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In the third episode of his "Entrepreneurship and Ethics" miniseries, Stanford professor Tom Byers speaks with fellow professors John Mitchell, chair of Stanford's Computer Science department, and Mildred Cho, associate director of Stanford's Center for Biomedical Ethics. Mitchell and Cho discuss emerging ethical questions posed by advances in computer science and biomedical research, and explore how efforts in their respective fields can inform ethics training for entrepreneurs and innovators of all stripes.

Transcript

(upbeat music) - Or they think, "Well, of course we're doing this for good purposes, and so why do we even have to think about the bad things that could happen? We don't need to go there," but we do need to go there.. (upbeat music) - And one of the things he showed was a video of a realistic image of a politician saying something that that politician didn't actually say, and then somebody said, "Well, you know, do you think that will ever be used for some ill purpose at some point in the future?" - The, "Don't be evil," has its sorta parallel in medicine, but the, "Move fast and break things," definitely does not.. (upbeat music) - Welcome to "Entrepreneurship and Ethics," a special miniseries we're presenting on the "Stanford Innovation Lab Podcast." I'm Professor Tom Byers, and I teach entrepreneurship in Stanford's School of Engineering.. For the past few decades, I've taught my students how to turn their ideas into actual ventures, but over the past few years, a string of Silicon Valley scandals has bothered me, so I'm putting together a series of conversations about ethics in entrepreneurship.. Today I'm speaking with two Stanford colleagues, Mildred Cho and John Mitchell.. Mildred is a Professor of Pediatrics at Stanford and the Associate Director of Stanford's Center for Biomedical Ethics, and John is the chair of Stanford's large and influential Computer Science Department.. In this conversation, we'll explore how efforts in the fields of medicine and computer science can help shape ethics training for entrepreneurs and innovators of all kinds.. One note before we get started: this conversation was recorded before COVID-19 and the protests and activism sparked by the murder of George Floyd.. (relaxed music) So, Mildred, let's start with you.. This podcast is all about finding better ways of teaching entrepreneurial students how to build ethical frameworks for themselves, so can you talk a little bit about your own background and give us a sense of what medical ethics training look like in your own career and education? - Well, so, my background is actually in the biological sciences..

That's how I was originally trained, but I did come to biomedical ethics because of ethical questions that were raised in the course of doing biomedical research, so even back when I was an undergraduate, I was doing work in the lab that will now date me on recombinant DNA, and at the time, the city of Cambridge actually had a moratorium, put a moratorium on that research because of fears of genetic engineering, and so, that got me interested in the policy and the ethics around laboratory research, but I think what's sort of useful maybe for us to be talking about in terms of how that is related to entrepreneurship and innovation is that we have a very strong framework for medical ethics because, as everyone has probably heard, there's sort of principles like, "Do no harm," that are the foundation of medical ethics, but there's not a very strong similar kind of foundation for doing research or doing innovation, and that's partly because the kind of ethics that we talk about in medicine are really about the sort of fundamental assumptions about the role of a physician, and we don't have similar parallel fundamental assumptions about what the societal role of entrepreneurs are and of what researchers are.. - Well, it's really great to have you here in this conversation.. John, can you talk about how ethics and the questions of ethics have intersected with your career? - Yeah, thanks, Tom.. Let me give you a few examples.. I think many people in computer science and related technologies, you know, have some questions around who's funding your work and are you on board with what the potential applications of a research or research and development activities might be? That can be questions about a company.. What are they gonna do with something that I built or designed with my students for them? So, we all have to think about that.. It's very hard to tell what the applications may be, but that's a kind of question everyone faces.. I've worked for some number of years in the field of cybersecurity.. That's one where we look at good and bad things and how they occur in a digital environment.. Perhaps surprisingly, for those of you who aren't in the field, one of the most basic things is we need to study attacks and defenses..

We don't know how to defend against attacks unless we know how to carry out a cyberattack.. We say the course is how do you defend your system, but really, people get excited about how to attack things, break into systems, find information that's hidden in some way, and with regard to attacks, we always have this ethical disclosure principle.. If we find a vulnerability in a system or a way that somebody can do harm with it, we always want to report that to the vendor and the producer of the system, give them time to make a repair before we make it public so other people don't take advantage of the attack that we found, so there's some ethical principles in the field of cybersecurity around that.. Maybe I'll just mention briefly one example around the area of privacy, which I worked on for some period of time.. In studying web tracking, how someone, how the big companies track what you do online, we found a large company, Google, that had done something that seemed a little bit surreptitious in order to defeat a privacy mechanism that was widely accepted.. Our discovery led to what was then the largest find against an e-company for privacy violation, but we weren't sure how to proceed with this kind of thing that we found.. It wasn't an attack, the kind of thing we're used to finding in security.. We had to think about it a little bit differently, and we decided that we should first notify Google to let them tell us whether we were right or not and simultaneously kind of keep records of our correspondence so that we could really report the situation to others if we felt that was necessary.. We ended up going to the newspaper, and it was a fun story for all except perhaps some few people at Google.. - Let's dive into some of the newer things happening in both your disciplines and then see how they're intersecting..

