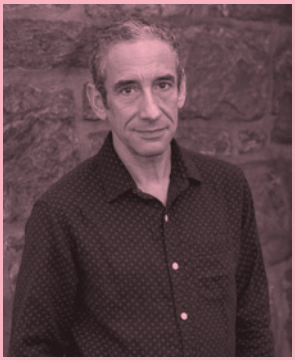
MozFest is one part of a much larger movement — a global community of coders, activists, researchers, and artists working to make the internet a healthier place.

We asked a handful of people we admire to talk about that movement, their role in it, and where they think it's going. The result?

Seven fascinating conversations between 14 fascinating people. In the following peer-to-peer interviews, you'll see an acclaimed filmmaker and media theorist discuss how to make technology more humane. You'll see a digital rights activist and environmental advocate swap ideas on movement building. You'll see a former Member of the European Parliament and a Hong Kong-based technology policy expert compare digital rights on their respective continents. You'll learn about the state of inclusive STEM education in Egypt and Ireland. And much more.

On Building Tech That Better Serves Humanity

TIFFANY SHLAIN is an Emmy-nominated filmmaker, author and founder of The Webby Awards. Selected by the Albert Einstein Foundation for Genius: 100 Visions of the Future, Tiffany's films and work have received over 80 awards and distinctions including four premieres at The Sundance Film Festival. She lectures worldwide on the relationship between technology and humanity. Info on films, her new book "24/6: The Power of Unplugging One Day a Week," published by Simon & Schuster and talks at: www.tiffanyshlain.com. Follow on Twitter @tiffanyshlain.



Named one of the "world's ten most influential intellectuals"by MIT, DOUGLAS RUSHKOFF is an author and documentarian who studies human autonomy in a digital age. His twenty books include the just-published "Team Human," based on his podcast. He also made the PBS Frontline documentaries "Generation Like," "The Persuaders," and "Merchants of Cool." His book "Coercion" won the Marshall McLuhan Award, and the Media Ecology Association honored him with the first Neil Postman Award for Career Achievement in Public Intellectual Activity. Learn more at https://rushkoff.com/. Follow Douglas @rushkoff.

(photo: Rebecca Ashley)

From Tiffany
To Douglas

Hello!

From Douglas
To Tiffany

Hello — and gosh! It's been a long time since I wrote “Cyberia” and you founded The Webbys. Back then we both thought the best way to promote a healthy digital society was to celebrate those who were envisioning and engineering positive, pro-social futures. But around the time of the AOL-Time Warner merger, around 1999, it became clear to me — and I'm guessing to you, too — that the net was about to be more about the growth of capital than the growth of culture. As a result, we got the surveillance economy and the attention economy, which instead of helping people create value for themselves and each other, simply use tech to extract value from people and places.

Right about that time is when I wrote this weird little piece for Adbusters called “The Sabbath Revolt,” where I was arguing that people should adopt a “one-seventh rule.” One day each week, not just away from tech, but away from buying and selling. Taking a day off would help people recalibrate their nervous systems and their social priorities.

It kind of fell on flat ears. But now with Day of Unplugging and your book “24/6” and Tristan Harris convincing tech companies to show us how much time we're spending, I'm wondering: Is the amount of time we spend on our devices as important as how we're spending time?

From Tiffany
To Douglas

For the last 10 years, my family and I unplug completely from all screens for one day a week, which has been extremely profound. Since we started this practice, our society has become more and more screen-obsessed — and the Web has become more and more beastly, trying to manipulate in more ways.

There was a moment when I founded the Webby Awards in 1996, where a lot of people got their hopes up for this open, decentralised system that everyone could contribute to. Then when it became centralised, the priorities changed and it was about sucking in all your time and monetising every moment of your life. So for me, the book is about a multi-pronged approach. One, you need a full day off the network once a week. Twenty-four hours is necessary to do the long-term thinking we're not able to when we're jacked into the network 24/7. You need the space to do the kind of thinking that drives culture forward.

Secondly, we need to change the models that are happening with the web. I don't think it's a mistake that there's a reckoning in the gender movement and the tech movement at the same time. We need more diversity at every level of when we’re creating these tools.

So to answer your question: It's not just about disconnecting. You need time away — *real* time away. Not just a couple hours before bed, but a full day off every week to regain perspective and bigger picture thinking.

And we need more diversity in the creation, oversight and regulation of everything having to do with technology and the web. We need to revisit the original vision of the web. We have lost the beauty and the power of what a decentralised network can do.

From Douglas
To Tiffany

The thing I start wondering, though, is now that we're moving into the internet of things, the new Silicon Valley vision is for the web to go away, altogether. I'm wondering now if we're going to remember the good old days when the internet was when you went online?

From Tiffany
To Douglas

We're already complaining that our phones are always on, but that's nothing if your *house* is online. You know?

I completely agree. But I still think we need to push back. I think that that's part of what we need to be protecting — the boundaries of our own existence. It isn't healthy to have a 24/7, completely-permeable society where there are no boundaries. One thing in terms of my family's weekly day off screens: We call it "Tech Shabbat," but in my mind it is not a religious practice. I am not a religious person. I want taking a "Tech Shabbat," a full day without screens a week, to be like yoga and meditation. The practice of taking a day off of the network of life and work is over 3,000 years old for a reason. This is just an updated version for our modern age, when everything has become 24/7.

From Douglas
To Tiffany

Right. The one-seventh rule. But then we've really got to figure it out. Let's say you have an advanced version of Nest — one of these digital thermostat-y things that's on the internet. As you're walking around in your house, you're delivering data to the networked thermostat,

which is then using it not just to govern your system, but to inform all these other parties about you.

From Tiffany
To Douglas

I guess we want a way for the internet of things to go local...

Let's think of some different business models. I keep thinking, what would you pay to *not* have your data sold? For a device like Alexa, but with constraints around it? There are versions of these things that don't have access to every aspect of your life all the time. They do have an off switch. I hope people are going to start to rise up and say, you know what, I don't feel comfortable that my data being sold in this black market and influencing elections. We need a different model.

From Douglas
To Tiffany

Not to stroke their ego, but that's why the original shareware / Mozilla / Mosaic model for internet development is so much more resilient. It's so much hardier. If they treat the data that we're producing like a commons, rather than stuff that they've extracted, then we're not being exploited by our technologies anymore. We're all sharing in the benefits.

From Tiffany
To Douglas

From Douglas
To Tiffany

It becomes a healthier environment.

If we started a model for technology that was a commons... God. If we put our medical data and our personal data into a big commons, it would disrupt the business model of all the corporations overnight. Their proprietary data would be worthless.

From Tiffany
To Douglas

I feel like people don't have a handle on the consequences of "free." The free that's not *really* free. Once people have a better handle on that, I hope and think it will inspire new models that give people more control over what they're giving away. And, alternative models for a healthier web that returns to the commons and decentralisation.

From Douglas
To Tiffany

Yeah. It's the equivalent of people understanding the difference between the low prices of Walmart and the high cost of Walmart.

From Tiffany
To Douglas

I feel a big shift. I feel like it's top of everyone's mind right now. Or, they know they *should* be thinking about it. We need to be having a global conversation.

From Douglas
To Tiffany

Most of our technologies are designed to use us. If that's the relationship, of course it's going to make you feel drained and sad and sick. The original purpose of the economy was to help people create and exchange value. Now our economy is here just to extract people's value.

From Tiffany
To Douglas

This comes back to the original hopes for the web. We got so excited about the web in the early '90s with this potential to extend our ability to create and connect. But I never thought everyone's heads would be down all the time staring at their devices and it would keep people from being present with others right in front of them.

From Douglas
To Tiffany

It's interesting. When the visual web emerged, it felt like a slight step back from the possibility of the internet. It was flat and opaque and more like television. I had this worry: *This is going to be less about personal weirdness and expression, and a little bit more about conformity and what-can-I-sell.* Then individual webpages became MySpace, and then the cookie-cutter profiles of Facebook.

From Tiffany
To Douglas

Completely.

From Douglas
To Tiffany

But the terrific pro-human, pro-social qualities of these spaces can be retrieved before it's too late.

From Tiffany
To Douglas

Yeah. And to figure out how to make that happen, you need that day away every week to do some longer and bigger-term thinking. And it's about reconnecting with yourself and your family.

From Tiffany
To Douglas

Exactly.

From Douglas
To Tiffany

And it even makes you a better web developer and user.

On Digital Rights In Asia And Europe

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(photo: Diana Levine, CC-BY)

From Malavika
To Julia

Hi, Julia.

From Julia
To Malavika

Hi, Malavika.

Let's continue the conversation we started over email about the state of digital rights in Asia and Europe. Specifically, we were talking about the public sector delegating difficult internet regulation tasks — like counter-terrorism, intellectual property protection, or hate speech — to private actors.

There is some degree of consensus in the European policy space that there's a problem with law enforcement on social media. And in some respects, that even goes beyond

law enforcement. Like in the UK, you had these initiatives around so-called harmful speech that actually isn't illegal, but it's considered a problem anyway. Yet there is no consensus about what exactly should be done about it.

So, my impression is that the policy response is focusing on shifting the liability for illegal activities to the platforms, rather than the people who actually commit illegal acts. Because then it's not the lawmakers' problem anymore. Basically they're telling a social media company, "There is crime happening, fix it" — fully knowing that any tools that would promise anything close to 100% success would have huge rates of false positives, and would violate fundamental rights.

But since they're not prescribing any specific method to deal with this problem, the public sector can somewhat abdicate any responsibility for the negative effects. In my view, that's a cop out. It's also dangerous in the long run: If you're not willing to take responsibility for how the law is enforced, then you're giving up power and you're basically telling a company like Facebook, "You are in charge of what is allowed and what is not allowed."

And of course, a company like Facebook is not going to enforce the law. They're going to enforce their private community rules that go way beyond the law in a lot of ways. So again, it's dangerous to abdicate responsibility for what we consider acceptable speech to a private company and accept whatever their standards are for society at large.

From Malavika
To Julia

There are three things in what you said that really resonated for me. One is this idea of false positives. On a lot of platforms — as well as initiatives that I see in Asia, whether it's biometric IDs or facial recognition — they don't care about the false positives or the false negatives, because there's this narrative that something is better than nothing. That's particularly true of developing economies where they feel, "These are people without consent.

They are either digitally illiterate or actually illiterate. They don't understand the consequences of what is being developed."

So this idea of false positives and false negatives is seen as acceptable in order to improve and fine tune a system. And in countries where you don't have a lot of guardrails, whether legally or technically, a progress narrative will push through imperfect systems, just because it's seen as *something* in the fight against big social harms.

