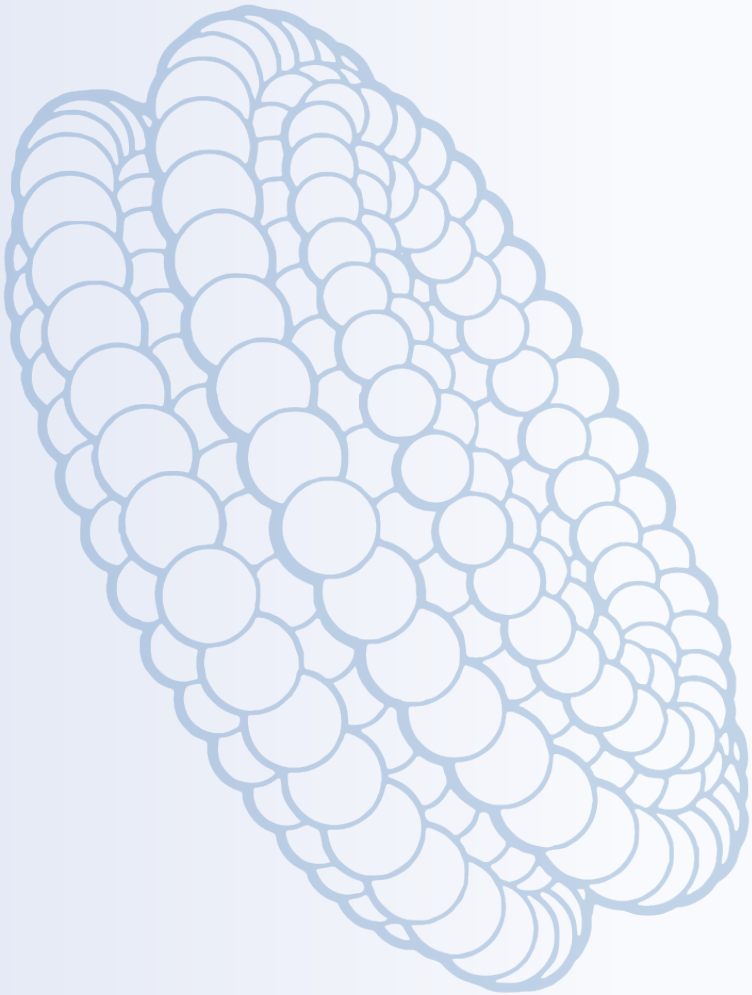
FORESIGHT INSTITUTE

Q3 PROGRESS UPDATES



2023 Progress Update and Future Plans

Thank you for enabling us to do the work we do, supporting the beneficial development of high-impact technologies that are too ambitious for legacy funders to support.

CONTENTS

Introduction

With your support, Foresight Institute has been able to support undervalued areas for beneficial technology advancement more than ever before.

Which areas do we focus on?

- Molecular nanotechnology for better materials to heal our biosphere
- Biotechnology to fight age-related diseases and extend healthy human lives
- Neurotechnology to improve human cognition and experience
- Computer science to secure human and AI cooperation
- Space to further human exploration of our universe

How do we support these areas?

- Five monthly seminars to give experts in each of these domains a chance to regularly discuss recent advancements, and their implications, in a curated seminar format
- Six annual workshops to give experts in each of these domains a chance to collaborate on the frontiers of these technologies in a fast-paced, two-day, in-person setting
- A fellowship supporting 10+ fellows in each of these domains (more than 75 fellows total!) via mentorship, networking, and professional exposure to advance their careers
- Four annual prizes to award outstanding work in molecular nanotechnology, longevity, and – to be launched in 2023 – computer security!
- One monthly salon in different cities across the globe to welcome new talent into the Foresight community
- Two annual, end-of-year festivals gather top talent of these domains to collaborate on progress across technology silos

In addition to our scientific core program, we have expanded our Existential

Hope work, to explore distinctively positive scenarios powered by beneficial technology progress, in contrast to the doom scenarios we are all too familiar with.

In this Q3 report, you can get up to speed on all of these areas, or dive into the ones closest to your heart.

Thank you for supporting beneficial futures through technologies by funding our seminars, workshops, fellowships, and prizes.

Sincerely,

Allison Duettmann, and your Foresight team

AI Safety Grants

Foresight is pleased to launch its first grant program. This grant program seeks to support projects working to progress three areas we consider underexplored when it comes to AI Safety.

