AI in MEP Design with the CEO of Augmenta Francesco Iorio | Transcript

Welcome to Green Building Matters, the original and most popular podcast focused on the green building movement. Your host is Charlie Cichetti, one of the most credentialed experts in the green building industry and one of the few to be honored as a LEEDfellow. Each week, Charlie welcomes a green building professional from around the globe to share their war stories, career advice, and unique insight into how sustainability is shaping the built environment. So settle in, grab a fresh cup of coffee, and get ready to find out why. Green building. Green Building Matters.

00:33
Charlie
Hey, everybody. Welcome to the next episode of the Green Building Matters podcast. A big part of the future, and I've really been dedicating the last four years of my career, is technology and in the built environment. Not just gadgets, smart buildings inside of the building, but how about even how we design buildings and how we design sustainable buildings? And that's the guest I have on today. We've seen each other at some amazing technology conferences. He's the CEO of a great startup. Francesco, how are you doing today? Welcome to the podcast.

01:03
Francesco
Thank you for having me, Charlie. I'm doing it. I'm doing really well.

01:07
Charlie
I know some of my co-founders at Schema really well, even back to some of the Autodesk days, and Richard and Marty and our teams are working

on an integration together with our amazing design tech tools. We'll have to define that to the audience here. What does that even mean? But take us back. I love to just get that kind of origin story. Francesca, where did you grow up and where did you go to university?

01:28
Francesco
Absolutely. I really grew up in a very small town north of Italy. You can imagine a small town in a valley in the Alps. Not much to do or see. And it's a very different life from a big city. You have to do whatever you can with the stuff that you got. And so that actually kind of teaches you some interesting lessons to do a lot with very little. You have to keep yourself entertained. You have to do whatever you can . To do well in school. You have to do well overall. I've got to start your thoughts about your career with just the chances that you get. That's really kind of how it started out.

02:09
Charlie
Resourcefulness, too. I could picture that. Northern Italy and the mountains. I grew up in a small town in north Georgia. I'm in Atlanta. Mountains, but nothing compared to the Alps. There, that sounds great. And then I guess you had some choices on where you're going to go to college. So what did you kind of want to be when you grew up and what made you go the path you started and then we'll get to where you ended up?

02:30
Francesco
Absolutely. Again, when I was a kid, again, my only redeeming factor at some point was that my parents actually got me a computer. Which is really a highlight of my life. So that's really kind of what got me started. At the time I was a kid, I was a teenager, I had a big passion for video games. And when my parents actually got me a computer, I thought that it would be

fun to try to make them myself instead of just playing them. And literally that prompted me to essentially teach myself how to program in assembly back in the day that dates me actually quite well. So and actually start making some games. That really kind of gave me an early perspective of what it means to like extract the most of the performance of a computer. Again, it ties in with my overall kind of sense of doing a lot with little, if you will, to optimize things. Video game development is actually very precious actually in that sense. And it really kind of launched my career because eventually I became a professional all games developer for quite a few years.

03:36
Charlie
Love that resourcefulness. And this is a sustainability minded podcast and nothing like, you're optimizing, being efficient. I hear that over and over with you.You've got some advanced degrees, so maybe even hit on that as, hey, what made you want to go back? Or even more schooling. But also early in your career, what were you doing? Early career, absolutely. Again, early in my career, again, I actually worked mostly on computer games development. So while it was actually a study for my master's degree, computer science actually was the choice that was kind of getting down into the details. Which then kind of led a few years later into my PhD studies, which are also computer science and machine learning specifically. But then eventually I grew out of the games industry and I thought that it would be interesting for me to apply the experience that I had in using again, very effectively and efficiently, computer systems actually into solving larger problems really. I picked this particular field of computer science called high performance computing, which is applying really kind of monumental amounts of computer power, if you will.

So you can imagine computers that take a whole building or like a floor of a building, like really big things. I said they're actually used to model stuff like ocean currents or oil reservoirs or finance, of course, as you can imagine.