When I've done work on things like biometric IDs, I've almost thought that they're beta testing surveillance technology on groups and populations in marginalised communities that don't have the ability to refuse to be included. And it's a similar thing when it comes to the sort of privatisation that you're talking about: It's a privatisation of something that should be within the domain of government and law enforcement. But it's being delegated to people who aren't necessarily the right fit.

The second thing you said that resonates with me is privatisation. It's exactly the same in a lot of domains, whether it's trying to create a smart city, or whether it's in China or India or somewhere where governments are not necessarily the best purveyors of technology. Governments enter public-private partnerships on everything from health systems, to transport, to energy, to a whole lot of things that are not just about free speech or expression. They're about very civic basic needs — needs that are very, very crucial to daily life.

Those are things that are within the domain of governments; that's what you pay taxes for. So the idea that those are delegated or even abdicated to private actors is a very disturbing trend. If it was differently designed, I would be happy with the idea of decentralisation. But I don't like the increasing monopolisation and platformisation of many services. When you delegate public accountability to private actors

that act in self interest and that don't necessarily act in the interests of citizens, that's a very fundamental shift. You're going from a social contract to terms and conditions set by private players.

Julia, you touched on this in your email yesterday: You have certain rights and expectations when it comes to a government player, whether under the constitution, whether it's tort law, negligence, consumer protection, or labor laws. Those are rights you may have against a government actor, but that you might lose if services are provided by private actors.

And the third thing that resonated is, what kind of incentives are we creating when we are pushing this onto private actors? In many ways it's creating the wrong incentives, like for citizens to increasingly act less as citizens and to act more as users. At the Stockholm Internet Forum, Alix Dunn from the Engine Room said the only two industries where she ever hears people refer to “users” are the tech industry and the drug industry.

From Julia
To Malavika

You're right.

From Malavika
To Julia

I'd never thought of it that way. But when essential services and decisions about speech, assembly, rights, and privacy — all of these aspects that make us people — are delegated to private actors, it creates the wrong set ofincentives and disincentives. It ends up with everyone being seen as a user and not as a citizen. And that's something we should resist.

From Julia
To Malavika

In the European policy context, there is a particular irony to this. I think the reason why the European Commission is really pushing in this direction is not so much because they're malignant and because they want Facebook to rule the world — not at all. They do it because agreeing on common standards among the countries is too difficult. For example, we don't

actually have a European criminal law that defines what constitutes criminal hate speech on a European level. Most countries have some sort of national law. Some of them don't have criminal hate speech. There are codes of conduct and soft law initiatives. But essentially, the reason why we don't have common European laws on a lot of things is because the countries can't agree; because the value systems are too different. Ironically, that then leads us to accept whatever a private company has decided is the standard as a substitute for enforcing the law.

I also want to react to what you said about the false positives and negatives, and why politicians consider them acceptable. To a large extent it's because they don't hit everyone equally. Which ties into the point you mentioned in your email about algorithmic discrimination: The false positives reflect marginalisation in society.

The false positives and negatives also reflect what algorithms are bad at. This was a point I was trying to make during the copyright debate. Our conception of copyright — and I think the same is probably true for other legal concepts — is changing based on what an algorithm can distinguish. For example, the idea of originality, or the ideas of parody and criticism and caricature, are losing importance in copyright law. Because an algorithm can only do pattern matching and can only determine, "Is the copyrighted content there? Then it's probably an infringement. Is it not there? Then it's not an infringement."

The same is probably true in the criminal context, when they use algorithms for criminal sentences. An algorithm cannot evaluate the severity of a crime or the harm that was caused. But it can evaluate the likelihood of reoffending or other things that can be statistically inferred. And so our entire concept of what we consider justice or what we consider illegal is changed by what a computer can do.

From Malavika
To Julia

That's particularly important because in a lot of these domains the question is, “How can we use AI?” rather than “What is the problem we're trying to solve?”

From Malavika
To Julia

Don't use them. Yeah.

From Malavika
To Julia

And also a conscious decision about not using shutdowns as a very blunt instrument.

From Malavika
To Julia

You can’t say “We'll just shut everything down without any sort of nuance.” If you have a shutdown in Kashmir, or if you have a shutdown every time kids are going to school and have exams — that's a stupid use that has no

But shouldn't it be the other way around? That we build tools based on our values, rather than change the values to reflect the limitations of our tools?

From Julia
To Malavika

I find that really interesting. Researchers based at Harvard and MIT looked at this in the context of changes to the criminal law in Massachusetts. In the beginning, the research question was “How can we improve the algorithms used in the criminal system to have less racial bias?” And eventually, the conclusion was “Don't use them at all.”

From Julia
To Malavika

That's a difficult discussion we have to have. I found that article you sent [about the merits of internet shutdowns in Sri Lanka] and the rebuttal very provocative. It's making the argument, “Let's just not use social media.” It's useful to make a conscious decision about what technologies we do want to use and in what context, rather than just using them because it's there.

From Julia
To Malavika

Yeah.

relationship to the consequences it might have for business or finance.

Also, the role of alternatives is something I keep coming back to. Do you use AI or not? What's the better tool? A lot of times we shut down social media without considering: Could the government actually provide better information to combat misinformation about a national security issue? Rather than not allowing anyone to use social media at all, because we fear bad actors?

From Julia
To Malavika

There are better answers than these really blunt propositions like shutdowns. But for some reason they don't make it into the political debate. We're seeing this in Europe in the area of counter-terrorism: We had this proposal on countering terrorist propaganda online that was an extremely blunt instrument and was treating a small blog with a comment function the same way as Facebook. It was basically covering any hosting provider whatsoever and saying they have to respond to law enforcement take down requests within an hour. And it was very clear that from the way that the law was written, what they had in mind was video. They were thinking of YouTube and Facebook. They were not thinking of the comments under a small blog. The Commission's own data shows that the likelihood of there ever being any terrorist content on your average hosting provider is infinitesimally small.

Nevertheless, they proposed this extremely blunt instrument and then used something like the Christchurch massacre as justification. Which I find very strange, because in the case of Christchurch, the problem was not that the material wasn't deleted within an hour. I think Facebook took down the original video within 17 minutes — so, they would have been *more* than compliant with what the proposed law was saying. The problem was about the spread of reuploads. And so this legislation wouldn't have changed anything.

From Malavika
To Julia

There is a lack of nuanced, academic discussion about what actually works. It's very difficult for academics to bring the results of their research into the political space.

One of the problems there is also that so much of the data is proprietary and in the control of the platforms and the private actors. It's not available to academics to study. So, even if you want to study how hate speech gets disseminated, who the actors are, what are the patterns — things where AI might actually be used — there's no access. It's also hard to study whether countermeasures or counter speech narratives are working or not. Again, you have no ability to study it in any meaningful way over time. I know companies like Facebook are trying to now give data to the Social Science Research Council, but that highlights the fact that they're gatekeepers.

From Julia
To Malavika

Yeah.

From Malavika
To Julia

They determine who to play with and who not to play with, and on what terms.

From Julia
To Malavika

Do you think it's primarily a regulatory problem? That we just need to pass laws that force those companies to share the data? Or is it also a computer science problem of what algorithmic transparency actually means?

From Malavika
To Julia

That's a really good question. To some extent they're able to not divulge data because they see everything very broadly as being their "secret sauce." They don't divulge how they do things because that gives competitors too much information. And again, this plays into this whole monopoly problem that we're talking about. But it's also partly regulatory — that could be one way of fixing it.

Also, they're always telling us how we should all learn how to code. But they never tell the technologists that they need to learn ethics.

That's a fundamental problem with the design process; they think ethics can be a very nice bolt on at the end. It's not engineered into the entire process.

I don't know if the right set of outlets are provided for companies to share information in ways that don't divulge personal information and anything sensitive about the companies. I mean, they're perfectly happy to track copyright content when World Cup ads appear on Twitter, right? If anything is an infringing image, they're able to track that quickly. But somehow when it comes to policing other kinds of content, they're like, "Oh my God, we're so helpless. We don't know how to do this." Which seems strange to me.

From Julia
To Malavika

I think there's a difference in difficulty whether you're looking for something that you already know — like the football ad — or something that looks different every time. So, I do think there is some merit to this argument that not all illegal content is equally easy to identify automatically. I think copyright is actually one of the harder problems, because whether it's illegal or not is context-dependent. If you have something like the Christchurch video, the context doesn't matter. It's always the same video, so it's comparatively easier. Whereas if you have hate speech in broad terms, it can look very different and it would be much harder to detect automatically. You would probably have huge numbers of false positives.

Also, I don't buy the trade secret argument at all. Nobody has been able to explain to me what the public value of trade secrets is in the first place. With patents, there's the idea of, “We give you limited protection in order to make the invention public, and then after the patent runs out, it's usable for everyone.” At least in *theory* I can understand the idea.

But with a trade secret, you're basically saying you get infinite protection in return for keeping something secret, and there is no public

benefit to that whatsoever. So, I don't see that as a legitimate concern. What I'm more concerned about is: How is it possible to make that information public in an understandable way that people can work with? This is an important problem; researchers need access.

This is a place where regulation has a role. The European Commission is probably going to propose an overhaul of the e-commerce directive, which enshrines the hosting safe harbor in law and is fundamental to internet regulation. My fear is that it's going to be an effort to extend direct liability to all kinds of sectors.

One thing they are talking about is regulating online advertising as a business model. That is actually a good idea, because if you look at the platforms that are the focus of public concern, what they have in common is not that people can upload stuff — there are a lot of websites where you can upload things, and most of them do not pose any threat to society whatsoever. What those platforms that require stricter scrutiny all have in common is a very strong focus within their business model on targeted advertising. I think that's much more useful to look at.

From Malavika
To Julia

On the point about transparency: Did you read that piece Jonathan Zittrain wrote recently in the New Yorker? He addresses the very interesting idea of intellectual debt, in this context of making algorithms and AI explainable.

He notes that we've always had inventions where we didn't know how they worked, and we still use them anyway. Whether it was lifesaving drugs or scientific accomplishments, there's been a lag between development of the product or service and understanding exactly how it works.

But scientists spend time explaining this after the fact. So there's an intellectual debt that's created in understanding it, and we pay it off over time as we understand side effects, how drugs work, cross indications.

And eventually, that intellectual debt gets paid off; the thing that was inscrutable then becomes explained. Right?

From Malavika
To Julia

And he draws this parallel with how AI and algorithms work. He says that kind of intellectual debt is being created again, where these systems are working in really mysterious ways. Even the people who develop them aren't able to exactly explain how they work. And if we don't ramp up our efforts to repay this intellectual debt, we're going to have even more crises. It's a really different way of looking at all these usual debates about explainable AI and transparency.

From Julia
To Malavika

Yeah.

From Julia
To Malavika

I think it's a fair point. I'm just wondering if this is a debt to the general public, who are not computer scientists, to understand Bayesian statistics and pattern matching and so on. Or, whether it's also a debt to educate computer scientists about the shortcomings of algorithmic systems.

