Changing the Game with PinPoint Challenge™

CAPTECH TRENDS PODCAST | EPISODE 29

Vinnie:

Hello and welcome back to CapTech Trends. We have a really interesting podcast today that I think you guys are really going to enjoy. We're talking about sports technology, in particular, for this one, golf, and how you can accurately position a golf ball, on a golf course and all the reasons why that's interesting, and all the features and fun you can have with doing that. I've got two guests with me. The first is Clinton Teegarden. He's a director in our systems integration practice, out of DC. And second, new to the podcast, is Roberto Castro. He supports our sports practice at CapTech, and was actually a PGA TOUR player, from 2012, to 2021. So he has a lot of insight into the competitive aspect of this, and what professionals are looking for. He also is an industrial engineer, from Georgia Tech, so it's a really good fit for CapTech. Roberto, Clinton, welcome.

Clinton:

Thanks for having us.

Roberto:

Thanks Vinnie.

Vinnie:

Roberto, why don't you kick us off by helping us frame what we're talking about today, from a golf perspective.

Roberto:

Thanks, Vinnie. Yeah, we're really excited at CapTech. We recently debuted a new sports experience, called PinPoint Challenge™. We'll talk about the technology solution that enables PinPoint Challenge, but to set the stage, or state the problem, let's take a step back 25 years. How do you capture data on a golf course? And just think about the field of play, right? A football field is a hundred yards long. A basketball court is a couple hundred feet long. Baseball field is 400 feet to deep center. A golf course can be 7,500 yards long, the field of play can be 200 acres. Capturing data is really, really difficult, in a big setting like that. The PGA TOUR built a really incredible shot tracking system. So when I was playing out there, I had access to my stats, and I could see how well I was doing, or how poorly I was doing. And that was a huge, huge advantage. CapTech tried to figure out was, "How can we bring data capture to recreational golf? How can we have a lightweight, low cost solution, that would enable us to capture data, and bring a cool experience like PinPoint Challenge to recreational golfers?"

Vinnie:

And it's not just the size, right? It's also complexity, because it's not a level playing field. There are hills, and angles, and weather, and all sorts of other things that are more complicated than a basketball court, for instance.

Roberto:

Oh, absolutely. You nailed it. Just think about weather challenges. If it rains on a baseball field, they tarp it. Football has some tough weather, but basketball is indoor. And then think about the technology, and

the hardware. The broadcast. Broadcasting golf, you're laying a hundred miles of cable over the golf course. We used to walk across all these wires as players, and not think twice about it, but it's just a really interesting technology challenge. Broadcasting golf. Capturing data in golf. All of these things that we take for granted. It's an example of a big problem enabling creative solutions. And that's what the industry's really done.

Vinnie:

What's interesting is the ShotLink product, as accurate, and as impressive it is, it's a big operation. It's a lot of people. It's a lot of technology. It's a lot of networking and cable routing. What was asked of me, by one of our co-founders, Sandy Williamson, was, "Can we come up with a way that gets close to that level of accuracy, with consumer level devices, that could be used for recreational golf?" I want to tell this backstory a little bit, because I think it represents CapTech really well. He asked me to do that, and my first thought was, "He's crazy. There's a reason why this technology is so complicated, and so big, and so vast," but I got a notepad out, and a pen, and I started brainstorming some ideas. And I was reminded about a project. CapTech does a thing called, tech challenges, and we've had some podcasts about that, where we challenged groups of people in the organization to come up with innovative solutions, giving a pretty broad set of ideas, and keep the guardrails pretty light, so that they can actually be innovative.

And one of the things that came through that was, indoor wayfinding using phones, smartphones, for children's hospitals. And it was sub-inch accurate. It was crazy accurate. I started thinking about that solution, which I wouldn't have if we didn't do the tech challenges and these teams didn't come up with this. And it was pretty easy to convert that over to golf. And what's great about that is when we have these innovation challenges, and get innovative ideas, it's not a single point solution. You then start thinking, "Gosh, I could route people who are visually impaired through a subway station," or "I could route people through complicated, confusing conferences," or whatever else. It's a really good CapTech story from that perspective. But step two, was speaking with Clinton, and Clinton, I'll let you go here in a second. And having Clinton actually prototype that. It's one thing that draw on the back of a notepad, but then actually get it into a physical, real working environment, there's some challenges you have to overcome. So Clinton, why don't you talk a bit about how you took it from an idea to something that works.

