MIT ILP
INDUSTRIAL
LIAISON
PROGRAM

ilp.mit.edu

MIT STARTUP EXCHANGE

startupexchange.mit.edu

COVID-19
Weekly Summary

Vol. 12 June 25, 2020

MIT | Corporate Relations

MIT ILP UPDATES // COVID-19 RELATED

This is a very brief collection of current resources and information from MIT's Industrial Liaison Program covering a range of issues related to COVID-19 and is offered to help us all navigate during this unprecedented and disruptive time.

x...///..<<...>>c..

UPCOMING EVENTS

MIT ILP WEBINARS
https://ilp.mit.edu/attend

30 June – Back at Work Post-COVID-19 (1 of 2)
2 July – Regional Webinar Series #3
7 July – Scaling-up Low-carbon Energy, with MITei
8 July – MIT Startup Exchange: Materials Innovations
9 July – Back at Work Post-COVID-19 (2 of 2)
13 July – Regional Webinar Series #4
15 July – Regional Webinar Series #5
20 July – Regional Webinar Series #6
27 July – Regional Webinar Series #7
21-23 July – MIT Startup Exchange STEX25 Accelerator Startups

MONDAY, 29 JUNE, 11:30 AM -12:45 PM: HOW ARE CANCER RESEARCHERS FIGHTING COVID-19? (PART II)

Koch Institute:
Michael Yaffe, MD, PhD Overcoming respiratory distress;
Angela Koehler, PhD - Novel therapeutic candidates;
Sangeeta Bhatia, MD, PhD - Nanomedicine for monitoring, prevention and therapy;
Robert Langer, PhD - Drug and vaccine delivery;
Moderated by Salil Garg, MD, PhD
https://ki.mit.edu/news/events/withinsight/jun-2020
http://calendar.mit.edu/event/how_are_cancer_researchers_fighting_covid-19_part_ii#.
Xuew8lB7nCA

TUESDAY, 30 JUNE, 8:00 AM OR 6 PM (2 LIVE SESSIONS): CONVERSATIONS: FAREWELL FROM CISR PRINCIPAL RESEARCH SCIENTIST JEANNE ROSS

Center for Information Systems Research (CISR): Jeanne Ross
https://cisr.mit.edu/content/conversations-with-cisr
Two live sessions:
8 AM ET https://mit.zoom.us/webinar/register/WN_Ze7SNbikSPq1vkroXRXQWQ
6 PM ET https://mit.zoom.us/webinar/register/WN_BVl3yIrVR-G94_oZmSDsCA

MONDAY, 14 SEPTEMBER, 10:00 AM - 7:00 PM: CONNECTED THINGS 2020

Enterprise Forum: The **Connected Things 2020 conference** will gather together corporate and startup leaders to uncover the opportunities and challenges at the intersection of Internet of Things (IoT), Artificial Intelligence (AI) and Machine Learning (ML).
Registration: $35 - $425 (various rates for members, non-members, students, etc.)
Agenda:
http://connectedthings.mitforumcambridge.org/overview/agenda/
http://connectedthings.mitforumcambridge.org/

PROJECTS, INITIATIVES, RESEARCH

ANALYTICS / SOCIAL DISTANCING: RULES OF THUMB: ADJUSTING CLASS SCHEDULES IN FALL TERM '20

For further details please contact: Munzer Dahleh, Sarah Fay, Peko Hosoi, Dalton Jones Institute for Data, Systems, and Society (IDSS), https://idss.mit.edu/vignette/rules-of-thumb-adjusting-class-schedules-in-fall-term-20/

Inside spaces such as lecture halls and lab spaces bring an elevated risk of transmission of COVID-19. The foundation on which university schedules are built, whom to bring to-gether in inside spaces becomes a challenge. This guide highlights parameters and de-cisions that university administrators will make: which classes to offer to which students, online or offline.

Why the Problem is Important:

Student schedules are increasingly interdisciplinary. With increasing numbers of double majors and breadth-of-study requirements, students have interacted with different other students pre-COVID-19. In normal settings, this allows for enriching intellectual stimulation. In post-COVID-19's new normal, however, these spaces of interaction need to be re-thought.