If you missed the official launch, please take the time to watch the recording here: launch video. To learn more, to apply, or to become a sponsor, see the link here: https://foresight.org/ai-safety/

Since launching in August, the program has received 50+ applications split across three major categories. We have approved two grants and are working with our advisors to help us decide on many other applications.

Advisors

Thank you to everyone who has agreed to be an advisor!

Current Grant Recipients to Date

Roland Pihlakas & Joel Pyykkö

Project name: Aintelope project

Funding amount: $52,682

Project summary: Support for two researchers to work on the first version of Aintelope, a multi-agent cooperative framework which models human emotions to study value formation and alignment.

Keenan Pepper

Project name: Embedded Agency Playgrounds

Funding amount: $70,000

Project summary: Support for compute and one researcher to do empirical research in embedded agency playgrounds, write papers, and publish open-source tools. Embedded Agency Playgrounds here mean virtual worlds where agents with modern deep learning architectures can exist and interact as embedded agents. A main concrete research goal is to reproduce the results of “Robust Cooperation in the Prisoner’s Dilemma” but using trained transformer models instead of handwritten expressions of modal logic.

Seminar Highlights

Our monthly seminars are the virtual backbone of our community, enabling researchers, entrepreneurs, and funders across the world to come together to cooperate in advancing their focus technology.

Hendrik Dietz

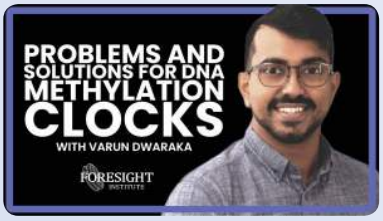
Virus Traps and Other Molecular Machines of the Future

Programmable molecular self-assembly with DNA origami is an attractive route toward implementing these principles to create synthetic molecular machinery. Hendrik combines computational design and cryo electron microscopy to learn how to construct synthetic molecular objects with increasing accuracy and increasing complexity.

Eric Hargan

Reimbursement for Longevity Treatments

In this talk, Hargan discusses the challenges and opportunities for gaining reimbursement and insurance coverage for longevity treatments. He reviews the current healthcare reimbursement landscape in the U.S. and how new medical technologies and treatments are evaluated for coverage and payment.



Varun Dwaraka

Moving Beyond Chronological Age Based Biological Clocks

In recent years, DNA methylation (DNAm) has shown remarkable associations to aging and longevity. However, these clocks have had issues which have presented problems with clinical application. Mainly, the precision of these markers has been limited, some clocks don't respond to validated biological interventions, and immune cell changes have been confounding factors.

Wanding Zhou

Updated Infinium BeadChips for Delineating DNA Methylation Dynamics in Large Cohorts

The new Infinium BeadChip has been specifically developed to reveal cellular identities and characteristic epigenetic irregularities in development and cancer processes. Furthermore, we uncovered innovative applications of the Infinium BeadChip for low-input DNA and integrative analysis of genetics-epigenetics interactions.

Brett Kagan

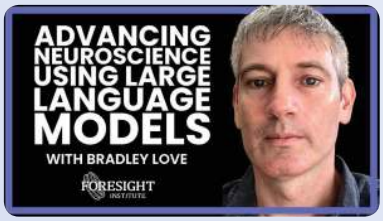
Brain Cells in a Dish as an Information Processing Device

What is intelligence? How can we create a generally intelligent system? The former question has remained contentious since humans first asked it, while the latter has inspired countless science fiction stories. Recent exciting advancements offer pathways to empirically investigate – and perhaps one day answer – both questions.

Owen Phillips

Brain Aging is the Key to Longevity

Phillips, CEO of brainkey.ai argues that brain aging is the leading cause of death for those over 80. He explains that the brain's high computing and wiring costs make it vulnerable to aging. To support these costs, the brain requires extensive cooling, waste removal, and energy supply systems.



Bradley Love

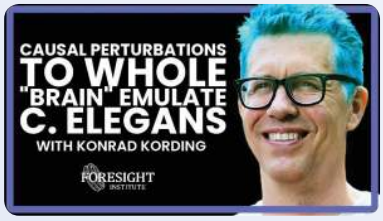
Advancing Neuroscience Using Large Language Models

In this talk, Love explains his tool BrainGPT, a model that can shed light on the structure of neuroscience as a field. Importantly, BrainGPT will not summarize nor retrieve articles. In such cases, large-language models often confabulate, which is potentially harmful. BrainGPT is an open-source community effort with 1337+ volunteers.

