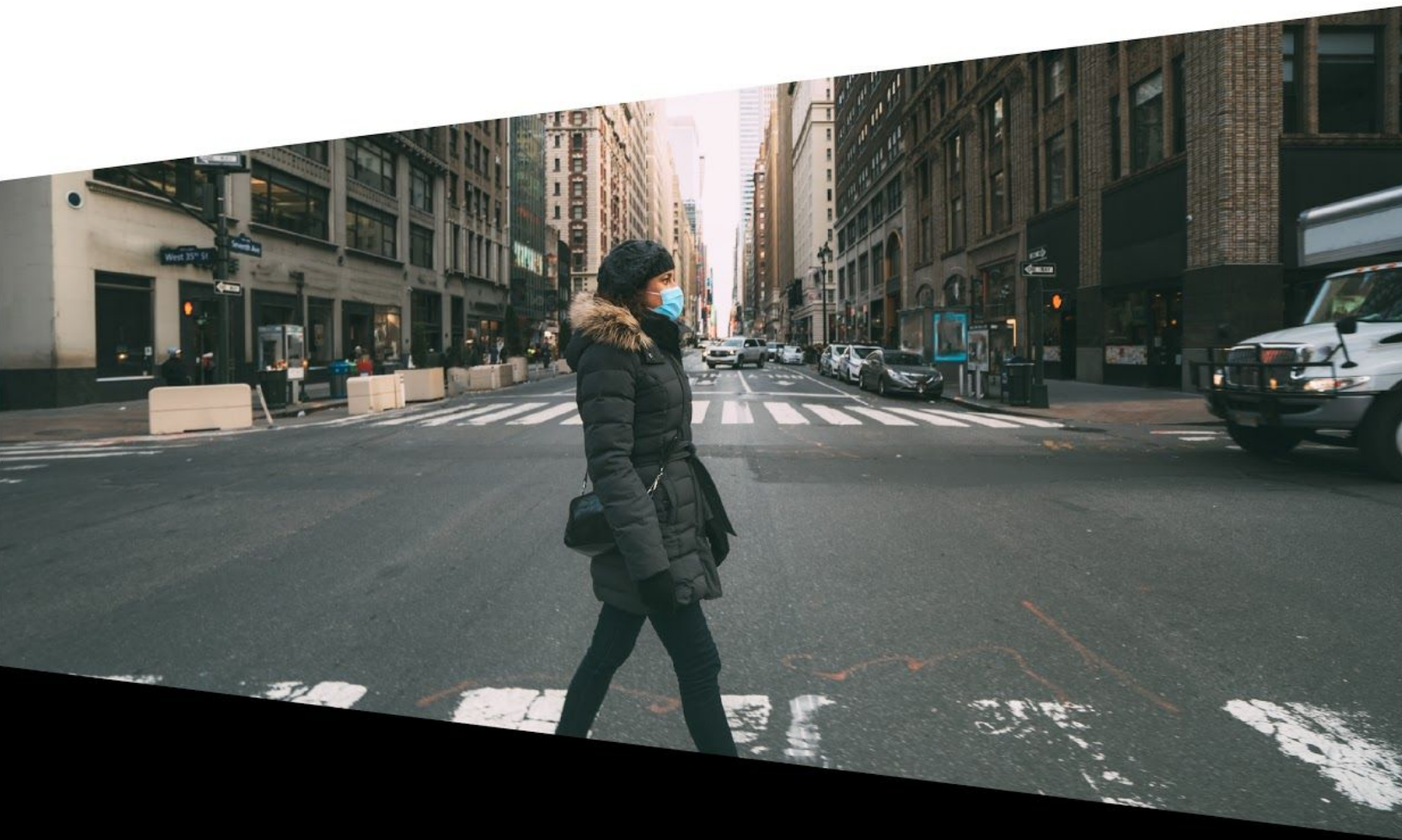# SPARK BEYOND

HARNESSING HUMAN AND ARTIFICIAL INTELLIGENCE TO NAVIGATE THE COVID-19 ERA

Harnessing Human & Artificial Intelligence to Navigate the COVID-19 Era

If humanity only knew what humanity already knows...

To confront the current pandemic and any future crises, we are leveraging the power of Artificial Intelligence to turn accessible information into knowledge that canserve as the basis for informed decision-making. We apply systematic thinking to explore the complex behaviours of humanity and planetary systems, understand how crises impact society, and learn how to conquer them. By combining information from a multitude of sources, we seek patterns and interesting emerging signals that are indicators of phenomena and opportunities which would otherwise remain invisible.

