

# CREATIVE INTELLIGENCE

## WITH JAMES INGRAM

**EPISODE THREE: CREATIVE INTELLIGENCE, CAR DESIGN AND AI**  
WITH GUEST ALEX ALEXIEV  
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**James Ingram:** Hello, and welcome to the Creative Intelligence Podcast with me, James Ingram, host and CEO of Splashlight. This is a series of conversations exploring tools and technologies that fuel creativity and inspiration. In this episode, we'll be talking about using VR in car design. So I'm really excited to introduce this week's guest, Alex Alexiev, the senior designer at McLaren Automotive. Taking his inspiration from travel, cars, architecture, aviation and nature, his philosophy that design is a 3D art form is perfectly aligned with McLaren's vision, which is all about using cutting edge technology alongside craftsmanship. So Alex, welcome.

**Alex Alexiev:** Thank you. Pleasure to be here.

**James Ingram:** It's good to have you. So I guess to dig right in, why don't you start by telling us a little bit about your work at McLaren?

**Alex Alexiev:** I joined McLaren at the beginning of 2014, officially. And ever since then I've been involved with some of the exciting products that are out now, and obviously working on future products at the moment. We do thrive on, as you said earlier, innovation, so we look to incorporate unique technologies, not only in the cars but in the workflow and the processes we use to design those cars. So, McLaren itself is quite a small group compared to some other OEMs in regard to the design team – there's about 10, 11 of us total, including our director, so it does mean that we're quite agile, and it's really easy to accommodate these kinds of technology and elements. So for us, it's unique. I think for myself, speaking directly for myself, definitely is that it's a fast moving company. You're from one project to the next, so you're constantly in a creative kind of environment that pushes you to do unique stuff. So yes, definitely having a lot of fun for the last five years.

**James Ingram:** That's great. So when it comes to AI and machine learning and 3D printing, these different kinds of technologies out there, are you guys able to take advantage of some of that? How are you incorporating some of these cutting-edge tools?

Alex Alexiev: I think the automotive industry in general, there are some sides and elements of it that are very much locked in an environment where they thrive on the process that was previously used. However, as I said earlier, we do tend to adopt quite easily to new technology. So virtual reality is one that recently has definitely become a big part of what we do. A matter of about a year or so ago, my design studio manager, Mark Roberts, and myself, we worked for a local startup company in Guildford that actually develops gaming tech and AI in virtual reality, and through their drive and push to generate a new tool we designed Vector Suite, that's the name of the tool, with them, this a unique tool that works in parallel to the same principle that a designer uses to design a car. So in effect, you design this 3D workspace in virtual reality that a designer can put on a headset, he has all the same tools, you know, a pen, they could create line weight, he can control, and really draw a car in 3D. So, that's been an exciting tool. Now all the designers are kitted out, they all have the software and the sensors and headsets on the machines, so it's really good. And we have used VR previously in the sense of verification. So, as you design a car, you work with alias modeler that generates CAD data, basically the 3D entity of what you're doing in the computer. In this process then, we were able to review – and a lot of the industry does this, where you review 3D models of cars and interiors etc. – but that was it, pretty much, for the software. So it was a matter of just reviewing. Whereas, now with the new tool you can create...

James Ingram: You're like immersed in the whole...

Alex Alexiev: Yes. And in a matter of 40 minutes you can generate two, three, four different proportion models.

James Ingram: Is that right?

Alex Alexiev: So at that point, yes, you can quickly iterate and create 3D art form. Because at the end of the day, automotive design and product design, industrial design, a lot of it focuses around the object itself that you interact and use. It's not just a pretty picture in one view. So it quickly lets you understand what you're creating, and in some cases lets you adapt, and as you're designing it, really figure out some of the complexities around the shape.

James Ingram: How is it going from a classic way to design cars to using that tool? Did you find your mind thinks differently? Did you feel freer? Did you feel more constrained?

Alex Alexiev: I think in some cases, because one of the things, one of the attributes of the tool we have is that we can bring in engineering data, so

information and things we need to work with. So radiators, and bumper beams, and crash structures, things like that are requirements. So you'll get the wheelbase in with the suspension and all the other components in the engine. So you know which areas are key for the structure of the car, and to make the car work. But what this data allows you to then do is as you start sketching, you know exactly where it is. So that line that looks perfect on the piece of paper might not necessarily translate, but doing it in the tool allows you to see where that...

James Ingram: That now the radiator doesn't fit anymore.

Alex Alexiev: ... that a.k.a. hard point, exactly, as we call it, and work with it to help create a form and translate the design, or the idea that you have in your head, on a package that works. So it's really good because really quickly it can illustrate concerns and issues with the design, whereas those you'd have to first illustrate, you'd have to design them, then you'd have pass them onto a CAD member that will build the model and highlight those. But as you're doing it, you notice them immediately so you adapt and change and evolve the design to fix it instantly.

