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Austin Russell is the founder and CEO of Luminar, the 27 year old global leader in automotive lidar hardware and software technology. Under Russell's leadership, Luminar has developed the first lidar and software technology capable of power producing autonomous vehicles, has amassed over 50 commercial partners including the majority of the world's largest automakers, and went public on the Nasdaq in December 2020 with a current market valuation of approximately \$7 billion. In this conversation with Stanford adjunct lecturer Ravi Belani, Russell explains how he put his company on the path to enormous success through unconventional choices and a strong core mission.



Transcript

Narrator Who you are defines how you build. 00:00:06,390 (digital music) - Welcome, Stanford and YouTube communities, 00:00:12,780 to the Stanford Entrepreneurial Thought Leaders Seminar, brought to you by STVP, the Entrepreneurship Engineering Center in the School of Engineering at Stanford and BASES, the Business Association of Stanford Entrepreneurial Students. Today, we are thrilled to have Austin Russell here to ETL. Austin is the 27 year old founder and CEO of Luminar. How many people have heard of Luminar? Oh fantastic, okay. So, as you guys, as many of you already know, Luminar is a multi-billion dollar publicly traded company that makes LIDAR sensors, hardware and software sensors for the automotive industry. LIDAR, as you know, is an amalgamation of two words, light and radar. It is using photonics and optics for 3D visualization and analytics and intelligence. Now, before I give Austin's formal introduction, let me explain why I am so excited to have Austin here with us today. As you guys may know, the essence of entrepreneurship, the definition of entrepreneurship comes from Harvard Business School Professor Howard Stevenson, he's generally the one that people use when they're citing academically, and he defines entrepreneurship as the pursuit of opportunity without regard for resources controlled.

Or, said another way, it's about pursuing opportunity unbridled by constraints, where, really, the vision is your currency and your energy source to overcome obstacles that might be in your way. And true entrepreneurs can unlock locks and overcome challenges that others can't and they're usually driven by a vision that transcends the obstacles in front of them. For me, Austin is a quintessential modern day entrepreneur and it's not just because his pursuits are entrepreneurial, it's because his pursuits are deeply contrarian and in the pursuit of that, the entrepreneurship side stands out in even starker relief. So, let me just set the stage for that as I introduce Austin. Austin grew up in southern California in Irvine? - Newport, Newberg, Irvine, yeah exactly. 00:02:17,883 - Near, near-- 00:02:36,903 sort of three to six months into Stanford. He gets a Thiel Fellowship for \$100k and he decides to stop out of Stanford. That alone is a momentous decision, I think many of you can understand the gravity of that, but what's more is that Austin goes all in into one of the most un-sexy spaces at the time, okay? So, he decides to pursue optics and photonics in 2012. So, he's not stopping out to go after a sexy area that is sort of a foregone conclusion of success. He's not gonna start a crypto company or even a software company, he's doing hardware and he's doing deep tech hardware, okay? It's any, it's classically the things that any mainstream VC would tell you to run for the hills and avoid.

He also decides to do not just hardware, but it's capital intensive hardware. His first product with his first vision is gonna cost in the tens of millions of dollars. It's not just a couple hundred thousand dollars to create an MVP or a white paper. There are deeply entrenched competitors. So, I'm sure you guys are all familiar with the Google cars, with those flying buckets of LIDAR sensors, Apple's working on this, and he decides to go head to head with them, and he's 17 and he decides to drop out of Stanford. He doesn't have a PhD, let alone even a bachelor's degree. Okay, you fast forward nine years later, in 2021, he's raised \$450 million, the company has gone public, and he has retained 33% ownership of the company. Just as comparison, if you look at other software companies or other young founders, like Aaron Levie from Box, who did a classic software enterprise viral company, he has 5% of equity when he goes public, after having raised similar amounts of money. And so, not only has he built something that is deeply disruptive, he's also done it in a way where he's also retained significant ownership. So, how did he do it? And how did he overcome the challenges and obstacles that many of you may have confronted along that journey? Well, those questions and more, hopefully we'll answer in the next hour.

So everybody, please welcome Austin. (audience applauding) So Austin, let me give the floor to you. First of all, is there anything that you want to explain to people that don't know Luminar about what Luminar does? - Well, I mean, from what you said, 00:04:53,010 it sounds like a horrible idea. I don't know why anyone in their right mind would stay within a mile of, no. (chuckling) But, but yeah, I think you gave a little bit of the overview there, too. Obviously it was, it was quite a journey, being able to get to this point. But in terms of the whole concept around Luminar in the first place was to be able to create a new kind of breakthrough ground up system for LIDAR which, as you said, stands for light detection and ranging. It's basically sort of the eyes of the autonomous car that sends out laser pulses in the environment to know exactly how far away things are, measuring the speed of light. You guys are familiar, if you're familiar. But basically, what we had to do was create something that would be for production vehicles that consumers could be able to utilize.

