

LEVERAGING AI IN THE AGE OF PANDEMICS

Beating Covid-19, Preventing the Next Crisis

June 12, 9:00 – 10:15
Zoom

1. Using AI to fight Covid-19

AI tools are significantly helping governments, the medical community, companies, other organizations and citizens respond to the current pandemic crisis in several different ways.

A recent OECD paper¹ listed the main AI applications currently used:

- I. understanding the virus and accelerating medical research on drugs and treatments;
- II. detecting and diagnosing the virus and predicting its evolution;
- III. assisting in preventing or slowing the virus' spread through surveillance and contact tracing;
- IV. responding to the health crisis through personalized information and learning, fighting misinformation;
- V. monitoring the recovery and improving early warning tools.

I. AI could allow scientists to analyze huge volumes of data in a much shorter time.

Some examples of AI use in this area:

- deep learning models can help uncover or predict old and new treatments for Covid-19;
- access to datasets in epidemiology, bioinformatics and molecular modelling is being provided;
- computing power is also being made available by tech companies, research institutions and public-private initiatives;
- innovative approaches including prizes, open-source collaboration and hackathons are actively boosting AI-based research.

II. Algorithms that identify patterns and anomalies can detect and predict the spread of Covid-19, while image recognition systems are speeding up medical diagnosis.

Some examples of AI use in this area:

¹ OECD, *Using artificial intelligence to help combat COVID-19*, April 2020

- AI-powered early warning systems can help detect epidemiological patterns by mining mainstream news, online content and other information channels in multiple languages to provide early warnings;
- AI tools allow the identification of virus transmission chains and infer epidemiological more rapidly than traditional reporting of health data;
- applied to images and symptom data, AI could help in rapidly diagnosing Covid-19 cases.

III. AI applications are contributing to preventing the virus' spread.

Some examples of AI use in this area:

- a number of countries have been using population surveillance tools, powered by AI, to monitor Covid-19 cases. For example, South Korea has used geolocation data, surveillance-camera footage and credit card records to trace coronavirus patients. China has assigned a risk level to each person, indicating contagion risk;
- many countries have set up contact tracing apps to rapidly identify possible contagion hotspots and prevent them from spreading elsewhere. In Europe, after sorting out the technical and privacy issues and a trial period, many contact tracing apps are expected to become fully operational in the next weeks;
- semi-autonomous robots and drones have been deployed to respond to immediate needs in hospitals or quarantine facilities;
- wearables and apps may enforce social distancing rules at work or in public spaces.

IV. AI tools can supply better information and fight disinformation.

Some examples of AI use in this area:

- virtual assistants and chatbots have been deployed to support healthcare organizations;
- vulnerable and high-risk individuals have been identified and contacted by platforms addressing possible complications from pre-existing conditions and social isolation;
- social networks and search engines have been using AI tools to fight misinformation spreading online (the so-called "infodemic").

V. AI tools can also be used to monitor the economic crisis and the recovery (e.g. Google's Community Mobility Reports) and learn from the current crisis the main means for setting up early warning systems for future pandemics. Algorithmic economics - the machine learning applied to economic modelling - could be a new promising frontier for research in economics and the current pandemic is contributing to driving it to make better and faster predictions in such a volatile period.

2. Limitations and challenges of AI use

Despite all the hype surrounding AI and its versatility epitomized by the many applications presented above, the current technological limits must also be acknowledged.

Covid-19 is a new phenomenon, still partially unknown, and correlations quickly spotted by AI tools may not be of help in correctly predicting future developments. Epidemiology could vary depending not only on different virus features, but also on different cultures.

A recent Financial Times article² mentioned a telling story about Ebola. Six years ago, a research group based in Boston came up with what looked like a smart idea - using digital data to monitor and predict the spread of the disease. The HealthMap platform, the name taken by the project, was hailed in the media as a breakthrough against a deadly virus raging in one of the poorest areas in the world. However, results quickly turned out to be disappointing. Why? Western-based scientists made the wrong assumptions. They took for granted that a disease such as Ebola behaved like malaria and was spread as humans moved, and they also presumed that, if mobile phones were on the move, their owners were travelling as well. Both assumptions proved to be very wrong.