James Ingram: This is incredible.

Alex Alexiev: So yes, it has its benefits. Like I said, all of it's in the... with the plan to actually reduce the amount of time that it takes to design a car.

James Ingram: To get a design approved and working, and...

Alex Alexiev: Yes. And it's such a good workflow as well because I think, as you generate these themes, because we're all interconnected in the studio, I can send them across, for example, to my design manager, he can have a look at them, make a few amendments, and you have that instant gratification of knowing, okay, I've finished it, someone can review it, change it, and then we move on from there instead of waiting a week or two to generate CAD, to then set up a review, to then review with a manager and have input.

James Ingram: So it's quick feedback.

Alex Alexiev: So yes, you instantly cut back a lot of...

James Ingram: He can just go and put his headset in and remodel.

Alex Alexiev: The iterative process becomes quite quick.

James Ingram: That's incredible.

Alex Alexiev: So yes.

James Ingram: So do you find you explore more concepts because you can go quicker?

Alex Alexiev: I think you can, definitely. I find it a little bit liberating as well, because design and in general, these products are 3D. If something isn't working in one view, you can work in two or three other views to actually help solve and create a new form that does work. So it allows you to think in 3D, which is really good. And I think every designer hands down will say that the best part of working on a car, whether it's the interior, exterior, is working on the physical entity, in the clay, and this is similar to that, digitally.

James Ingram: Right. Yes, just like working in clay.

Alex Alexiev: So, yes, it allows you to creatively move and adjust volumes and surfaces that you effectively do in clay as well.

James Ingram: That's something. So I'm curious how much AI and machine learning is really getting used in the car design industry. Is it on the outside, is it more on the inside, performance enhancements, how is a designer as this... in context, and themes that you're seeing, is in the design process?

Alex Alexiev: I think there're multiple aspects of this data. Acquiring and then also using. But in our case, the design itself, you do tend to capture a lot of data regarding usage and how the vehicle is used. Obviously, a lot of it also comes down to, in particular side of interior design of a car, is ergonomics. So we do quite a lot and we have a full team of ergonomic engineers that actually look at the way people use cars. They look at comfort sections, they look at how people fatigue over time as they're using the car. They also look at the user experience side of things. So, with technology, all modern cars basically have screens in them, but all the information that possibly can be available doesn't always need to be displayed. So there's always challenges for us, and what we do quite well at McLaren I think is we always take out the unnecessary. So, you can have tons and tons of data, but you know, some of it will enhance the experience, some of it won't. And that's what we do well I feel, is that we take away the unnecessary. And that's a strategy we follow on the exterior and interior. I mean, a great example of that is a 720s. As we designed that car, it has a folding cluster, and so the information screen that's in front of the driver has multiple modes, a normal sport track, but one of the particular modes is this kind of screen override that actually folds the main driver display away and displays a smaller display, which at that

point highlights only crucial and critical information. Things like gear, speed, and revs, for example. So in an environment where, let's say you're driving down the road at nighttime, you don't need all those data sets and information constantly. So we found that through not only through the legal minimum required information, but through what actual customers use and care to know what information is necessary. So, if you're driving down the road at nighttime, you fold the screen away. You have the information that you need, no more, it helps reduce distractions and things going on in front of you. Or obviously, to the contrary, if you're on a track, you don't need to know what song title is playing on the radio at the moment. So yes, all that is taken away and it's all about the lean and efficient data that you need.

James Ingram: So, you're getting a lot of data through the machine learning, through AI, but then at the same time that's helping you understand the experience of that person.

Alex Alexiev: So, McLaren being a technology company, obviously all of our routes are born on the track as we say. So Formula One, this is where everything we've developed in the automotive sector has come from. So, there's a lot of data learning and sensors and managing that data that happened in Formula One that's ultimately translated straight into the automotive department of the company.

James Ingram: Yes, because I think what's interesting in creating., you have to create a product that is usable for the consumer, and then create something that is alluring, right? And has that appeal that a car needs, but also has to have performance on the outside as well, and the look. How do you think working together with these machines and this kind of technology, you're integrating that. Because I don't know so much about the car design process, are you given a challenge? In other words, the car's got to increase by three kilometers an hour, and how do we reduce wind drag, but yet how do we get something that's more beautiful or this kind of style? How does that information get to you in that process, and then you absorb this kind of thing?

Alex Alexiev: As we start designing cars, particularly in McLaren, what I find is a really unique experience working at McLaren is because engineering design, aerodynamics, everybody works together – and that's from the get-go.