Brad Templeton

Dark Aliens, New Looks at Answering Fermi's Paradox

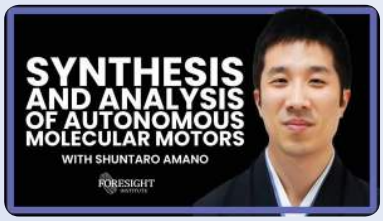
The question of why we have not yet encountered extraterrestrial intelligence, known as Fermi's Paradox, remains one of the most intriguing unsolved puzzles in science. In this talk, Templeton will discuss some of the new hypotheses emerging for explaining the Paradox, such as the "dark forest theory" that interstellar civilizations avoid detectable contact because of mutual distrust and potential threats to survival.



Konrad Kording

Causal Perturbations to Whole Brain Emulate C. Elegans

Being able to simulate a nervous system is clearly one of the salient goals of systems neuroscience. Being able to do so we need two things: a parts list and a functional description of the neurons. In this talk, Kording sketches what exactly it will take to simulate a complete nervous system: the nervous system of C. elegans.



Shuntaro Amano

Synthesis and Analysis of Autonomous Molecular Motors

Autonomous molecular machines continue to operate as long as the energy source is present (e.g. light, chemical fuels) and can perform work progressively. They are of paramount importance for future nanotechnology, but only a limited number of synthetic examples have been realized to date.

In this talk, Shuntaro presents his recent achievements that address the above issues. In the first project, we realized a chemically driven autonomous molecular pump, which keeps taking up macrocycles by harnessing the energy of chemical fuels.

Workshops

Cryptography, Security, AI Workshop

At Foresight Institute, we believe the intersection of cryptography, security, and AI—while still nascent—could be fundamentally important for crafting beneficial futures. To explore emerging opportunities, our second annual workshop on this topic was held from July 10 - 11 in San Francisco. We invited 60 relevant researchers, including Jan Leike from OpenAI, Kipply Chen from Anthropic, and Tristan Harris from The Center for Humane Technology, amongst others, to explore promising opportunities for progress.

The opportunities focused on by our workshop groups include efforts to securely open-source alignment, avoid ML backdoors, build secure personal AI assistants, prevent collusion amongst multiple AIs, create robust ID systems, improve hardware security, and many others. Workshop attendees were given the opportunity to vote for the projects they deemed most promising.

Seven working group proposals resulted from this workshop, which can be viewed here: https://www.youtube.com/playlist?list=PLH78wfbGI1x1hGI7c8tfz15BfXCZOLM1W

Furthermore, the full participant list, keynote speaker list, and the full agenda can be seen here: https://foresight.org/intelligent-cooperation-workshop-2023/


FORESIGHT
INSTITUTE
Advancing technology
for the long-term
benefit of life.
Space
Neurotech


Hello
TOM
Hello
DE KAI


FORESIGHT
INSTITUTE
Advancing technology
for the long-term
benefit of life.
Space


INTERNET
freedom
FIGHTER

Molecular Systems Design Workshop

This workshop took place on September 11 - 12 in San Francisco, and was joined by 60 researchers, including Ben Reinhardt from Speculative Technologies, Adam Marblestone from Convergent Research, Alexis Courbet from Washington University, William Shih from Harvard University, Chris Schafmeister from Temple University, and many others. The purpose was to drive progress towards the original vision of nanotechnology: creating reprogrammable tools that can create individually specified chemical bonds at scale.

The workshop report with resulting project proposals will be available in the next few weeks. In the meantime, you can find the workshop agenda and participant registry here: https://foresight.org/foresight-molecular-systems-design-workshop-2023.

DeSci Workshop

DeSci represents a movement built upon the principles of Open Science, uniting various projects and communities in the pursuit of a better, complementary alternative to the current scientific system.

Held July 15 - 16 in Paris, this workshop aimed to advance and proliferate the intersection between web3 technology and science, decentralizing

technology to innovate on scientific publication, data sharing, and knowledge engineering.

We brought together scientists and technologists to explore and utilize decentralized science (DeSci) tooling, in particular the Foresight Tech Trees.

Topics explored included:

- Development and application of Tech Trees for technological progress
- Health Data Revolution: The potential of health data in enhancing longevity
- AI/ML in Scientific Research
- Computational biology tools for reproducible science
- Ethics and regulation of DeSci

Upcoming Collaboration: Bezos Earth Fund x Foresight Institute

We will be hosting a workshop titled 'AI for Climate and Nature' on 17 - 18 October, taking place at The Institute, San Francisco.