And there's a lot of different contrarian, as you said, that's a lot that we had to make along the way, but the ultimate goal and what we were able to achieve was to be able to build something that could dramatically enhance the driving experience, enhance the driver, as opposed to replacing the driver, and be able to work with, now, the majority of major global automakers to enable next generation safety and autonomous capabilities on their next generation vehicle lineups. So yeah, working with automakers is not easy, but it's very incredibly rewarding when you're able to succeed at that. And that's really where I think we have an opportunity in our, fortunately, having the ability to change millions of lives along the way that, for the adopters of these vehicles, as it gets out there, more and more so. But basically for the first time, I think, we're seeing this transformation in the autonomous vehicle space from all R&D into actual real production cars and we're effectively spearheading that. And again, the important part is, is that it's not just about the self-driving part, it's also about the safety part and the holistic mission there is, and we can talk at some point about some of the longer term vision, but the mission there is to be able to dramatically improve collision avoidance capabilities on vehicles, which sometimes people take for granted, but the reality is, is that the problem has never been worse. Where more and more people, more and more cars, are getting into more and more accidents, even despite all of the technology advancements that have happened on vehicles over the past couple of decades. So, that's what we're really looking to be able to turn around and solve one of the leading causes of death globally and suffering, so it's a important part of it as well. - And you articulate that in a vision statement. 00:07:20,160 I want you to share what your vision statement is. And can you share how early on in the journey you crystallized that vision statement and what recommendations you have to other founders in terms of how important it is to articulate a vision and when they should put focused attention on that? - Yeah, absolutely.

00:07:35,220 And I would say the most recent iteration of this, and this is coming from a few years ago, basically we have this hundred year vision for what's laid out and the hundred year vision is to save as many as a hundred million lives and a hundred trillion hours of people's time out on the road over the next hundred years. And every single thing that we do as a company all adds back up towards that vision. And I think it's just really important of, you're gonna have amazing days as an entrepreneur, you're gonna have horrible days that you wish you didn't exist. And you just, you're gonna have to go always back to that holistic mission and meaning for not just yourself, but that whole team around what are we actually doing? What's inspiring in terms of the greater purpose around what we're building and why it's there? And I think the more inspiring of a holistic mission that you can have, the better a talent that you're gonna be able to attract, the more impact you're gonna have. And I think, just frankly, there's gonna be just a lot more satisfaction with everything that you do. But it doesn't always have to start out so grandiose. It can even just be as, you know. I mean, in the first part it was just make the best LIDAR, make the best technology. You can have, I mean, even that in itself was ambitious enough because, as you said, we're basically competing with the Googles and Apples and every major automaker and every major tier one and other folks there. But then at some point, you just have to keep building and building and building on top of that until you can kind of have this bigger picture holistic mission that everything can roll up under in everything that you do.

And I think identifying that as early on as possible, whatever that may be, is absolutely critical to the success of a new company that's looking to get great talent and up against incumbents that just don't have that same kind of direction. - So, I just wanted to underscore that, 00:09:26,580 so even at the very beginning, you did have, I don't know if you articulated it as a vision, but you had a focus statement that was critical. Is that, is that right? - Yeah, yeah. 00:09:35,247 Yeah, absolutely, and I think it was that and then it was make autonomy safe and ubiquitous and then we ultimately crystallized it to that a hundred year vision. - But even when you were a Stanford student, 00:09:44,850 you're about to drop out, even at that stage of the company, you had a-- - Oh, yeah, yeah, absolutely. 00:09:47,460 A hundred percent, yeah. - And so, 00:09:48,540 can we, can you take us back? So, I wanna ask the question that's sort of the elephant in the room for all of our aspiring entrepreneurial

Stanford students, is: what advice would you give to the Stanford students that are wrestling with whether or not they should drop out of Stanford and pursue something entrepreneurial? How do they know if it's the right decision or the wrong decision? - Yeah, that's a, 00:10:07,410 (throat clearing) that's a good question and the reality is, is that there is no single right decision or single wrong decision for everything and I think it's the same thing that even Peter Thiel said, when he was first convincing me or some of the other Thiel fellows that he joined with in dropping out, is that it's, if you know that timing is important in terms of pursuing a journey or an idea or a concept or something that you have, it's not gonna wait for you, it's not gonna. Sometimes you just really have to capitalize on opportunities that are there then. If the reality is, is that if I had waited until, for example, in this specific case, graduated, let's say, I probably would've had, what, I probably would've had probably a PhD probably right around now, to in terms of what we're building, if I did graduate from this field and it would be way too late to try and pursue anything in this field. It would already be completely dominated by a host of other players.