James Ingram: Instead of super specialized.

Alex Alexiev: Exactly. Instead of one department finalizing their kind of creative bubble and handing it onto the next one and hoping some of that translates, we actually work together from the get-go where we talk

about the aerodynamic challenges we want to solve. Obviously we talk about the performance figures we want to achieve. What we want the interior and exterior to look and feel like, how the car is going to cool, where the airflow is going to flow around the car, how all that's going to work, you know, down force targets, all those things. And collectively, yes, we come up with a brief where everyone, respective to their department, can create unique and efficient technology to deliver that car. So, you know, some cars, for example, like the Senna, have really large targets when it comes to down force. I mean, the car creates 800 kilos of down force and weighs not much more than that. So, that being said, it does influence the way the car looks. The front splitters have a lot more frontal area, helps increase frontal down force, same as well in the back with the big wing. And then a lot of that, you know, working with the engineers can influence the design process of the car. So if they come to you and they say, okay, we need our data, for example, simulations have showed that we need this much open area for a certain intake, then that automatically influences what the designer is doing. In some ways it's a restriction, but in some ways it's an opportunity because what we do quite well if we're given an area target, and let's say it's given in a flat plane, the designer can walk around and work with the clay model and say, okay, what if we take a little bit of air in this way and a little bit that way we combine the two areas? So it's not as literal, and it's actually happened in the past many times, where aerodynamics will come up with a solution, and we'll challenge it, and then collectively we'll find a new better solution through the process of discovery. That's happened quite a few times in the past, McLaren and in particular programs that I've worked on. So it's unique. It's never an impossible challenge. It's always actually nice to think about different ways of solving the problem. And, yes, a lot of that comes down to simulations and whether it's structural simulations or aerodynamics and fluid dynamics, things like that.

James Ingram: Tell me about some of your creative side. I mean, to become a car designer is it all engineering, is it also in your creative side? What kind of profile is a car designer?

Alex Alexiev: I think in general, car designers overriding kind of element of car design is you have to love cars at the end of the day.

James Ingram: Of course, right.

Alex Alexiev: Maybe the sensation of speed and going fast and kind of... there's always an emotional element to cars as well. And particularly my case, I always loved cars. I mean, I was the little kid that was going crazy when a fast car drove by, you know, went to all the car shows, but I think an important side of design as well is the art and the ability

to create and to sketch and imagine things. So, I always loved art as well, so I always sketched, did the art classes, made sculptures, did things. So, going through school to be honest, car design is not the kind of thing you hear about too much. So it's a bit of a discovery process to find out, "Oh my God, this actually exists as a job."

James Ingram: Classic arts is what you...

Alex Alexiev: Exactly. That's generally what you think about when you think art and design in general. It can be, you know, there's so many facets to it. But in my case, I only found out about car design about junior year of high school.

James Ingram: Is that right?

Alex Alexiev: And then I figured, let me see if I can actually do this. So, I had luckily an opportunity to work with my dad at the time and we ended up building a car based on a couple of sketches. So it was that, that really got me fired up about design and subsequently ended up going to California. I had basically two opportunities to go either Detroit or California for automotive design. And at that point I figured, you know, California, I will take it.

James Ingram: California. Good choice!

Alex Alexiev: So I studied at ArtCenter College of Design, pretty much did a few internships while I was out there and worked in Japan, in Toyota Advanced Studio, just outside of Tokyo, did a Volvo internship, a couple of sponsored projects here and there. So I was exposed to these industry leaders that in many cases worked at the school as well. It allowed you to get this insight into the process and how it works. By the time you leave that university, you pretty much know every side of what you're going to be doing in the...

James Ingram: And it's classic training, right? Or was there a lot of the tech as well?

Alex Alexiev: Well, this is I think the important part as well because Art Center is interested in creating car designers. They do teach you about things like packaging. Packaging is the idea of fitting occupants, the engines and the components that make up a car and how they collectively make that car one item, so yes, you learn about packaging, learn about different technologies and innovations used in how they create things. Because when your designing a car, if you don't know the technology or the process that's going to be used to make that specific part or shape, it can quickly limit what you're creating. If a part is designed to be injection molded it will look one way. If a part is designed to be 3D-printed, as you mentioned earlier, it's almost open

to any opportunity because there aren't some of the tuning requirements and restrictions. So that's where some of those technologies are obviously influencing or are going to influence car designed in a completely different way. Because what wasn't possible before, from a stamping process or from an injection molding process, can be done without a blink of an eye now with this new 3D printing.

James Ingram: Talk more about that. What would that be like?

Alex Alexiev: In particular, 3D printing, because of its restrictionless ability, you can print shapes that you almost can't machine, you can't cast with standard process – so it allows you to really challenge the way the form looks, and that is something that is going to influence quite a lot. There's already some OEMs that have done similar things, and 3D printing engine components.