I was at the Internet Governance Forum and we had a discussion with Vint Cerf about algorithmic discrimination. He was making it sound like it's always just a problem of bad data input. But I don't think that's the case. For example, Facebook had a category so advertisers could target people who hate Jews. That wasn't a problem of input data, because it's not like this category of people doesn't exist. They do exist, and the data probably correctly shows that. It's a question of whether advertisers *should* be able to target them. That's not a question of mathematical accuracy of the underlying algorithm.

From Malavika
To Julia

Exactly.
Bias is not always dependent on the data being clean or dirty.

I also found a piece by danah boyd and others really interesting. It looks at algorithms as socio-technical systems, and the different ways in which bias manifests. They talk about five different “traps” that you can fall into. One of them concerned introducing a score to measure people's likelihood to reoffend, to help a judge make a decision about sentencing. You have to account for the knock-on effects of something like this. It could be that the judges are then asleep at the wheel. They think, "Oh, here's a really perfect score, I don't need to think about itanymore. I'll just implement this score without any discretion." Which might work really well for the mean, but be really terrible for the outliers and those edge cases where principles of natural justice might apply, or common law principles might apply.

But the opposite could also happen. So even in a situation where the judge could make all kinds of mistakes and the score might actually be a good thing, the judge could view this intervention in a very hostile way. The judge could think, "I've had so many years of training. I've gone to law school. You think some stupid computer is going to tell me how to do my job?" And then he outright rejects all those scores, because he sees them as a challenge to his authority.

If you fail to account for both ends of the spectrum, and you just intervene in a system with this algorithmic decision making tool, then you've got all kinds of problems that you didn't provide for. There are a lot of instances where something might work well for people who fall within the average, but work terribly at edge cases, whether it's policing, speech, or content.

From Julia
To Malavika

Yeah, there are a number of problems with these applications. One is that biases that exist in society can easily seep into these systems. For example, with these criminal justice scores, one factor is the number of expulsions from school. Whereas we know from

research that teachers are much more likely to expel students of color. So in that way, even if you don't have race as a category, you're going to introduce it through other things that have a racial bias.

But even if the data is good and doesn't have any bias, there's still a problem. If you have any sort of difference between categories of people, it's going to be amplified. If you release all the people who get a good score and you keep all the people in prison who have a bad score, then whatever constitutes the bad score is going to become associated with criminality.

Then rehabilitation is going to be all that much harder. Basically you have to decide what's more important: more efficiently releasing the people who are least dangerous, or the prospect of rehabilitation for everybody. Because you can't necessarily have both.

It's not a problem of the algorithm being inefficient. It's just that it's measuring the wrong thing. It's imagining that there is no interaction between the outcomes of the algorithm and the world that it is trying to represent. It's like saying, "Whether or not I release you from prison is not going to have any effect on your future."

From Malavika
To Julia

While we're talking about things that really concern me about scoring in general: China is often used as the poster child for all things terrible and dystopian and "Black Mirror," right? With the social credit system?

From Julia
To Malavika

Especially in Europe.

From Malavika
To Julia

That drives me crazy, because as much as I don't like the system, I also don't like the reporting of the system as, "Oh my God, it's so terrible, but I don't need to worry about it because it's happening somewhere else." Because in the U.S., you've had all kinds of credit ratings systems for a while.

From Julia
To Malavika

Yeah.

From Malavika
To Julia

There's a certain “othering” that happens with technology somewhere else. To some extent it's completely justified, because if you don't trust the privacy safeguards or other guardrails in those countries, that’s fair. But I think it's often from a complete lack of understanding of how it's implemented. It's nice to play into all this sci-fi tropes and see it all as Armageddon. But the way these things are proliferating in Asia is through a blurred line between the social and everything else. Our social behavior is resulting in scores that affect everything from whether we get a loan, whether we get admission into something, whether we get jobs. Things that were purely fun and personal and were done within a certain context are being used to extrapolate and make decisions about us. They are used in ways that are not just social anymore.

From Julia
To Malavika

From Malavika
To Julia

Are people aware of that? Do they change their behavior to play toward the score?

There's gamification at both ends. There's gamification on platforms, where they use all the nudges and the behavioral economic techniques to make it all seem so playful and casual and informal. It encourages users to divulge more and more data because they think, "Oh, this is a game. I get points. It's like playing Pokemon." They don't see the impact of it.

But there are also ways people are gaming the system to improve credit scores, and it's changing behavior.

In some ways this reputation economy can be super enabling. People who are part of the informal sector who previously had no

professional persona — gig workers, food delivery drivers — suddenly start to build some kind of reputation. They see it as very empowering. So again, western narratives about it being a really creepy system don't always apply.

But then you realise that all of this reputation gain is locked with a particular vendor. It's not a portable score; they can't say, "I'm going to go drive for your competitor, and I can take my good scores and points and reputation with me." The value accrues to the platform and not to the person.

From Julia
To Malavika

I'm not sure if that's something that would need to be regulated. Wouldn't smart companies simply say, "We do allow you to port your reputation"? I don't know if anybody does that, but it seems like the right move to me. Let's say you're a competitor to Uber. Just say, "If you've been driving for Uber and you have a five-star rating, we're going to import that into our system if you switch to us." I don't think that Uber could do anything about it. They would probably try to claim some kind of intellectual property on the rating, but that seems like nonsense.

There is a certain hypocrisy in the way that the western media report on scoring. And I think when it's about China, there are some Cold War sensibilities: "This is what they do, but this is not what we do."

In Europe it's probably less that way, but of course in Germany we also have a credit score and it's run by a private company that has very little accountability about how their algorithm works. A German NGO recently did a crowdsourcing exercise to try to reverse engineer it and find out how it works.

Also, it's interesting how the global technology discourse is filtered through a U.S. lens. We're here to talk about Asian digital rights and European digital rights, but quite often we come back to U.S. discourse — like the criminal

justice system and scoring. That's just an observation; I don't know what to do with that. I guess it's unavoidable because a lot of the actors and the big companies are American.

From Malavika
To Julia

But it's also interesting how the GDPR has excited people in Asia more than you would imagine.

From Julia
To Malavika

In a good way?

From Malavika
To Julia

In a good way. A lot of people are trying to cut and paste it. It's forced companies to say, "If we want to trade with Europe, we need to be aware." Law firms are doing training programs for their clients.

There was a lot of excitement, and it's actually given some weight to the privacy discourse. Earlier it was very easy to say, "The US model is weak in certain ways," or, "You rely on the FTC and FCC, and it's not that great." But then the GDPR forced people to look at Europe more than the US when it comes to data protection.

From Julia
To Malavika

But imagine other countries around the world start passing legislation that are incompatible with each other. What happens then? It's a bit of a gamble, but I don't think it's sustainable in the long run to just say, "Well, we'll just pass internet legislation that has global application." Who is going to enforce that? At the end of the day, the GDPR is enforced through the market power of the European Union.

From Malavika
To Julia

I think the GDPR has a certain meme value; it raised the level of discourse and the number of actors and stakeholders who feel they have to educate themselves about this. Even from an enforcement or trade point of view, if it has limits, the fact that it energised conversations

around privacy and data and algorithmic accountability... at this point, we'll take anything we can get.

From Julia
To Malavika

That's really good. It was a big fight, and the fact that it was passed in the form it was is due to a number of almost random circumstances that created a window of opportunity, such as the Snowden revelations. We're really going to have to see how it plays out in the long run.

But it's good to see that in some areas regulation can have this positive effect. In the European Parliament, I found myself 80% of the time arguing against legislation that was not thought through. And 20% of the time trying to push for something to actually pass. Which is kind of discouraging about the state of regulatory intervention and technology. Even though I'm far from a libertarian and I really do believe in government regulation of the internet, in practice a lot of what is put forward is actually creating problems for us. So it's good to see there are examples where this is not the case.

From Malavika
To Julia

In Asia, I often hear that old metaphor about industry 4.0 battling with law 1.0. I often have to say, "Well actually, that's not a bad thing. Because a bad law is worse than having no intervention at all. Not rushing to fill a regulatory or legislative gap is not always a bad thing. Waiting to have more evidence of something before you decide to enter a space is not a bad thing.

Especially when you look at some of the over-broad legislation you see under the guise of cybersecurity or killing encryption — sometimes waiting and watching is not terrible.

From Julia
To Malavika

Yeah. I'm also not sure that you need to have that level of detailed technical understanding to be able to regulate. My impression is that lack of technical understanding is not always the biggest problem. It's more the lack of rigorous analysis of the argument that is put

forward. And that's not something that you need a computer science degree for. It's more something that you need time for, and independence from lobbyists, and academic input. And all of these things cost money. A smaller state is not going to make those problems any less pressing.

From Malavika
To Julia

Impact assessments are not the sexiest thing to hear in government.

From Julia
To Malavika

The European Commission does impact assessments for everything, but some of the time it's policy-based evidence making. They already know what the answer is supposed to be, and then they try to create the evidence to suit that narrative. That's of course not how an impact assessment should go.

From Malavika
To Julia

Yeah.

Well, because of time we need to stop here — otherwise, we'd just keep going.

From Julia
To Malavika

Maybe we can continue the conversation at MozFest!

On Power Dynamics, Knowledge, And Building Equity Online

ANASUYA SENGUPTA is co-director and co-founder of Whose Knowledge? She has led initiatives in India and the US, across the global South, and internationally for over 20 years, to amplify marginalised voices in virtual and physical worlds. She is the former Chief Grantmaking Officer at the Wikimedia Foundation and a 2017 Shuttleworth Foundation Fellow. She received a 2018 Internet and Society award from the Oxford Internet Institute. Follow Anasuya on Twitter @anasuyashh.

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(photo: Paula Mariel Salischiker, pausal.co.uk, CC-BY)

From Anasuya
To Cory

Hello, Cory.

From Cory
To Anasuya

Hi, Anasuya.

Something I've been thinking about lately, with everything that's wrong with the internet, is how we approach solutions. We spend a lot of time thinking up new ideas and prescriptions, but not enough time on maintenance and fixing what already exists. There's not a lot of thinking about how to stop things from getting worse online.

For example: We have ideas for which things people should add to Wikipedia to make it more inclusive. But we don't talk enough about

how to make sure that if you *have* an idea to make Wikipedia more inclusive, that it's possible to try it. We have lots of ideas about how to make software more secure, but we don't spend nearly enough time making sure that people who find defects don't go to jail.

From Anasuya
To Cory

It's interesting you said that. As a feminist, this is very familiar to me. Feminists and social justice activists always think this way. We think about holding the line. Once we get something, we think about redesign and re-machination for something better. You're right that internet activists don't always think about it this way.