Can you give some examples, John, of ethical dilemmas that computer science students face once they enter their careers? - I think one of the most basic decisions that people make when they study a field is, you know, what area of the field, what subject area, what topics would they like to work on, you know, and then I think it's important for people to think about the consequences.. If you're interested in robotic surgery, you'll feel one way about it.. If you're interested in basic algorithms for graphs, you'll have another set of issues.. People need to choose a topic area where they're comfortable with its applications and implications.. Later, when someone goes and takes a job in a company, a specific role in that, you know, there's a question there.. Do I agree with what the aims of this company or organization are? And specifically, if you're gonna adopt a role, you're gonna be in charge of a certain kind of activity.. Is that something you believe in or not? Do you have qualms about it, and if so, what would you do? One of the complications is that many small-end projects in large companies pivot at some point.. You're started out trying to do one thing.. Turns out not to work quite as well as you hoped, so maybe you can take the ideas you've developed and use them for another purpose, so one quote I thought I'd mention just 'cause I liked it so much is from Alex Stamos, who resigned from Facebook over some principles, was the guest lecturer, has been the guest lecturer in our computer security class for a number of years, and one of the things he advocates to students if you're gonna go into the cybersecurity field, first decide your ethical principles, and then build your career around that.. - Mildred, let's talk about how new technologies are impacting your world of biomedical ethics..

- I think one of the challenges now is that medical innovation is starting to require collaboration across disciplines and across cultures, so going out of the medical culture and moving into the tech culture, where, you know, you have mottoes that range from, you know, "Don't be evil," to, "Move fast and break things," and neither of those are really, you know, I mean, the, "Don't be evil," has its sort of parallel in medicine, but the, "Move fast and break things definitely does not," so, I think what John said is really worth taking to heart in the sense that I think when people are coming from this medical, ethical framework that is really, that underlies everything they do, and then they're having to kind of collaborate with people who don't come from that background at all, they have to really understand how those kinds of collaborations might create value clashes, and think through ahead of time what are you gonna do when you identify a position which is causing this value clash.. What are you gonna do about that? I think another way that sort of technology is maybe making some sort of difference is that there's increasing situations that arise that are kind of parallel to what you were talking about, John, in terms of sort of teaching people about attacks and defenses, and it's this concept of dual use, so every technology can be used for good and used for bad, and that's something, that's a concept that in medical research and innovation is not really grappled with at a very fundamental level because everybody's coming, again, from this medical background where they think, "Well, of course, we're doing this for good purposes, and so, why do we even have to think about the bad things that could happen? We don't need to go there," but we do need to go there.. There's always new technologies that are raising new ethical issues, like, and you've seen 'em in the news, like gene editing and the CRISPR babies in China and so forth, and so, for the CRISPR babies example, there was already pretty wide, worldwide consensus that that was not a cool thing to do, but there's sort of more, less splashy things, but are really sort of really difficult to grapple with in terms of ethics and teaching ethics, and it's sort of slow, underlying social changes and sort of institutional changes.. So, one example is that the lines between clinical practice and research and innovation are now very blurred, and those are sort of areas that have their own ethical frameworks, and they're not the same, so that's a challenge, and another one is sort of this change that we're seeing where you now have something called citizen science and do-it-yourself biology, and we don't have an ethical framework for that, injecting yourself with new things that you made in your basement, which might cause broader population health effects, so those are sort of the sort of things that we need to understand better how to grapple with.. At our Center for Biomedical Ethics and many others like us, we are thinking about sort of the ramifications to ethics for having, you know, as a society created this thing we called the Learning Healthcare System, where basically all the clinical data that is generated on a minute-by-minute basis in hospitals is now intended to feed back into sort of data analytics system that is now used for research purposes, so yeah, there's a lot more thinking about that, but the answers are not necessarily keeping up with the demand.. (relaxed music) - I was curious to learn more about some specific classes and projects that have advanced ethics training for computer scientists and biomedical researchers.. To kick off that conversation, John started by giving a brief history of how ethics became part of Stanford's computer science curriculum.. He also talked about CS 182, a new Stanford computer science course called Ethics, Public Policy, and Technological Change.. That class has been making waves on

campus and has even received some well-deserved attention from the national media.. (relaxed music) - I think we started having courses on ethics in the Computer Science Department in the 1980s..