So, sometimes timing is very important. The other part is, is just I think you have to be able to succeed in a few different dimensions and a few different personality traits and I think there's three very specific things that have to intersect at the same time. And that's curiosity, drive, and passion. All three of those things have to come together at the same time. You're missing any one of those things, you can't be successful as an entrepreneur. So, I think that, but when that does come together and it's something that you really believe in and, frankly, is, like I said, other people believe in and your customers believe in, too, or will believe in, for that matter, then there's really no reason why you can't be successful independent. You can be at school, you can not be at school. That's all good. But I think, on balance, I will say that Stanford is one of the, realistically, the foremost at, probably, being at the forefront of all of this and encouraging the entrepreneurship and the right kind of environment to be able to foster exactly that. So, I think probably, of any academic environment that is generally good for fostering that kind of thinking and mentality, it's certainly here, so.

- And so, just to make this clear 00:12:30,122 and, I'm sorry, how were you feeling, when you made the decision to drop out, was there fear? Did you have any fear about that decision? Was there gravity on that decision? Or did it feel pretty easy and natural? - No, super easy and natural. 00:12:43,440 - Super easy and natural, there was no consternation. 00:12:44,760 - Not, not, not at all. 00:12:45,957 - Austin's dad's in the audience. 00:12:48,870 And your parents didn't even say, "Son, I don't"-- - Oh, that's a, yeah, that's a different one. 00:12:53,100 My dad is in town here, too. I'm looking out at it. Yeah, it was definitely, different kind of discussion that's happening there. I think the thing is, is that if you don't, you need to have an extreme amount of conviction in whatever you're doing. If you don't get over that barrier, you're not gonna be able to make it in the real, so you really have to be confident in what you're doing to be successful.

Frankly, even if you're blissfully ignorant and confident in there, too, if you have enough confidence, then it's amazing what you can do. - So, let's talk about how you source that conviction 00:13:34,050 'cause it does feel very clearly that you had this clear conviction that you would miss out on the opportunity if you didn't take action then. But so many people at the time, if you were looking at doing something that was deeply technical, it's gonna cost tens of millions of dollars to build. How did you have enough, what was required for you to put the dots together to say that the timing is now for me to focus on optics and photonics in 2012, to have the conviction to actually go all in? - So, I would just say for optics and photonics generally, 00:14:04,170 and by the way, I think the timing actually still is now, I think the timing is for the next, you know, couple of decades for that matter, I'm a firm believer that, and I sort of saw a theme and it had a thesis that what electronics was to the 20th century, optics and photonics and optoelectronics would be to the 21st century in terms of just major innovations and iterations and problems being solved at a global scale that can deliver massive amounts of value, and saw that as also the clearest path to be able to make sort of a global change and also make a lot of money while doing it at the same time. So, I think when it comes down to it, being able to identify broader themes is a really interesting way, and just sort of these trends that, and it's not gonna be the stuff that everybody's talking about. Frankly, a lot of times, if everybody's talking about it, then it's probably over. You're gonna have a lot of competition, you're gonna have a lot of different people focused on things, you want to find niches to be able to start off with that are specific. Now in this case, optophotonics, in and of itself a niche, but it's different in the sense that, for example, most major, I mean, talk about universities, most major universities, you have electrical engineering programs, you have computer science programs, you have other things. Photonics programs you don't, there's no, 99.9% of schools don't have, you can't graduate as an undergrad in photonics, that's not even a thing. So, and actually, Stanford's one of the foremost experts on that, more generally in terms of the level of talent that's had here, and even then, that's almost pretty much entirely the graduate school.

So, it's just interesting to see those dynamics. And the important part is, I think, is seeing interdisciplinary connections and just being able to actually ensure that it's supplied to the real world and that there is a practical application of that kind of product or technology or whatever it is that you're building as opposed to just doing, say, research for the sake of research, which I think is still a little bit of a struggle with the academic community. Which nevertheless is extremely important for the fundamentals of everything that's done, but I think it can all benefit from more entrepreneurship. - Okay. 00:16:38,610 So it sounds like you connected the dots between the potential and the markets, it captured your passion, your curiosity, and your drive, and so that was enough for you to commit your one precious life to this at Stan, when you were, to drop out and go full-time on this, all in. - Yeah. 00:16:53,363 - When was the moment when you-- 00:16:55,445 - In other words, YOLO. 00:16:57,720 YOLO. - Back when that term was cool. 00:17:01,925 - I might be dating myself with all the 00:17:02,758 (laughing) younger generation, but.