An important reason for the spread of Ebola was not people's mobility but their behaviour at funerals (in some cultures, mourners are required to touch the body of a deceased person).

As well, phones in countries such as Sierra Leone are not seen as personal property but as a shared device, constantly passed from person to person. Therefore, there was no one-to-one relationship between phones and people.

The truth of the matter is, that even a huge and real-time amount of data and extremely sophisticated AI models could fail if they are not accompanied by a deep human understanding and interpretation of the reality. For this reason, a joint human-based and monitored AI seems to be the right choice, taking into consideration that failure is always a possibility.

The question of the trade-off between the protection of citizens' rights, such as privacy, and the need to impose temporary restrictions in emergencies, such as in the current pandemic, is another important issue. In Europe, once the more serious infringements on privacy law were dealt with, the debate now mainly focuses on the use of contact tracing apps.

On April 21, the European Data Protection Board adopted the "*Guidelines 04/2020 on the use of location data and contact tracing tools in the context of the COVID-19 emergency*" which clarifies the conditions and principles for the proportionate use of location data and tracing tools for the establishment of virus spread patterns (in order to assess the overall effectiveness of isolation and quarantine measures) and to inform those likely to have come into close contact with persons subsequently confirmed positive, in order to stem the contagion as quickly as possible.

² Gillian Tett, *We need more than Big Data to track the virus*, Financial Times, May 20.

The EDPS has specifically drawn attention to the need to ensure that any measure taken in these exceptional circumstances is necessary, limited in time, minimal in scope and subject to regular and effective review and scientific evaluation.

Privacy limitations, already foreseen by the GDPR, could also be applied to the collection of health data for scientific purposes. Even in this area, the EDPS has intervened to better pinpoint these exceptions. It is quite obvious, also in this area, that AI cannot be seen as the world's savior as it would be inappropriate and could cause a tech disillusion. Contact tracing could be helpful if accompanied by other measures across the trace, test and treat triad.

During the lockdown, Europe displayed a sound resilience, thanks to an increased use of digital tools (usually more basic than AI). However, at the same time, the emergency situation clearly revealed how most of the tech companies relied on by EU citizens, companies and also governments were not European. This undeniable fact could have very different policy implications also for AI. For some, it showed the good side of Big Tech, displaying how large and established companies can be up to the task when most needed. For others, however, it has called for a stronger push towards ensuring a real digital sovereignty for Europe.

3. The European AI strategy: the difference between BC and AC (before and after Covid)?

A few days before the news erupted in the media of the pandemic beginning to spread across Europe, on February 19, the Von der Leyen Commission delivered its first important digital policy proposals, with two Communications (*Shaping Europe's Digital Future and A European Strategy for Data*), a white paper (*Artificial Intelligence: a European Approach to Excellence and Trust*) and two reports (B2G Expert Group Report: *Towards a European Strategy on business-to-government data sharing for the public interest* and the Commission Report on *Safety and Liability Implications of AI, the Internet of Things and Robotics*).

The AI White Paper will establish a framework for trustworthy AI based on excellence and trust.

In the so-called "ecosystem of excellence", among several planned actions, the Commission has proposed to Member States a revision of the 2018 Coordination Plan, facilitating the creation of excellence and testing centers that can combine European, national and private investments. This involves working with MSs to ensure that at least one digital innovation hub per MS has a high degree of specialization in AI, setting up a new public-private partnership in AI, data and robotics under the Horizon Europe Programme.

For the other ecosystem ("ecosystem of trust"), the Commission assesses the main risks associated with AI in order to ensure a European regulatory framework for a trustworthy AI.

The risk-based approach allows for a proportionate regulatory intervention, heavier for the high-risk AI applications than the lower-risk applications.

According to the white paper, an AI application should be considered high-risk if, together, 1) it is employed in a sector where, given the characteristics of the activities typically undertaken, significant risks can be expected to occur (for instance, healthcare, transport, energy and parts of the public sector); and 2) the AI application in the sensitive sector is used in such a manner that significant risks are likely to arise (based on the kind of impact on presumably affected parties). Moreover, the use of AI applications for employment processes, biometric identification and other intrusive surveillance purposes would always be considered as high-risk.