From Cory
To Anasuya

I was raised in the feminist movement as well. I think I see what you're saying. The "yes, but" that I'll add is in expressions of things like hate speech, there's an under-appreciation for the potential for people who have more social power to abuse hate speech rules to censor the people we're trying to protect.

In the UK, I watched as anti-hate speech rules were used to attack black activists who criticised the police. The cops have lots more resources for civil enforcement than black activists who are being victimised by the cops.

This all can get mistaken for "free speech at any cost" as opposed to "weigh the costs of abridging free speech."

From Anasuya
To Cory

Right. The John Scalzi-version of "don't use free speech to be an ass-hole, especially if you're the cop."

From Cory
To Anasuya

Yeah, and the appreciation that power differentials persist even when you make rules. If the rules don't take into account power differentials, then the inequality of access to civil justice becomes the dispositive factor in how the rules are used.

From Anasuya
To Cory

This is an interesting version of the "holding the line" idea. Especially when you center our own privilege and recognise that the internet

is not just a socio-technical system, but also a social-technical-political system.

Sometimes we are holding the line for a system that has ignored power from the start. Wikipedia is a good example: Wikipedia assumed neutrality, assumed a kind of level playing field. But that sense of neutrality has been constructed with a very significant power differential.

That is where you need to deconstruct and reexamine the foundations of what we're holding the line for and with whom and for whom.

From Cory
To Anasuya

Very well said. It reminds me a little of the argument that I've had with people about science fiction stories that are beloved but, in my view, very flawed. A good one is "The Cold Equations."

Its premise: There's a girl stowed away on a rocket ship that's delivering vaccines. When the pilot discovers that she's stowed away, he realises that he can't land the ship because he won't have enough fuel. So he has to shove her out of the airlock.

It's presented as an inevitability. But what drives me nuts is that the premise only works if you accept *all* of the things that happened before the story started. Why are they sending out spaceships that don't have enough fuel to land if the weight's a little more? Why weren't there vaccines on their planet to begin with? Why isn't there an autopilot?

From Anasuya
To Cory

It is very convenient to say, "All premises date back to prehistory and are unquestionable, and therefore..."

Exactly. I use seat belts as an example of this all the time. Rules for seat belts are great and important. But start deconstructing what those rules mean. Who were the seat belts designed for? And why is it that women are 71% more

likely to be injured by a seatbelt in a car crash, or 17% more likely to die than men? Because seat belts were designed for men, using crash test dummies based on the North American male body or the European male body.

From Cory
To Anasuya

I'm on your side here. But there's something I get stumped by. I have a friend who works on human rights and data analysis. We were talking about the problems of algorithms and the lack of diversity in statistical analysis design. He said as important as it is to have people who are smart about the social context of automated systems, the biggest problem that he sees is not the lack of diversity in the outlooks. (Although that *is* a problem.)

He says a much bigger problem is a lack of statistical rigor. He says that there's a huge danger that if your priority list goes diversity and then statistical rigor, then all you do is diversity-wash a process that is flawed at a foundational, technical level.

From Anasuya
To Cory

You and I know that the key piece is garbage in, garbage out; if your data set is bad, what you get is bad. That's exactly why the question has to be "for whom, by whom, and for what," at all points. "Bad data" is sometimes epistemic injustice because when you ask the question, "By whom," it's not diversity washing. It's seeking equity because of epistemic injustice.

From Cory
To Anasuya

Lack of diversity can be a diagnostic heuristic. To say, "Is this terrible because it wasn't diverse?" A lot of things are terrible because the design teams weren't diverse. But I think the other thing that you're saying here is that you also have to ask yourself, "If it *were* diverse, would it be fixed?"

A good example is Chinese facial recognition. It really struggled with the faces of people from African descent, because their training

data was usually lacking. So they went to one of their sub-Saharan African client states and requested their entire driver's license database, which they then used to train their facial recognition system.

Now it's much better at recognising black faces — which means if you are black and a dissident or under suspicion in China, it can track you much better now.

So I think you're right. You have to not just attend to who's in the room or what data is being used, but also if it should exist in the first place.

From Anasuya
To Cory

And who has the agenda and design-setting power, right?

From Cory
To Anasuya

Yeah. Who gets to decide what your victory condition looks like?

From Anasuya
To Cory

Right. That's a good way of thinking about it.

Regarding the conversation around diversity, I'm going to come out and say it: I hate the word “diversity” and find it hugely problematic. For me, both “diversity” and “inclusion” have problems because of diversity washing, which we're all doing. It becomes a checklist. “Have you got one of this and two of that and a slice of that?”

Then “inclusion” is problematic because it's primarily a construction of power and privilege. “We're going to invite you in, and we only invite the people who we think are not going to rock the boat too much, who are not going to give us trouble. We'll invite the people who are nice to us and will challenge us in a nice way.”

Neither of those gets to either equity or to justice. And that’s the key piece to me: where is injustice, and what does it look like. Because at the end of the day, the two big issues with

the internet are colonialism and capitalism. Those two things are not about diversity and inclusion. Those two things are about reparations and reclamation and redesign.

From Cory
To Anasuya

Thank you for raising that. I've been having an ongoing internal and external debate with colleagues and friends about decolonising data.

My concern is the same one that I had when I first encountered this idea, talking with people who were part of the traditional knowledge movement and wanted to establish sui generis rights for indigenous people from Australia who are survivors of genocide. Their policy prescriptions were to create something like a property right for very ancient things — languages, symbols, and so on — and then to hand over control of that property right to institutions of indigenous people. But those institutions were created by colonial parties. The Australian government recognises who is and isn't officially indigenous, and then also recognises who is or isn't able to speak for them.

This is a problem in Canada, too, where I've had friends who were counted as indigenous at first because they had one indigenous parent — and then counted as non-indigenous when that parent died and they were forced to leave the reservation. Then their ability to use sacred symbols of their heritage — specifically to criticise the people who made the choice to exclude them — was at the sufferance of the people who'd chosen to exclude them.

I speak as someone who's not indigenous. I want to be respectful of the views of indigenous people, but it seems like property is just a terrible framework for figuring out how to do reparations.

From Anasuya
To Cory

You're right. Yes, property is terrible. The reason that we end up using it is because, to badly paraphrase Audre Lorde, “sometimes that's the only way to get to burning down the master's house.”

From Anasuya
To Cory

Institutions then become weapons or instruments of the oppressed, because that's the only way we have found to navigate and negotiate things. If you're already so far behind in the power game, how do you transform institutions?

From Cory
To Anasuya

Maybe that's right.

From Cory
To Anasuya

We've had 40 years of neoliberal orthodoxy that says things are only valuable if they are property. There's an enormous temptation to say — and we hear this now in privacy debates — "This is valuable, therefore it's property. Therefore we need to have property arrangements for it."

In the conditions of massive inequality, that's not going to work great. Look at what happened to copyright: We expanded it to cover samples. We said: "This will be a form of justice for the exploited African American musicians whose music was taken at knock down prices by corrupt record labels and then assigned over to them in perpetuity. Now they'll get paid for samples."

And they do for a little while. But then what ends up happening is that the hip hop artists that are performing today have to sign deals with record labels, because the only way they can clear the samples they need to use is to be under the wing of a record label. And *they* have to sign away the royalties for samples in the future.

Creating property-like rights under conditions of inequality is like giving your kid more money when the bullies keep taking their lunch money. The bullies don't just say, "I'll just take that five dollars I normally take and leave you the other five dollars to buy a pizza." They take all of it.

From Anasuya
To Cory

On this last thing, I couldn't agree with you more. I'm entirely against property in this form, and the piece that I'm trying to come to is recognising why, when you have been historically and structurally marginalised, you come to certain versions of the world as a potential solution rather than the more transformative one.

I'm going to give an example:
Whose Knowledge? was invited to speak at a conference earlier this year. My co-founders gave a kick-ass keynote around race and ancestry and the fact that we cannot imagine the future without looking at the past.

One of the interesting things that happened was that we were invited onto a panel about the indigenous commons, looking exactly at some of these issues that you're bringing up. But not a single indigenous person was going to be on that panel. So we had to ask the organisers to put aside funds to make sure that we had an indigenous scholar there.

From Anasuya
To Cory

It was a great panel, but we had to push for it.

When we're trying to reimagine things, we have to decenter ourselves and say, "Okay, who do we center in this conversation?" Otherwise, we're going to end up with indigenous leaders — from communities who gave us the original notion of the “commons” — saying, "You didn’t include us in this redesign, reimagination process, so we're just going to use what you've already given us: colonial and capitalist institutions like property.”

That's why moving from diversity to equity makes sense. It is really important that when you look at an issue, you look at those who are

From Cory
To Anasuya

How did it go?

closest to that issue. Those who are closest to the pain need to be closest to the power of setting the agenda and designing. That means not one or two people, but a critical mass.

When we held the “Decolonising the Internet” conference last year in Cape Town, 67% of participants were women or non-binary folks. 68% were from the Global South, and 77% were people of color. It completely changed the conversation. You would have had a very different conversation about the internet than you would in many of the other events you're at.

From Cory
To Anasuya

This is something I think about in the context of Q&As. When I do a Q&A, I say that I'm going to alternate between people who identify as a woman or non-binary and people that identify as male or non-binary. And, we start with a woman because oftentimes it's just one or two questions. Many people are very critical of this, including some women, who say that they feel put on the spot; that if they stand up and ask that first question, they only got to because they were a woman.

I am completely sympathetic to that viewpoint and I do not think that this is a perfect system, but the undeniable truth of this is that I get different kinds of questions and a different kind of discussion. And if I don't use this method, I just hear from dudes and it's always the same stuff.

From Anasuya
To Cory

That's exactly right, and I'm with you.

One of the ways I do it as a facilitator is to have people discuss in pairs for a little bit before the Q&A starts, to have a brainstorm. Then I’ll wait to see who puts their hands up; the first hands are almost always male. And then I can make the point, after the second man, that the first hands were all male and now I would like to invite those who do not self-identify as male to ask questions.

From Cory
To Anasuya

Also: My issue is not with people who stand up to try and make a point in the guise of questions. My issue is the people who do that really badly. Make it pithy. Make it a zinger. Make it two sentences.

From Anasuya
To Cory

It's about presumptions of power, right? We assume people are able to be pithy and on point and argue with a sense of confidence — but that comes out of a form of hidden power that is deep and natural.

The reason I think brainstorming with others works is because it gives people a safe and welcoming environment in which to then have the confidence to be open.

Openness as an end in itself makes no sense if it's ultimately not safe and welcoming to those who want to be included.

From Cory
To Anasuya

Right. There's a saying: "You should have an open mind, but not so open that your brain falls out of your ears."

That's a funny thing that happens. I have a dear friend whose big blind spot is that he's so smart, and has so often discovered that what was accepted wisdom is wrong, that he now no longer accepts anything. For this reason, he's a climate denier.