When was the moment, then, that you actually knew that you would succeed, that the product actually was gonna realize

the vision that you had mentally and be a market success? - Um-- 00:17:25,110 that it was gonna be successful, to make it work. I think, for what it's worth, as an entrepreneur, you sort of have to take the mentality that failure is not an option, Apollo style, where no matter what you do, you have to succeed, you have to make this work. So, if you're going all in on something, you have to do that in a very, very intelligent capacity. And I think kinda like that Warren Buffet saying of like, "Don't put all of your eggs in "a bunch of different baskets, put it all in one basket "and watch that basket very carefully." So yeah, in this case, you have to build and I think I would say probably, I don't know, within the first year of sort of what I was doing there, too, I didn't know the full extent of what it could do and what it could ultimately mean, by any stretch of the imagination, but I knew that it was valuable, I knew it was impactful, and frankly, when you're in a technology ecosystem and you can build valuable technology, it's amazing how much interest you can get from potential customers, in this case, automakers, technology companies, other stuff. People want to, people will want to buy technology from you, people will probably want to even buy your holistic company if it really is that breakthrough. So, if you can build the right breakthrough tech in the first place and get that product market fit, that makes all the difference. - I just want people to get a good feel 00:18:55,380 for the difference between great and good. You're the youngest self-made billionaire for a reason and so, I wanted them to understand, what does validation feel like when you're in one of these, you know, mega unicorns, so. I understand, it sounds like from day one, you had a hundred percent conviction that it was gonna succeed, but there was a moment when maybe you could relax a little bit because you had the external validation that it was gonna succeed. Can you give us any more tactical detail on what numbers you were sensitive to that gave you that validation? - Yeah, yeah, yeah.

00:19:24,360 And we, like I said, we had raised, obviously, a lot of capital and other stuff along the way. I would say, though, that the true validation never, you never get a hundred percent true validation, until very, very late in the, probably 10 years in, maybe that's when you start to get your true validation for it. But I mean, the reality is, is that different steps along the way, I would say the first sort of major iteration of the product of like the first time when we had everything come together with the LIDAR, flipped on the switch and everything can actually image and it can work as you would expect it to work and your theoretical calculations match up with the real world, those are the moments that's the mind blowing moments. At the same time, it's the first moment when we came outta stealth mode, we were actually, we had no press, no interviews, no public website, no anything for the first five years of the business, that was that. - Would you recommend that, by the way? 00:20:21,150 Because that sort of goes against, it's another contrarian move. Most people would say let's fumble towards victory, iterate, you release and then mention and talk and interact with the market frequently so that you get feedback. You went into deep stealth for five years. - Yep. 00:20:35,970 - Was that the right decision? 00:20:38,230 I mean, honestly, like I think the distinction is, is that if you, we kind of have jokingly had to say that we had to find 2000 ways to not build a LIDAR before finding the way that would actually solve the problem for all these different dimensions and everything of what it takes to be able to make this happen. And you want to do that behind closed doors.

You want to be able to make sure, in a world of where everyone is always over promising and under delivering in the startup-y aura of hype sphere, there is value in under promising and over delivering, or frankly, just not promising literally anything at all. Hence being deep in stealth mode. But then, when you do have that and when you're ready to be able to show it off, I mean, I think it was literally the first time that we launched out of stealth mode, next thing you know, you have just breakneck interest from everything from the customer side to, I mean, I think we were getting these huge features from Bloomberg and the New York Times and other-- - And how do you overcome the criticism, 00:22:03,720 which is like the classic customer development trend over the last decade that yeah, you know, you want to get outside of, outside of the business, interact directly with your end customers and iterate quickly? - And you can do that too. 00:23:18,000 and it was like you didn't have to worry about any of the noise, didn't have to worry about any of this stuff, and you can just focus on what you need to do. And that focus part, I think it goes back to, is definitely critical, but it's all those things that add up that make a difference. - And so, I wanna dive into some of 00:23:30,630 the creative things that you did because even if you have the conviction, you know it's right, being a 17 or 18 year old kid needing to raise, you ended up raising \$450 million, but even raising your first money, even if you know that you're right, is a challenge. It's a challenge even for people that have a much deeper pedigree under their belts when they go into VC funds. Can you talk about the creative ways in which you got financing? Obviously, the Peter Thiel check was \$100k. It's great, but it's not enough to build a next gen LIDAR system. And how did you get financing and any un-intuitive tactics that you used that you would share with others? - Yep, yep, yep.