And so I actually kind of sucked my teeth into that actually for quite a few years. And I moved to IBM Research, where I get kind of most of my work in that direction. So that really taught me how to harness really substantial amounts of power for very complex, very gnarly computational problems.

05:25
Charlie
I love that word gnarly too, but I mean, massive computers, I think we take it for granted, just the processing power of a smartphone. And in a little but we'll talk more about AI and what's needed to even pull off what we need with data centers, too. But so you really were doing that early and you mentioned machine learning. I know a lot of that work is going to show up here when we talk about augmented too. So that was the computing side. You took a leap and you ended up at Autodesk for over 10 years. And that maybe got you in and around, I'm going to assume, not just the computational side, but a little bit with building. So tell us about what brought you to Autodesk.

05:59
Francesco
That's absolutely true. Essentially what brought me to Autodesk was in fact, actually the desire at Autodesk at the time to harness this computational power that was suddenly becoming cheaper, accessible, which was called the cloud. So the cloud was actually kind of a big opportunity at the time. And given my experience in leveraging and harnessing these larger, large computational systems, essentially, I was kind of picked too well by Autodesk to try to understand and create essentially novel avenues to leverage this sudden burst of available energy and platform for computational power for the better. So to essentially to help in engineering applications. And so I actually moved to autodex specifically to try to understand and to foster, well, the use of advanced computational methods in the pursuit of better engineering designs, more specifically. That's how this, actually my journey at Autodesk started.

06:56
Charlie
That was important at the time. You know, maybe Revit had been on the scene for several years. That's just one component of so many other great tools. . Autodesk has. And you were maybe speeding it all up, and I love that. So as you look back, were there any mentors along the way? You know, Francesco, sometimes a mentor, someone, we follow their material, read their books, see them on stage, sometimes it's someone that meets with us, challenges us, opens doors. Have you had any mentors doors along the way?

07:23
Francesco
I would say that my main mentor actually has been my father. It's not in terms of my technical kind of knowledge or skills, if you will. He kind of allowed me to pursue something that at the time was a very unconventional career choice. And that kind of really kind of inspired me to try, fail, try my best. To get up and get up again and again. And try again. I saw. And that kind of really kind of worked out in the end because again, that kind of entrepreneurial kind of spirit actually still kind of is pervasive. And that's really kind of what led me actually, even at Autodesk, to move from the original, let's say, interest I had in mechanical design towards construction. Essentially I realized that was an opportunity like beyond essentially what the original scope of my work actually was going to be there. And that kind of cascaded into essentially the entire research program that became known as Generative Design.

So that all started with essentially my father essentially kind of allowing me to kind of pursue my dreams, if you will. The opportunities that I thought actually could be. That could be good.

08:33

Charlie
I love that. You need that as a kid. You need someone. Not just a little bit of permission. Then that changes to encouragement, then that changes to, you really could do this. You need someone speaking that into you. And it sounds like you had that. It's amazing. All , so let's connect the dots a little more on the career. So over 10 years at Autodesk, and then what'd you end up doing after that?

08:57
Francesco
To conclude on Autodesk, that kind of. That ties in well. That's really kind of what led me to where I am today. Atlanta. It was really kind of during this tumultuous period where the introduction of this concept of generative design. Kind of started taking shape. And I was actually bringing it forward with a group of great engineers and scientists with me. That was actually the time when I met the person who would eventually become a co-founder. And we really were both completely fascinated by the concept of what computers could do as active partners. So in solving really challenging what kind of human scale problems. And that really kind of what actually drew me towards construction kind of more and more.
The impact that we saw in potential, in terms of the opportunity to change the construction industry was so great. The scale of it actually was so large, even compared to manufacturing. So that's that led to us kind of forming Augmenta as a company specifically for the purpose of essentially leveraging this immense opportunity of using artificial intelligence for the betterment of this industry that is really permeating human civilization.

10:17
Charlie
Well, and you have that strong background in machine learning. And then you started the company in 2019, before the pandemic, and then a couple of years even before ChatGPT was public. You were already doing this. And so we're going to talk a lot more about augmented. But one more look

back, I love to ask. Yes, Just hey, what's on the highlight reel so far? What are some of your proudest accomplishments?