James Ingram: Really?

Alex Alexiev: Yes, bits and pieces around the car. But I still think we haven't seen enough of it implemented on the exterior of a car. Particularly the interior. There are a few companies in the world at the moment that are working on developing that process to the point where it can be sold on to a major manufacturer and used in the process. It has many benefits. Reducing tooling costs, for example, parts that are produced in a car can cost a lot of money per piece, depending on the brand. For us, for McLaren, obviously we don't make 28,000 cars a year, so you don't have the bargaining chip of volume with some manufacturers when you're creating parts. And maybe 3D printing is one way of doing that, where you don't have large costs associated with tools to develop components, so you can effectively print one-off pieces. That's going to be something definitely that industry will embrace, and then we're looking into.

James Ingram: Do you see the VR and the 3D printing kind of colliding to create even more inspiration?

Alex Alexiev: I definitely think so, because in the case of the VR you can generate quickly the shapes and forms, 3D print them and you can have that entity you thought about this morning in a physical form by the end of the day. That's the exciting bit.

James Ingram: That's remarkable.

Alex Alexiev: That's the exciting bit.

James Ingram: Now that the tools are advancing, they're getting more among us, and you see this in other industries that I've been talking with, how do you

challenge yourself and design team to press further now? To go beyond what you think you used to be able to do, and let the mind go. Because that's kind of what's happening right, the tool kit is getting bigger, although there's more data, but your tools to create are getting more sophisticated.

Alex Alexiev: Yes, they definitely are. Every time there's a new tool like that, there's a bit of a learning curve that goes with it. Obviously trying to embrace it and understand why and how it works. But I think we like that, we thrive on it, because it's when you create something unexpected you end up going, "Actually, that's kind of unique. Let's see if we can make it work and actually apply it to an area that you wouldn't expect." A great example is with something BMW did back in the day with the GINA concept, for example, that was a car that based around this framework and a stretched skin body. And as a result of that technology, and obviously at the time it was just a show car, but it helped create the form language for the cars that came afterwards. So with these really sharp crisp bone lines on the car. That in effect happened as a result of this fabric that was stretched over a framework, similar to skin over bones kind of thing. Sometimes it can actually affect a different part of the business you didn't even think about. You can create form language from this technology that is for a completely different purpose.

James Ingram: Interesting.

Alex Alexiev: So yes, there's a lot of opportunity in that.

James Ingram: Going back to your time at school, and how they're teaching you to get ready to use technology that you'd classically need to learn the design and the functions of putting car design – I know we kind of went a little tangent on 3D, because it's really interesting – but taking you back to that. How else did they prepare you for tech and things going away?

Alex Alexiev: In the particular case of the University there, the fundamentals were the most important. In my case, when we started, we were not allowed to use 3D software. We were not allowed to render in Photoshop and do that. The instructors, and most of them who have trained industry leaders at the moment were still at ArtCenter, they said, "Look, if you can't sketch with pen and paper, no tool is going to enhance that ability." So it all starts...

James Ingram: It's a similar process, yes.

Alex Alexiev: We do that daily at work. You walk around with a pad, and that's all you're doing all day long. All those ideas are generated with pen and

paper. Then they translate and get used in other software and technology. So if the fundamentals aren't there it almost doesn't matter what technology is capable of, because you need the creation of the idea of this vehicle first. So all those tools enhance that. It is really important to basically start out with the fundamentals, and we did. As you progress through the schooling process, you start to use the digital tools, you start to learn how to Alias. Because at the end of the day, most of my job, and my colleagues' jobs, is to work and interact with clay modelers to understand and obviously create beautiful forms. CAD modelers do the same. So if you can't speak the same language that they do, you're kind of in a tough spot. So as a designer, you're multitasking and working with different facets of craftsmanship, I guess you would say.

James Ingram: Right. When you're in school, you always see these sketches of incredible concept cars, where they're really just thinking of these bizarre... the way they look and things. How far can you go like that, when you're a designer? Can you push the limits really far? Then kind of convince them back into...?

Alex Alexiev: I think that's what we always do. In the automotive industry, we always work minimum 3-5 years out. But we do also have activities where actually think "What's a McLaren going to look like in 2030? What's the vision of the future?" Obviously we want to create a positive future, so we look to innovations now a days and actually challenge. Say, "Okay, maybe in the future the car will be able to do this and that." That's what we do, we have these moments of advanced design thinking where we come up with concepts, and in many cases this has now actually happened, and actually with some of those cases that, "Oh, this sounds way too crazy," are now in production. I'll give an example. In particular, a few years back when we started working on Senna, my boss at the time said, "Okay, let's take a few weeks here, and let's do a creative kind of inspiration phase. Where everyone just draw me stuff for 2030, let's see what we can come up with. And that way we have, in that case we have a roadmap of what we want to achieve."