00:24:09,690 And, but, by the way, for what it's worth, I think by the time we're done, it's probably well over a billion and a half dollars in terms of total, total financing there-- - A billion and a half dollars. 00:24:20,520 And can you share what percentage of the company you still own? - Yeah, about about a third. 00:24:50,570 So yeah, first and foremost, the reality is, is that raising money, particularly in the early stages of a business, is extremely dilutive. Money is always the most expensive, so to say, in the early stages, by orders of magnitude. Actually, you know what's really, it's really funny. So, I was just there with, actually here we are in the Jen-Hsun Huang Auditorium here, too. Just a couple hours ago, or a few hours ago earlier today, we announced this big deal with Mercedes alongside NVIDIA there, too, which was a fantastic outcome and expanding across their whole lineup of vehicles for the next generation technology that we're building on it, and actually was there with Jen-Hsun, funnily enough. And I was like, "Oh, well, speaking "at your auditorium later, hey?" So that was pretty cool. And it's so weird, by the way, too, being here. When I was in the audience like 10 years ago, too, taking a look at some of these talks and other things and I was thinking it, kind of coming full circle.

But the thing that I remember Jen-Hsun saying here, too, just a couple hours ago, was that he, the big thing that he wanted to do, the first thing he did when he IPO'd was he wanted to buy his parents a Mercedes. And I think it was like a \$50

thousand Mercedes that he ended up buying for it and he's like, "That was the most expensive Mercedes ever." Because that, now, he's like, "I did the math and now that's the equivalent of a \$200 million Mercedes." Based on the current value of where NVIDIA is at. So, it goes to show, point is, is that if you believe in the long term growth trajectory, you can, money is very, very expensive. But in the early stages-- - Wait. 00:26:36,000 He spent that 50 thousand at the beginning of the company? Is that-- - Yeah, yeah. 00:26:37,680 Towards the, towards the beginning-- - Towards the beginning. 00:26:39,780 And he couldn't have put that into his-- - Like, orders of magnitude, growth, 00:26:41,880 if he held onto it instead of selling that portion of stock, or whatever, it would've been \$200 million. - Got it, yeah. 00:26:50,733 - That was the joke about the \$200 million Mercedes, so. 00:26:55,120 But point is, is that I think early on, it's very important to try and be creative and thoughtful about how you finance and one of the things that, the strategies that I took early on is because we had so much conviction in terms of long term value about what we could create, and this, I think SAFE notes in particular is a certain mechanism of financing that was originally started by Y Combinator and proliferated throughout.

It was, how do we say, much more niche and much smaller scale there, too. People would do like \$10 thousand SAFE notes, \$50 thousand SAFE notes, maybe \$100 thousand SAFE notes. The reason for these notes instead of operating off of traditional equity financings where people give you a certain amount of money for a certain percentage of the company was basically you would be able to, in exchange for either getting a higher valuation cap or getting a discount off of a future round, be able to effectively push out when that mark to market is on valuation. And from a discounting perspective, even if you basically are saying "X investor, I guarantee you will get a 30% return by giving you a 30% discount." Or plus or minus, whatever it may be. Which, by the way, is for most investors, those kinds of returns are really good. But if you think that you're gonna 10 X and like grow by 1000%, 30% is completely in the noise. So, that's where you can be creative around these things, and that's, so we took a mechanism that, normally people raise \$100k on, and over the years raised \$200 million on SAFE notes, which I think-- - I've never heard that. 00:28:36,305 (laughing) It's obscenely, an obscenely extreme data point, everybody, so. But it's an example of your entrepreneurial thinking, yeah. - Yeah.

00:28:48,000 So, so yeah, so technically speaking, technically speaking, we actually, before going public, only ever did one equity financing because it all, all the notes sort of converged together, so. - And in that first year when you're just starting, 00:28:59,670 when the money's the most difficult to raise, how much of it was funded by the hacker house? (laughing) - I mean, most of it. 00:29:04,763 - So, that's what people had said. 00:29:06,747 So, when did you get your first outside check outside of? So, you guys understand the hacker house, he rented a big house, he subleased the rooms and he made a margin off of that. And you also, you also created this community that was also a competitive advantage. - Absolutely. 00:29:23,330 (laughing) - So, you end up getting your cash 00:29:25,750 from the hacker house, talent-- - Yeah. 00:29:35,820 literally the market rate for what people were bidding on for a closet, you know? I like-- - Yeah. 00:29:43,620 Which it was around like \$2,500 per month for literally a closet in the hacker. It was, it was crazy in terms of people were coming up with creative ideas for how can you just, people wanna be a part of the community.

