[Interviewer] Hi Catherine, thank you for being with us today and agreeing to participate in this interview. So I'm going to let you go ahead and introduce yourself.

[Catherine] Hi guys. My name is Catherine Gu. I am a masters student graduating this year. So MS 2020 from MS&E department. My concentration is computational social science. And this is my last quarter here at Stanford.

[Interviewer] So Catherine, the first question, can you tell me a bit about yourself, your background? Like where did you grow up?

[Catherine] Sure. So, I actually just moved to America in 2018 for the master degree. I grew up in London, Northwest part of London—Hamstead if anyone knows where that is. And then I went to school locally, and then I went to Cambridge for my undergrad. I did economics for the three years while I was at Trinity college in Cambridge, and I did an additional actually one year of master degree in economics and finance, before working in the city of London for the next three years. So I just did a lot of quantitative related stuff, but kind of linked to my economics degree. And after that I came to here.

[Interviewer] So, how did you become interested in engineering?

[Catherine] I would say it's actually coming from my job. So, you know, I started, so my first role was at Man Group, which is an asset management company and I started as being a risk modeler. And there was a lot of model buildings, but at the time it wasn't very advanced, we were only using the VBA programming language within Excel. But you know, I learned a lot in terms of just algorithmic design and so on. And also at the same time, within Man Group there's one algorithmic firm called HL. And I just remember back in the days, that was around maybe 2014-15, I just always loved to go to the ML engineering team and ask them, you know, how these models are being built, because my job is trying to understand the risks. So I actually have to understand, you know, how they actually coded everything. And I was like, wow, that's really fascinating. And later on within the organization, I moved the role to be more investment focused and I was working on the hedge fund side. So as an investor, we were looking at a lot of hedge fund investment strategies and my sector happen to be the global macro sector. So what that is, is really trying to put big macroeconomic bets and just trying to use both a combination of human decisions, but more and more, you hear these sort of knowledge which is coming from big data and machine learning and so on.
So that's one side of me understanding, okay, there's a new world kind of coming out out there and I really want to get to know more about it. And actually at the same time, it was funny—so three of my best friends, from Cambridge—two of them are economists and one of them did maths. So they actually started a side project. And what they did was literally using econometrics models, but you know, trying to combine that with Python and machine learning and building models so that they can invest money into sport betting stuff. And they were actually starting to become very successful. And I remember during the summer one of the years, you know, I was spending a lot of time with them and they're teaching me how to code things in Python and stuff. And I thought that was really interesting.
And it just seems to me that if you do have a very good understanding about models and what you're dealing with, I think that the aspect about coding is just a matter of learning another language and being able to master it really well. So I thought, okay, this is something I should get to know better, and especially I liked the quantitative stuff. And that's when I started to kind of look out for how do I become sort of an engineer, since I wasn't convinced before.

[Interviewer] Can you tell us a bit about your area of concentration? What do you work on and how did you get interested in your area of concentration?

[Catherine] Yeah, sure. So my concentration is called computational social science, which I think is a very unique concentration. And I realized that especially when I was applying for master degrees, because I don't think there was actually that many universities offering this sort of concentration in the first place. So apart from Stanford, maybe Cornell have something similar in terms of operational research and the University of Chicago actually had a course called computational social science. So my original motivation, I think, you know, again, it was all, I guess it's a matter of timing. So at the time there was a really influential book called Thinking Fast and Slow, which came out. And having read that, you know, again, coming from a social economic background, I was like, this is super interesting to be able to really understand how people behave, but now we have all these big data, which is actually providing that analytical factor into understanding what's going on. So that's exactly why I wanted a course which is related to that. So I guess, you know, how I describe computational social science concentration for me is I tend to choose courses at Stanford which has more to do with incentive mechanism designs. So an example was during my first quarter at Stanford, I actually did a course with professor Tim Rothgarden who has now left Stanford for Columbia University. But he taught this class called CS 269I, which is Incentives in CS. So that was super fascinating. Because it's talking about, you know, how you can just kind of understanding these sort of, well, you break down things into formulas and understanding the cost and benefit analysis, and link it and to real applications like advertisement on Facebook, on Yahoo, on Google, or prediction markets and so on. So all these sort of things came about and I was really loving it. And in the same time I also took another class, which is CS 251. And that was taught by a professor Dan Boneh and this class is called Blockchain and Cryptocurrencies. And for me that was totally unplanned, but I really fell in love with that class together with CS 269I because, you know, I thought it is a CS class—which it is—but I think there's a lot more to it than just knowing how to code, because really I came to Stanford not knowing anything. And I was taking CS 106A together with these CS 200-plus classes. But what the blockchain class really taught me is just this interdisciplinary sort of intersection between CS, but really together with economics and data, which is really fascinating. And I sort of just kept going down that route. So now when I look at my concentration and sort of my interest of study, it's focused predominantly in the world of blockchain. And this is really, really trying to understand, you know, what does decentralization mean? How can we design different governance and what sort of cryptocurrencies we can design in order to facilitate some of the real needs out there? So an example would be something called central bank digital currency, which is what I've been sort of looking at. And you might have heard of that already because, actually to do with COVID-19, you know, together with this whole concept of, you know, universal basic income and so on. People are thinking one more in terms of, say, digital dollar, digital wallet and how we can distribute things. So that's a really super fascinating area and yeah, this is what I've been working on.