As Bezos Earth Fund is exploring high impact opportunities in the AI for Climate and Nature domain, this workshop invites leading researchers, entrepreneurs, and decision-makers to pull up their sleeves to collectively drive progress by exploring the following questions:

1. What are the climate and nature challenge spaces that AI can have significant impact on, based on AI's "superpowers"?

2. Recognizing that a subset of challenges has already been taken up by researchers and industry, which gaps are still opportunity spaces?

3. Are there not-yet-realized AI advances that could accelerate us towards tipping points on high-impact climate and nature solutions?

We hope participants will explore new opportunities, and drive long-term cooperation to leverage AI to benefit climate and nature.

Upcoming Vision Weekends 2023

Held in two countries over two weekends, our Vision Weekends are where top talent across biotechnology, nanotechnology, neurotechnology, computing, and space are encouraged to burst their tech silos and plan for flourishing long-term futures. In general, these are the events which bring our community together.

Vision Weekend France will be taking place from November 17-19, 2023, at Château du Fëy, Burgundy. Contributors include Anders Sandberg, Danielle Strachman, Jason Crawford, Lee Cronin, Robin Hanson, and Tammy Winter.

Vision Weekend USA will be held from December 1-3, 2023, in San Francisco. Vision Weekend USA contributors include Adam Marblestone, Avi Loeb, Chris Kemp, Ed Boyden, Emilia Javorsky, Tom Kalil, and many others.

At both of our Vision Weekends, participants can create their own experience, choosing between:

- Track 1 – Made up of back-to-back panels, exploring technological trajectories of biotechnology, longevity, molecular nanotechnology, neurotechnology, cryptography, AI, space, and more with leading figures across fields.
- Track 2 – Including topical socials, where speakers will join after their panels to deep-dive with you into the topics discussed during their panels.
- Track 3 – Reserved for a magical mystery track, designed by the participant! They can sign up to give a lighting talk, demo, or show and tell on a topic of your choice.

To learn more about the agendas and speakers for both of these events, as

well as ticketing, sponsorship, and accommodation, please check out the webpage: https://foresight.org/vision-weekends-2023/

Vision Weekend France

For our sponsors, speakers, and fellows, extracurricular surprises of the weekend include our cyberfutures banquet, the Foresight Prize awards, exploring interactive technology demos, and the Foresight memorabilia exhibit!

Presenters

Adrian Matysek
National University of Singapore

Alex Fedintsev
Radical Life Extension group

Alexis Courbet
University of Washington

Allison Duettmann
Foresight Institute

Anders Sandberg
Future of Humanity Institute

André Loesekrug-Pietri
JEDI

Beatrice Erkers
Foresight Institute

Bradley Love
University College London

Danielle Strachman
1517 Fund

Divya Siddarth
Collective Intelligence Project

Ekaterina Ilin
AltaiPony

Ela Madej
Fifty Years

Erik Benson
KTH Royal Institute of Technology

Friederike Grosse-Holz
Blue Horizon

Jonathan Passerat-Palmbach
Imperial College London

Lee Cronin
University of Glasgow

Lewis Hammond
Cooperative AI Foundation

Mariam Elgabry
Bronic

Michael Matthies
Arizona State University

Patrick Rose
SPRIN-D

Peter Hrosso
Apple

Primavera de Filippi
Harvard Berkman Klein Center

Robin Hanson
George Mason University

Stephane Redon
OneAngstrom

Stuart Armstrong
Future of Humanity Institute

Tammy Winter
Stripe Press

Todd Huffman
E11

Trent McConaghy
Ocean Protocol

Yuri Deigin
Youth Bio

Vision Weekend USA

Vision Weekend USA will be held at iconic Bay Area locations in San Francisco, Redwood City, and the Berkeley Hills.

You can choose to join on a day ticket, including Saturday at the Internet Archive in San Francisco and Sunday at the Bird House Villa in the Berkeley Hills.

For our sponsors, speakers, and fellows, various satellite events are available to choose from, including a tour of Retro Biosciences, a speaker reception on Friday night, and a breakfast tour at the LongShot Space company on Sunday morning.