And that was, it was just, it was just wild to see, early on, just how much of, well, literally wild west type mentality it was. But there was some, there was a lot of civility there to it at the same time, it's not like the movies in that sense. - But that was your cash for the first, how many months? 00:30:14,183 Like was that for the first, like-- - It was the first like, you know, year-- - 00:30:17,365 - Yeah. 00:30:29,040 the valuation caps, you can, you don't have to give people as big of discounts, you can do other things, but. Yeah, it makes a difference. But the point is, is that even by shifting out dilution a year or two on things, that literally can make all the difference. I mean, you guys are familiar with exponential scales on things, if you, even slight changes in terms of the timing of when that dilution happens just makes dramatic differences in the total outcome of what can happen from a ownership stake perspective. To the point is, is that the reality is, is that most of the time, to end up with like a 5% stake, for example, by the time you go public, I mean, people end up diluting themselves 20 times over. It's actually a lot of new shares that you just have to constantly issue and issue and issue and issue and issue. And that can be very challenging, so.

The key thing, though, is that it's not just about, and this is a very, very important point, it's not just about the owner, for example, as an entrepreneur, it's not just about the ownership stake that you have, it's about all the other employees that you have. You dilute, yes, you get diluted on something, but if you bring more shares in, you do more financing, more dilution, then it dilutes everybody else along with you. So, what you want is to be able to end up in a virtuous cycle of value growth with your employees rather than a vicious cycle of value growth where then you have to issue more shares to then make up for that value and change things, so. - And were, were the SAFEs capped, 00:31:50,820 then, or is it just discounts? Were they-- - It was initially capped 00:31:53,349 and then it was discounted. - Then it was discounted. 00:31:54,182 (laughing) Okay, that also makes a big difference in the drivers. I wanna make sure that we save room for you guys to ask questions, so I'm gonna ask one more question and then we're gonna open it up, which is, is that awesome? You did share about, you know, the three cardinal principles that drive you, curiosity, passion, and drive. - Right. 00:32:25,260 their survival? - Yeah. 00:32:26,093 No, it's a good question.

I think, honestly, when you are initially worried about survival on that, too, you have to think about generosity in a different way than you think about generosity when you're at a different stage of business. But I think the generosity part, as just a holistic philosophy, goes a long way. Going back to the mission and the purpose around what you're trying to do, the point is, is that there is a bigger picture movement of what you want to build and what the impact of this is. Yes, in theory, the fundamental purpose of any corporation is to make money. And that is true and that has to be the case because without

money then you can't invest and without investing, you can't build what you want to build and if you can't build that, then you can't make the impact. But the point is, is that that is the byproduct, not the end result, for what you want to do. And from a first principles perspective, that's very, very important to be able to establish. And I think getting people along for that, for example, even early on, getting people along for that journey, making sure that people have equity as part of the company in that journey, is part of the whole generosity concept, all the way to, I think when you do have an opportunity to have liquidity and when you do have an opportunity to be able to help others along the way, even outside of the company or operation or whatever you may do in life, I think that can be particularly meaningful. And in this case, just not too long ago, had done a donation, in this case, of \$70 million to the Central Florida Foundation, which is part of what's, is with the local community that we have out in Orlando, Florida where our headquarters is, where we're able to help both local and global causes all around in terms of being able to make a difference and make an impact. And it's awesome just seeing, even everything from helping a housing crisis locally all the way to a global scale.

We have now ocean trash cleanup robots that are being deployed with other partner programs that are around to be able to prevent and remove the majority of trash outta the ocean by 2050, so there's a lot of really interesting things that can be done that you can also apply creative skills to. Earlier on, I think the reality is, is that unfortunately the vast majority of, not just necessarily entrepreneurs, but just people in general, they probably don't really think in a, around the generosity aspect until they're probably in the last couple of decades of life. Maybe sometimes even literally until the exact end, you know? And I think that, in part, takes away from some of the importance of being able to apply yourself towards these causes and towards what makes a difference in the world, more generally. And I think that whole aspect of, and in my case, philanthropy is gonna be a super important part, not just now, for in the future. And that again, it applies not just, it's not just about the capital side of it and money side of it, giving, but it's also, again, going back to the holistic mission around what you're trying to do and the causes you believe in and, for example, the hundred million lives saved, that we can do, I think. If we, if we accomplish that, that'll be, certainly, the proudest achievement that what it could do, so. - That's great. 00:36:03,420 I think there's a question here. Student Hey Austin, so I'm currently an undergrad 00:36:08,970 and I'm an engineer looking to work at the intersection of software and hardware. And one of the questions I have for you is kind of like, how did you approach, you know, go to market as an early entrepreneur? So, I'd imagine that, as a hardware company, as like a startup trying to sell to some of these auto manufacturers is actually gonna be quite difficult and you're gonna run into a lot of pushback from these legacy companies, so.