Clinton:

Yeah, thanks for that. When we started with this, from a technology standpoint, we actually, like you said, started with the wayfinding, and that's all really AR based, augmented reality based. And it's using a lot of different sensors, and camera input, to then ultimately get the users where they need to go. And so we started that as our foundation, "Okay, what can we take in?" And as we started to peel back the layers, we realized, "Okay, well there's some challenges that we don't want to have to deal with on the golf course, such as having to go out way ahead of time, and set up really mapping the course, and setting things up." And so it started to evolve. We wanted to, "Okay, let's use some of those similar concepts, but find different technologies within a mobile phone that can do that."

Relying still on GPS, relying still on the camera, also using the compass. And then just any other information that we might be able to take in, to build something that would be just as accurate, but be able to walk out on the golf course, no setup ahead of time, and be able to have start taking in data instantly. And that's where we kept going back to is like, "We need to remove as many barriers as possible to make this useful." When we're talking about the ShotLink product, great product, amazingly accurate, but it takes about a week to set up, and two semis worth of equipment. And that's something

that we want to avoid, obviously. If we can walk out there, set it up, and get going, and any normal user such as a volunteer, which the golf community thrives off of could run this technology, that's where we want to go.

It was a lot of evolution, a lot of going back, "Okay, let's remove this part of it. Let's see what else we can replace it with." It wasn't just, "Well, we have the solution, and now it's just solving the coding problem." There's a lot of back, and forth, and just minor changes, and we're still making those changes. A year ago when we started building the ShotLander technology, we had three yard accuracy, and now we're getting about a sub one and a half yards, which is just a great growth.

Vinnie:

Well, that's on the fairway. How accurate are we on the green?

Clinton:

We are just as accurate in both. It really matters more how far away from the ball you are, as a user, and that's really going to depend on more user mistakes, than it is on the technology itself.

Vinnie:

But I thought you implemented measuring technology so that the greens were very, very accurate.

Clinton:

We do offer an extra measuring tape solution, so that if the ball were to land super close to the hole, and we're talking maybe less than a yard, or two, when we want to remove any inaccuracies, we pull out the phone, and open up a different functionality. And that one actually is using augmented reality, that's using dropping an anchor point between the hole, and the ball, to really get that measurement, and really double check what the ShotLander technology behind it, is actually outputting it. That's where you're going to get the sub one inch accuracy, if you're pulling that out. But we can't use that all the time, because the ball, it needs to be close enough to the hole in order to be able to use that, and get that accurate data.

Vinnie:

Gotcha.

Roberto:

But I love the story, Vinnie, of how Clinton came up with that. Like you said, if you hit a golf ball 15, 20 yards from the hole, it doesn't really matter if it's 18 yards, or 19 yards, a yard accuracy is plenty good enough. But let's say you're doing it Closest to the Pin competition, there's a big difference between 18 inches, and 20 inches, because it's going to determine the winner. One of our first testing events was in Sea Island, Georgia, earlier this year, and one of our colleagues hit a golf ball to about nine inches from the hole, and ShotLander recorded it as two and a half feet, or three feet. So it was an obvious error.

And we realized that as you get close to the hole, we might have to break out an old school tape measure, to really determine the winner, and we really need accuracy. And that just drove Clinton crazy, that we had built a digital solution, but might need to override with a tape measure. So he built a digital AR enabled tape measure, and I think that two weeks later he was like, "Hey, so I figured that out. You just use the phone camera, and now you're down to an inch." And I was like, "This is amazing."