10:40
Francesco
I mean, to be fair, again, I would have to say the proudest accomplishments so far. As was when I saw the first building that was constructed earlier this summer. Our artificial intelligence participated actively in the design. Of course, some of it, like as in I felt, I mean, for me personally was a monumental accomplishment. Like as in you have to think about it in a particular perspective. Let's say, teach that in artificial intelligence how to think as an engineer. We had to squeeze thousands of years, if you will, of construction knowledge, if you will, and efficiency and analysis. Into a system that can reason at least on par, or that can accompany the engineer's decisions on what's best. And so really, as in that certainly for me overall in my career year actually has been, I think, so far that's the promise that she made for sure. Literally has come to life, that real building that benefited from your technology. I've gotten to know your company a lot, but why don't you tell our listeners about Augmenta and talk a little bit more about your company and any kind of exciting things you have going on today.

12:01
Francesco
Augmenta is an artificial intelligence firm, as we mention. So we're focused entirely on essentially automating building design in detail. So a building design engineer, that's really what kind of sets us apart. So what we create is artificial intelligence agents that really help Augment pun very much intended for a class of users in the construction industry, like developers and architects and engineers, to really craft designs that are executable. That is actionable. So and that's really kind of how we're trying to be very differentiated in terms of the. Not just the competition, but the industry, the way it has operated actually so far. It's not solely a matter of automation.

It's not only a matter of time compression, but it's literally the ability to drive the design process all the way into action, into procurement, into planning. And that's for us, it's really a strong prerogative of what we do. Because let's say traditionally design systems that have existed in the past or so far have left such an immense amount of affordance to designers and engineers that it is too easy for them to create something that cannot be built or that is kind of fundamentally wrong by virtue of not being code compliant, by virtue of not being sustainable or not efficient. We're trying to, again, imbue the knowledge of what efficiency, what sustainability, what construction actually means inside these tools as intelligence. And so that's what our aim is. Again, we are seeing the first proof of this technology coming to life. In the projects that are happening today.

13:54
Charlie
I love that the augment, the fast forward, we have a lot in common with what we're building and schema. But you're focused on MEP first. And so is your customer with your AI tool, is it usually engineering firms? You even mentioned developers, or can you have a few different types of customers.

14:13
Francesco
Let's say our target customers today are mostly specialty subcontractors in the electrical trades and engineering firms. Let's say that they are the stakeholders in the value chain of construction that need that level of detail. So they need that level of certainty. They need to procure the construction materials, they need to schedule the labor force, they need to essentially understand the schedule impacts of changes. They need to react quickly to anything that comes up from the market or from the field. And so those are the people that we meant to empower first. To actually make the most of the largest amount of difference in the shortest amount of time. In fact, again, our partners that created the building that I mentioned earlier were CNR Electric and KDS Engineering. They created this building in a very,

let's say, linear fashion. They started from a close up design. They automatically created the electrical raceways using our system and then they used the output essentially of the design, the very detailed design, to automatically cut, bend and label the, essentially the concrete systems of the raceways so that there would be the least amount of waste possible. So that actually kind of harks back to why we're actually doing this. It's all in service of efficiency, it's not only service of cost. We want the least amount of landfill to be filled with. Construct well unused construction material like first. That's the real tip.

15:50
Charlie
I hear you saying your AI tool helps with that efficiency in the design. A word that you hit on. I've had to learn a lot about them when I was getting out of construction. My background real quick, Georgia Tech, then commercial construction, later real estate development and LEED and green buildings and now technology. When I was getting out of construction, there was LEED around 2005 and then there was BIM. And so I went the LEED route. And so it's kind of ironic, Francesco, now BIM has come back around, is a big part of my life now with BIM files. I've worked with some very large developers, even like Heinz out of Houston, Texas. One of my best green building clients in the world when I was really focused there. Sometimes though, the word constructability is missing and I think you alluded to it.