A helpful abstraction can be the network mapping students to classes that they take. As an example, consider Alice (A), Bob (B), Claire (C) and Daniel (D) that take at most two classes (ECON-101, MATH-101). Alice, Bob and Claire take ECON-101, Claire and Daniel take MATH-101. We can depict this using arrows connecting students to classes if they take a class.

It is impossible to find any clustering that at the same time (a) allows all students to take all of their classes on-site (b) to not allow infections of one student to all others through meetings in classes (potentially through an intermediate infection). A "solution" would be to ask Claire to take ECON-101 on-line, or to offer two sections of ECON-101 or MATH-101 (then with a section with only one student).

Partitioning students into groups, called pods, that only take classes—or sections of classes—can limit the spread of the virus, and, at the same time, allow students social interaction within their pod without breaking social distancing guidelines. Additional sections of classes to allow for pods could be done both physically (by having students from different cohorts sit separately) or temporally (by having professors give multiple times the class in sub-sections).

This comes not for free, and some students will need to take classes on-line, and more sections of classes will be necessary if the mixing of students in closed spaces should be minimized. The rest of this article highlights important choices in designing schedules that are compatible with small pods, and gives a case study in which MIT calibrates the feasi-bility of pods of size 50 for its classes with an essential on-site component. (We emphasize that groups of 50 students will not be epidemiologically stable – non-overlapping groups of this size allow, at least, for easier testing and contact tracing, and will give the administration a margin to partially reduce social distancing measures.)

x...///..<<...>>c..

To Sum Up:

We believe that essential MIT classes could be held on site at a reasonable administrative cost, with students clustered in independent pods of average size ~30. Asking students to only take classes on-site that are necessary for their graduation might further alleviate some administrative constraints. A challenge of the design of pods, and, ultimately, of adherence, is the social component of pods. Good communication, also of our arguments against elicitation of student preferences, and socially-distanced meetings, might help to tackle this challenge.

COMMUNITY BIOTECHNOLOGY INITIATIVE & MIT CENTER FOR COLLECTIVE INTELLIGENCE

David S. Kong, Director, Community Biotechnology Initiative, Media Lab, https://www.media.mit.edu/groups/community-bio/overview/

Thomas Malone, Director, MIT Center for Collective Intelligence, https://cci.mit.edu/

The **Community Biotechnology Initiative (CBI)** works at the intersection of community organizing and movement building, collective intelligence and social sciences, and accessible biotechnology tool development to active the global movement around grassroots-driven life sciences, or "Community Bio." We believe that the emergent power of decentralized, diverse communities, augmented with digital tools and democratized biotechnologies, can drive disruptive innovations in the life sciences to inspire creativity and improve lives. Our projects include low-cost, open-source hardware, microfluidic systems, infrastructure for sharing lab-on-a chip device designs, global synthetic biology education curriculum, collective-intelligence based crowd-sourcing platforms, and new interfaces for artistic expression with biology.

The **MIT Center for Collective Intelligence** explores how people and computers can be connected so that – collectively – they act more intelligently than any person, group, or computer has ever done before.

Pandemic Response CoLab
https://www.media.mit.edu/projects/pandemic-response-colab/overview/
https://www.pandemicresponsecolab.org/

Pandemic Response CoLab will help individuals and groups work together to solve practical problems created by the COVID-19 pandemic. By leveraging an open online collaboration platform, we hope to mobilize innovators, communities, businesses, and others to develop actionable solutions to real problems.

Over time, we expect the online community using Pandemic Response CoLab to help: Identify key problems related to COVID-19, Develop solutions to these problems, and Recruit people and resources to implement these solutions.

Pandemic Supermind Actovation
https://www.media.mit.edu/projects/pandemic-supermind-activation/overview/

The Pandemic Supermind Activation brings together leaders in the biosciences and beyond, harnessing the power of humans and technology to identify the critical unmet needs of the COVID-19 pandemic, addressing this main challenge;

How can we develop pandemic resilience—the ability for society to recover quickly from global disease outbreaks—both in resolving the current COVID-19 pandemic and in building the public health and other infrastructure to prepare for future pandemics?