From Anasuya
To Cory

This is what a bunch of us think about when we think about epistemics. The notion that a fact is something that so laden with power that, unless we recognise the power in the context of that fact, you're going to end up exactly as you said: One form of information looks like the other one. One form of information dissemination looks like the other, even when it's not.

One of the ways I've been thinking about it is this continuum between fact, multiple truths,

propaganda, and lies. For me, this is a continuum that inherently looks at power and privilege. But my question is — and this is significant given how we think about what's on the internet — what happens when those you're giving data to are unable to recognize the significance of that data, because it doesn't look like that data applies to them?

From Anasuya
To Cory

Can you give me a concrete example?

From Cory
To Anasuya

Internet activists at all the tech companies are constantly talking about the next billion. It drives me nuts. Of the 3.5 billion that are already online, three billion of those are *from* the global South. Forty-five percent of all women are online. It's still reasonable to say that a significant proportion of those that are online and use internet services are women, non-binary folks, black and brown folks. And indigenous folks to some extent, especially with cell phones.

But none of the internet really looks like us. How do you share that data and make it matter?

From Cory
To Anasuya

Yeah. Understanding the salience of data is something that most of us will never be able to do in most of the functions where the data is salient. You need to have the statistical literacy and the domain expertise.

What we've done historically as we've ramped up the technological complexity of our world is rely on transparency. So even if conclusions can't be understood, legitimacy is visible. Basically, we're delegating the government to be our expert in adjudicating truth claims — and the government is delegating some of that responsibility to journal editors and so on. Which is why in the context of Wikipedia, we say things like: "Is it from a reputable source?" We allow it to be cited in Wikipedia because we're delegating truth seeking to a process that we view as legitimate.

From Anasuya
To Cory

Here's the interesting piece to that. One of the most reliable and rigorous of sources is embodied experience. And what do reliable sources mean when the publishing world is primarily publishing in English? Even when *not* publishing in English, of the 7,000 languages that exist, only about 500 of them are online. Are we saying that everybody else that speaks a language doesn't have any knowledge?

From Cory
To Anasuya

I don't think the problem with that knowledge is its lack of reliability. I think the problem with that knowledge is the difficulty of adjudicating disputes about it. If two people have embodied knowledge that are contradictory, what do you do to resolve it?

For example, in the Mormon Church there have been many schisms over articles of doctrine. You had two different people who had two different deeply held faith revelations. Even if you accept faith revelations are sometimes true, which revelation was the true one? How do you adjudicate those disputes?

From Anasuya
To Cory

There are always going to be slices of the world and slices of embodied knowledge that are going to be hard to adjudicate in that way — especially things that are about feelings and deep emotion.

You bring up the Mormon Church; one of the reasons we have so many fonts in so many languages of the world is because the most number of books in any language is the Bible, because of the church's role in colonisation.

From Cory
To Anasuya

Sure.

From Anasuya
To Cory

So *who* writes has always had a certain power. That adjudication process is already flawed in multiple ways, and it's not really in terms of embodied knowledge. It is in publishing.

It's in peer review. It's in every form of knowledge production that we have.

Given that, what we're looking at is: What does reliable peer review look like when it is in multiple contexts that are not just textual?

From Anasuya
To Cory

We actually have ways to understand that and to improve the way that peer review works in text, not just in English. But the dominance of English is in review and citation. For instance, look at open-source journals in Latin America. Latin America has the most open-source journals. But we don't cite Latin American journals enough.

I think there are multiple ways in which you get to rigor, but rigor cannot also mean a version of rigor that is only Enlightenment-based, science and technology can't be assumed to begin from 18-century Europe. What I'm trying to push at is the recognition that rigor is important, reliability is important, authentication is important — and none of those things can happen if we don't examine the epistemic system in which they're occurring, and who has the power in that epistemic system.

From Anasuya
To Cory

Go for it.

From Cory
To Anasuya

Right.

From Cory
To Anasuya

I think I have a way to tie all of this back around to where we started from...

From Cory
To Anasuya

All of these truth seeking exercises are limited by the realpolitik of power. I think the reason why people believe in conspiracy theories today is because they no longer acknowledge the legitimacy of truth-seeking exercises — because those exercises aren't legitimate. Truth seeking has become an auction, not just an epistemological process. What truth seeking tells you is who has more money.

From Anasuya
To Cory

Truth can become a choice of the powerful. And you have an environment in which truth seeking has a certain institutional drift: late-stage capitalism. So truth seeking by power and money gains deeper legitimacy — you already have the systems in place that make it look okay.

But there are those of us who are contradicting it and challenging that.

On Movement Building

MARK SURMAN is Executive Director of Mozilla, a global community that does everything from making Firefox to taking stands on issues like privacy and net neutrality. Mark's main job is to build the movement side of Mozilla, from rallying the citizens of the web to building alliances with like-minded organisations and leaders. Mark's goal is nothing short of making the health and accessibility of the internet a mainstream issue around the world. Follow on Twitter @msurman.

DR. GAIL BRADBROOK has been researching, planning and training for mass civil disobedience since 2010 and is a co-founder of the social movement Extinction Rebellion (XR). XR uses non-violent civil disobedience in an attempt to halt mass extinction and minimise the risk of social collapse, and has rapidly spread internationally since its launch in October 2018. There are already 350 XR groups in 50 countries. Gail has been arrested three times for acts of civil disobedience, most recently at the Department for Business Energy and Industrial Strategy and previously at fracking and incinerator sites. Her talk on the science of the ecological crisis, the psychology of active participation and the need for civil disobedience has gone viral and been part of the inspiration for many to join XR. She is from Yorkshire, the daughter of a coal miner and was recently profiled on radio 4's profile show for her part in instigating a rebellion against the British Government. Follow on Twitter @gailbradbrook.

(photo: Martin Lever / Orkney)

From Mark
To Gail

Hi, Gail. I'll start: Most everybody accepts that we have a climate crisis, and that getting on the streets to tackle it is imperative. You're working on one of, if not the most, important issues on the planet.

Meanwhile, in the internet health movement, we really want people to take action and be aware of the digital environment in addition to the physical environment. How does what we're working on look from where you sit? Does it look trivial? Does it look related? Does it look important?

From Gail
To Mark

Open-source communities are a really great antidote to this idea that you have to have capitalism driving innovation.

The idea that money is going to sort things is replaced by relationships, and people doing things because they care.

From Mark
To Gail

I'm glad to know that's a link you see. Open-source projects can be definitely like that.

The other piece: You can't open a newspaper today not see something about Facebook or fake news or the role that big, rich, American tech companies have played in enabling Brexit or Trump or whatnot. On that scale — beyond the activism of making the technology — does the impact of the big tech companies in the US feel like it's important in the climate crisis, or a sideshow?

From Gail
To Mark

Its impact on democracy's massive, and it's really important. Before we got the Extinction Rebellion together, I was involved in making a short film called “How to Fake Democracy,” which involved faking orgasms on the steps of the Houses of Parliament.

From Mark
To Gail

[Laughs]

From Gail
To Mark

And that was one of the things that was pointed out — the Cambridge Analytica approach.

I don't believe we have democracy. My understanding is in America, whoever pays the most money wins. It's a corporatocracy. It's run for corporate needs. And corporations have rights; nature has no rights. There's no law to prevent ecocide as a crime against peace. That's the work that Polly Higgins was trying to bring through. And the big corporations are allowed to go offshore, to have a different set of rules, to have a different tax system.

It's also arguable that we don't have capitalism — that what the market system's doing is not good for anybody. It’s this idea of a mad,

runaway paperclip machine that's just going to convert us all into paper clips, even though nobody wants that to happen.

And I wanted to say something about "climate crisis": We talk about the climate *and* ecological crisis. It's not helpful just to say climate, because the biodiversity crisis is arguably worse.

Something in the operating system of humanity is not working for us. We have to stop harming and start repairing the harm. We need to change things so that we're all purpose-led as individuals and as companies.

From Mark
To Gail

We don't see that really in the tech world; there's no shifting of the harmful business model. When you say you would want every company to have that kind of purpose, do you see any company right now of any size that does?

From Gail
To Mark

I don't believe any of the bigger companies are really behind purpose. But it's not about blaming anybody; it's not finger pointing at a person.

I think a few things need to happen.
People have to face this thing — it's like looking into an abyss. It's easy not to look at it when you're in these beautiful offices, when you've got a nice life, a good salary, and all that.

But your children haven't got a future.
Some people think that human extinction is going to happen in our children's lifetime. There's some science there. There's also the analogy that during the Permian mass extinction, when 97% of all life was destroyed, there was smaller heating and less carbon dioxide than now. It's horrendous.

So look at it squarely in the face and ask yourself how you're living. One of the things we've come across in Extinction Rebellion is the idea

of the breaking of law as an act of initiation, to separate yourself from the system. We *are* the system. It's not over there. We are it. And there's something really initiating to me when you just go, "I've had enough of this. I'm not doing it anymore." It can be a real dark night of the soul. It can be a transformative, melting, not-sure-what's-happening feeling.

And out the other side is a lot more courage and a willingness to live life adventurous. It feels quite fun, actually. It's a hard thing to say to some people who have been arrested and had a horrible experience — but when you're privileged, and you've made that decision to put yourself on the line, and you've said you've had enough, it can be quite sexual. It's just something in the mischief of it all.

From Mark
To Gail

I can imagine that transformation, from different eras of activism that I've been involved in since being a teenager in the peace movement. That shift is exciting. It felt a little bit like we didn't have a future in the peak of the Cold War, as well. It was different and not as impending, but I get that feeling.

The obvious next thing to ask:
What are you seeing all of that courage adding up to? It feels like Extinction Rebellion actually has pushed the needle. Maybe it's just public attention? Maybe it's on people in power engaging? You're in the middle of it; you know if the courage is actually getting a reaction, as opposed to just feeling good.

From Gail
To Mark

Sure. Our first goal was to shift what they call the “Overton window” — the idea that there's a sphere of acceptable normal public debate. When we started, the idea that there's an emergency was not there. We were still having a discussion about whether climate change was real. We’re starting to get rid of that.

In the UK, Dave Attenborough made films that have woken people up. There was the IPCC report and certain science papers

and obviously the school strikes, as well. The Overton window shifted, and there's a greater acceptance that there is a climate and ecological crisis. And that's a good first step.

The politicians are doing things, but it's real lip service. It's like there's an emergency and we've hit the alarm button — but we're just staying in the house, in the fire, and not even getting water buckets. We might get round to it in 2050.

I think it's important not to get attached to outcomes, even though my heart is longing for them. The reason for doing things is because it's the right thing to do. So let's just give it our best shot. Let's ask, "What does it look like when we stop harming each other, when we start repairing things?"