16:36
Charlie
So let's unpack that more. Not all the time, but sometimes the architect and engineer's design files, let's call it LOD350 or higher, that's just to get to your permanent set of drawings. But then the contractor is almost going to throw that away and create an AS built BIN file which maybe doesn't have quite as much info design intent. It's just because of that word constructability. Can you unpack that more? It's a big problem to trust that

design problem. It certainly is a problem. Again, and that's one of the kind of big projects that we're trying to bridge. Constructability and compliance, . Let's say having the expertise of a trades person . Embedded into your design systems, it again, it truly is where we see BIM going next. BIM per se is essentially a documental form and it's a set of procedures to get to that result. There's nothing preventing you from making those mistakes. And this information is so fragmented today that it is very difficult for the essentially higher level stakeholders like the architects or the developers to have any purview whatsoever about that level of information. The decisions that they can make early in the design process that then have repercussions downstream are met with very little information. Those decisions are actually done on, again, on the permit wallpapers. And not on construction documents. The problem actually with that is that, yes, then when it goes out for bid, then the contractors essentially need to make it you know, doable, need to make it actually constructible, need to turn it into something that can be built. Efficiently again, as sustainably as possible. Within their own limits but that's really what they're trying to do. For us it's really again, embedding part of this knowledge, really. Part of this unwritten rules that go beyond, let's say, the rules of the trade themselves as prescribed by the building codes. So really kind of embedding into the knowledge that the systems actually have when they perform the design automation or when they help you to design. Having that purview and bringing that purview earlier and earlier in the construction design process is what we believe ultimately will be risk the construction process itself will reduce the amount of wasted construction materials due to mistakes of rework and then ultimately essentially really embodies and embeds the concept of efficiency, performance efficiency by default into a building design rather than as an afterthought or and a rush job.

19:24

Charlie

Well said. I keep hearing efficiency and resiliency, but how about sustainability? Let's zoom out for a minute. This is the Green Building

Matters podcast. We see decarbonization laws, we see the need for all electric buildings. And so I know personally you're passionate about sustainability. So how does Augmenta help with the sustainability of a new green building project?

19:46

Francesco

There are numerous factors. They all stem again from the really fundamental challenges that the industry has today. So there are challenges in terms of productivity that impacts sustainability. There are challenges in terms of risk and timing and cost of capital, the cost of labor, cost of construction material, let's say all of it really contributes to the ultimate sustainability of a bill because very few people have the budget, very few construction projects at the time that can be spent on minutiae work that makes the building extremely high performing or extremely detailed. So there's a catch 22 there. You can invest really heavily in a strong engineering process and a strong detail design process to reduce that. But the cost of doing that, the time actually to do that generally is unsustainable from the economics actually perspective. That's where we come in. That's where they work.

20:54

Charlie

You're gifting back a lot of time because you automate not just the busy work, but the optimal layouts. You're giving that engineer more time and more design feedback to spend on sustainability is what I'm hearing. And I think, as you know, we do a little bit of that with Schema on the base building side too. Let's keep running with that. What else do you see there on sustainability? You're absolutely correct.

Francesco

So again, they say that the fundamental avenues to sustainability that design automation brings are these. There is a direct correlation between

the amount of changes and rework. The amount of uncertainty that goes into a construction design document is directly proportional to the amount of wasted construction materials. As you know better than me, so 30%, sometimes up to a colossal amount, like 30% of construction material goes into a ditch instead of actually ending up in the building. And that's something that people rarely consider embodied carbon, as in, it is not physically part of the building, but it's still material that had to be brought to the site and then discarded. It still counts. Reducing the amount of material that is wasted, either due to too much local manufacturing, local assembly, local cutting, local essentially handling of the material, or by again, uncertainty in the construction documents that leads to actual rework, to actual errors. So reducing that is certainly an essential part of the equation. The other is the actual performance. The actual performance.
As you know, today we are mostly dedicated, our first agent that creates electrical systems. And so they say electricity performance is less of an issue in a building, but as we move forward into the new other trades like H Vac in the coming year.