James Ingram: What the future might look like.

Alex Alexiev: Yes. If you don't know what you want to achieve you're not going to do that much, to be honest. So we all pushed it. We all created some unique concepts. Myself and the rest of the team were all sketching. Some of the guys came up with some great ideas, in particular 720s, one thing we wanted to do was create this kind of cockpit environment where it was all about vision. It was like sitting in a fighter jet, you can have 360 vision around you. In a sports car, generally sports cars have compromised vision. Have compromises

here and there. That was something that we obviously achieved on the 720s and it's such a great experience to drive that car. At that time, that car was out, but we wanted to then push the vision thing a little bit further, so when the concept design phase was happening, the idea of the glass door was something that was sketched and proposed at the time, and Esteban Palazzo, one of the designers who was leading the program for Senna, subsequently obviously led that car through the design process. Now you have a car that's a fully homologated road car with a glazed door that helps bring light into the cabin, it makes the sensation of speed feel much more exhilarating. Down to even the basics of parking the car, now looking downward you can actually see where the curb is. So it enhanced many facets of driving the car. And some of those elements come from these creative phases, where we just think about concept and future, and what we want for the brand. That's really important, that's what they really push you to do in school as well, isn't it? You're not going to get hired for coming up with a car that's for two years from now because most studios are well past that anyway.

James Ingram: Right.

Alex Alexiev: So the further out you can think and the more you can innovate through pushing and trying to incorporate unique technologies through your designs, the better, really.

James Ingram: If you could have something made in the AI world, a machine learning, what would you want to have so you felt more inspiration, or you felt more inclined to create something even more special? Is there something out there that you would like to see in that world that would help you with what you're doing?

Alex Alexiev: I think one thing that is really unique and I find fascinating, and one thing we have done in the past as well with McLaren is we always look to biomimicry. So the way nature evolves, the way nature and things have become so efficient. There are some unique opportunities there to have an understanding of the way things morph and change and develop over time, in particular to looking at some of these parametric design strategies. We've investigated and obviously looked at some 3D printing technology, I think there are great examples of it out there. There's this one company based in LA, it's called Divergent 3D. What they end up doing is they create kind of almost bone structures to create really lightweight suspension.

James Ingram: Super strong.

Alex Alexiev: Exactly. Super strong, super light, visually light as well because of all the cavities and openings, but that has a very close tie obviously to

biomimicry. And what they've done is create these suspension arms, and these sections and portions of cars that look like almost kind of biomorphic-shaped. That look nothing like...

James Ingram: And you need the computer technology to help you with that.

Alex Alexiev: That is where you need the computer technology. Because some of the simulations that obviously the computers generate to help you transfer loads for suspension...

James Ingram: Metallurgy and what it can handle.

Alex Alexiev: Exactly. And that's where AI comes into play. It can then generate versions and shapes – some of them, yes, you need to make them aesthetically pleasing – but you can then input in to it to help create these unique shapes and forms. That I think is really exciting for the future, because in my case I think nature has always been the best indicator of efficiency.

James Ingram: Right.

Alex Alexiev: Look at some of these birds that can dive at 220mph, peregrine falcons and stuff.

James Ingram: Right. Studying them.

Alex Alexiev: Nature's impressive, yes. If you really look and dissect and understand why things look the way they do.

James Ingram: That's really great to hear. I think what is interesting in some of the other industries that I've been talking to, you go from these classic design situations where it's heavy on the mind, it's really whatever's in your mind, because there's no time to get all these collective types of data. As you seen, these things begin to change. Whether it's urban planning or architecture or interior design, or out here you're car designing, your mind can go even further, and you get to see if it's going to work. Where do you see other industries and where they're taking their design capabilities, and you say, "Wow, I wish we could get that into car design." Do you see anything from other industries as a designer or creative?

Alex Alexiev: Yes. I think in particular, one thing that has always influenced me, and some of the guys at work, is architecture. Architecture tends to be either very classical or very advanced. In reference to some designers, like Zaha Hadid, for example, making these very cantilevered structures that you look at and you go, "How the heck does that stay up as a building?"

James Ingram: How does it work?

Alex Alexiev: But I think in her case as well, she has really looked to nature to these beautiful shapes and overlapping forms and all that. That's something we have looked to in the past, I've looked to it in the past as well for inspiration, for design. Creating lightweight structures in the interior of a car, for example, that create kind of a really layered approach to the design. It looks visually lightweight but it's complex in some places as well. So architecture is a big one. There is a lot of innovation with some buildings that change and adapt their shape based on light, for example, obviously to cool down or keep privacy in some cases, but it's still as adaptive, moving active panels. That relates straight back to what we do at McLaren.

