ENVISION Conference 2019 - “The Future of Us”

WORKSHOP DESCRIPTIONS

Workshop 1 - 1:00 - 2:00

Our Social Innovation Bottleneck - Robin Hanson

We gain value from clever complex arrangements of not only physical devices and software, but also of social relations. And as with devices and software, it takes effort to innovate better social institutions. But while today there are decent incentives at the start and end of the social innovation channel, we have a big bottleneck in the middle: we neglect small scale field trial-and-error field experiments. Breaking this logjam could pay great dividends.

Anticipating a post-aging world - and anticipating that anticipation - Aubrey de Grey

We are probably still 15-20 years away from the development of rejuvenation biotechnology that is sufficiently comprehensive to constitute the genuine defeat of aging - and since this is pioneering technology, we could be 100 years away. But in order to make the most of this advance, we must not wait until it happens to start figuring out how to exploit it. Universal access to these therapies for everyone old enough to need them will only happen promptly if we plan ahead and invest in the necessary infrastructure and training. But the big risk is actually not that we will fail at that stage - it is that we will be caught out by a much more near-term sea change, triggered by progress in the laboratory, that tips the consensus of publicly stated expert opinion in favour of the imminence of dramatically longer healthy lives. That shift will collapse the public's prevailing irrationality about aging almost overnight, leading to massive changes in big-ticket spending patterns and a huge destabilisation of the economy. In order to minimise this turbulence, decision-makers in all walks of life must anticipate that anticipation.

Editing Nature: Governance Hurdles and Ethical Holes - Natalie Kofler

Decisions to genetically engineer wild species – whether for public health, environmental conservation or agriculture – are loaded with genetic, ecological, and societal complexity and uncertainty. With the potential to forever change the evolutionary trajectory of shared environments, novel genetic technologies, such as CRISPR gene editing and synthetic gene drives entail considerable ethical and regulatory challenges. How then can we ensure these decisions are made with wisdom? Together, we will discuss how scientific and value-based knowledge inform technology decision-making. We will explore policy frameworks that are interdisciplinary in nature and those that include historically ignored perspectives. The inadequacy of dominant theories in environmental ethics to support decisions to genetically engineer the environment will also be considered and an alternative ethos proposed; one that respect the interconnectedness of human and environmental health and invites technology into that relationship to augment the flourishing of both.

Ethics & Astrophysics Forum - Melinda Soares

Three astrophysicists will host this forum, which will open the floor to discussion on the ethical concerns facing the astrophysical and space science communities. Alwin Mao, of Princeton University, will join the workshop forum to encourage a broad perspective. He is a theorist that uses computational simulations addressing open questions in star formation.

The Future of Subjective Experience: Implications from Emerging Technologies - David Yaden

In Homo Deus, historian Yuval Noah Harari argues that advances in biological and information technology may come to exert a substantial influence on human subjective experience(s). In some cases, enhanced individuals may come to differ from the non-enhanced not only in degree – but also in kind. We are still far from any such fundamental alterations to human experience, but there are several technologies poised to profoundly influence subjective experience, even within the next decade. While Harari provides fascinating far-future speculations about 1) psychopharmacology (e.g., psychedelic substances), 2) non-invasive brain stimulation, and 3) virtual reality environments, there is a need to examine current and emerging manifestations of these technologies. In this workshop, I use Harari's work as an inspiration to describe contemporary scientific research using these technologies – as well as to facilitate a discussion and co-creation session about novel forms of subjective experience that may become available to us in the not-too-distant future.

Workshop 2 - 2:15 - 3:15

Automation in the short and very long run - Robin Hansan

Jobs data can say: (1) what factors predict which jobs are how automated, (2) how have those factors changed over the last two decades, and (3) how does increasing automation change a job's employment and pay? Basic econ & systems theory can also suggest where human-like minds may remain competitive in a long run of very capable automation.

Point-of-Care Sensors for Infectious Disease Diagnostics for Global Health Future - Umer Hassan

The future of global health is centered around infectious diseases which remain the leading cause of mortality around the world. Diagnosing disease at its onset will have a critical impact in saving patients' life. Point-of-Care (PoC) diagnostic biosensors provide a solution and can have a significant impact to achieve global health equity. In this talk, I will discuss development of PoC biosensing technologies and their integration with the patients' clinical data to develop personalized disease prognosis systems for applications like HIV/AIDS and Sepsis. I will conclude with the discussion on the emerging challenges in Global-Health in particular infectious disease diagnostics. How PoC technologies for personalized diagnostics could drastically reduce the time to appropriate treatment, dramatically increase survival rates, and save healthcare systems billions of dollars around the world. I will also emphasize on the implications and challenges in translation of these biomedical technologies in various health care settings.