H Vac is the largest offender, if you will, or this largest component of building energy performance. So building energy usage, which then translates into carbon emissions, of course. So having a system always try its best within the limits of the law and the building regulations, to create the most efficient possible design for H vac systems, for plumbing systems, for electrical systems, and all of them at once is what ultimately brings the other not substantial portion of sustainability game, which is the operational sustainability. Having an efficient design by default. Having people essentially create designs that are very efficient, not as an afterthought or not again as a rush job. Something that all buildings that get designed have this as a built in characteristic.

23:53
Charlie
We can bake in the best practices within a firm too. And that could be your

best sustainability practices. I love that. Maybe just one more question on computing, slash, just AI. We need more data centers. They're going to use energy, but you know, over here, do you need a huge data lake? Do you need a large language model? Or to the layperson listening to this podcast, it's not quite into AI yet. So you just need a smaller, what we call a SCHEMA data pond within a firm. So what, how do you look at how much data do you really need, say for Augmenta to do well on your next design build project for an electrical contractor? Like is it a lot or maybe not as much as people think?

24:34
Francesco
We are very conscious of the fact that data in construction is actually surprisingly stuck. There's certainly a colossal amount, but it generally has a pretty quick expiry date. That's the kind of a joke that I make. As in, data actually can get obsolete quite quickly. Especially some data. We have been very conscious of this since the very beginning, since when we started the company. We opted for a hybrid system that relies on data that we generate ourselves synthetically and data that comes from real world projects. You can imagine how self driving cars companies create their own artificial intelligence to drive cars around. No one could afford to drive in the real world thousands or millions of cars or billions of miles. It's something that would be impractical given the sizes of the data that is necessary or necessary. So what they do is that they create essentially simulators. So they create kind of virtual environments where they run these virtual cars and they create these data sets of these cars essentially driving in these environments and so do we.

25:50
Francesco
We have created essentially our own simulators that make kind of virtual buildings that the system then can use to train itself upon. Of course, the synthesis process takes a long time to perform too well. Whereas not the

learnings that the machine learning system can perform can operate actually at a much faster pace. So to summarize, it's a hybrid. It's a hybrid. So we do not need vast amounts of, let's say, new data. Any new data that we insert into the system allows the system to get better. It improves over time, so more and more amazing.

26:29
Charlie
I love it. Just following the work you and the team are doing. It's fantastic. Well, let's talk about the future. I usually ask what's coming at us in this green building movement, but you can also answer it if you want, even on the AI side of things. Like what should we be reading up on now, Francesca? What are you kind of excited about? What's next?

26:46
Francesco
I mean there's a lot, there is a lot actually coming up. Or again, as I was actually saying earlier. I think we're just on the cusp of a wave of innovation. Again we just saw each other again, going back to my Proudest moment. The first building that was actually mentioned earlier is not a luxury spa in the Emirates. It's a public elementary school in rural Michigan. So this really excites me to go in because it speaks to the impending democratization that this level of technology is going to bring to this industry and more broadly. And again, a true spirit to our name. This is really an extension of human ability. It's a level of technology that really transforms the way people work. It's not just a small aid or a workflow automation. Well, it's something that is truly beyond. Truly beyond what has been kind of seen before. I have to say. It's a combination of things because again, the affordances that this new wave of technology is bringing are absolutely astronomical.

28:00
Charlie

I'm excited about it and I do think that AI is going to help continue to solve this sustainability problem we have. And you're doing the work. I'm still passionate about this field. I love every bit of it, man. Let's get to know you a little bit more. Some rapid fire questions. What would you say is your specialty or gift?

28:17
Francesco
That's a tough one. I would say. Well, I think maybe if I have a virtue is that I love to collaborate with people. Like in, like for me, collaboration and surrounding myself with people who are kind of better than me is what I enjoyed actually the most. It's one of the things that I enjoyed the most in life by the day. If I had one characteristic it is that I assemble groups of people to do better than the sum of the part that starts. I think giving the trust to people and trying to understand and having them collaborate and always can bring up actually what's best is what traditionally has allowed me to find kind of the true kind of diamonds in the raft, if you will. And that's, I believe, actually one of the reasons why the team at Augmenta is so amazing.