Vinnie:

Clinton, you mentioned removing barriers, being able to walk up with no setup. There were a couple other things. I remember early on there we were doing some brainstorming around how you could find the position of a ball on a course, and we'll talk about why this is so valuable in a minute. But some of the ideas that we rejected early on, were rejected, because they impacted the play. Some of them would say, for instance, the caddy would have an app on the phone, or a device in their pocket, or maybe even a smart watch, that has a button tap, so they could walk to the ball, and tap it. When you think about that, you're like, "Well, that would be really accurate." But two things happen when you do that. One, you're asking people who are really serious at what they're doing to put their mind somewhere else, which distracts them, and they'll probably forget to do it from time to time. And most importantly, they have to walk all the way to the ball first.

Whereas, if with a solution like this, as soon as the ball lands, you can capture it, well before anybody even gets anywhere near the ball. These are a couple examples of things we had to work through, and reject, to make sure that it was as simple as possible.

Clinton:

Yeah, you're right. This is really challenging, because we need to do it as quick as possible, but with also staying away from the ball. There might be still players hitting more balls your way, or you don't want to interfere with the ball, where it lands, causing it to roll, or do anything. So we need to stay as far away from the ball as possible, ideally, even falling into the gray, so that nobody even knows that we're there. And it was really great at the last event that we just ran this at, most of the players that were teeing off, had no clue that somebody was standing down there doing this, until we pointed it out to them, "Oh, you see that person down there, they're actually running the product."

"Well, they're really far away from it. Can they get it from there?"

"Yep. Yep, they can."

Vinnie:

Roberto, can you talk a bit about, from a pro perspective, a couple things. I imagine there's a lot of tech companies out there that want the caddy to do something, or the golfer to do something, or my first thought was to chip the ball, so that we know exactly where the ball was. But I can imagine golfers don't want any variation in their equipment. What's it like as a golfer, when you know that all these different tech things are available, and people keep bringing them to you?

Roberto:

I think there are barriers to acceptance, professionally, and recreationally. Let's start with the pro game. You're absolutely right. In theory, it's great to have the caddy tap his phone, or do this, or do that. Well, you know what invariably happens? Weather rolls in, or you have a ruling, or you're on the clock, or you get down to Sunday afternoon, you're trying to win a golf tournament, and all those things are going to fall by the wayside. So putting extra work on the player, or caddy, is not really feasible.

And then switching to recreational golf, there are a lot of GPS only solutions, but the big barrier there, is interfering in an enjoyable experience. Taking your phone out between shots, I generally hit it in the fairway, and hit it on the green, and it's still a pain to even tap your watch, but most golfers, you're having to rake a bunker, you're trying to grab a drink, or a hot dog. There's too many things going on to

put more work on a golfer, especially to draw them out of what is supposed to be an immersive outdoor experience with their playing partners, and back into a digital world, in their phone.

I think that's one of the cool things about ShotLander is that yes, it does require a third party to track the golf ball, but participants in our, Closest to the Pin competition, don't have to do anything. They're like, "So what are you going to ask me to do?" It's like, "Nothing. Just enjoy yourself, and then you can still participate in this." And that's really compelling.

Vinnie:

I didn't think about it from a recreational standpoint, but as you were saying it, I was like, "Oh my gosh." If a group of four are on a par five, even if everyone pars the hole, there's been 20 phone interactions.

Roberto:

Right.

Vinnie:

And for most people, who aren't going to par the hole, you're talking somewhere between 20, and 30, or more, phone interactions, on one hole. That blows up any enjoyable experience.

Roberto:

Let's say it's recreational tournament golf, or a junior golf event. You're not going to ask those kids to tap their phone between shots. And then even if you're just playing with your friends. We did this exercise about a year ago. Three of us went to play a casual nine holes, and we each fired up a different stat tracking app, that runs off GPS only. By the second hole, we had all abandoned it, because you record a shot in the wrong... I just don't want to be clicking my phone a hundred times around, to capture my stats, and my data. The alternative with ShotLander would be, if we had somebody following our group, whether that's a caddy, or whether that's a parent in a junior golf tournament, again, golf is rich in volunteers. As Clinton said, that person could stay out of the way, capture golf ball locations, and data, from distance, and not interfere with the play, recreational, or I would call it competitive.