To date, we have applied this AI technology to the collection and application of information about the spread patterns of the Covid-19 virus. Having now formed collaborative laboratories with global policymakers, our next opportunity is to evaluate scenarios to suppress the virus' spread and mitigate its economic and social impact.

Background

The global spread of the SARS-CoV-2 virus is a complex problem that involves a large number of stakeholders (e.g. nations, cities, towns, organisations, and the public), impacting across the spectrum of industries and verticals, from tourism and transportation, to retail and office work, to government and education, and the supply chains and infrastructure that support them. Each of these entities has its own objectives, constraints, and unique conditions which must be considered. This is critical for understanding and limiting the virus' spread, especially as the virus properties are highly dependent on multiple contextual factors, which are not yet clearly or fully understood.

As we seek to create stimulus and policy measures to restart society and the economy following the virus' first wave, we need to do so not only in such ways as to minimise further spikes in the virus' spread, but also in ways that address the ongoing challenge of climate change. As many scientists and political leaders have observed[1], the causal factors behind SARS-CoV-2's transference to humans - deforestation and loss of bio-habitat - are related to climate change. If we do not address the causes of climate change, we will see more pandemics in the coming years. Unfortunately, the majority of current stimulus measures will have a negative impact on climate change[2].

Smart machines and big data are often lauded as effective solutions, but they aren't enough. AI can solve some of the world's biggest, most complex problems. It accomplishes this by identifying patterns and trends in vast datasets, the scale of which surpasses human analysis. In order to make sense of this complexity, we must combine the power of AI and algorithms with the insight, empathy, and understanding of human expertise.

Together, we can craft new narratives and create new policies which will enable our society to adapt to the rapidly changing conditions and future crises of the Anthropocene Era. This

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[1] "Open Letter to Global Leaders – A Healthy Planet for Healthy People, the Club of Rome", https://clubofrome.org/impact-hubs/climate-emergency/open-letter-to-global-leaders-a-healthy-planet-for-healthy-people/
[2] "Greenness of Stimulus Index", Vivid Economics, https://www.vivideconomics.com/casestudy/greenness-for-stimulus-index/

integration of humans with AI is called Augmented Intelligence, also known as Intelligence Amplification (IA), in which human abilities are augmented *with*, rather than replaced *by*, machine intelligence.

About SparkBeyond

The behavior of complex systems such as the global environment, economy, and society are notoriously difficult to predict, especially when relying solely upon human cognition. SparkBeyond's advanced, AI-driven web knowledge mining capabilities, widely applied to public datasets coupled with a broad network of data partners, analyzes these highly complex systems - ones with many factors and actors - in order to offer human experts new ways of understanding them.

In pursuit of true AI-powered problem solving, SparkBeyond has built an Ideation Machine that integrates the world's largest collection of algorithms, and bypasses human cognitive bias to produce millions of hypotheses in minutes. It expands the scope of unique insights by auto-augmenting data with a rich network of data sources, including – but not limited to – news sources, scientific research, patents, and clinical trials, as well as geographic, census and financial data.

This plethora of resources achieves a holistic perspective to discover patterns, connect the dots, and ask questions a human analyst would never think to ask. The Ideation Machine can analyze complex problems through the lens of multiple hypotheses, all concurrently, and determine which has a greater likelihood of accuracy in the future. Furthermore, such analysis allows for the discovery of potential disruptions to supply chains and other business processes, suggesting ways of mitigating risks and creating new opportunities.

All of this unprecedented capability is then put into the hands of human experts with open minds, offering them the opportunity to apply their unique expertise to theories and supporting datasets that human endeavour alone could never have revealed.

About Pivot Projects

Pivot Projects is a collaboration of nearly 200 volunteers from 25 countries. They come from Europe, North America, Central Africa, South East, Central Asia, and the Far East, from all walks of life - wealthy countries or poor ones.

Participants include seasoned experts in computer science, environmental sustainability, systems thinkers and modellers in engineering, economics and public policy. They work alongside community and religious leaders, as well as experts in global indigenous cultures and societal resilience. Pivot Projects also includes a large number of young people who are still in school or just launching their careers, who are determined to steer society onto paths that lead to greater sustainability, resilience, and equality.

The scope of Pivot Projects is broad and crosses many areas of human and ecological activity, including a particular focus on the COVID-19 pandemic.

The behaviors of our complex, global systems are notoriously difficult to predict, especially when relying solely upon human cognition. At the center of the Pivot Projects' effort is a recognition that the world is made up of a myriad of interconnected natural, human, and emerging systems. Humans alone can't make sense of all of those interdependencies. While we try to improve some things, we risk making other things worse.