More projects: https://www.media.mit.edu/groups/community-bio/projects/

STUDENT / ALUMNI: PROJECTS / INITIATIVES ETC. / COVID-19

Myth-busting on YouTube
Fernanda Ferreira l School of Science / MIT News, 3 May 2020, http://news.mit.edu/2020/myth-busting-youtube-izabella-pena-0503

Postdoc Izabella Pena uses social media to combat the infodemic about the Covid-19 pandemic
YouTube: https://www.youtube.com/user/izabellaneshich/videos
https://en.contracovid.com/

In mid-March, Izabella Pena received a WhatsApp text from a friend in Indianapolis, Indiana. "He said, 'Oh, I got your audio message from a priest in rural São Paulo,'" remembers Pena, a postdoc in Department of Biology Professor David Sabatini's lab at the Whitehead Institute for Biomedical Research.

Pena had recorded the five-minute audio message about risk groups and the novel coronavirus SARS-CoV-2 for her family's text thread after she heard one-too-many comments about how only the elderly caught the more severe forms of Covid-19.
She never imagined it would spread like wildfire. "I realized the power of these tools," says Pena of WhatsApp. "You can really reach people and share your information."

While Pena's message was fact-checked and scientifically correct, a lot of the information being shared on these platforms isn't. In Pena's native Brazil, the messaging platform WhatsApp has played an outsized role in the spread of fake news concerning SARS-CoV-2. Seeing the onslaught of misinformation, Pena first panicked. Then she fought back, choosing to use the vehicles of fake news to spread facts. "We scientists need to learn how to use WhatsApp, YouTube, and Twitter to communicate," says Pena. "Because that's how people are getting their information.

Recently, Pena added another job title to her resumé: vice-president of **ContraCovid**, an initiative **to make coronavirus information accessible to Latino and immigrant individuals.** "We are sharing information in four languages: English, Portuguese, Spanish, and Haitian Creole, to benefit the community here in the U.S. and abroad," says Pena. But ContraCovid wants to do more, including creating videos like Pena's in other languages and recruiting more scientists, so that their materials can reach more and more people.

x...///..<<...>>c..

https://arts.mit.edu/start/wiesner-student-art-gallery/schnitzer-2020/
https://arts.mit.edu/start/wiesner-student-art-gallery/

Awarded annually to 3 - 5 MIT students for excellence in a body of artistic work.

PAPERS, ARTICLES, PRESENTATIONS, TALKS

DIAGNOSTICS / CRISPR: POINT-OF-CARE TESTING FOR COVID-19 USING SHERLOCK DIAGNOSTICS

Julia Joung, Alim Ladha, Makoto Saito, Michael Segel, Robert Bruneau, Meei-li W Huang, Nam-Gyun Kim, Xu Yu, Jonathan Li, Bruce D. Walker, Alexander L. Greninger, Keith R. Jerome, Jonathan S. Gootenberg, Omar O. Abudayyeh, Feng Zhang, posted 8 May 2020
doi: https://doi.org/10.1101/2020.05.04.20091231
https://pubmed.ncbi.nlm.nih.gov/32511521/
https://www.medrxiv.org/content/10.1101/2020.05.04.20091231v1

The recent outbreak of the novel coronavirus SARS-CoV-2, which causes COVID-19, can be diagnosed using RT-qPCR, but inadequate access to reagents and equipment has slowed disease detection and impeded efforts to mitigate viral spread. Alternative approaches based on combinations of isothermal amplification and CRISPR-mediated detection, such as the SHERLOCK (S pecific H igh S ensitivity E nzymatic R eporter Un LOCK ing) technique, offer reduced dependence on RT-qPCR equipment, but previously reported methods required multiple fluid handling steps, complicating their deployment outside clinical labs. Here we developed a simple test chemistry called STOP (SHERLOCK T esting in One Pot) for detecting SARS-CoV-2 in one hour that is suitable for point-of-care use. This simplified test, STOPCovid, provides sensitivity comparable to RT-qPCR-based SARS-CoV-2 tests and has a limit of detection of 100 copies of viral genome input in saliva or nasopharyngeal swabs per reaction. Using lateral flow readout, the test returns result in 70 minutes, and using fluorescence readout, the test returns result in 40 minutes. Moreover, we validated STOPCovid using nasopharyngeal swabs from COVID-19 patients and were able to correctly diagnose 12 positive and 5 negative patients out of 3 replicates. We envision that implementation of STOPCovid will significantly aid "test-trace-isolate" efforts, especially in low-resource settings, which will be critical for long-term public health safety and effective reopening of the society.

