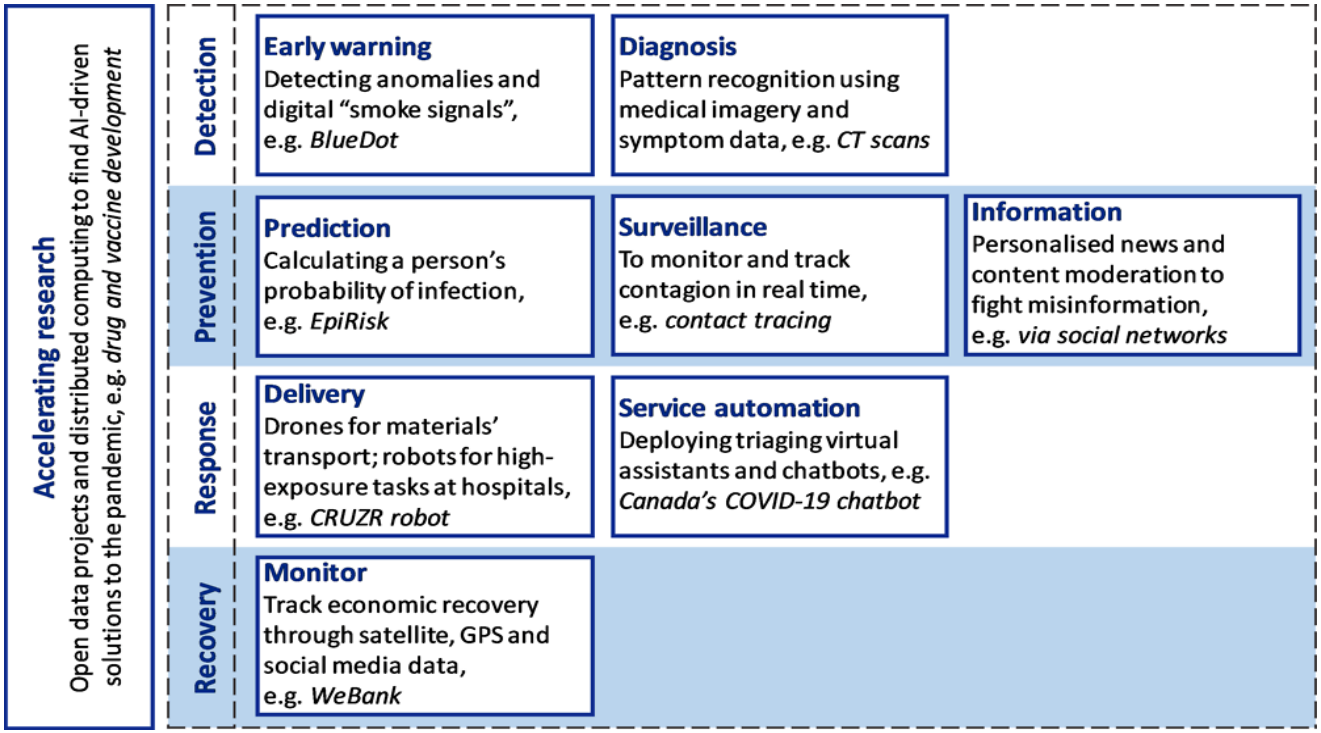
China

- 5G based telemedicine at different hospitals for remote diagnosis, treatment services.
- CT and X-ray coordination solution based on 5G for accurate identification of CT and other images in the screening of suspected cases of COVID-19.
- Information sent via 5G networks, including ECG monitoring data and ultrasonic images, thereby improving the capability of medical treatment for emergency and severe cases.
- 5G cloud-based intelligent robots to undertake such jobs as remote nursing, body temperature taking, disinfection, cleaning and drug delivery, effectively reducing the risk of cross infection and improving ward isolation management.
- 5G infrared temperature measurement has been applied to traffic hubs in a number of cities to monitor the condition of passengers.
- 5G remote education (Cloud Video Distance Education, Live Distance Education, Synchronous Classroom etc.) thus avoiding gathering of students during the outbreak and reducing the risk of cross infection.



http://www.caict.ac.cn/english/research/covid19/study/202004/P020200426371477971478.pdf

Importance of AI for pandemics (Covid-19)



Source: OECD, https://www.oecd.org/coronavirus/policy-responses/using-artificial-intelligence-to-help-combat-covid-19-ae4c5c21/

AI-assisted Screening System for COVID-19

Medical imaging diagnostic solution that uses CT chest scans to assist with early detection of coronavirus infections that complement standard lab testing. Based on CT imaging data from over 4000 confirmed coronavirus cases, the solution was rolled out in more than 20 hospitals in China.