James Ingram: Like your speedometer display control.

Alex Alexiev: Exactly. Whether it is closing off intakes on the exterior to help clean up airflow, or redirecting air and all that. A lot of those pretty much tie into the same mindset of panels that move and change and adapt. A lot of that is, and can be developed, in the actual substrate. In the actual product. So that it has almost the intelligence to know that if this panel heats up to a certain degree or temperature, it moves. So it adapts and changes – so I think that's unique. In the future we'll see a lot of that, in my opinion. It's almost sci-fi at the moment, but it is possible. It will be cool to see something on the cars.

James Ingram: You wonder, you look at Jarvis in Iron Man. How far away are we from you having a Jarvis.

Alex Alexiev: Exactly.

James Ingram: You just ask it different molecular structures designs run a scenario.

Alex Alexiev: It will happen, I think it's inevitable. But I do also recognize some of the, at the moment, challenges with it. I'm sure you've had this scenario where all of these smartphones we carry around, and they're great, and they can do everything, but as soon as I go out to the Goodwood area or Brighton somewhere, you're just far enough away from a cell tower – all that technology can't do anything.

James Ingram: It can't.

Alex Alexiev: So unless the infrastructure is there, and the connected devices we have can actually work with no fault, I think we're still a little bit off, time-wise. But that doesn't mean that in smaller environments, inner city environments, I can imagine that just starting and growing as an

incubator through these little city environments, and just expanding out from there. So I think yes, it's exciting what it'll do, it'll challenge in particular our industry in car design, because at some point the car will become, and a lot of people are already looking into it, as the shared device.

James Ingram: Yes, it's just another device.

Alex Alexiev: At that point, yes, I do start to personally challenge and think, well, "What is a car at that point? Is it mobility, or public transport? What is it?" To me, a car is something that gives you the opportunity for freedom. You can jump in it and say, "I want to drive 500 miles that way," and just go. And it's when that product becomes limited, that's when I start to question if it's a car or mobility.

James Ingram: Right.

Alex Alexiev: But... yes.

James Ingram: And then electric cars, self-driving cars.

Alex Alexiev: Exactly. Yes.

James Ingram: There's a lot.

Alex Alexiev: Yes.

James Ingram: I mean you guys are... you are specialized in car.

Alex Alexiev: Exactly.

James Ingram: Kind of kills the point to have a self-driving race car. Although, I did see that there's a race coming out where they have these autonomous racing cars.

Alex Alexiev: The Roborace series.

James Ingram: Yes, the Roborace series.

Alex Alexiev: Yes, with some of Daniel Simon's work there. But yes, I think it will be interesting when you take the driver out of it, because in most cases nowadays, you watch Formula One, it's about Hamilton and Alonso and Vettel and all those guys, and it's about how they use this machine to achieve a result. But when you take the human element out of it... yes, it'll be interesting to see.

James Ingram: What was interesting is though, I talked to that gentleman at a race, the Formula E race in New York, they were talking about the race driver, the race car driver, now is actually the mathematician in these scenarios. Because they can take the cars at hyper-performance and put them through riskier situations because a human won't be impacted. And so you have basically a race of math. Now you've got these mathematicians and designers who have to design a car. So it's a different racer.

Alex Alexiev: Yes.

James Ingram: Like you see drone racing going on. So what do you think about that? If you had to design in these different scenarios, take... do you see, in your tools that you have now, something you'd almost have to have to design to those more complex scenarios.

Alex Alexiev: I think in some cases it will make the job easier. Because like I said earlier, within the design process of an interior it's all about the human and how he interacts with the product.

James Ingram: That's true.

Alex Alexiev: But if you were to take that away, I think there's so many opportunities for what the shape of the exterior could look like, because at that point... generally, the cabin is the biggest thing in the volume.

James Ingram: It restricts you.

Alex Alexiev: Yes. Where if that's gone, you can create some really sleek and innovative and unique-looking shapes. So it'd be an interesting challenge to do.

James Ingram: Interesting challenge, right?

Alex Alexiev: At some point yes, look at that.

James Ingram: That's very cool.

Alex Alexiev: It's cool.

James Ingram: That's very cool. So I think what you're saying is, if I'm understanding, these tools are in your everyday processes. VR... do you feel they're at a point where they're seamless? Like your creativity is kind of the same, whether I did a pen or I'm on digital? Has it matured?