DATA / TRACKING: BUILDING AN INTERNATIONAL CONSORTIUM FOR TRACKING CORONAVIRUS HEALTH STATUS

Segal, E., **Zhang, Feng**, Lin, X. et al. Nat Med (2020). Pub. 6 June 2020.
https://www..com/articles/s41591-020-0929-x
https://doi.org/10.1038/s41591-020-0929-x

We call upon the research community to standardize efforts to use daily self-reported data about COVID-19 symptoms in the response to the pandemic and to form a collaborative consortium to maximize global gain while protecting participant privacy.

The rapid and global spread of COVID-19 led the World Health Organization to declare it a pandemic on 11 March 2020. One factor contributing to the spread of the pandemic is the lack of information about who is infected, in large part because of the lack of testing. This facilitated the silent spread of the causative coronavirus (SARS-CoV-2), which led to delays in public-health and government responses and an explosion in cases. In countries that have tested more aggressively and that had the capacity to transparently share this data, such as South Korea and Singapore, the spread of disease has been greatly slowed1.

Conclusions: In summary, we call for participation in an international consortium, the CCC, that will serve as a hub for the integration of COVID-19-related information. This collective effort to track and share information will be invaluable in predicting hotspots of disease outbreak; identifying which factors control the rate of spreading; informing immediate policy decisions; evaluating the effectiveness of measures taken by health organizations on pandemic control; and providing critical insights on the etiology of COVID-19. It will also help people stay informed on this rapidly evolving situation and contribute to other global efforts to slow the spread of disease.

POLITICAL PSYCHOLOGY / UNIVERSAL BASIC INCOME: WHY HAS THE COVID-19 PANDEMIC INCREASED SUPPORT FOR UNIVERSAL BASIC INCOME?

D Nettle, E Johnson, M Johnson, **Rebecca Saxe** – 2020, PsyArXiv preprint, Created: June 02, 2020 l Last edited: June 16, 2020, https://psyarxiv.com/csr3u
https://doi.org/10.31234/osf.io/csr3u

Prof. Rebecca Saxe, https://mcgovern.mit.edu/profile/rebecca-saxe/
Lab: http://saxelab.mit.edu/
Pubs:
https://scholar.google.com/citations?hl=en&user=g42kJfIAAAAJ&view_op=list_works&sortby=pubdate

The 2020 global COVID-19 pandemic has led to a marked increase in positive discussion of Universal Basic Income (UBI) in political and media circles. However, we do not know whether there has been a corresponding increase in support for the policy in the public at large, or why. Here, we present two studies carried out in April and May 2020 in UK and US samples. In study 1 (n= 802), we find that people express much stronger support for a UBI policy for the times of the pandemic and its aftermath than for normal times. This is largely explained by the increased importance they attach to a system that is simple and efficient to administer, and that reduces stress and anxiety in society. In study 2 (n= 400), we pit UBI against an equally-generous but targeted social transfer system. We find that, for pandemic times, support shifts towards UBI. This is partially explained by a number of perceived advantages, such as simplicity of administration and suitability for a changing world. Our results illustrate how a changing social and economic situation can bring about marked shifts in policy preferences, through changes in citizen's perceptions of what is currently important.

CLIMATE / PANDEMIC: WE CANNOT IGNORE THE LINKS BETWEEN COVID-19 AND THE WARMING PLANET

By Richard Richels, **Henry Jacoby**, Gary Yohe and Ben Santer, Opinion Contributor — The Hill 05/27/20 04:30 PM EDT, https://thehill.com/opinion/energy-environment/499604-we-cannot-ignore-the-links-between-covid-19-and-the-warming-planet?rnd=1590527443

Henry Jacoby, William F. Pounds Professor of Management, Emeritus, Sloan School of Management; former co-director of the Joint Program on the Science and Policy of Global Change, https://globalchange.mit.edu/about-us/personnel/jacoby-henry

The emergence of COVID-19 suggests that global warming may present an even graver threat to human welfare than many recognize. As indicated in the scientific literature, not only could the current warming of our planet increase the likelihood of an air-borne pandemic such as COVID-19; it could also damage our health and welfare.