Vinnie:

Clinton, walk us through a use case scenario here, so that the audience understands what it would take in this type of recreational golfing event. Would you have one volunteer per hole? Do you need more than that? Are they standing in one location? So it's just one person with a phone, and a range finder, per hole, and you're good? Walk us through how that looks.

Clinton:

That's a great question. And the answer is yes, we could support all of those. And that's something that we wanted to, coming out of this, when we were wanting to deliver a product, we want to make it flexible for the various types of events that you might do. Such as the Closest to the Pin challenges, where you're actually just one person standing at one hole all day, and it's just one shot per person, or you're following a group of people, and you're tracking the same four people throughout the day, and you're gathering every shot. Or maybe there's one person at every hole, possibly multiple people at every hole, depending on how long the fairway is, and tracking all those points correctly. We actually support all of those scenarios to make sure that we have the ultimate flexibility to run the technology, gather the data accurately, and then, of course, output the data in a useful manner so that we can do

something with it.

Vinnie:

And what's the learning curve? If you had a group of volunteers, and you had a bunch of phones, and range finders, what's the training time, what's that look like?

Clinton:

What's really great about this, is I think ShotLander, and the PinPoint Challenge is a great story about all the different practice areas at CapTech. We brought our CX group in, and they got involved, and they ran user research. And I say all that to say the learning curve is very short. When we were introducing this to some college hires, I actually drove two hours to deliver phones to them that I had here, and that they were going to use, and taught them for about 10 minutes, and then they ran a whole event that day. And I never once helped them. It was pretty amazing. In fact, I think it was harder for folks to remember which number am I reporting from the range finder, than it is for them to actually use the mobile app, which is really saying something. Our CX group did a fabulous job of really putting together some great designs, and user flows.

Vinnie:

Let's get into the, who cares about this, we're talking about accurately locating a ball in 3D space. Roberto, who cares? What does that open up to us? What does that enable? What can we do with that information, now that we're tracking it, and now that we have it?

Roberto:

Like Clinton said, it can be used in various settings. We chose Closest to the Pin, as the first one, because it's the most accessible. If you do a long drive contest, two out of four people don't even get out of the golf cart, because they know that some big, tall, strong guy, is going to hit it the farthest. What's something that everybody can have fun with, everybody can compete in, and that's Closest to the Pin. And it just requires lower manpower. You need somebody on the tee, somebody on the green, to track a golf ball. And that's what PinPoint Challenge is. PinPoint Challenge, is the digital Closest to the Pin of the future. Instead of taking out a tape measure, pencil, and piece of paper, and the only thing you track is the current closest, so maybe two, three people, out of a whole outing, will participate in that.

We now capture everyone's data, and we can feed that into a live leaderboard, that has a map view. PinPoint Challenge was unveiled last week around the tour championship, in Atlanta. We supported a First Tee charity event. We supported a really fun happy hour cocktail event, that really surpassed my expectations. Instead of standing around slugging drinks, and food, we had about a 50-yard shot set up, right near to the clubhouse, and people could go down, and take multiple shots, and really participate in this cool experience. And as people were on the patio, they could follow the live leaderboard, and they would say, "Oh my gosh, look at Vinnie. He just slotted in third place. He hit one to five feet."

And then we also, around the tour championship am-am, which is where a lot of the top sponsors played at East Lake, the day after the FedEx Cup concludes. We had 160 golfers, over 12 hours, come through. We now know where all those golf balls landed, what the dispersion looked like, for amateur recreational golfers. We had it in the clubhouse, after. So when they're at the reception, they can check, and see whether they beat their buddy, who played on a completely different side of the golf course. Whereas before, you had no engagement once you left that green. PinPoint Challenge is the first use

case for ShotLander, but there can be many more.

Vinnie:

The innovation side, that I start thinking of is, once you have that extra piece of data, because you know who the golfer is, you know the hole, you know the course, once you have the extra piece of data, you can actually replay entire competitions. If you were to record, let's say it was a college tournament, every stroke, from every player. Using augmented reality, you could rewatch any hole you wanted to, with avatars in place. Or if you had integration into something, like a golfing game on your phone, or a PlayStation, or whatever, you could actually compete against historical performances. Or virtual reality, you can go in on the sidelines, and watch the flight path of all these balls. From an innovation standpoint, once you have that extra bit of data, it's pretty limitless what you can do from a creation standpoint.