The way we're trying to run this rebellion is through a self-organising system, a decentralised system; trying to bake in different ways of being around each other; saying that self-caring in the work is really important. And there's loads of this that doesn't work properly. It's a mess, right? It's complex. But the intention is there, and work is happening.

It feels to me that it's about shifting the paradigm. I don't think this is going to work by saying, "Okay. Look. There's a climate and ecological crisis. But we have these policies, and a Green New Deal, and it's all sorted."

From Gail
To Mark

I wish it was that simple. But I think we have to change and be in a different space, and a different relationship with ourselves and each other and nature.

From Mark
To Gail

Right.

From Mark
To Gail

Can we talk more about the decentralised aspect of Extinction Rebellion? That's one piece I've been watching closely.

Living in the world you want is obviously a key thing you have to do if you want deep transformational change. You don't have a social movement or organisation that has grown this quickly that has clear leaders. It's pretty exciting to watch that.

From Gail
To Mark

We've been looking at holacratic models. And it feels to me that they are designed for organisations. We're a network that's growing in the UK and all over — we're around 150 UK groups, and then more internationally. It's like a fractal repeating itself, including all the messes that are in it.

One model is just to simply define 10 principles and values, and say, "Here's what this is about. And if you want to be this, then you just have to stick to these kinds of principles and values." That helps to have a sort of semi-occupied spread with a little bit more holding.

Then there's another bit that goes, "We want to train you in what it means to be part of XR." So teach people the DNA of the movement. And also figuring out that what's working in the UK is not necessarily going to work elsewhere.

And then there's *another* bit, where we are trying to create working groups that help organise at the UK level and internationally. That's more concrete, more organisational structure. We were also practicing direct democracy, and people's assemblies, and things like that.

So we're playing at something, but we've got to get it right soon because, in all honesty, there isn't a great deal of time.

From Mark
To Gail

We also need to spread out the power. That's why I got involved with the internet and open source and all these things — because they can connect environmental activists, or feminists activists. We could decentralise everything, but that's not somewhere we're landing right now.

From Mark
To Gail

It's the way that power aggregates and money aggregates.

From Gail
To Mark

I know. I remember all that. It was all going to be Shangri-La, but it's Shangri-Shit, instead. What did you get wrong, tech? That's the finance system getting its claws in, isn't it?

From Gail
To Mark

Some communities have worked that one out — you have to redistribute. You have to have a mechanism. That's why the Quakers invented the game of Monopoly: To say even if you start with an equal playing field (which you don't by a long way — racial justice, et cetera), it all accumulates with one player. So then you have to redistribute. You have to have that as a value in cultures. That's what I say about rewiring. It manifests wrong in our culture; it's a trauma.

Some people call it patriarchy, don't they? But it's a trauma that says “I've got to hang on to things.” There's a beautiful line in one of Charles Eisenstein's books where an indigenous community is asked by anthropologists, "Why do you not store your meat?" And they say, "I store the meat in the belly of my brother."

From Mark
To Gail

Well, thank you for all of that. There's lots of inspiration in it.

We didn't even get to the fact that the tech industry is two percent of carbon emissions. Obviously a task for the tech industry is to fix how it's contributing to all this. And looking at how the movements connect and come together is the place to start.

On Data, Art, And Building Bridges

MIMI ONUOHA is a Nigerian-American, Brooklyn-based new media artist and researcher whose work deals with the missing and obscured remnants forged from a society based on automation. Through layerings of code, text, interventions, and objects, she seeks to explore the ways in which people are abstracted, represented, and classified. Onuoha has been in residence at Eyebeam Center for Art & Technology, Studio XX, Data & Society Research Institute, Columbia University's Tow Center, and the Royal College of Art. Her exhibition and speaking credits include venues like La Gaitê Lyrique (France), FIBER Festival (Netherlands), Mao Jihong Arts Foundation (China), Le Centre Pompidou (France) and B4BEL4B Gallery (San Francisco). Follow on Twitter @thistimeitsmimi.

IRINI PAPADIMITRIOU is a curator, producer and cultural manager, working in the UK and internationally. Currently Creative Director at FutureEverything, an innovation lab and arts organisation in Manchester, she was previously Digital Programmes Manager at the V&A, where she initiated and curated the annual Digital Design Weekend festival and Digital Futures among other programmes; and Head of New Media Arts Development at Watermans, where she curated the exhibition programme, exploring digital culture from a critical perspective and the impact of technology in society. Her most recent exhibition, Artificially Intelligent, was on display at the V&A September to December 2018. She is a co-founder of Maker Assembly, a critical gathering about maker culture: its meaning, politics, history and future. Follow on Twitter @irini_mirena.

From Mimi
To Irini

Hello!

From Irini
To Mimi

Hi!

I'll start by saying a few things about art at MozFest. Since 2014, the idea has been to bring in the artist's voice to talk about internet health issues and art and design's role.

For example: Mimi, in your work, you're dealing with data. You're looking at the idea of absence in a way that's really interesting. I've been working with many artists who are using data in their work, but it's very much about things that are there, and not things that are not there. People who are missing, who are not

visible, who are more vulnerable, who have weaker voices.

I would love to hear your thoughts about that — how you bring this idea of absence into your work.

From Mimi
To Irini

Bringing up the question of voice is really interesting, especially in relation to absence. The space of thinking about what is *not* being collected is very rich. Because there is all this stuff to explore, these reasons for “why not?”

People are always very aware of what data is not being collected about them. They're very aware of the information they need but cannot get access to. In many of these cases, it's a question of not who is speaking, but rather who is being heard. And they're not just not heard — they also don't have the same access to decision-makers. That’s a theme I see in the project.

But there's this other side: Sometimes there's something very productive about what's not being collected. That can actually be positive — an intentional absence. It can be really useful to say, "No, we want this information to not exist." Or, “We don't want this thing to persist.”

So, there is a productive part, but also a destructive aspect. I think that's good, because it allows for nuance. What I'm always thinking about in making my work is: How do we consider these questions or these topics from multiple perspectives?

It reminds me of something the artist Jenny Odell talks about: When you look at one thing, and then you look at it more and realise it's actually two things, and then you look more and it becomes *ten* things. So much of the work that artists do in this space is that sort of multiplicity.

From Irini
To Mimi

I totally agree with you, and find this fascinating. There are so many different layers. One thing that I also find quite frustrating as

a curator is where art stands in society. I've been trying to collaborate with or approach tech companies — and also people in other sectors — and it's not easy. We do live in bubbles, and it's really important to make the case and fight for artists to have a voice and to help us see things differently, to enable critical conversations.

Another thing I'm wondering about is when you first started experiencing the web. My first email account and interaction with the internet was in 1998 or 1999. I'm trying to remember how this experience of voice and who is heard has changed over all of these years.

From Mimi
To Irini

I was quite lucky in that my first real, lasting experience with the web was around the same time as you. I was pretty young, and I was using the web because I had a group of friends online. We all wrote, and would all comment on each other's writing. We were all in different parts of the world.

From Irini
To Mimi

That's amazing.

From Mimi
To Irini

In the off-line world I lived in multiple contexts and I had different friends and felt like a different person in these different contexts. But I also had this online life, where I *also* had friends and I had this other complete context.

It gave me this very early experience of thinking of the web as a space for multiple types of interactions, multiple types of people, and multiple types of contexts. And that is something that I realise now has definitely impacted my interest and pulled me into thinking about these issues.

This was pre-Facebook and before you really had these huge tech giants. It's clear that the web has changed drastically from those days. In some ways I think there's been collapsing.

From Irini
To Mimi

Yeah.

From Mimi
To Irini

There's a collapsing of anonymity. I had this experience as a young person of meeting these people who I knew online. And thinking, "Oh, wow, there's no way I could have figured out who you were, by your username, by anything."

Today, that is a bit more of a possibility. And there's this double-sidedness to that. Because anonymity can be used to protect people who are trolling or doing terrible things to other people. But then, as we were saying before, there's a flip side: It's a means of obfuscation and protection, particularly for marginalised communities or people who are harassed more online. It can be great to actually have a bit more of a shield.

From Irini
To Mimi

I'm so used to all these platforms and how we interact with them that it's really hard sometimes to go back and think, "Oh, what was my experience back then?"

Also: The way that we use all these platforms — Facebook, Twitter, Instagram — makes us think that the internet is the same for everyone. But I wonder if that's actually the case. Maybe it's just how we think of the web in the West.

From Mimi
To Irini

Yeah.

From Irini
To Mimi

Of course, many people still have no access to those platforms, or to the web.

From Mimi
To Irini

I don't want to romanticise the past, because of course there were a lot of problems. But I think you're right — it's hard to compare whether there were more spaces for different types of people in the beginning. But it felt like there was more of an understanding of that, as opposed to now. Today, you can very easily imagine someone thinking that Facebook and the internet are the same thing.

These reductions felt less possible in the 1990s and early 2000s.

From Irini
To Mimi

I wonder how things have change for art. Did you experiment with making art online, years ago? There were amazing artists in the late 1990s — cyber-feminists critiquing the internet and bringing out these ideas of feminist cyberspace.

Do you think the way artists engage with the internet now has changed? And, how do you use the internet to disseminate your work and to get people to engage with your work?

From Mimi
To Irini

Yeah. Well, I wish I had been making art back in the day. I'd love to know the answer first-hand to that question. I didn't really start making art in this space until the 2010s.

The advantage of being in this moment is that there is far more infrastructure, there is a bit more funding. There is more of an understanding of net art, of media art, art that is talking about technology.

From Irini
To Mimi

Yeah.

From Mimi
To Irini

It's still niche. But we are indebted to so many of those early artists. People like Mendi and Keith Obadike. They were black internet artists — who are still around and still make incredible work — who were almost like a permission for so many of us. Seeing the work that they could do and being like, “Oh, you can do this. You can talk about all of these issues at the same time. That's possible.”

I am happy to benefit from this stronger infrastructure. More curators are interested in this, and more spaces will show it. And more people want to talk about it. Especially right now, when we're thinking about things tied to emerging technology, including AI. When I first was making work, so many people were like,

“I don't even understand.” When I would say “data” they would say, "Oh, like for your cell phone plan?"

So much of my work involves starting from this idea of data collection itself being a creative act. And the fact that I can say that, and people can at least be like, “oh I want to hear more” — to me says a lot about how far we've come. Of course, this is also commensurate with the ways in which the tech industry has grown and spread. It is affecting many of us, whether you're in a rural environment, whether you're a person who still doesn't have access to the internet, whether you are using a mobile phone and have limited broadband. All of us feel very much touched by this infrastructure.

From Irini
To Mimi

Yeah.

From Mimi
To Irini

Something I tell my students is that when you have a new technology, it's in those first few years that you really decide the terms of it as a culture. You start to decide, “Okay this is how we're going to use it. This is what is allowed, this is what is permitted, this is what is not.”