Alex Alexiev: I think they're pretty seamless. I mean, you can go from a sketch to VR and back into CAD pretty quickly and efficiently. I think at the moment, sometimes they don't talk quite well. Some software doesn't work with this input, or that input. So you do have to find workarounds to make it happen – but with enough will anything is achievable. I think we find ways of delivering what we're after at the moment. I think it'll only get better in the future. And a lot of it comes down to computing power as well. Some of the software is getting so heavy that you need to have really appropriate machines to operate it.

James Ingram: Or it is slowing you down...

Alex Alexiev: Exactly.

James Ingram: Or it's not fast enough to render, or whatever.

Alex Alexiev: Exactly. So in particular case to McLaren we do a lot of this real time rendering. So we also have some new ways of spec'ing cars with customers. We use Unreal Engine as one of our technologies that help generate a lot of the configurators that you see now as well. So it's almost this photo-real environment that you can change, and it's not something that you need to program previously and then run through a loop with the customer. On-the-fly reflections are mapped onto the car.

James Ingram: You can change the aesthetics and color.

Alex Alexiev: It just, it makes it faster and makes it much more hyper-realistic almost. And that's kind of what we need now, because the good enough brochure of the past isn't good enough nowadays.

James Ingram: No, it's not. And then the feedback, so as a designer in cars, because you're so far out, how are you looking to get input from if the consumer's going to like it? Because other creative industries, they have to worry... it's quick, if I design something and you don't like the house then I have a problem. Or if I'm designing apparel, these clothes are out quickly. How, in the car, when you're that far out, are you worried about or taking into consideration what the consumer might like?

Alex Alexiev: Well, I mean, in car design, you do tend to always look to the vehicles you've just done, for example, and find elements that people have either had challenges with or would like improved. And people that are buying £200,000-£300,000 cars, or in some cases more than that, £1m, they'll tell you if something's wrong. They're not going to sit quietly. Which is really good for us because we want to know. And if

certain things are to improve, a lot of it comes directly from our customers, our dealers, because they know the customers quite well, and often times will supply information for us, for things to either look to in the future and design and then enhance.

James Ingram: The racing teams.

Alex Alexiev: The racing teams as well. Sometimes though it just comes down to common sense. In particular to the 720S, I'll give you an example there of what we did, a lot of the switches that are located in the central tunnel that operate the car at normal sport and track mode, obviously as well as driver verse neutral. A lot of them were based in the center, and just from using the car, and actually driving the cars on the weekends from time to time, you kind of get this understanding that maybe these switches are a bit too far back, maybe we should make it a bit more user-friendly. So what we did on that car is we shifted all of the driving controls up and forward in front of the driver. So you don't need to look away when you're going into reverse.

James Ingram: Wow. Yes so you just...

Alex Alexiev: Some of it just comes naturally because you start thinking, "If I'm using this car would I want to look down?" And alternatively, if you're on a track and you have a helmet on you can't look down. So a lot of input does come from our development drivers as well. So we have a team of development drivers that are assigned to different segments of cars, sports ultimate series. And they basically will provide feedback that some of it's on track experience, some of it is on road. And that's where a lot of these innovations come from, is listening to the customers, listening to the technicians and the drivers. Because at the end of the day, when you use the product you'll find ways of improving the next generation more and more.

James Ingram: Right. Functional design being used, and then you have the creative side of the design, where it's just pure aesthetics.

Alex Alexiev: Yes.

James Ingram: Well obviously it's not pure aesthetics, because you're talking about it's got to perform, it's got to create something. There are industries where they have so much freedom to create, they don't have those restrictions. They're not trying to create down pressure, they're not trying to create safety. They're pure aesthetics. But yet there's these industries... those industries are changing. There's more and more information and data coming their way. And it can make them nervous, like it's going to make them less creative. What would you

advise someone like that? Here you've got incredible requirements for your creativity. To perform. How would you encourage someone to not be afraid of that kind of information, and you can still challenge yourself?

Alex Alexiev: Well I think being unshackled I guess, as a designer, as an innovator, is always important. But I would say definitely, if you're looking to create a product or a service that is marketable, that's something that you can generate money from, you do need to solve a problem. It can't just be design or form just for the sake of form. So I would say embrace the data that effectively enhances what you're trying to develop. And in the cases that it doesn't, particularly to McLaren, we don't do vans and we don't do buses and all these other alternative means of transport, because we want to focus on what we want to focus on. So yes, definitely stay tried and true to what you want to achieve, but in some cases of usage case and marketability, you have to adapt over time and incorporate unique inputs.

James Ingram: As a commercial artist, basically.

Alex Alexiev: Definitely, because we don't do this just for the sake of art. We do it also for a living.

James Ingram: Yes it's true. So it's got to sell.