Thankfully, technology allows humans to collaborate with smart machines to understand the world's complex adaptive systems. We can use that understanding to co-create interventions that lead to holistically positive outcomes. This unique process will discover interventions which can be acted on, such as hidden virtuous circles, connecting mutually supportive local actions with multiple benefits across multiple systems.

Pivot Projects is offering Collaborative Laboratories based on its research for national governments, global policymakers, and people and communities in regions around the world. Pivot Projects works with the G20/T20 and COP26 teams to support their policy work. The

project is committed to Open Data, Open Science, transparency and collaboration, and will make online tools available to run on large-scale computing systems.

About the alliance

In recent months, the XPRIZE Foundation has assembled a coalition of 62 Partners and 90 Members to seek solutions to the challenges of the COVID-19 pandemic. These include Anthem, cities such as Los Angeles and New York City, UN agencies, UK Catapults, standards bodies (e.g. IEEE), telcos, and more. In addition to providing major funding, these organisations have made large datasets related to the pandemic available to others.

The Foundation has developed the view over many years that the world's biggest problems require the aggregation of vast amounts of data, including direct and indirect observational data, and machinery that can ask many questions (hypotheses) of that data - more questions than any human would produce.

Suggested Activity

The XPRIZE Foundation seeks methods to extract symptomatic observations from a wide range and variety of datasets that:

    a) have predictive value,

    b) can indicate the speed of viral propagation

    c) have high accuracy

    d) preserve individual privacy and

    e) comply with national privacy laws whilst being consistent with popular conceptions of privacy and trust.

Pivot Projects has made considerable progress over the last three months building an unprecedented, multi-disciplinary, multi-national, multicultural system model, supported by a variety of research and data sources, and spanning a vast variety of interactions between the pandemic, the environment, economy and society. The SparkBeyond AI platform is capable of

understanding this model and applying it to the generation of hypotheses from the vast datasets in which it has invested.

We propose to demonstrate quickly and in a very focused way, the power of such an approach. In collaboration with SparkBeyond, Pivot Projects, XPRIZE and the Coalition, we suggest forming an ongoing research and ideation group, powered by AI and supported by a variety of datasources, to explore ideas concerning the propagation of the virus.

The challenge will run for several months and feature longitudinal data gathering, probably starting with Self-Reporting as a simple entry point. The immediate target for this work is a ten day period in September 2020 in which we will target recommendations and findings to hit the UN General Assembly and AI4Good.

We have discussed the intent to form an ongoing, open coalition to continue assembling and making available global data on the pandemic and associated tools, and to exploit these using the holistic model we are developing in Pivot Projects, maintaining Pivot Projects' commitment to Open Data and Open Science.

Pivot projects will provide the multi-disciplinary expertise required to accomplish this . Using SparkBeyond's Ideation Machine will provide the group with unprecedented capabilities to understand changes as they occur in deeply complex systems. They will also have the ability to generate novel ideas, such as strategies and policies, that could be used to manage and contain the virus. The Coalition will provide the data and funding required for such an endeavor, and XPRIZE would drive impact by taking ideas generated by the group, and turning them into various types of competitions (e.g. prize competitions, hackathons, grants etc).

Activity Timeline

June 22 - 29: finalizing the project proposal, including a short pilot project demonstrated by Sparkbeyond's AI-powered platform.

June 29 - July 3: receiving XPRIZE's feedback and making changes to the proposal.

July 6 - 10: a series of pitch meetings with potential Coalition members.

Once a partnership agreement is signed and financial and data-sharing commitments are given, we will embark on a **2-3 month-long project**, resulting in a series of suggested actions (ie. strategies, policies, educational activities, media campaigns and required technological breakthroughs). These would be adopted and carried out by Coalition members.

Resources required

For the pilot project (for a duration of 3 weeks):

SparkBeyond:

- A dedicated leadership resource (33%)

- A dedicated data science resource (33%)

- Computing assets

Pivot Projects:

- A dedicated leadership resource (33%) from Resilience Brokers.
- A dedicated community management resource (50%) from Resilience Brokers.
- A dedicated research lead resource (50%) from Resilience Brokers.

Pilot project: Demonstration

- A dedicated leadership resource (33%) from Resilience Brokers.
- A dedicated community management resource (50%) from Resilience Brokers.

- A dedicated research lead resource (50%) from Resilience Brokers.
- Volunteer fund for researchers and data scientists involved in Pivot Projects (to be paid as required for participation) $10k a month

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XPRIZE