[Interviewer] What are your career plans after Stanford, and how did you decide on them?

[Catherine] So I will be joining Visa, which is, they have an office, Visa research office just down the road, five minutes away from here. And I will be joining the crypto team. And in specific, my role is going to be a senior technical product manager and I'll be working on the CBDC development. So at the moment it's all very, how could I say, open space, because you know, there's no one who is leading it per se, maybe China, but the US is definitely doing a lot of work right now as well. And Visa's role is really trying to help to brainstorm and trying to provide both strategic, but also technical, frameworks in order to actually implement this concept to reality, say in two years, three years time.

And how did I come across it? I guess the first, I mean, I know that Visa is interested in crypto for a while, but I guess, I mean, I did some internship in the crypto industry already and I really enjoyed what I do. So I know that this is the area I actually want to go into. And, you know, throughout my second year, because there's people coming for career fair and others, I just really just opened myself up and just talked to a lot of people and tried to get a sense and understanding exactly what different projects are doing, because I think something unique about crypto is you will have a lot of projects and there will be a lot of opportunities as well. So it's really a matter of understanding what your skill set really lies and trying to make sense of if this is something you really want to do, say in the two, three years time span at least. And having spoken to so many people, I decided to go with Visa in the end, because I really felt to have this exposure and work in a field which is still happening, you know, I would be someone who can actually make an impact and to contribute towards the design of CBDC. That in itself is very meaningful for me. And also, specific to CBDC, it's very unique because you actually really need to understand macroeconomics very well and actually read all these central bank white papers, together with the understanding about crypto, to make it happen.
So I feel like, you know, my skill set could be very valuable for the people and that's why I decided to work with Visa in the end.

[Interviewer] That sounds like a lot of, it's a good time to definitely be a part of it when it's still in its development and then to be able to look back and be like, yeah, I was part of that history.

[Catherine] Exactly. Yeah, that'll be very exciting to do work on.

[Interviewer] I can't wait to see what to do. So the next question is, what most excites you about your future? I think we kind of talked about it a little bit, but you can probably go into more detail.

[Catherine] Sure. I mean actually I think, you know, I hope it applies to everyone, just because with the change of coronavirus, you know, it just suddenly changed all of us. I think it really gives us a breathing space to think about what we wanted to do, but we didn't do and what we can really do when this is all over and stuff. And I think there's some pent up energy built in myself as well as a lot of other people, because it just feels like, you know, you see that suddenly something hit us, but there's a lot of things that can happen really quickly. And previously, maybe the concept about, you know, there's a lot of framework—existing, old system that could hold things back. Well, I think COVID-19 is actually a good thing because it really breaks a window for us to try new things. And for me, particularly as I said, I think CBDC was born exactly because now policymakers are like, you know, we don't always have to just stick to the traditional monetary policy rules, maybe why not have this new concept of stable point, or this concept of digital dollar and just try out and see if it can really help on top of our existing tools to shape people.
So I think what's exciting about the future, I hope, is that people have like a more open mind in terms of thinking, okay, what we can do, because really when you're, you know, you're facing with a lot of existential sort of potential risks, you kind of think, you want to prioritize things and try out things that you think is worth doing. And I think that's exciting. And hopefully, you know, there'll be a lot of great applications, whether that's in crypto or more likely in biotech and all of that. I think that will be super fascinating.

[Interviewer] So the next question is, what advice do you have for future students and how can they make the best use of their time in MS&E and at Stanford?