Addressing cell damage - and therefore the diseases of aging - with Gene Therapy - Liz Parish

With time cells incur damage at the molecular level. We call this damage Aging. Scientists nowadays distinguish 7 or 9 forms of damage (depending on how they classify the different types of errors cells incur) that cutting edge R&D is working at. Different companies work on different kinds of damage and therefore on developing different kinds of therapies to address that damage. E g some startups work on senolytics, some on stem cells, some on gene therapy. BioViva has three partners to help develop gene therapies to tackle the damage due to faulty or missing genes incurred with time. BioViva itself is a bioinformatics company that collects the data for computerized analysis from patients signed up with it and from patients who have taken part in clinical trials by its partners. Integrated Health Systems (IHS) refers patients to doctors and clinics that can offer the desired gene therapy. BioViva's team at Rutgers' University is working on developing better virus vectors for gene therapy. And Maximum Life Foundation is funding a clinical trial that offers gene therapy to 10 patients suffering from mild to moderate Alzheimers' in a world first to address dementia with gene therapy. Currently BioViva and its partners work with 4 genes: the gene for telomerase to lengthen telomeres and thereby repair faulty DNA. This is the gene therapy that MaxLife will offer to Alzheimer patients. The gene for follistatin that will restore muscle tissue lost with aging. The klotho gene that helps with brain function and to repair kidney damage among other things, And the gene for PGC-1a that improves mitochondria quality and quantity. This is the beginning. BioViva's mission is to increase the number of therapies on offer and to decrease their price. We hope that in five years IHS, aided by data collected and analyzed by BioViva, will

offer gene therapies to address all damage due to faulty genes, and do so at an increasingly affordable price in many nations, including the USA

Neural interfaces: background, design considerations, and potential - Nathaniel Danielson

Insights into neural coding and learning -- combined with advances in machine learning and wearable technology -- provide a unique opportunity to fundamentally change the way humans interact with computers and machines. In designing such a technology, a number of important questions arise: what are the cells to directly interface with? What is their principal application? How do we assess risks to privacy? And how can we work to ensure it's widely accessible and unbiased in its development and use? I'll demonstrate the technology CTRL-labs is developing and use that as a platform for discussion around these issues.

Scaling Robotics with Machine Learning - Wei Liu

We have seen tremendous achievements in Computer Vision due to the powerful feature learning with deep neural networks (DNN). Many successful models achieve state-of-the-art results by combining classical core ideas with a DNN. For example, faster-rcnn combines sliding window and selective search detection ideas in a unified way and becomes the de facto architecture for object detection. We show that there are many areas in Robotics that we can combine traditional core ideas with the power of DNN to achieve much better results. Especially, we demonstrate in the self-driving car scenario that we use DNN to dramatically improve 3D object detection, temporal detection, 3D semantic segmentation, trajectory prediction, etc. Beyond the model itself, there are also lots of engineering challenges that need to be solved to bring SDCs to the public and commercialize them.

Accenture Technology Vision Viral Desai

In this workshop, run by our sponsor Accenture, Viral Desai will talk about how Accenture uses technology in their business and their vision.

Workshop 3 - 4:30 - 5:30

How to Become Posthuman - Francesca Ferrando

In this workshop connected to her talk, Francesca will examine the macro questions (such as designer babies, super AI and the Anthropocene) and the micro questions (such as our daily interaction with technology, bio-hacking and consciousness hacking, the evolution of epigenetics, and, more in general, habits of existence) that relate to the posthuman.

What is Racism, How Should we Measure it, What Should we do About it - Courtney Cogburn

Courtney D. Cogburn employs a transdisciplinary approach to examining the role of racism in the production of racial inequalities in health. She is on the faculty of the Columbia Population Research Center and a faculty affiliate of the Center on African American Politics and Society and the Data Science Institute. She has focused on examining the effects of cultural racism in the media on acute physiological, psychological, and behavioral stress responses as well as associations between chronic psychosocial stress exposure and Black/White disparities in cardiovascular health and disease. She is also developing a project using data science to explore links between media-based racism and population health. In this workshop she will discuss her research.

Three Paradigms in Existential Risk Studies: Where the Field is Today, and How it Got There - Phil Torres

The field of “existential risk studies” was founded in the early 2000s by scholars who took seriously both the long-term future of humanity and the sundry risks associated with, in particular, “dual-use” technologies. Since then, three distinct paradigms, or thought-traditions, have emerged within the field, two of which are dominant today. In this workshop, we will explore the origins and evolution of thinking about existential risks from transhumanists in

the 1990s to contemporary perspectives informed by (a) “Effective Altruism,” and (b) systems theory and holistic risk analysis. We will discuss the pros and cons of each, with an eye to not merely understanding the topography of dangers but affecting real-world changes that improve humanity’s future.