Let us be clear: We are not talking here about future warming, which is already of great concern. We are talking about the effects of a rise of 1oC that we have already experienced. Even with such "modest" warming, a stunning barrage of extreme events have happened in recent years, many of which cannot be explained in the absence of climate change.

How can climate change increase the likelihood of a pandemic? Epidemiologists have been cautioning for several years that it wasn't a matter of whether a novel coronavirus pandemic would strike, but when. It is well established that viruses jumping from the wild to humans are the major source of this threat, and we know that the degradation and decline of forests weakens the natural barriers protecting us from the source of infection. Shrinking forests arise not only from deforestation caused by population growth and urbanization; global warming also affects forest health.

HISTORY / MEDIA: COLLECTIVE AMNESIA: 5 LESSONS FROM "NEW MEDIA" DURING THE 1918 WAVES OF INFLUENZA AND RACIAL TERROR

Katerina Cizek, Artistic Director of Co-Creation Studio at MIT Open Documentary Lab, http://opendoclab.mit.edu/presents/kat-cizek/
http://opendoclab.mit.edu/
Immerse is an initiative of the MIT Open DocLab
9 June 2020: https://immerse.news/collective-amnesia-792933233419

History may not repeat, but it can rhyme. At Immerse today, we are concerned with emergent tech and media creation in the context of Covid-19 as well as the global uprisings against state-sanctioned racial terror. History might help reveal the connections between technology, art, pandemics and racial injustice. What rhymes do we hear?

1. State and media players name the virus to define the narrative...

2. Pandemics create vacuums for media conglomerate takeovers...

3. Artists get sick too...

4. Documentary and social media can be foggy, ephemeral...

5. Waves of pandemics, waves of racial terror...

Over 100 years ago, users of new and old forms of communication tech were both constrained by a pandemic and propelled by it. So too, struggles over the pandemic narrative, the platforms and the messages aligned with millions of deaths, and a transformed media landscape. These struggles were connected to brutal expressions of violence to uphold white supremacy, and uprisings to challenge them.

What rhymes do we hear?

INFORMATION-MISINFORMATION / ANALYSIS: ANALYSIS OF MISINFORMATION DURING THE COVID-19 OUTBREAK IN CHINA: CULTURAL, SOCIAL AND POLITICAL ENTANGLEMENTS

Yan Leng, Yujia Zhai, Shaojing Sun, Yifei Wu, Jordan Selzer, Sharon Strover, Julia Fensel, **Alex Pentland**, Ying Ding, arXiv preprint arXiv:2005.10414, 2020, submitted 21 May 2020, https://arxiv.org/abs/2005.10414

COVID-19 resulted in an infodemic, which could erode public trust, impede virus containment, and outlive the pandemic itself. The evolving and fragmented media landscape is a key driver of the spread of misinformation. Using misinformation identified by the fact-checking platform by Tencent and posts on Weibo, our results showed that the evolution of misinformation follows an issue-attention cycle, pertaining to topics such as city lockdown, cures, and preventions, and school reopening. Sources of authority weigh in on these topics, but their influence is complicated by peoples' pre-existing beliefs and cultural practices. Finally, social media has a complicated relationship with established or legacy media systems. Sometimes they reinforce each other, but in general, social media may have a topic cycle of its own making. Our findings shed light on the distinct characteristics of misinformation during the COVID-19 and offer insights into combating misinformation in China and across the world at large.

DEPARTMENT OF ECONOMICS PAPERS / ARTICLES

Implications of Heterogeneous SIR Models for Analyses of COVID-19

Glenn Ellison, NBER Working Paper No. 27373, June 2020
https://economics.mit.edu/files/19936

This paper provides a quick survey of results on the classic SIR model and variants allowing for heterogeneity in contact rates. It notes that calibrating the classic model to data generated by a heterogeneous model can lead to forecasts that are biased in several ways and to under-statement of the forecast uncertainty. Among the biases are that we may underestimate how quickly herd immunity might be reached, underestimate differences across regions, and have biased estimates of the impact of endogenous and policy-driven social distancing.

x...///..<<...>>c..