Mandatory requirements for high-risk applications would cover the following areas: 1) training data; 2) data and record-keeping; 3) information to be provided 4) robustness and accuracy; 5) human oversight; 6) specific requirements for certain specific applications, such as biometric identification.

These requirements would be at least in part verified under prior conformity assessments, in line with already existing mechanisms for a large number of products being placed on the EU's internal market.

Of course, ex post controls could still be enforced by competent national authorities.

For non-high risk applications, the Commission envisages a voluntary labelling scheme, allowing the economic operators to signal the trustworthiness of their products or services.

As data is the essential enabler for AI, the *European Data Strategy* aims at Europe emerging as a leader in the data economy, providing for a single market for data and a larger role for European companies.

The Commission starts from acknowledging that the EU has the potential to be successful in the data-agile economy, thanks to its technology, its know-how and its highly-skilled workforce. However, several issues are holding the EU back from realising its potential in the data economy, mainly due to the fragmentation between Member States (compared to the small number of US and China-based Big Tech firms). Among the most important issues, the strategy lists: 1) availability of data; 2) imbalances in market power; 3) data interoperability and quality; 4) data governance; 5) data infrastructures and technologies; 6) empowering individuals to exercise their rights; 7) skills and data literacy; 8) cybersecurity.

Included in the actions envisaged by the strategy, the Commission aims to support business-to-business data sharing, investing in a High Impact Project on European data spaces and federated cloud infrastructures, by the establishment of EU-wide common, interoperable data spaces (in manufacturing, environment, mobility, health, finance, energy, agriculture, public administration and skills) and the setting up of a cloud service marketplace, empowering individuals regarding their data and investing in skills and general data literacy.

Both documents (the AI White Paper and the European Strategy for Data) provide specific policies for SMEs and elements for a proactive international approach.

After the end of the consultation on the AI white paper, the European Commission is expected to put forward legislative proposals in early 2021.

4. Key questions

- a. What are the main lessons to draw from Covid-19 for the digital future of European industry and AI policies? Could there be some room for revision of the AI EU strategy based on an ongoing assessment of the role played by digital, in general, and AI during the current crisis?*
- b. Where should AI investments be readdressed to tackle the challenges posed by Covid-19? What should we expect from the budget allocated to AI and data strategy and, more in general, digital technologies in the next MFF, now currently under revision?*
- c. After Covid-19, should the US and China digital companies be seen more as potential partners that could help European digitalization, especially supplying quality products at zero or negligible cost for citizens and SMEs, or as competitors for possible EU digital champions?*
- d. Are privacy rules set by the GDPR fit for the post-Covid AI age?*
- e. How will COVID-19 affect the EU digital roadmap, including the AI and data strategy implementation?*

5. Main Highlights

"Leveraging AI in the age of pandemics. Beating Covid-19, Preventing the Next Crisis". This is the title of the VideoTalk held on 12 June by I-Com – Institute for Competitiveness, with guest speaker Lucilla Sioli, Director of 'Artificial Intelligence and Digital Industry', DG CNECT of the European Commission.

Bringing together EU institution representatives, research and business organisations, trade and consumer associations and other relevant stakeholders, the VideoTalk offered the opportunity to discuss how AI-driven solutions are playing a key role in multiple aspects of the response to the COVID-19 crisis in Europe – from accelerating medical research on drugs and treatments to predicting the evolution of the virus – and to take stock of the Commission's AI strategy in view of the awaited presentation of the legislative proposals.

The event was opened with a speech by I-Com President Stefano da Empoli. The main speaker, Lucilla Sioli, then took the floor. There followed an open debate moderated by Mattia Ceracchi, I-Com Head of EU Affairs, before Ms Sioli's final remarks.

Below are the main takeaways of the discussion.

AI & the pandemic: digital resilience and lessons learned

The Covid-19 pandemic has revealed the importance of accessing connectivity and digital technologies for a multitude of actors - individuals, families, educational institutions, small businesses, companies and governments. Artificial Intelligence has proven to be a comprehensive asset to be potentially exploited to support and implement a wide variety of different applications. In reacting to the coronavirus emergency, AI has been used in several fields, e.g. drug and vaccine research, drawing up of projections over the virus' spread, development of contact tracing apps.