Presenters

Abigail Kukura
SCSP

Adam Marblestone
Convergent Research

Avi Loeb
Harvard University

Ben Reinhardt
Speculative Technologies

Bryan Bishop
10x Management

Cee Cee Schnugg
Boom Capital

Chris Kemp
Astra

Christine Peterson
Foresight Institute

Creon Levit
Planet Labs

Dana Watt
Breakout Ventures

David Eagleman
Stanford

Dean Tribble
Agoric

Ed Boyden
MIT

Emilia Javorsky
Future of Life Institute

Hein-Pieter van Braam
Ramatak Inc.

Hon Weng Chong
Cortical Labs

Jason Crawford
Roots of Progress

Johan Mathe
Atmo

Konrad Kording
Kording Lab

Malcolm Handley
Strong Atomics

Mark Miller
Agoric

Marta Belcher
FileCoin Foundation

Michelle Ritter
Steel Perlot

Reason
FightAging

Robert Cargill
quadraScope

Sam Rodriques
Francis Crick Institute

Sonia Arrison
100 Plus Capital

Steve Jurvetson
Future Ventures

Todd Huffman
E11

Tom Kalil
Schmidt Futures

Tony Kulesa
Pillar VC

Vittorio Sebastiano
Stanford University

Sponsor Vision Weekend

Sponsoring Vision Weekend allows junior members of our community to attend Vision Weekend when they otherwise would not have been able to. There are also a host of perks which come with sponsoring – please see the image below for details.

Vision Weekend USA Sponsorship Perks!

We're excited for our sponsors, speakers, and fellows to join us in Redwood City at Retro Biosciences for a tour of their intriguing modular labs and learn how we might add 10 years of human lifespan. Sponsors, speakers, and fellows will also join us at the Internet Archive for our cyberfutures banquet, the Foresight Prize awards, and to explore the interactive technology demos. Sponsors will also be invited to a tour of the LongShot rocket lab to learn about how to accelerate space opera futures.

Sponsorship Tiers

2023 Fellowship Success Stories

Danielle Fong, of Lightcell Energy, recently demonstrated light to electricity efficiency of about 60% at the maximum power point of Lightcell's special cells. She also officially opened their office in SOMA, San Francisco. Furthermore, she has recently raised about $1mm on their uncapped SAFE and achieved a record brightness of about 66x direct daylight.

Ekaterina Ilin recently published a paper in the Royal Astronomical Society! The topic is how we could resolve magnetic features on the (unresolved) surfaces of stars, to ultimately understand the severity of space weather for exoplanet habitability.

Ross Gruetzemacher and the Transformative Futures Institute have just launched their new website.

Barry Bentley, of Cardiff Metropolitan University, received a Fulbright Award to conduct his research at Harvard University and Mass General Hospital. His focus there will be to develop technologies to preserve cells, tissues, and organs by "freezing biological time". With the chronic shortage of organs for transplantation, improving the ability to store organs could by some estimates prevent or delay up to 35% of all deaths annually.

Jamie Joyce, of Society Library, began to host AI Knowledge Mapping hackathons at the Internet Archive every Tuesday over the summer!

Cedric Schaack begun his new position as Assistant Professor at Wake Forest University. There, Schaack will research new chiral organic electronics, which hold great promise for applications in display technologies, sensing, and quantum information systems.

Irene Regeni, of Leiden University, published a paper in Agnew Chem– Engineering Soluble Diketopyrrolopyrrole Chromophore Stacks from a Series of Pd(II)-based Ravels.

Dr. Mariam Elgabry is calling for contributions! Bronic is seeking to explore groundbreaking design, interdisciplinary collaboration, and creative activism to spark biosecurity socialization.

Adrian Matysek has just published his latest research paper at the National University of Singapore, "Targeting impaired nutrient sensing via the sirtuin pathway with novel compounds to prevent or treat dementia: A systematic review"

2024 Fellowship

This year, our fellowship saw the highest number of fellowship applications we have ever received – 200% more applications than last year demonstrating overwhelmingly strong talent. After weeks of reviewing and interviews, we are thrilled to share that we have finally decided who will be part of next year's cohort. They're brilliant, and working on cutting-edge projects that will inspire you. Next quarter, we will share their names and affiliations with you.