Roberto:

Totally. CapTech is a national trustee of the First Tee, and we're closely involved with them. And this fall, we'll be exposing ShotLander, and PinPoint Challenge, to some First Tee participants. That's about to kick off here soon. But we've really gotten great feedback because it drives engagement. How do you keep kids involved In First Tee? You engage the kids, and you engage their parents. If the parents are into it, then the kids keep coming back. And there's just something different to sending a piece of paper home, like, "Hey, we drew on a map where your son, or daughter's seven iron went today," versus being able to capture that data, put it on a map, put it on a mobile website, and text it to mom, or dad, that night.

Vinnie:

You could actually do real time updates, every single time the ball is captured on the ground with ShotLander, it could update, and animate, an interactive web experience, where grandparents could be watching it seven states away.

Roberto:

Totally. You could spread it far. And that was one thing people thought was cool. If they hit a good shot, in one of our PinPoint Challenges, we would say, "Hey, text the leaderboard to your friends." Golf has become so social like that. I know if I get invited to play golf on a Friday, the text messages start flying on Tuesday, Wednesday. So it really can engage people, digitally, including parents. Like I was saying at the First Tee, it's really engaging for parents to see what they did. You have to go where people are. And right now, they're on their phones. If it's been a long busy day, even if it's not live, to get an email that night that said, "Hey, your son, or daughter learned these two, or three STEM principles, and this is how their progress is coming on their seven iron," it's like, "Wow, that's really cool. I want to continue to follow this progression and stay in the program."

Vinnie:

It's really cool how accessible this solution is, because if you think about the more technically advanced ShotLink technology, that's not available, pretty much outside of men's professional golf. And so this democratizes the technology, and gives that, not as accurate, but the same functionality, to basically any audience that cares to experience it.

Roberto:

Yeah, and it can go beyond golf. I've been following the really smart people who build this thing, like Clinton, along the way, and he tested on a soccer field, near his house. You can do, I think there's a CapTech offsite coming up, where we'll be throwing Frisbees at targets, and you can follow along, create a live leaderboard. It's just capturing geolocation, in space. It's a hundred percent correct. It's accessible, and just translatable to many different things.

Vinnie:

Clinton, let's get back to the technology bit, for the developers on the podcast. What were some of the unexpected challenges you had to solve for?

Clinton:

It was a lot of math, but it wasn't really unexpected. It was just more, once you get involved in it, you start realizing, "Man, there's some really complex math," that even just before this, I never really given it two thoughts about how even GPS works. And one of our first challenges was, "Hey, modern GPS technologies are only good to five meters." When Roberto's talking about some of those applications you can install from the app store or play store, and you're using them, sure, it's going to get you close, but their accuracy is going to be five meters, at the closest. Maybe they'll get lucky ever now and then, and really put you there, but that's what they're rated to. Then most of your other GPS technologies, and where they get more accurate, is to do what's known as substations. And so your WiFi, and cell towers, are used this way, so that it helps triangulate your position better by more than just your GPS.

And then on newer phones, we also are getting dual frequency GPS, and that really helps pinpoint your location that much faster. Once we were able to work through that, we were able to solve... Some of our early solutions were, "Okay, how can we help the GPS be a little bit more accurate," because we were having issues there. And once we were able to really do some research, and write some nice solutions, with some of our own custom math, that would take in all this data, and ultimately help find where the user is standing quicker, because that's where it starts. We need to know where the person running the mobile app is standing very, very accurately, because everything starts from there. And then from there, the next point was, "Okay, well if I know where I'm at, I need to know how far away the ball is from me."