Image courtesy Huiying Medical
https://www.intel.com/content/www/us/en/artificial-intelligence/posts/huiying-medical-covid19.html

Autonomous Virus-Killing Robots

UV-C robots have been used to sterilize hospitals, but most aren't designed to work with humans in the room. In order to detect and avoid humans, the robot prototype uses vision and AI to work around people and automatically switch off before anyone enters the field of ultraviolet rays.

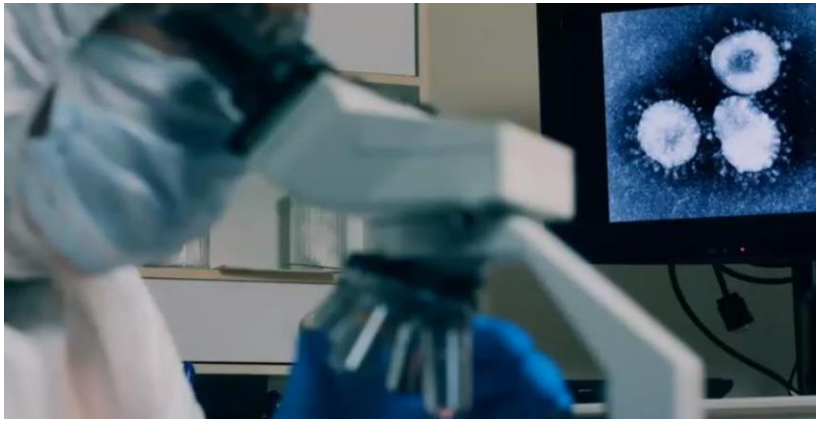
Image courtesy Akara
https://www.intel.com/content/www/us/en/corporate-responsibility/akara-fight-against-covid19-article.html

AI for medical imaging analysis

Korea's AI-based medical image analysis specialists trained their AI algorithms with large scale chest X-ray data, to detect abnormal findings such as pneumonia – a major symptom of COVID-19 patients – with high accuracy in just a few seconds.

Rapid development of testing kits

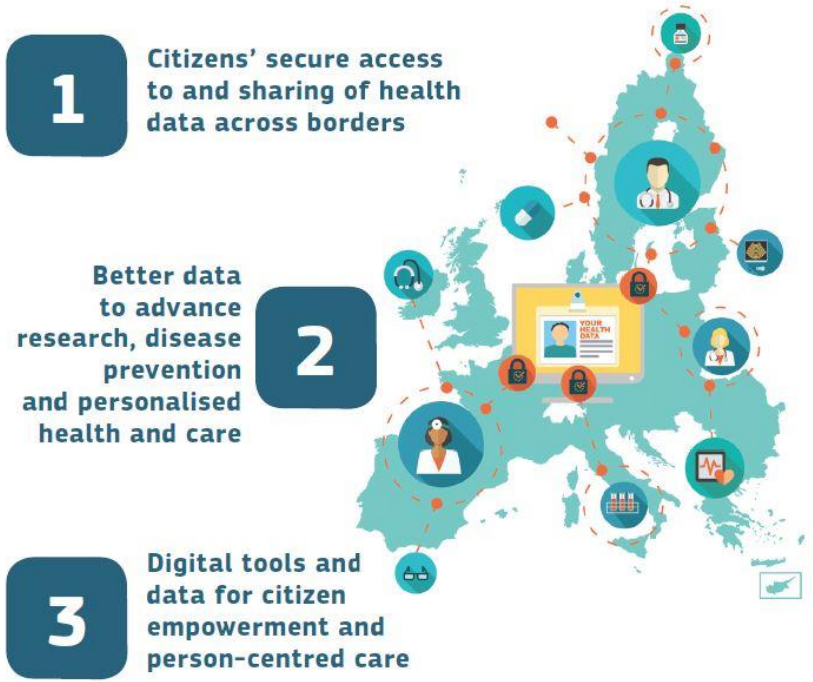
A COVID-19 diagnostic kit was developed by a Korean biotech company using ICT, AI and high-performance computing technology. It dramatically shortened the process of developing a virus diagnostic kit from several months to around two weeks.



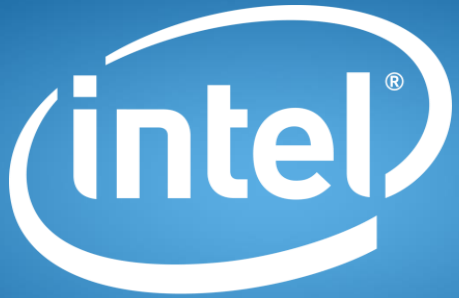
Source: Flattening the curve on COVID-19 : The Korean Experience http://www.korea.kr/common/download.do?fileId=190536078&tblKey=GMN

Towards a European health data space

- Foster the exchange, and sharing of different kinds of health data (electronic health records, genomics, registries, etc.)
- Support targeted research, diagnosis and treatment
- Support the delivery of primary care
- Development of new treatments, medicines, medical devices and services



Source: European Commission



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