29:07
Charlie
I think that can hold back some leaders when they feel they have to be the smartest person in the room. And while you may be the smartest person in the room at that specialty, maybe you're world renowned for it. This person could be world renowned for that. And then like you said, you add it all up and you're unstoppable. But I think there's some leaders that unfortunately may hire down just so they feel they have something of an edge from the smarts. And I think that's going to hold those leaders back. I don't see that all with you, and I just admire that. So let's get a bunch of brilliant people together and I can learn from them too. That's kind of what I heard there.

29:40

Francesco
Absolutely. And again, just to compound on that. I think that's the only way you can motivate people to go on a mission. Again, this industry, this field and this affordance. The potential to be so transformative that people have to be here beyond the technical challenge. Beyond what they care about, the economic impact or the social impact or the environmental sustainability impact by themselves, if you will. It's truly more than a job and gathering together. Actually, a group of this type of people takes, in my opinion, very humbly a particular type of leadership.

30:19
Charlie
High performers want to be around, other high performers want to be challenged. And that's good stuff. It is a mission and it is hard work. Maybe before we move on here I am working on building a tech startup. You've been doing it for a while. Just if someone has an idea maybe they might not have the resources yet, but they have a technical skill set. I don't know what helped you take that leap of faith? When you left Autodesk, you found your co-founders and you said, let's go for it. What I don't know, is it courage? Is it craziness? What helps make that leap of faith?

30:52
Francesco
As I said, like, as in maybe I have it. I can tell it's not about ambition. It's true. It's been more of a calling, if you will. For me, it was astonishing, the difference that we could make. So that really drew me to this opportunity. So there was nothing else but literally the acknowledgment via years of understanding and digging into the field, the realization to the aha moment earlier. The realization that I could truly gather a group of people to make a substantial difference, a substantial impact. It's a realization that. That is rare to have in one's life. Where you truly have a belief truly understand that nothing is against it, there's nothing that tells you that is impossible to do. that you have to work hard, you may fail even multiple times, but there

may a way to do it, and it's so worth doing that you leave everything else Behind.

31:59
Charlie
That's well said. That's really good, man. And it came back to that little bit of just encouragement. Well, let's talk about habits. Do you have any good habits or routines that help you stay on point?

32:09
Francesco
Oh, I think it's actually good to alternate like. Like strong focus sessions to will. Reading on your subject with something that takes your mind off and it's not off, just off the topic. But something that truly kind of gives you a difference. Different perspectives that your brain can process with a different mindset. And that's why I still play video games. I still actually have other activities in my life. It is not just to decompress. It's truly to exercise a different portion of the brain that normally actually would only in my case a very technical essentially aspect or very general business aspect would actually be less exercise.

32:57
Charlie
That brain's sharp, but it's sometimes not in your. The work in front of you. It's adjacent. I love that. It's good. And I'm sure you literally helped build up the gaming industry. The games these days are just incredible. . There's the resolution, the sort of. So next is bucket list as we get to know each other more. I'm actually a fan of the bucket list. Not everybody has a bucket list, but is there a certain place you want to travel to or adventure or write a book? What are a couple things on your bucket list?

33:24
Francesco

There are plenty. But let's say that certainly one of the things is I would love to travel to Asia and particularly Japan. I actually had the opportunity and privilege to live there for a little while, actually many years back and I left a piece of my heart there. So it's certainly on my bucket list this year. At the very least, return as a traveler for an extended period of time and hopefully actually can stay for a longer period. I truly enjoy Japan.

33:50
Charlie
I was fortunate this past summer to take my family Tokyo next to Mount Fuji, Kyoto and Osaka. So we'll have to compare notes that be such a magical place as we continue here. I love to ask my podcast guests, is there a book you'd recommend? Doesn't have to be about buildings. If not a book, may recent documentary or TED Talk. Just something our listeners might want to get a copy of.