Alex Alexiev: So it is great. And I think some of the gaming industry recently is now... obviously with the incorporation of VR I think, Sony with their Gran Turismo game, now have incorporated virtual reality. So the game is virtual reality capable, there is multiple games and platforms that they've developed that are very interesting to play. I've played it.

James Ingram: Yes, I would love to talk about that, because McLaren's in Gran Turismo.

Alex Alexiev: So we did, that was one of those unshackled experiences for me as a designer because I was able to create and work on the ultimate Vision GT for McLaren. And in that case, it is almost boundless.

James Ingram: Just for entertainment.

Alex Alexiev: Just to do whatever. But we almost had to put some restrictions on ourselves to say, "Okay, well, let's create a brief, what is this all about?" So the car we designed...

James Ingram: So you had to put restrictions on yourself?

Alex Alexiev: We almost did, because you could go way too crazy. And some of the things we thought about, okay, from a driving perspective, we're designing a car in a video game, obviously we can challenge some things but what do we want to do? And first we wanted to make it one of the most engaging cars to drive, hence the driving position. Leaned forward, you're actually experiencing the sensation of speed much better than you were if you were sitting back. It's almost like being on a motorcycle. Then we said, "Well, what about visual inputs?" In that forward facing position you could see the suspension arms, because the whole cabin was glazed, even below the waistline, as we call it, which is below where you can usually see. So because it's all glazed you have the suspension that's visible. So you come into a corner, the suspension moves. You're giving further inputs to the driver as to how fast he's going. He comes into a hard corner, the brakes, which are centrally mounted, also glow. So you're giving them even more information of what's going on around the car. And it's, I think, those elements that help create a unique racing experience. So we had to put that challenge onto ourselves and say, "Okay, how are we going to enhance what it feels like to drive a McLaren in a video game?"

James Ingram: That's amazing.

Alex Alexiev: And as a result...

James Ingram: I'm sure there's some design process.

Alex Alexiev: There is, yes. That was part of the design process. And then obviously at that point we wanted to work without other teams, you know, aerodynamics and Powertrain guys, to say, "Okay, in the future, that's 10 or 15 years from now, what will we be able to achieve?" And they'd say, "Really? You're asking us that question? But yes, this will be fun. Let's see what we can do." So they proposed some things with the Powertrain, they proposed some things with active aerodynamics, particularly in the way the car steers and controls, so... and those are all obviously things they're aspiring to do in the future. You can do it in the video game at the moment, but it will be unique when one day some things like that do happen.

James Ingram: So who would have thought that the video gaming world actually became a prototype exercise in a way...

Alex Alexiev: It can be an exercise in the aspirations of a unique design on a car.

James Ingram: What a great experience.

Alex Alexiev: Yes, definitely, it was very fun.

James Ingram: That was a great experience. Well I think some of the things, the takeaways, if there was a couple of key things that you feel you're proud of, that you've been involved with, the tech and the integrations, is that game probably one of them? Or is it the VR?

Alex Alexiev: I think I'd say definitely the VR, because I've always liked 3D generation. Whether it's in digital form or in physical. So VR was that kind of first tool, and I'm really happy that McLaren was one of the first companies... because we are a technology company, I had no doubts that we would push in that direction. So yes, very happy to be involved with that. I've done a few events with my manager, Mark, here, particularly in London. And we're actually doing a series of design nights globally, at McLaren dealers, where we talk about McLaren design, we showcase the tool. We really show some of our customers and prospects how we create the cars they aspire to have. So yes. I think definitely the VR tool and obviously the gaming because of its unshackled element. But there's nothing more satisfying as a designer than working on a car and seeing it drive past you down the road. So that's always a very pinch-worthy experience. So yes, definitely very proud of that.

James Ingram: That's really great. The theme of this podcast is on creative intelligence, and there's a lot of research designers have to do. But if you can use these kind of tools to accelerate the research, it becomes intelligence in the sense that it's put in front of you. And you've got more data to use, you've got more experience to get physically, the tool kits you're talking about. And I can hear it in your voice and see it in your face... listeners can't see your face, but you have a lot of passion around what you're doing. And I think the main takeaway is that these restrictions, you almost put them on yourself to be more innovative. And that these other industries, that other creative sectors, that are getting influx of technologies, data, inspiration, shouldn't be afraid of it. But they should use it to make even a better product, even something more creative and more commercial application.

Alex Alexiev: I completely agree.

James Ingram: That's great. So thank you again Alex, for joining, and being so passionate about what you're doing. To find out more about the podcast, please visit our website at [creativeintelligence.fm](http://creativeintelligence.fm) and follow us on twitter @theCQpodcast. You've been listening to the Creative Intelligence podcast. Thank you for joining me, James Ingram, and my guest Alex Alexiev, for what's been a stimulating and informative discussion.