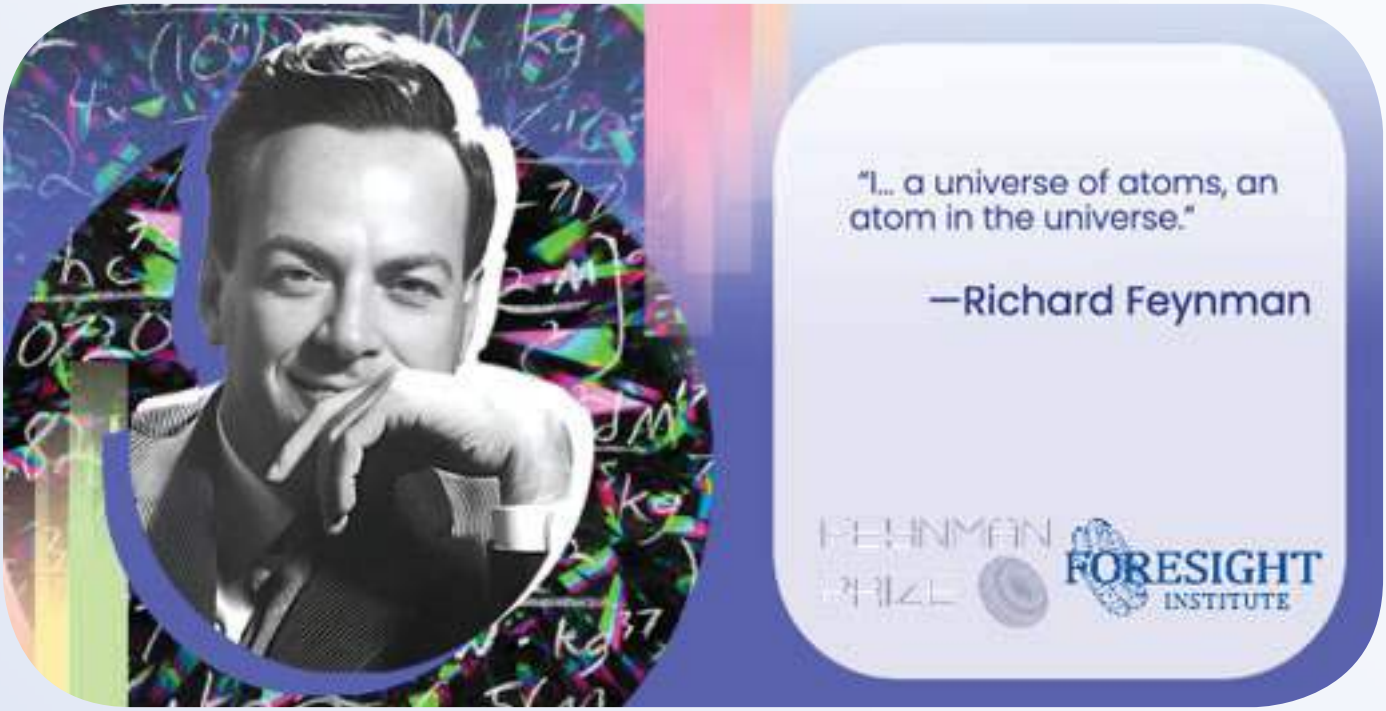
Global Meet Ups

Existential Hope x DeSci Berlin

The main aim of this meetup was to explore how Foresight Institute's Technology Trees can help us create desirable outcomes when we accelerate technology that is too ambitious for legacy institutions to take on.

Prizes

Feynman Prizes



Applications are now closed for our 2023 Feynman Prize! In total we received a whopping 37 applications, which are under review by our judges. We are looking forward to announcing the winners at our 2023 Vision Weekends.

Through the Feynman Prizes, Foresight Institute wishes to recognize recent and brilliant achievements that contribute profoundly to the field of Nanotechnology. Please see the webpage for more information on the prize history, previous winners, and the prize categories themselves – https://foresight.org/foresight-feynman-prizes/.

Norm Hardy Prize

Norm Hardy was a computer scientist most widely known for identifying the confused deputy vulnerability. His most significant contribution was KeyKOS, a capability-secure operating system that ran on commodity hardware, as well as key contributions to the creation of capability secure languages and protocols. Norm also recognized the importance of extending good security concepts out into the user's experience, requesting that the Prize in his name encourage work in that area.