A first lesson learned refers to the well-known relevance of data availability as a building block for AI development. The crisis has further highlighted that access to health data is key to ensuring the development of applications and sharing best practices in the healthcare sector. However, further cross-country and cross-sectoral cooperation is required, within both the private and public sectors, to provide a new boost to a reinforced European way to AI. A second important lesson learned concerns the use of certification for safety related reasons, as it has proved to have played a key role when assessing the safety, accuracy and robustness of an AI system.

Another important issue further highlighted by the Covid-19 crisis is the known dichotomy between the need for a robust regulatory framework guaranteeing citizens' protection and rights, and the parallel need to foster research and development in the digital sector. Indeed, any AI regulatory framework is perceived as a barrier for the development and deployment of new technologies. If, on the one hand, it is undeniable that regulation could potentially slow down the innovation process, on the other hand, it is of major importance guaranteeing citizen and patient safety, particularly concerning medical devices. In order to ensure the best balance between the above-mentioned needs, the Commission has decided to postpone its proposal for a regulatory framework to the first quarter of 2021 (also see below).

EU support for AI applications to fight Covid-19

During the Covid-19 crisis, the Commission has supported the development and deployment of Artificial Intelligence in a large variety of areas, encouraging a series of projects focused on leveraging AI potential to tackle the challenges posed by the pandemic, both in healthcare and socio-economic aspects.

Firstly, AI has become an important tool for reading images (radiology), accelerating the process of distinguishing Covid-19 related pulmonary effects from other types of pneumonia, as well as monitoring the disease evolution over time. Even though this technology was initially developed in China, today, its course has been markedly sped up in Europe, involving important collaboration among European hospitals and authorities in the exchange of data and images. Another example of EU-funded projects is the deployment of disinfection robots, which have been playing a major role in ensuring the protection of medical staff dealing with infected environments.

A further major AI application, which has been at the heart of the debate in recent weeks, concerns the development and deployment of contact tracing apps. In line with the EU toolbox principles (April 2020) – e.g. voluntary nature of the use, data minimisation principle, temporary storage of data – these tools could be an important asset in restoring a normal and safe social living. Certainly, in order to guarantee an effective, secure and accessible service throughout the internal market, safety and interoperability must be placed at the core of contact tracing tool development.

AI in the new EU Recovery Plan

As part of the EU initiatives, one of the key tools for the future development of digital and AI technologies, will be the revised Multiannual Financial Framework (May 2020). The Commission's proposal has increased the available resources for the R&I programme of Horizon Europe and the Digital Europe Programme. Horizon Europe will play a major role in promoting research on digital technologies through its cluster 4, including the creation of the private-public partnership to foster R&I on Artificial Intelligence.

The second pillar of the Commission's Recovery Plan is Next Generation EU. This will support Member States' economic recovery, with funding mainly allocated under the European Semester framework, in line with the Commission recommendations, placing a strong focus on green and digital transformation priorities. Here, the recently published EU DESI Index provides to each country with an overview of its related performance and progress made in the digital sector and the measures to adopt to enhance digital transformation.

The Recovery package also proposes strengthening the InvestEU programme. It envisages a Solvency Support Instrument to help restore the healthcare sector and private companies deeply affected by the pandemic, as well as a new Strategic Investment Facility to support and strengthen key value-chains in the digital sector at EU level. Moreover, the development of European own technologies was highlighted as a key step towards the creation of a digital environment based on EU fundamental principles.

Next steps

Following the consultation on the AI White Paper (deadline: 14 June), on 29 June the revised High-Level Group Guidelines containing an assessment list for practical use by companies will be published. This will provide a precious perspective for digital public and private actors, and will prepare a series of further stakeholder engagement activities this year. As mentioned, to guarantee a wider possible stakeholder and citizen involvement, both through public consultations and further targeted stakeholder engagement initiatives, the Commission has decided to postpone its proposal for a regulatory framework to the first quarter of 2021.

Another important update comes from the European Parliament. In order to promote and facilitate inter-institutional dialogue on AI, the EP has decided to establish a new special committee on Artificial Intelligence. The committee will begin to work in September with a one-year mandate, its final purpose being to foster inter-institutional exchanges on AI, to simplify the parliamentary debate and to make the subject more accessible both for citizens and decision-makers.