We had started originally looking at AR technologies, using either LIDAR, or even machine learning. The problem is those are only good, out to about 20 feet. And a lot of times these balls are 40, 50, 60, 70 yards away, and we need to be able to stay that far away. Obviously those weren't going to suffice. So the most common off the shelf product that we can get to, that'll give us sub one yard accuracy, is a nice range finder, so we picked some of those up. Then the next part of the solution is really, "Okay, I know where I'm at, I know which direction to go, but there's 360 degrees around me that I could walk. I need to know which direction to go in order to really say this is the lat and long of the ball." And so we turned to the compass on the phones. I learned many things. One, that compasses don't point north, well, they point to magnetic north, which is different than true north. True north is what your latitude, and longitude is based off of.

Vinnie:

And that difference isn't a constant either, is it?

Clinton:

It's not. It's not constant based on time, or is it based on your location. There are actually currently, I

think it's a hundred miles difference between, the true north, which is literally actually right at the North Pole, like where the earth actually spins, but magnetic north shifts, and it continues to shift over time. And if you think of a globe, or something that's round, well, the degree of inaccuracy between magnetic north, and true north, can actually change based on how you're looking at it. If I'm standing right underneath magnetic north, and correlation to true north, they have zero degrees difference. But if I go a 100, 200, 300 miles to the west, or east, that's going to change. And so we need to actually base, even an offset, off of that. And so those are things that you learn along the way, because in early childhood you're taught, "Hey, if you get lost, get your compass out, walk in that direction."

And now I know it'll get me close, but it's probably not going to get me quite there, which is pretty amazing. And then that started, and we realized compasses are actually really inaccurate. There's a lot of interference that's right inside your phone, speakers are built off magnets, there's a lot of other technology in your phone, and your compasses are just wildly inaccurate. And so it's like, "Okay, well how can we make that better, and how do we solve for that?" And so we started creating some extra flows, and options, that users could take to help offset for some of those inaccuracies, which can tighten our window from being sub three, or four yards, to sub one, to two yards, of accuracy, which is pretty awesome.

Vinnie:

Is there a preferred platform? Is there any difference between using an Android device, or an Apple device?

Clinton:

Right now we are running purely on Android devices, and the reason why is it allows us for two things. One, modern iPhones right now are not using dual frequency GNSS chips. Ultimately, what it means is that from a satellite, we are getting two signals, rather than one, and that's going to help us triangulate our position that much faster, and much more accurate. If you think, ultimately all GPS is doing is, is a satellite out there, and it just emits a timestamp, over, and over again, and then you're on your phone and receives it, it does some math to calculate the distance between you, and that satellite, if you get enough satellites, then you can continue to calculate that. So it's just a long, long running math problem. So if I can double the input, then it's going to go that much faster. The other part is that, on Android phones, we are able to go into some settings, and turn off duty cycling. Duty cycling is essentially something your phone does to try to conserve battery.

When you actually go, and open up your map on, whether it's through Google Maps, or Apple Maps, your little dot appears, and it makes it seem like your GPS is actually constantly on. But really what it is, it flips on for a second, and then it shuts off for the remainder second, it might stay on for 200 milliseconds, get a few satellite readings, and it flips back off. And that's purely to conserve battery, and it gets you very accurate, but not accurate enough for what we're doing. So we flip that off, so that essentially our math problem continues to run, rather than having to restart every second, or so. And that really, really helps the accuracy of the devices. Everything else could be done on an iPhone, and in fact, everything could still be done on an iPhone. And we plan on actually testing it here in the near future, but we do expect to have a little bit more inaccuracies in the way of the GPS, just for those reasons.

Vinnie:

That's interesting.

Roberto, kind of rounding out this conversation, as a leader in our sports practice, where do you see this

going over the short to midterm?

Roberto:

I think for us there's a lot of, it's kind of a two track path. One is in the sports industry. In the golf industry, I think there's a lot of exciting things you can do, once you can build products on top of data, for recreational golf. And the second, is just cross crossing industries, which CapTech serves pretty much every industry out there. At the East Lake event on Monday, had a gentleman walk up to me, and say, "I don't really care where golf balls are, but I'm a GC in commercial construction, and I would love to know, in real time, the data on where my most expensive pieces of equipment are, and then where these panels that I'm installing are." He's like, "Can you guys do that?" And my thought was like, "This is exactly what we've been trying. This is exactly the point of ShotLander, and PinPoint Challenge. It's a creative solution to a difficult problem. And he has the same demand, and the same need." So that was a really light bulb moment for me, and starting conversations, and carrying over into the next creative problem that our folks can solve.