The Norm Hardy Prize recognizes work that:

- Helps users understand, preferably tacitly, the security aspects of what they do;
- Introduces workflows that make the secure way to do something the easy way;
- Develops design principles for systems that are as easy or easier to use because of their security;
- Explores 'theory of mind' with respect to how users interact with secure systems

The long-term goal of the Norm Hardy Prize is a set of design principles and tools that encourage developers to create interaction designs that make it easy for people to use secure systems securely. Please see our webpage for more details: https://foresight.org/norm-hardy-prize/

Collegiate Propulsive Space Lander Challenge

The Collegiate Propulsive Lander Challenge, which launched in 2023, is a collection of five key milestone awards ($15k - $50k+) designed to drive elite collegiate rocketry teams to execute on self-landing rockets. Each milestone can be won by three teams, meaning a total of 15 awards will be distributed. Currently, 1500 students from 20 college rocketry teams around the world are engaged with this prize – they aim to build audaciously advanced self-landing liquid rockets.

Please see the webpage for further information: https://landerchallenge.space/

Existential Hope

We are thrilled to have hosted an extraordinary lineup of brilliant minds on our podcast over the previous quarter on our Existential Hope podcast.

In addition to the episode's transcript and art piece, we have now also enriched each podcast episode with a curated list of "Recommended Resources". Whether it was seminal books, intriguing concepts, or other podcasts of note, listeners now have at their fingertips a comprehensive guide to further explore the topics discussed in each episode.

Daron Acemoglu

New Paths For Human-Technology Synergy

In this recent episode, we were honored to host Daron Acemoglu, a distinguished economist and Institute Professor at MIT. Drawing from his new book 'Power and Progress: Our Thousand-Year Struggle Over Technology and Prosperity,' Acemoglu provided a nuanced exploration of the complex world of technological progress. He offered valuable perspectives on how technology has the potential to either empower or marginalize individuals, emphasizing the importance of directing advancements toward inclusivity.

Recommended resources:

- Why Nations Fail by Daron Acemoglu and James A. Robinson
- Power and Progress: Our Thousand-Year Struggle Over Technology and Prosperity by Daron Acemoglu and Simon Johnson
- The Time Machine by H.G. Wells
- The Tyranny of Merit: What's Become of the Common Good? by Michael Sandel

Liv Boeree

Game Theory, Moloch & Our Hopeful Future

In this previous episode, we had the pleasure of diving into all things existential hope with Liv Boeree. Once a professional poker player, Boeree has shifted her focus toward the field of effective altruism, driven by a quest for genuine social impact. Our discussion touched on her initial fascination with science, her attraction to the competitive world of poker, and the ethical considerations that led her to question the game's zero-sum nature. The conversation also ventured into wider topics like the misaligned incentives often found in competitive environments and the challenges of collective action.

Recommended resources:

- Win-Win - This is Liv Boeree's podcast where she delves into topics like the win-win potential of competition and its benefits and shortcomings.
- Meditations on Moloch by Scott Alexander - This is the blog post by Scott Alexander that Liv Boeree found insightful about misaligned incentives in competition.
- Raising for Effective Giving - Liv Boeree is a co-founder of this organization that applies the principles of Effective Altruism to poker.
- Liv Boeree's YouTube Videos - Here, you can find the videos Liv Boeree made about Moloch.
- Interviews with Daniel Schmachtenberger - Daniel Schmachtenberger offers valuable insights into systems thinking and related topics.
- Interviews with Jordan Hall - Jordan Hall is another thought leader in systems thinking and related fields.
- Samantha Sweetwater - She is a noted figure in exploring indigenous wisdom.
- Backlist Podcast - This podcast was mentioned by Liv Boeree as an example of a collaborative effort.

Media Coverage

Allison Duettmann spoke at the Dublin Longevity Summit to provide an update on The Longevity Prize. She also joined the Progress Forum for an AMA on Advancing Science, and joined the What That Means podcast to discuss Neurotechnology & Molecular Manufacturing.

Fund beneficial futures!

Thanks to your support, we will continue to work for our community as they advance technological progress, and further increase awareness and responsibility for the beneficial technologies they develop.

Given the current global financial situation leading to an unpredictable budget, your contribution matters a lot this year. Every dollar makes a difference in enabling us to continue to grow a community of technologists committed to beneficial futures.

We have a variety of opportunities for more tailored collaborations, such as workshops and fellow sponsorship, and have a few exciting perks, such as our personal longevity group, to thank you for your support.

As a donor, you fund the beneficial development of science and technology that is too ambitious to be supported via legacy institutions.

We gratefully accept donations here, and please contact allison@foresight.org to learn more about potential collaborations.

Thank you for advancing technologies for beneficial futures with us!