34:14
Francesco
I mean this may be an odd one, but to my point earlier. So that is the book that I would recommend, people, lovers of or of motorsports or not.
So it's this book called One Day Will Be One Day We Will Win by Yoko Togasu. And it's the story of a group of Honda engineers determined to make the Honda return in a Grand Prix in motorcycling Grand Prix and at the end of 1980s, trying to essentially pull off something technically impossible. And the stubbornness and the passion and the sleepless nights and kind of the lessening there is that this group of engineers eventually failed to achieve what they set out to do. So by the work that they performed propelled Honda massively forward of almost any other car and motorcycle manufacturing in the 1990s in terms of technological breakthroughs. And this truly kind of embodies one of my favorite quotes from Soichiro Honda.
that success is 99% failure. So as in that people have the courage to try something unexpected and be prepared to fail. Because if you're not

prepared to fail, you can't really have a chance at moving the status quo by much. So this book is kind of fun in a sense and really very intriguing from another perspective.

35:46
Charlie
I'm going to go ahead and get my copy and read that during the next break because it sounds like it's for a tech startup too. I'm going to get my copy. Thank you. And to our listeners, we'll put a link to the book in the show notes. What a great recommendation. A couple more things as we start to wind down here at Christmas. Incredible interview. I'm glad to get to know you even more. So if you look back on your career so far, is there any career advice you wish you'd have known earlier?

36:11
Francesco
What can I say? A career advice I wish I would have known earlier. Let's see. That's a really tough one. I would say that an advice that I actually got from one of my later mentors when I was at IBM is to always try to think about your gifts, as in whatever it is that you know or that you have a skill at doing. Never take for granted that it cannot be applied to something really significant. So as in the fact that you today have a particular job or a particular trajectory you're working on something specific, it builds up your understanding of the world. You build an understanding of a particular set. So applying your knowledge and your determination and your passion to something that is earth moving. So it is not reserved to an elite of people. Wveryone should and can try to do it. And so the career advice that I had is that I should have personally started even earlier than I ended up doing. . So trying to pursue something really significant because truly, especially today, with the affordance of the modern technology, it is within reach for a vast amount of people to truly make a difference.

37:33

Charlie
Oh, well, a lot of wisdom there. We got it out of you and you lit up and that was a great answer. Thank you. Okay, last question. Let's say someone is listening to our podcast, they're getting inspired. Whether they're jumping into the green movement or maybe just this kind of AI inspiration, design movement, then all of a sudden's a new category. Any words of encouragement for someone just now jumping in?

37:56
Francesco
I think that there's just. There's never been a better time. I truly believe that. look at the industry as a wholeIt has been traditionally a very conservative industry. And it has been, let's say, a series of forcing functions that moved it towards adoption of technology. But I believe that the new generation of designers, engineers, new entrants in the construction industry, will only be more motivated by the introduction of new methods, new technologies. So even with this impending colossal labor shortage, I truly believe that it will be incentivizing for people to join the industry if the perspective is to be augmented, to be extended, and to have a chance to do much better than ever before. So there's really never been a better time to try your hand at improving the construction industry anywhere. Anywhere, in any capacity.

38:57
Charlie
Honestly, you nailed it. Come on in, we need some help. But you're , you have a lot more tools, you called it a mission. And make sure you're just working with the team, that you really can be a part of the way that buildings are designed in the future and it nets out to good sustainability. That's what I've heard here today. To all of our listeners, please connect with Francesco on LinkedIn. Let them know what you thought of the interview. Check out everything at Augmented AI, Francesco, my team at Schema, we just admire the work you and your team are doing. Can't wait

to partner more and just keep up the great work and I enjoyed you on the podcast today. Thanks for being a guest.

39:33
Francesco
Thanks a lot, Charlie. The respect is absolutely mutual and we'll be doing more and more. Z for sure.

39:40
Charlie
Thank you.

39:41
Speaker 5
Thank you for listening to this episode of the Green Building matters podcast@gbes.com, our mission is to advance the green building movement through best in class education and encouragement. Remember, you can go to gbes.com podcast for any notes and links that we mentioned in today's episode and you can actually see the other episodes that have already been recorded with our amazing guests. Please tell your friends about this podcast, tell your colleagues, and if you really enjoyed it, leave a positive review on itunes. Thank you so much and we'll see you on next week's episode.