Curious to see how you approached it and how you kind of like iterated your way through go to market. Thanks. - Yeah. 00:36:35,943 Yeah, I mean, I think in terms of the go to market side, you have to take it in, in this case, you have to take it in different phases. You know, first is, is just make sure that you can get the buy in of the right people at the right organizations that this can make a meaningful difference. And it's all about reaching the right people. 99.999% of people at automakers would have absolutely no freaking clue what they're looking at when they're looking at a point cloud off of some LIDAR prototype, but if you reach the right person, as was the case, for example, back in 2015, 2016 with Volvo, which is one of our lead partners and customers, who actually had a LIDAR expert that was on board their team. He went up to Portola Valley, took a look at the point cloud in the car, and he literally fell out of his chair the second that he saw that. When you have the context, just like, wow, this really can make a huge difference. And then you get those champions and sponsors that have that vision for you with companies that you'd like to work with and partner with and that's really, really important along the way.

Otherwise you will just get lost in the noise, you won't be able to grow. So I think that's the most important part, at least in the B2B context, that, B2C is a little bit different, but that's sort of the world that we've been operating in. - And for founders that wrestle with 00:37:49,650 whether to go after smaller enterprises where they can iterate more quickly and get some type of deal quickly versus the bigger OEMs that are gonna take forever and could kill the company, do you have any guidance on which you should choose? - Yeah, start smaller and then work your way up. 00:38:01,560 I mean, that's honestly the best. I mean, don't get me wrong, if someone at the table say, "Hey, like let's go sign a billion dollar deal tomorrow." And they're a big company or a small company, but doesn't matter, just take, focus on, be customer obsessed, as with the Amazon philosophy always is, but, you know. But listen, if you have a choice of stuff there, too, I mean, naturally I think it's gonna work out that you're gonna work with smaller enterprises because they're more nimble. - But you guys actually started 00:38:27,330 pretty big with Volvo early on, or did you have smaller companies in advance of Volvo? - You know, we did, I think we had even 00:38:38,733 technology companies that were there earlier on. I mean, I guess they weren't that, I don't know, the Ubers of this world or-- - Okay. 00:38:47,730 they probably can talk about, but you know, I think Volvo, though, but it's all relative, right? So for example, in the world of automakers, Volvo is, sure they're an automaker, but they're actually a smaller. No, no, they're actually, they're actually a smaller auto maker, so.

So, for example, in the Mercedes case there, too, they're, they actually produce three times the volume of what-- - Yeah, that's a fair point. 00:39:22,440 so you have to be able to work through it. But, you know, it's a risk reward thing and if you can make it happen, then it makes a huge difference. - Terrific. 00:39:28,530 Other questions, I think we have-- - Okay. 00:39:44,523 to build team and bring other people on board? - I think that's where the extreme efficiency matters. 00:39:56,253 You have to be super scrappy early on. You're gonna have to find a way, in one way or another, to be able to get people on board with the mission, people on board with the vision. That's where equity can come in handy. You know, you want to be smart about it.

You don't wanna be too stingy with equity early on in terms of what you can provide at the same time in terms of the

opportunity and outcome, but just make sure that the people that you provide it to are going to be there for the long run. Day in, day out, doing absolutely whatever it takes to make the business successful. And if you have those people and can do it right, then that's really all you need. Now, I think at the same time, like I said, it's amazing what, even cash constrained, what people can really do when you put your mind to it to get to that next step. But the thing is, is that you have to make sure that the people that are along with you for the journey, make sure you recognize that there's no theoretical world where you can ever get to where you want to go to with the kind of cash constraints and with the constraints that you have. You have to see yourself taking it a step at a time. Visualize the end state, but then break it down into the individual steps of what has to happen for you to go there. What's the best case, what's the worst case? What's the path to really be able to get there? And I think walking people along for that journey early on also makes a big difference in sort of getting them on board and people are always gonna be the number one expense for most types of companies here, so. - Terrific. 00:41:37,650 Other questions, I think we have-- Staff So, we have about 150 people on YouTube and Zoom.

00:41:44,130 So, the most upvoted question is: if you had to do it over again, what aspects of your Luminar founder journey would you do the same versus do differently? (throat clearing) - Whew. 00:42:02,460 I think the important part about being an entrepreneur is not getting everything right. (laughing) You will make mistakes all the time and probably beat yourself up for it. The key thing is you just have to make the right decision more than 50% of the time. That's the key. You do that and you'll be in a good spot. But I think, at a general level, a lot of things had to work out, obviously, very well in lockstep to get to the stage of where we're at. But I would just say also, emphasis on the right people. I know people talk about it all the time, but it cannot be stressed enough. But making sure that you have the right people in the right roles in the right positions.