It’s a process that's full of cacophony, with people disagreeing. But after some time, the dust settles. And that just becomes how it is.

And I feel lucky because a lot of my career and a lot of my life I have been next to those moments. It’s useful to be in those moments, because you can look back and say, "Wait, these things didn't have to go this way." There's not an inevitability to how we design our social practices or the way that we consider technology. It's not that things had to go the way they did — but they did go that way. What does it mean that those systems are maintained?

From Irini
To Mimi

Absolutely. It's the fact that we can't escape — all these systems are so embedded in everything we do and in society.

After the Snowden revelations and Cambridge Analytica, there was a lot more interest from people to understand and take part in the conversation. I guess this is why many artists whom I've been working with have been getting more attention right now.

There is this need to ask questions, and artists have a very unique way and powerful way to demystify things for them — but also to make them feel that they have the power to ask questions and to get to make their voices heard.

The other thing that I'm wondering sometimes: Have we been normalising many of these systems and technologies? Are we becoming a bit more accepting of how much information we let go? Do we take enough steps to change things? There are so many things that we need to think about in terms of governance, in terms of legislation, et cetera.

From Mimi
To Irini

That is really interesting. To your first point, I think you're right: Artists can really affect cultural conversation around technology.

Some of these technologies have so much hype attached to them. People are like, “Oh, we want to talk about AI, we want to talk about crypto-currencies, we want to talk about this and that.” But there's often this gap where people who are not experts in those fields don't have the same places to comment and participate and understand. The misleading idea that you must be a computer scientist or you must be a programmer to be able to talk about any of these issues. When that really isn't the case.

So much of the work being done now is saying, “Actually, you are someone who experiences this. You are somebody who applies to an automated decision-making system.” As people who use them, that confers a kind of expertise. And so it means that we all can be at least talking about them from different vantage points.

This other point you raise — I think it's interesting what we normalise now. But my fear is actually slightly different. There is something so seemingly compelling and new and novel about emerging technology. And yet a lot of the things that artists talk about are enduring issues, enduring questions. About inequality. About loneliness. You see this when we talk about bias in AI. Why is it more compelling to talk about this when it comes to computational systems than it is to talk about them in social systems?

That's the thing that I worry about: We default to talking about them in these spaces because it feels like there's something more solvable or easier or more interesting than having similar conversations about the institutions or the systems that our technology is built on top of.

From Mimi
To Irini

Definitely. I agree with you — that is the most challenging part. Because it's uncomfortable and it's unknown and it's difficult.

From Mimi
To Irini

It takes quite a lot. And in a way that's our work, isn't it?

From Mimi
To Irini

We do need more people talking about it. We have to do that work —

From Irini
To Mimi

Yeah, absolutely. We need to do a lot more work in terms of having these conversations. And that's what I find really difficult.

From Irini
To Mimi

Yeah.

From Irini
To Mimi

Absolutely. How open we are about the challenges, opportunities, and things to explore. To see how we can be more prepared to deal with all of these challenges. But more and more we hear the voice of very few people, not the majority.

building spaces that bring in different types of people.

I also don't mean to say that artists are the moral saviors — not at all. Art can also shut people out.

From Irini
To Mimi

I totally agree. That's why I created programs that extend beyond the physical museum. It can be a big bubble; it's a very specific type of audience interacting with what you're doing. And it's only when you get out of there that you realise that you *can* take this conversation out and talk to other people, as well.

I would love to hear any ideas you might have on taking the work that MozFest has enabled us to do and approaching bigger, other companies that are less transparent. Companies whose doors are really hard to open.

From Mimi
To Irini

We're talking about a space where people have entrenched power interests. And not everyone has an incentive to practice any kind of openness or any kind of transparency. Or to really talk about equity, or the ways in which their technology may be oppressive.

There are many, many groups of people and parties that will not want to talk about this. It's worth acknowledging that part of the reason why the work is hard is because there is actually a thing we're up against.

A couple years ago, I was at this AI and inclusion conference in Brazil. It was mostly for people with high levels of expertise in the field. But there was one event that was for the public, and that event was full. So many people came. It to me was a huge sign.

This woman asked a question. She said, "This whole conference is about AI and inclusion, but this is the only event where we, the public, have been invited. What do we do if we want to get more involved in this?"

None of us had an answer for her.
And that's a problem.

So, what does it mean to speak outside of this bubble? And to think about the ways in which these conversations are very tied to the West? They don't really account for what it looks like as a global system. For example, a country like Nigeria, where I'm from, has its own set of social conditions and rules and so on. And these things mean something different.

From Mimi
To Irini

It's a back and forth. Because you need it to be local in terms of how things affect people, but also realise that this is just one piece of a much larger puzzle.

From Irini
To Mimi

Yeah.

From Irini
To Mimi

This is something I've been interested in: to get outside the Western bubble of thinking. I was really lucky to do some work in South Africa with Fak'ugesi Digital Art Festival a few years back, and also in Indonesia. It was so refreshing to just work with local people and artists and designers and creative technologies, and to explore different perspectives.

I had a conference experience very similar to yours. We explored algorithmic bias and trust at a very traditional tech conference about IoT. The organisers were people from industry. It was really interesting to be in that context and to understand how differently we define terms like "trust" or "accountability" or "ethics."

It was an eye-opening experience for both sides. We got interesting feedback from people who hadn't previously considered questions like, "How do you start a design process that is more transparent and open?" And, "Where do you engage with users and people who will be affected by these systems?"

From Mimi
To Irini

So much of this work is building bridges between people.

From Mimi
To Irini

Between people who are in different places and speaking different languages and have different viewpoints into one piece of this large puzzle. Before we can do work toward shared futures, we have to answer, “What do we mean, what are we saying? Do we understand? Are we all saying the same things? Do we get how this thing affects this person, and the consequences are later on?”

This is difficult and underrated.

From Mimi
To Irini

Toni Morrison talks about the work of the imagination. It sounds up there in the clouds — but I think this is actually very rigorous, real work. The ability to change the way that people think about something is huge. The power to see, “Oh, maybe things don't have to be this way.”

It's hard, because it doesn't lend itself to metrics and it doesn't lend itself to easy tracking, it doesn't lend itself to seeing the impact directly. It’s planting a seed and hoping that something comes of it. That is part of the work too — understanding that there are some times where you just won't see the effects.

From Mimi
To Irini

Thank you!

From Irini
To Mimi

Yeah.

From Irini
To Mimi

Absolutely. So there's a lot more to do. I know that art is not going to save the world, probably. It’s baby steps — getting into places where we wouldn't expect the art world to be.

From Irini
To Mimi

It's also seeing different kinds of options for the future, right? Seeing different, alternative ways forward.

This was really interesting. Thank you so much for your thoughts — it was great.

Ou Girls In STEM Education

ALIA ELKATTAN is a 2019 MozFest Wrangler for the Decentralisation space. She's passionate about building technology that supports and advocates for the principles she believes in: equity, justice, and accessibility. In 2018, her team won a Mozilla Creative Media Award to build Survival of the Best Fit, a web-based game that explains how automated decisions can be biased. Alia is from Cairo, Egypt, and is now studying Computer Science at NYU Abu Dhabi. Follow on Twitter @aliaelkattan.

AOIBHEANN MANGAN 12 years old and based in Ireland, is the 2018 European Digital Girl of the Year and an advocate and speaker for both rural broadband and Girls in STEM/STEAM. She's been a coder dojo youth mentor for three years and has run workshops at many events. Aoibheann is very passionate about equal opportunities in the STEAM world for boys and girls, and about finding a way to ensure those in rural Ireland get access to broadband and lessen the chances of a big digital skills divide. She has been to MozFest three times, and is thrilled to be a Youth Zone wrangler in 2019. Follow on Twitter @aoibheannmangan.

From Aoibheann
To Alia

I was looking at the news earlier, and discovered that here in Ireland, the points for getting a STEM subject in college have gone up because of the higher demand for them.

From Alia
To Aoibheann

That's great.

From Aoibheann
To Alia

It's motivating younger people to study STEM in a way that the Irish education system hasn't in the past. For example: In all girl schools, like the one I go to, there are no STEM subjects at all. And across Ireland, there are only a few pilot schools teaching girls STEM subjects.

Whereas in boys schools, there are a lot more of them — which is unfair.

From Alia
To Aoibheann

When you say there's no STEM subjects, are there any other opportunities for girls to be involved in STEM? Like extracurricular activities or after-school classes?

From Aoibheann
To Alia

Not at all.

From Alia
To Aoibheann

None?

From Aoibheann
To Alia

Not apart from going to clubs on the weekends. Not at the school — there's no opportunities for girls in that stuff.

From Alia
To Aoibheann

How did you become interested in STEM, if not at school?

From Aoibheann
To Alia

Well, we did it in primary school. And my mum is a teacher, so she coached me, and we also did Coding Dojo.

From Alia
To Aoibheann

You're lucky to have your mom around.

I'll tell you about my experience in Egypt. I didn't go to an all girls school, so there wasn't a gender divide. We had an IT class, which wasn't very advanced. But we also had a robotics club. Throughout high school I did robotics competitions every year, which was a lot of fun. That was the thing that made me interested in STEM fields.

It's interesting: In the club, we had an almost 50-50 male-female split. But when we went to competitions in the U.S. and in Austria, the divide was crazy. There would be like five girls and 75 guys. I remember one time I went to this competition and at the end they presented awards — one to a man and one to a woman. I got the woman in technology award,

From Aoibheann
To Alia

If more girls were doing STEM at school, then they'd be more inclined to go to events. But right now, a lot of girls in my school wouldn't really be going to any technology events.

From Alia
To Aoibheann

but I thought, *It's because there are no other girls*. I didn't feel like I deserved it.

From Aoibheann
To Alia

It's interesting: I saw a couple of Facebook comments recently about how a lot of guys go into programming and coding because they like playing video games. They try to hack the video games, and in the process discover more about programming.

And if you think about the nature of the most popular video games, a lot of them are super violent — and not something that attracts a lot of girls. It made me think that maybe we should be providing more entertaining avenues for girls to become interested in STEM.

There are a couple of girls that graduated from my university who are now working on a startup called imagiLabs. They're working on tools that let girls create accessories, and program how it looks. The idea behind that is to provide more entertaining and fun avenues for girls to become interested in coding. I think that's important; to not just market STEM fields as "you need this because there's a lot of jobs," but to show it as something that you can just genuinely be interested in as you're growing up and having fun.

From Alia
To Aoibheann

Yeah. And STEM is also coming into fashion, beauty, and music — things a lot of girls would be interested in. And this gets them interested in going into technology events like MozFest, as well.