[Catherine] Okay. That's a really good question. I think firstly, I think everyone should know your college time would be some of your best memories ever in your life. I know that because, you know, I did my undergrad and I went to work. And then thinking about it, I always sort of feel really nostalgic about my undergrad years just because it was so fun, despite all the stress about working and studying and exams and stuff. You know, it was by no doubt, one of my best memories ever. And similarly my memories at Stanford has been really, how could I say, unique and invaluable. I think people, when they come to Stanford, be prepared that there will be a lot of work. There'll be a lot of expectations obviously because we're part of, you know, one of the best universities out there, but then don't complain about it because you know, down the line, 20, 30 years in the future, even if you do want to get all these works and exams, you wouldn't get it another time. So really try to make the most of your time.
And the other thing that I would say to people, students, are probably try to be truthful to yourself. And that applies to a lot of aspects. I think, you know, it can be as small as what classes you really want to take. Do you just want to take the super popular classes just because everyone else is taking and therefore tick the box? Or do you want to take something that you just generally want to do, even though that may not even be part of your class requirement? And you know, the beauty about MS&E class requirement is that we actually have a lot more flexibility. So while you need to take all these core requirements, think about the extra things that you really want to do and could be beneficial for you. And then, you know, be truthful, can apply to other things in terms of like, you know, the friends you make, the choices you make in terms of what events you should go to and so on. I would just say you don't have to follow the crowd and especially at Stanford, you know, the rules are all open and you can write whatever as long as you think that is the best for what you want to do to develop later on. Think about everything from much a longer perspective. And then, come back to yourself and ask yourself that question. Is that really what I want? Is that what I want to be? Or is this someone I want to spend a lot of time with, because I think we both benefit from each other's company and so on. So I think, you know, just take a little bit of more time to think about those things before you make any decisions. I think that will help to save a lot of time when you feel like looking back—oh, I could have done something more or something else. So I think that would be nice. But yeah, it really just enjoy your time at Stanford. I think that's the fundamental

[Interviewer] What I get in that is like your authentic self and checking in with yourself and asking yourself some personal questions, like reflecting. Right?

[Catherine] Yeah. And actually it's funny, so I learned the acronym FOMO from here. I didn't know what F-O-M-O means, but I think since COVID-19, there's a new word trending, which is JOMO. So it's J-O-M-O, which is the joy of missing out. So, you know, it forces us to all stay at home, but it's tough because one of the aspect is to kind of force more internal interaction with yourself since you are alone, or, I don't know, for me, I'm just staying on my own. So I think, you know, it sort of trains you to think more about who you are and get to know yourself better. And again, that goes to the whole authenticity and be truthful. And I just think, especially when we're in our twenties, you know, there's a lot of noise, there's a lot of things going on. And definitely during normal times, every single quarter, I just felt, okay Stanford was such a great experience, but it was so draining because you know, there's so many things I could do. But then like for us, especially students at Stanford, the problem is not, you're going to miss out. It's actually just, you have way too much choice in order to pick. And it comes to a question almost about optimization. How do you optimize your time every single day? And I think that's the important thing. It needs training to be good at doing that.

[Interviewer] So the next question is, what will you miss most about Stanford and the Bay Area?

[Catherine] There's a lot of things I'll miss about that. So I'm going to be working quite close to Stanford, so hopefully I'll be coming back often enough. I'll definitely miss my friends, but you know, I will be in touch with them remotely, or hopefully in person sometime soon. And I think, you know, actually I would miss lectures and so on. Because I think, you know, when you're a student and just learning things, I think there's something really beautiful about that. It's just literally learning for learning's sake and it could be just really eye opening. And you know, some of my favorite classes, I remember one I took this year, I was [CS] 106A with Mehran. He was just amazing because you know, the way he taught about computer science, wasn't just, you need to be clever and just good at computer programming. He was actually talking about the art and science of computer programming, which is a way that I've never thought of. And I do think, I really will miss the resources at Stanford because you know, so many professors, you know, in my two years I've been working quite closely with professor Dan Boneh and there's other professors from our department, Professor Peter Glenn, Jose Blanchet, and Kathy Eisenhardt, for, you know, the entrepreneurial classes. I just thought, you know, we have some of the best people, best professors to teach us things. And I would really miss the benefit of having them just in the classroom and just sharing, you know, what is the latest? So that's one of the things I'll miss.
And I think, I'll also miss being a TA because, so I was a TA in spring quarter this year. Sorry, not spring, the autumn quarter this year. So I was the TA teaching CS 251. And, you know, it was kind of scary in a sense, because I'm teaching a CS class, but I'm not a CS major. And I've only just learned coding like a year or two before that. So having all these undergrad students asking you a lot of challenging questions, by no doubt this is very nerve wracking. So I sort of have a mini panic attack before the office hours or the Friday sections, because especially with the Friday sections, they will be recorded and you know, who knows who's going to listen to it. So you don't want to make any stupid mistakes during those. So I did a lot of preparation, but really it felt very good because, I mean, the CS 251 class on blockchain, it changes the material every single year depending on what is the most relevant stuff that's happening in the industry. So I learned a ton of stuff during the second year of CS 251, and also definitely through teaching. You just need to have really solid knowledge about what you're talking about because people can call you out as soon as you're kind of starting to randomly talking about things. So I will miss the challenge of being a TA and also, I guess, the joy in the end that students will listen to you and say, thank you for helping us. So that was quite fun to do. And yeah, I think one last, mini thing that I will miss about Stanford is probably the gyms. The two gyms we have here is world-outstanding facility. And you know, I go there like three, four times a week during normal time. So yeah. I even learned a little bit about, the indoor climbing earlier this year. And I only just started getting into it, I even got the professional climbing shoes. And then COVID-19 happened and I couldn't continue. So that was a shame. But yeah, I think not being able to use that facility is something I'll miss.