I think the earlier version was taught by Terry Winograd, who's a computer scientist, and my friend and collaborator, Helen Nissenbaum, who has a PhD in philosophy and is really interested in laws and principles and ethics.. So, the ideas have been with us for decades.. One of the things that's changed is the sense of importance and the evidence of impact, so the recent kind of realization of the impact of digital and other technology on our daily lives has really put things into sharper focus and made us more concerned about it, so on following from, you know, the early sequence of courses in ethics, many of which have been excellent, we have now a much higher profile, bigger effort, that's cross-disciplinary.. The ethics course 182 that you mentioned is taught by Rob Reich, who is an ethicist and philosopher in the Political Science Department; Mehran Sahami, who's one of our most popular teachers of programming and computer science, and Jeremy Weinstein, who has a long experience in politics and government service and the political process, so the three of them together really have a broader view; an interesting, sophisticated view about how technology interacts with ethical problems and the consequences of decisions, and they produced this course that I think is really excellent.. There's a number of different units looking at different kinds of technology, algorithmic decision-making, autonomous systems, data collection issues, private platforms and their interaction with the public sphere, but in each one of these things, there's an effort to look at the technology, to engage computer scientists in the class, and building some elements of that technology, and then carrying out a debate that looks at the implications, the kind of questions that would face someone working in that field and some of the upsides and downsides of making different kinds of choices around those topics.. - Yeah, and Mildred, there's a course in bioengineering that is, I believe it's required, that is pretty famous with David Magnus and Russ Altman, I believe, as the faculty members, The Ethics of Bioengineering.. So, a number of my students brought my attention to that as well.. - The whole idea of it is that first of all, it's being taught by somebody who's from computer science and biomedical informatics.. That's Russ, and then someone from biomedical ethics.. That's David, and I think that that sort of, that concept of bringing people together, again, across disciplines is really useful, and part of learning about the ethics is understanding sort of how do other people think about these issues and how do I think about them, and how are we different and the same in how we think about these ethical issues to kind of surface the differences in culture and values that each person comes to the table with..

- Something you, yeah, something you said, Mildred, made me suddenly very envious.. I talked about who's teaching our ethics course and what fields they come from, and you talked about who's teaching the ethics course you're familiar with, and you referred to someone coming from biomedical ethics.. The way we speak as academics, that implies there's a defined field of biomedical ethics.. I'd like to say this is taught by someone from the field of computational ethics, but we don't have one yet.. (relaxed music) - Stanford's Center for Biomedical Ethics was founded in 1989.. The center drives research on issues like genomics, cultural diversity, and neuroscience, and the center's faculty trained many of Stanford's premed and medical students in bioethics.. John and I were especially inspired by one particular project, the Benchside Consultation Service that they've been running for the past 13 years.. (relaxed music) - Actually, so, we have this Ethics Consultation Service for researchers in biomedical research.. It is open to not just people at Stanford but to tech companies or pharma and biotech, and we have done probably almost half of our consults for industry folks, and this is the source, actually, of a lot of our, that feeds a lot of our thinking on how to teach people about ethical issues because the, it's sort of, people sort of are voting with their feet to come to our Ethics Consultation Service, and so, it gives us an indication of what kinds of ethical issues are bothering people enough to reach out to us, and it's led to collaborations and, you know, the ability to sort of form a community of people who are interested in teaching about ethics.. - Do you think something like that would work more broadly? - Could we possibly do that? Could we set up a hotline for digital technology ethics? What kind of calls would we get, and on what basis could we offer any advice at all? Do you have any suggestion? What if we were gonna try to do that? Would we just get ourselves in trouble instantly, or is there - No, I think it would be, I think it would be - a positive path forward? - a great idea because I know that there is a demand out there, right, and you've seen this with companies like Google and some of the large tech companies around here trying to set up their own internal ethics departments, and that hasn't gone very well, so I think that there is a value, and I think our value in having our center providing research ethics services at Stanford is we can be an independent voice..