From Aoibheann
To Alia

Yeah. And I think it's also girls seeing more girls in STEM. When I would go to robotics events or to any STEM events and I just saw a bunch of guys I'd be like, *Wait, am I doing something*

wrong here? Why am I one of only five girls? So just showing girls that there are other girls in this field, spreading stories of women in STEM and people who have accomplished stuff in the past. Then girls don't feel like outsiders when they go into STEM fields; they feel normal.

From Aoibheann
To Alia

If you can't see it, how can you be it? There aren't really as many role models for girls in technology as there are for boys. If they had more female role models then they could think *this is great!* and they'd be able to pursue STEM instead of thinking it's a male-dominated thing.

From Alia
To Aoibheann

Yeah, for sure. I think it's tricky if you look at the big company founders, for example, like Mark Zuckerberg and Bill Gates — they are all guys. So maybe the idea is to look for different types of role models. Instead of marketing big tech CEOs, we can spotlight a 12-year-old girl or 15-year-old girl in your hometown that's interested in programming. The role models don't have to be these massive billionaires; just girls who look like you and are interested in coding and do it for fun.

From Aoibheann
To Alia

That's right. All the role models are people who are rich, not those who are interested in technology and want to change the way other people see technology.

From Alia
To Aoibheann

MozFest is a great place for change to happen, because at these conferences you can build a community and you can meet people from all over. Like the Youth Zone, for example: You and others who are the curators and the wranglers of sessions, you're studying computer science and you're bringing young people into these spaces. You're showing them a community where no matter who you are, or what gender you are, or what you look like, you can be involved in these fields. Do you agree?

From Aoibheann
To Alia

I do. MozFest is great for people who are already interested in STEM, but also people who aren't interested in STEM but would like to explore it. The people running Youth Zone sessions are really interested in STEM and they want to get other people interested in STEM, too, which is really, really great.

From Alia
To Aoibheann

Something else that could be beneficial is not to market a divide between STEM and non-STEM people. Because a lot of girls don't see themselves as a programmer or a scientist or a mathematician — but they could still be interested in learning about technology. If we try to introduce people who are more interested in, like you said, fashion or literature or films, and show them that there's intersections between STEM fields and all those other fields, then we can make sure that people outside of STEM still have an understanding of what's going on in technology.

On Open Hardware

ALLEN (GUNNER) GUNN is Executive Director of Aspiration in San Francisco, USA, Allen works to help NGOs, activists, foundations, and software developers make more effective use of technology for social change. He is an experienced facilitator with a passion for designing collaborative open learning processes.

ANDREW (BUNNIE) HUANG is best known for his work hacking the Microsoft Xbox, as well as for his efforts in designing and manufacturing open source hardware, including the chumby (app-playing alarm clock), chibitronics (peel-and-stick electronics for craft), and Novena (DIY laptop). He received his PhD in EE from MIT in 2002. He currently lives in Singapore where he runs a private product design studio, Kosagi, and he actively mentors several startups and students of the MIT Media Lab.

From Gunner
To Bunnie

How do you define “open hardware”?

From Bunnie
To Gunner

Definition is a good question, it’s still controversial. People haven’t figured out as a community exactly what it means. One thing that is helping to crystallize it is open hardware licenses; protecting your intellectual property (IP) helps to focus definitions.

In software, there are GPL, BSD, etc. licenses, and people understand what they do. People misuse GPL on hardware, which you can’t do. I personally prefer the CERN OHL license. I had a chance to look at the latest draft: I like where it’s going, but there are some loopholes that

allow people to cross my definition of open hardware.

It's drafted in a way that allows people to close portions of their design by wrapping it into a physical module, like a breakout board, and then making only the specs of the module's interfaces open source. So long as the module is available for sale, the license provisions haven't been violated. The original intent was to allow people to not have to provide source for, say, a resistor, as that is a physical module that's available for sale. But I can see how the provision could be abused to allow people to put the open hardware label on stuff that's mostly closed source. In the end, the trade-off seems to stem from the OHL being more concerned about getting people to open up the physical design kits for chips and FPGAs, and less concerned about circuit boards. I think their hearts are in the right place, at least.

To close the "module loophole," I like to think in terms of layers. For example: circuit board layer, chip layer, chassis layer. Typically people tend to focus on a single layer or specialty, and if you want to wave the open hardware banner, then everything related to the things you've designed at your layer specialty or skill domain should be open; everything else is a component or library you've had to source, and you can't be expected to make those open because they are outside your lane. So, if you are a silicon vendor doing RTL, all the RTL should be open; if you're a board designer making PCBs, all the schematics and layouts should be open. What you can make, you make open; don't play games and claim you're open while trying to hold key secrets back from the community.

From Gunner
To Bunnie

You have said in public talks that the future of open hardware is bright. Can you elaborate?

From Bunnie
To Gunner

The future of hardware in general isn't so bright, as Moore's law is ending. It's harder to make faster and faster chips for the same cost,

so the innovation cycle is slowing down; new products are no longer as differentiated any more.

Open source communities have fewer resources, so we tend to do development in our spare time. Now that the fundamental treadmill of Moore's law is slowing down, it limits how fast closed source efforts can move ahead. This means open source developers can keep going at the pace we were going and maybe have a chance to develop enough momentum around open standards to push the scales past a tipping point where closed source producers may have trouble competing.

From Gunner
To Bunnie

What sorts of time frames do you ascribe to bringing that bright future to pass? What kind of milestones might there be?

From Bunnie
To Gunner

I think it's a long time, as Moore's law is still clicking along, albeit slowly. I would say since I gave that first talk about the "bright future," we have passed one key milestone, which is that the "entry-level maker thing" now has the same CPU you would find in a mobile phone. Back then, it was Arduino versus a ~500MHz CPU, but now the Raspberry Pi has basically the same CPU as a mid-tier mobile phone. This means the baseline of the open hardware ecosystem is approaching that of the closed hardware ecosystem. That change took four to six years. So, I think it's going to be another five to 10 years before we start to see this baseline hardware turning into system-level standards that start to give closed source solutions a run for their money.

Another thing that would be good to see — and probably coming soon — is a really good open source WiFi reference design, and an open source

desktop motherboard reference design. If you read the rhetoric, the Open Compute Project is trying to do that — but you need credentials to see the docs. That is not open.

Once we have these core fundamental elements opened up, the ecosystem will need to figure out conventions around manufacturing, so there is an economy of scale you can get by sharing common parts between designs. If we all agree to use particular conventions for capacitors or power supplies, then you can get a real economy of scale, as manufacturers can share production across many projects. But it's going to take five to 10 years.

From Gunner
To Bunnie

How about fabricating our own chips?

From Bunnie
To Gunner

There are definitely projects that will be able to fabricate chips in quarter micron to 130nm range, those types of fabs are getting depreciated enough, so I could see small-scale fab happening there — but you can't do a microprocessor that's going to do a good job of running a server.

It's an open question with the FinFET barrier, it's a completely different process, not a lot of people do it, and that knowledge to mass-fabricate these chips at good yield isn't common in (e.g.) academia yet. So, I think down to around 20nm — the FinFET barrier — there is a reasonably good chance someone will do an open PDK. Especially if there is an industry downturn. When a foundry is a bit empty, they might be open to it; that might be conceivable.

From Gunner
To Bunnie

What public benefits do you see in open hardware?

From Bunnie
To Gunner

I do have a strong agenda along that line, a bit of a manifesto around the idea.

There is a quote, “Any sufficiently advanced technology is indistinguishable from magic.” I worry that if people believe tech is magic, we become slaves to it, and then we don’t think we can fix it ourselves. For example, with Apple’s “Genius Bar,” you can see the religification of hardware, a.k.a. brand loyalty. I’m not saying people have to know how to design a circuit board. What they need to know is it’s a thing humans design, not gods. The reason it’s important to talk about open source hardware is not because everyone needs to get a screwdriver, but because everyone needs to know someone in their immediate social circle who understands technology. If tech knowledge gets so diluted that you don’t know someone who knows someone who knows the tech, it does start to become “magic”.

From Gunner
To Bunnie

Mozilla is focused on internet health and keeping the web as open as possible. What are your thoughts on how a healthy internet will depend on or benefit from open hardware?

From Bunnie
To Gunner

The layers between the internet and hardware are pretty far apart.

Can you imagine a world where the hardware is open, but the internet is still a dystopia? Yes.

Can we imagine a future where if someone cornered the market on all servers, they then enact terrible internet policies? Yes.

I think it’s necessary, but not sufficient. I do think from the standpoint of, if you were to go to a place which is extremely oppressive or heavily surveilled, then perhaps open source becomes much more important as a worst-case backstop, then open source hardware is your parachute.

The thing that saves the internet is primarily going to be internet policy, backed up by a healthy and diverse open source ecosystem.

From Gunner
To Bunnie

What are the biggest threats to internet health posed by non-open hardware? How big a threat is 5G?

From Bunnie
To Gunner

From the standpoint of privacy, transparency, and trust, the ability for governments to control the infrastructure entirely and read and manipulate data, that's really problematic. Again the problem is even if your hardware was open, they could still co-opt the server. There could be a convention where there is open source hardware that only runs a signed distro of Linux that is known to be reliable, but even then...

From Gunner
To Bunnie

How should we model trust with our devices? How can open hardware help us protect our private data?

From Bunnie
To Gunner

I have a project, betrusted.io, it's basically that. I would like to build a hardware ecosystem that brings verifiability back into the ecosystem, simple systems that protect activists and journalists as well as every day people who want more trustworthy banking. I do think that open hardware can provide that service.

From Gunner
To Bunnie

What have you learned in running an open hardware business and offering open hardware devices for sale? Where does the demand come from and what are your thoughts on how to broaden that demand?

From Bunnie
To Gunner

I've learned there is an interest in open hardware — a core group who believe. Which is the only reason I continue doing what I do. From a business standpoint, you have to be realistic, you are not going to hit Apple's scale.

Because hardware cost is so intimately linked to the scale of your production, at the cost levels you can achieve, you have set realistic expectations about what a sustainable business looks like.

While there's definitely a group of people, it's still small. With the Novena laptop, after launching it was clear the market is small and not large enough to run a business off of. So we decided not to do a Novena 2. Knowing when to stop is key; where things go bad for open hardware is when people over-invest. Then they have to make hard decisions, and the circuit boards layouts come off the table because you can't afford the competition.

If you are going to call it open hardware, you have to be open hardware about it, and give the circuit board layout. You have to accept someone is going to clone your idea — that's the whole reason for doing it. Some days you are being cloned; other days you are the cloner. You have to be realistic, you are moving a huge cargo ship and you don't do it on a dime.

The good news is, I'm finding that the ecosystem of open hardware is growing. I'm buying open hardware tools and test equipment to build open hardware. I'm buying other people's open hardware modules and integrating them into mine. You are starting to see that happen. It's such a good feeling to no longer be alone.