Designing Human-Centered AI products - Sures Kumar

What is the role we as designers / product managers / engineers play in building artificial intelligence-driven products that are human-centered, ethical, and inclusive? Sures Kumar from Google’s AI user experience team will share insights from People+AI Guidebook, a resource Google product teams have utilized to navigate AI product decisions. Through hands-on exercises, you will learn how to determine if AI is the right solution for your user problem, introduce the system to the user and set expectations for system evolution, and explain how the AI system works and the impact confidence levels has on the user’s next steps.

Re-Engineering Humanity - Brett Frischmann

Every day new warnings emerge about artificial intelligence rebelling against us. All the while, a more immediate dilemma flies under the radar. Have forces been unleashed that are thrusting humanity down an ill-advised path, one that’s increasingly making us behave like simple machines?

In this wide-reaching, interdisciplinary workshop, Brett Frischmann will examine what’s happening to our lives as society embraces big data, predictive analytics, and smart environments. He will explain how the goal of designing programmable worlds goes hand in hand with engineering predictable and programmable people.

Through new frameworks, provocative case studies, and mind-blowing thought experiments that you’ll find hard to shake, Frischmann reveals hidden connections between fitness trackers, GPS technology, electronic contracts, social media platforms, robotic companions, fake news, and autonomous cars. The powerful analysis provides much-needed resources for imagining and building alternative futures.

Societal, policy, and regulatory implications of AI for healthcare and medicine - Daniel Elton

More than 30 AI algorithms have now been approved by the US FDA, and this is just the beginning of a revolutionary change in medicine. Today's overworked radiologists only spend a few minutes flipping through a scan using selective attention to determine the presence or absence of a specific disease or set of diseases the patient was indicated for. By contrast, AI systems can analyze an entire scan for many diseases at once, do not become fatigued, and do not suffer from cognitive biases such as base rate neglect or the halo effect. Moreover, AI can perform a holistic analysis from multiple modalities - scans, verbal reports, histological images, whole genome sequences, and a patient's entire history of electronic health records. Imagine having an AI 'super doctor' available at all times via an Amazon Alexa-like service. Numerous questions arise as a result of these near-future technologies - How should we manage patient's data? What new roles should doctors assume? How should self-improving (online learning) AI systems be regulated? How can we ensure that AI systems are secure, robust, and free from bias? These are the questions we will explore in this workshop.

Workshop 4 - 5:45 - 6:45

You Say ‘Disruption,’ I Say ‘Destruction’ - Noam Cohen

Over the last 15 years or so, the public has turned on the big Silicon Valley platforms, with good reason. They once seemed benevolent (By gum, they really may save the world!); then, perhaps, neutral (They are merely tools, only as good as the uses we put them to!); today, they are widely recognized as a social scourge (Can democracy even survive in a world dominated by Facebook, YouTube and Twitter?!)
But, I’d argue, nothing has changed; they always were social scourges. In the early days, these companies talked about “disruption,” promising efficiency and personal control over various activities like hailing a cab, renting a room or placing political ads. In fact, we’ve witnessed “destruction” in service of profit. That is, Uber needs to destroy mass

transit to have enough passengers hailing cars; Airbnb needs to destroy communities to have enough rooms to rent; and Facebook and YouTube need a polarized political system to keep people on their platforms. As one friend said, they look to destroy efficient systems so they can plant money trees in the ashes. Let's discuss.

Grand futures: just how "big" can the future be? - Anders Sandberg

This workshop will present some of my work and methodology on the "grand futures" program of exploring the limits of what can be achieved by intelligence. I will briefly talk about some of the main findings, questions and methodological insights, followed by a discussion/Ask Me Anything.

Advocating For Techno-Progress In The 21st Century - Ben Zion

This workshop will focus on an organizing push and collaboration with Apoll01 to make I-voting and decentralized approaches to public and private sector organizations a significant part of the political discourse in 2020.

The Next Generation of Healthcare: Using Drones for Lifesaving Deliveries - Whitney Huang

Bleeding during child birth accounts for 35% of maternal deaths worldwide, making it the leading cause of maternal mortality. While the incident rate in the US is only 0.02%, developing countries experience over 10x that rate, accounting for 99% of global incidents. Even with advancements in medicine, curable incidents continue to persist globally in locations with poor access to healthcare. Zipline International has been tackling this issue with a high-speed autonomous aircraft logistics system that sends medical supplies from the sky, delivering even to the most remote locations. A lot of progress has been made at over 23,000 lifesaving deliveries in Rwanda and Ghana to date, but there is still much work to be done to achieve our ultimate goal. How can we use the technology of today, and the future, to ensure a person's GPS coordinates shouldn't determine their access to healthcare, and thus their ability to live?

The First Steps to Create a Cyborg Sense - Kai Landre

In this workshop; cyborg artist Kai Landre will take the listener to a trip into their lifetime to discover which sense they would need depending on the most important memories of their childhood.