We're outside of any one institution or company.. We have a little distance there, can provide technical expertise, so I think it would be a great idea.. - I was thinking about ethical dilemmas as you were saying that, and somehow, I remembered a person who interviewed for a job in our department, could have been 15 years ago or more, and one of the things he showed was a video of a realistic image of a politician saying something that that politician didn't actually say, and we thought, "Oh, that's amazing!" And then somebody said, "Well, you know, do you think that will ever be used for some ill purpose at some point in the future?" And we all thought, "Well, think of how much computing time it took to produce this." At that time, that was an unrealistic thing for someone to do on a home computer, or individually.. It took a huge bank of computing machines in a research lab in order to do that, so we gotta dismiss that, but, you know, later on, you know, that turned out to be a big phenomenon in, you know, the world we live in today, so there's really interesting question of when do you call the hotline? When do you see that this is really heading in a direction that you don't like? - Of course, I'm over here thinking of it.. Do we need such a thing for startups? 'Cause they do not have HR departments.. The HR department is the founder or one of the founders, and who do you call? (relaxed music) - Entrepreneurship educators like myself have the most influence over the students who are still in our classes, so training those students in ethical thinking should always be priority number one, but if we can also scale resources for practicing entrepreneurs and innovators, it will help our students down the line once they're out in the wild building careers and enterprises.. It's interesting to consider how best we can play that role.. We want to help

all employees and entrepreneurs think through the ethical consequences of the technologies they're discovering and developing.. (relaxed music) Well, it's so fascinating that these two worlds.. On one hand, Mildred's, your world of medicine, and John's, yours of computer science are converging..

They've been converging for quite a while, but it seems that we're at this special moment as we enter into the 2020s, so let's make it personal, and we're educators, and I'm just thinking about these students that we get to be around every day.. We get a good window into the future, and we, you know, can have a little bit of impact on it.. Let's think about them, especially in the medical and technology areas.. What's your greatest hope for that generation to keep in mind as they do their thing, as they start their careers? - Well, I think it's fascinating to see all the fresh, inquisitive minds that arrive on campus.. I'm teaching a freshman seminar this quarter on blockchain technology and its potential implications.. The first-year students are surprisingly sophisticated about both the technology and how it can be impactful, and I've really been encouraged by the initial round of projects we've done on implications.. People have looked at healthcare, speeding up clinical trials, improving travel, making voting more reliable, and I'm really hopeful and confident that students will look forward to, you know, doing good, positive things in the world, and if we can help them, you know, have tools that will be effective to that end, that would be great.. - Yeah, so, I think in reading about the techlash, I was actually more optimistic in some ways that there is this techlash, and it is coming from the young people who are being critical and thinking critically about what they're doing and why they're doing it.. I've been able to reach out to students to get them to help us think about how we turn sort of these concepts of ethics into real toolkits that students can use on a daily basis in their own work.. - At the outset, I mentioned that this conversation was recorded before the onset of COVID-19 and the powerful protests and activism sparked by the murder of George Floyd..

One thing that strikes me now is that John and Mildred's students were already focused on projects that speak directly to the current moment.. Speeding up clinical trials without compromising medical ethics is at the core of the fight against COVID-19, and it's great to hear that some of our future computer scientists are already asking how the technologies they create might advance economic empowerment and trustworthy voting systems.. It's become painfully obvious lately how our worst assumptions about race become embedded in the systems we create.. It gives me great hope to hear that some of our future technologists are intent on creating technologies and enterprises that reflect admirable values.. If you're interested in exploring the connections between race and bioethics in particular, Stanford's Center for Biomedical Ethics has been pointing folks to the Black Bioethics Toolkit on bioethics.net.. We'll include the link in the show notes.. (relaxed music) If you enjoyed this episode, please subscribe to the "Stanford Innovation Lab Podcast" to stay in the loop on future episodes, and feel free to review us or give us some stars to help us reach more listeners with this conversation about entrepreneurial ethics.. The "Stanford Innovation Lab Podcast" is a Stanford eCorner original series.. The videos, podcasts, and articles on Stanford eCorner are designed to help innovators and educators cultivate entrepreneurial mindsets and make a positive, lasting impact.. Stanford eCorner is led by the Stanford Technology Ventures Program and Stanford's Department of Management Science and Engineering..

This episode was produced by Luke Sykora and Rachel Julkowski for Stanford eCorner and edited by Katie Fernelius.. Daniel Stussy is our designer and digital products manager.. Our growth marketing specialist is Nora Cata, and I'm Tom Byers.. Thanks for listening.. (relaxing music)..