Reopening Under COVID-19: What to Watch For
Jeffrey E. Harris, NBER Working Paper No. 27166, 12 May 2020
http://web.mit.edu/jeffrey/harris/HarrisJE_WP3_COVID19_WWF_6-May-2020.pdf

We critically analyze the currently available status indicators of the COVID-19 epidemic so that state governors will have the guideposts necessary to decide whether to further loosen or instead retighten controls on social and economic activity. Overreliance on aggregate, state-level data in Wisconsin, we find, confounds the effects of the spring primary elections and the outbreak among meat packers. Relaxed testing standards in Los Angeles may have upwardly biased the observed trend in new infection rates. Reanalysis of New Jersey data, based upon the date an ultimately fatal case first became ill rather than the date of death, reveals that deaths have already peaked in that state. Evidence from Cook County, Illinois shows that trends in the percentage of positive tests can be wholly misleading. Trends on emergency department visits for influenza-like illness, advocated by the White House Guidelines, are unlikely to be informative. Data on hospital census counts in Orange County, California suggest that healthcare system-based indicators are likely to be more reliable and informative. An analysis of cumulative infections in San Antonio, Texas, shows how mathematical models intended to guide decisions on relaxation of social distancing are severely limited by untested assumptions. Universal coronavirus testing may not on its own solve difficult problems of data interpretation and causal inference.

MIT-RELATED STARTUPS

MIT Startup Exchange: https://startupexchange.mit.edu/

BIOBOT ANALYTICS

Cambridge, MA, https://www.biobot.io/

We are global leaders in wastewater epidemiology. Our mission is to transform wastewater infrastructure into public health observatories.

SARS-CoV-2 is shed in the stool of Covid-19 patients, making its way into our sewers. We analyze sewage to determine the presence of infected individuals and estimate the number of cases. Data from sewage supports communities with:

- Trend analysis. Determine when to safely re-open, and keep open, our communities and businesses through frequent sampling.

- Early warning. Detect the re-emergence of Covid-19 in a population to rapidly take action and contain new outbreaks.

- Testing at scale. For a fraction of the cost of mass individual testing, get an overview of the scope of the outbreak.

HOOWAKI

Greenville, SC, https://www.hoowaki.com/

We began working on water repelling micro surfaces, but decided to shift our focus to other markets. Since then we have worked hard to provide high grip and low friction surfaces. We have developed a library of hundreds of micro surfaces to solve almost any friction problem.

Hoowaki LLC has developed an innovative one-piece injection molded design for a COVID-19 swab to help close the gap in U.S. and global COVID-19 testing supplies. The 12-year old micro surface engineering and product solutions company has adapted its proprietary HOOWAKI MICROGRIP® surface technology to create micro-pillars used in the Hoowaki® NP Collection Swab that is shown in clinical user testing to meet existing industry-standard products for flexibility and performance... https://www.hoowaki.com/covid-19-swabs https://www.prnewswire.com/news-releases/hoowaki-makers-of-hoowaki-microgrip-technology-engineers-and-initiates-production-of-covid-19-swab-to-enable-expanded-testing-301068620.html?tc=eml_cleartime

MYTIDE THERAPEUTICS

Boston, MA, https://www.mytide.io/
https://www.linkedin.com/company/mytide-therapeutics/

We are a multi-disciplinary team of engineers, biochemists and computer scientists who have created the first company to take a technologically advanced approach to solving long-standing challenges in both peptide synthesis and purification. Mytide's fully automated peptide manufacturing technology, coupled with predictive analytics and machine learning, is challenging decades-old paradigms to enable cost-efficient research and development, therapeutic manufacturing, and discovery. Our aim is to accelerate the discovery and development of life-saving peptide therapeutics for serious illnesses ranging from metabolic conditions to cancer to inflammatory disorders to infectious diseases.