And the way you structure and set up teams is going to look dramatically different every two years as a growing business and you have to constantly be rethinking how you're structuring the teams, the level of talent that you're able to get in and attract to the business. And at the same time, I think learning more about I would just say org structures. It sounds kind of boring, but just, there's resources now where you can look up org structures of technology companies and how things are set up and ask other entrepreneurs of how they set things up and how they manage the teams and how they actually succeed at scaling, I think is super important. You know, the reality is, is that, like I said, there's always a lot of different steps and a lot of things that you can have done differently along the way, too, but I think that is one of those things that will substantially reduce the amount of insanity that you have to go through on a year to year basis if you get that right. And there's some parts where I got it right very well, and there's some parts that, along the journey, that I had to learn. - That's a great way to frame it. 00:44:11,160 It's learning, it's learning. I think we have time for one or two more. There's a question right here. Yes.

- Hi, hello. 00:44:18,305 (tapping microphone) - You're on, you're on. 00:44:23,160 Student As a hardware focused tech company 00:44:26,340 in the automotive industry, I'm curious if and how supply chain disruptions during the pandemic affected Luminar and whether you're still feeling those effects given kinda like the long term nature of that technology or the development of that technology. And then additionally, I'm also curious how you view Luminar in this new currently shaping or currently evolving world as it relates to like geopolitics in the tech industry, especially as it relates to sensors as we've seen recently over the past year, this sort of change on, you know, between, namely like China and the US. - Yeah, so I'd say a couple thoughts in general. 00:45:10,770 From a supply chain standpoint there, too, there's, I think if there's anything that people have recognized over the course of the past couple years is that supply chains are very important, very critical, and cannot be taken for granted. This is a completely different shift in mentality for automakers, for big companies, for everyone alike. And I think, fortunately, we've been largely insulated from a lot of that stuff, given for two reasons. One is sort of the obvious, that we're not a, at least yet, a Fortune 100 company that produces tens of millions or hundreds of millions of product, that at this stage that has to worry about some of the larger scale challenges or issues. But I'd say more specifically, given that there's a lot of development vehicles, development work, we're really scaling up in some pretty larger scale numbers starting more later on this year and next year, the following year when we're scaling with series production with our automakers.

But the other part is, is that I made an early bet to be able to be completely vertically integrated from the chip level up. And a lot of the semiconductor shortage challenges that have happened have, well, I would say just the, a lot of the supply chain shortages that ended up happening have been around semiconductors and that's where being vertically integrated at the semiconductor level, where we control that whole side of it, everything but the, I actually have three different companies that Luminar owns that are part of this. One is Black Forest Engineering, the other is called OptoGration, the other's called Freedom Photonics. And so basically, it does a processing chip, the indium gallium arsenide receiver chip, and then we have the laser chip for the last one. So, having control over that supply chain is definitely very, very helpful. And that's also made a huge difference in sort of weathering that storm. The other part of it is, from a geopolitical standpoint, yeah, I would say that, there's, a lot of the stuff that people talk about, generally, I would just say there's always an infinite amount of talk about politics. Probably way more than there should be for things that don't end up being substantive issues to the real world, at least for these kinds of industries and whatnot. I think the relevant part is that you have to build a global supply chain ecosystem that is available to be able, in a cost effective way, provide product to different customers globally. Particularly for this industry, where some people can get away with just operating something in the US, for example.

Automakers are very globally distributed. You have these major centers in Germany or Japan or Sweden or China or around the world or wherever it may be. So that's why we actually have our first major series production factory they're

building out is in Mexico that we have that's sort of a more neutral location when it comes down to that. And then, we actually will be building out another factory in Asia to be able to support customers there and beyond, globally. This is something that we literally just announced a few hours ago today to support the expanded volume from companies like Mercedes and beyond, globally, so, it's important. - I have to wrap it up, Austin, 00:48:46,913 but, but-- - Yeah. 00:48:50,040 - So, but thank you so much for sharing so generously. 00:48:52,282 Thank you everybody for tuning in and coming into this session of the Entrepreneurial Thought Leaders Seminar. (audience applauding) And please join us next week when we'll have Andreessen Horowitz' General Partner Connie Chan as our special guest. And as always, you can go to ecorner.stanford.edu to see all of the materials.

So, thank you everybody, thank you Austin. - All right, thank you. 00:49:14,067 (audience applauding) (digital music)..