Vinnie:

If someone's listening to this, and they are involved in some sort of golf community, and want to experience this technology, is that available for people to do? How would they take that step, to start playing with this, or integrating with us to play with this technology?

Roberto:

Looking forward this fall, we will be supporting more charity events, a couple of corporate outings, because can really elevate your outing, by adding a cool live experience. We'll be supporting First Tee, and exposing First Tee participants to the STEM side of it, and we'll actually be doing some pro-am's, at some professional events. That's the day when amateurs play alongside. All of those things, we're open to adding more to that schedule. It's not a commercially available product, right now. We're really just proving the use case and proving the market. But open to any, and all ideas right now on how it could be further expanded in the golf space.

Vinnie:

Great. And Clinton, I wanted to wrap up with you as well. Over the next year, 18 months, are there any technologies pending, that aren't out now that are coming out? Refinements in the Compass, or GPS, or sensors, or whatever, that will continue to make this more accurate?

Clinton:

Yes, actually, we are actually right now, researching, going back, and using some augment reality, not necessarily for the AR at its core, such as viewing things necessarily in AR, but some of the technologies behind it. Google recently released updates to some of their AR packages, that allow us to position things in the world, using lat and long coordinates. So think about Pokemon Go, how they would position things, and they were really way before their time, and while we could do something similar to that, talk about doing something that is down to an inch accuracy, and they're doing that by supplementing the GPS encompass sensors with images, a lot of images, and specifically, they're using their Google Street view. And this is something that a colleague of mine have been having conversations internally about this, about how can we use maybe machine learning to help augment what we're doing.

To continue to bring that accuracy into more refinement.

And so something to play with. It certainly, again, you start to get into the areas of, "Okay, well that's going to require a bit more setup." But there's certainly a lot to be gained by doing that as well. So those are some of the areas that we've been looking at. And Google's release of that framework. We were starting to test it out, and play with it, and it's pretty amazing about how accurate it is when you're standing somewhere that Google Street view point through, and then how inaccurate it is when you're doing it on a golf course, and there's no Google Street view around you. And it really helps prove some of that theory out, and how it might be used.

Vinnie:

I could see if it is more complicated to set up, we can just have different options about you know...

Clinton:

That's right.

Vinnie:

As you increase fidelity in the app, there are additional things you may have to do. Before the podcast, I went out and I Googled ShotLander, and PinPoint Challenge, and there's a bunch of articles out there already. But if someone's interested, is there a place you would direct them outside of that, or just search on those names?

Clinton:

So CapTech has a sports experience microsite. You'll get a lot of wonderful information about what we're doing in regards to the PinPoint Challenge, ShotLander, and then everything else that we're doing in sports, and that'll be your best way of connecting with us, and also seeing what events we're going to be traveling to. Link URL

Vinnie:

Great. And if you want to hear more from Roberto, he has his own podcast. So I wanted to give you a second to give people the name of that, and a little overview of what you guys discuss. Roberto Podcast link

Roberto:

Sure. So I co-host a podcast called, the Course Record Show. It's available on Apple, Spotify, all the platforms, Google, and we talk about the business of golf. We've had entrepreneurs that have AI built swing models on, we've had former players. We have a guest coming up who is in the golf equipment side of things. So Course Record Show, check it out.

Vinnie:

Great. I think that wraps us up, Roberto, and Clinton. Huge thanks. Not just for coming to do this podcast, but I know the level of effort you guys have been putting in to take this from something that was an idea, to something that was a proof-of-concept innovation, to something that's actually a product. And for anyone who's ever done that, you know the difference between doing an innovative demonstration, and having something that's really product pass. It's a ton of work, a ton of edge cases. So thank you guys for being committed to that, and for joining me on today's podcast.

Roberto:

Thanks, Vinnie.

Clinton:

Thanks for having us.

Vinnie:

And for the audience, if you aren't following us, please do so, and we'll see you next time.