In this video we're gonna take a look at the future of gaming. How will video games evolve by 2050! Will artificial intelligence take over(захватит власть) and build the games while we are playing them designing the levels based on how we are feeling?

Today you can already put on full body suits that let you feel the hits in a game and even changes in temperature or what about making the real world digital by **wearing a vest**(одетый в жилет)

that lets you feel the g-forces while you are flying a real-world drone. And what are the freaky and sci-fi ideas that experts are thinking about when looking further out into the future.

First let's take a look at how the real world and digital world are being fused together to create sci-fi light games. Today there are toy radio-controlled cars that are equipped with cameras. Using VR goggles or a **dome display**(купольный дисплей) lets you see from the view of the race car as you race around in the real world. This is more common with drones. You can use goggles to see the live view from the drone's camera when flying. Making it easier to fly over long distances. This is called first person or remote

person view. The next step to this is to add digital elements **mapped to the real world**(отображённый на карте реального мира). Just like how you have augmented reality objects and games are digitally **infused**(наполненный) with the real world. This could be done with these first-person goggles.

So, as you are flying your drone there are different checkpoints and missions to play think pokemon go

meets drones.

You can see this in action with the mekamon robot. The name is a combination of mech and pokemon.

Mekamon is a four-legged robot. **It features a camera**(Он оснащен камерой) that can be used to live stream what mekamon is seeing to your phone or tablet. Using an AR overlay in the app players can simulate battles between their robots. In battle mode the AR can display virtual battles and use a damaged scoring system to determine the winner. What will happen if this thing gets linked with **haptic feedback devices**(устройства тактильной обратной связи). These are devices that use motors compressed air and other methods to let you feel what is happening in a virtual gaming world. Something that we will talk more about later in the video. This would let you feel what is happening when you play with these real-life robots. Say in a battle your robot suffers damage you would feel it. You could feel when you crashed your radio-controlled car, feel the g-forces when flying a drone or feel when you get hit by a laser. Imagine playing laser tag with augmented reality. You could see the lasers shooting around. You would feel where on your body you get hit and the game modes could change without needing to change the physical space.

Let's move further out into the future and look at more traditional video games. Not only will there be devices that let you feel what is happening in the game. But these same devices will tell the game how you are feeling at all times while you are playing. Using consumer headsets available today it is possible to measure different moods such as stress, boredom or relaxation. This could then be used as a feedback mechanism for a game. Allowing game characters to react to your mood or the game can generate storylines based on how you feel and based on how you felt during past storylines.

For example an **intimidating character**(пугающий характер) could change what they say

and how they say it based on what makes you feel more comfortable. Also if a character **annoys you**(раздражает тебя) maybe their voice or actions aren't a positive experience for you then the character could automatically stop doing certain things. This would mean that the characters would have artificially generated voices and personalities that can generate their own interactions as opposed to pre-recorded sound bites. This would lead to characters that are different for every player but ones that give all players the best experience.

Another example is a horror VR game that would aim to make you afraid enough that you enjoy it. But not so afraid that you stop playing. So, as you play not only do characters get to know you but new missions and worlds will be created by the artificial intelligence based on what they have learned from you creating a perfect but different game for every player that never ends.

The closest example of this today is work done by Nvidia where an AI created a virtual city to drive around solely from a video or a simula AI that created the pac-man game purely from playing it. And what happens if social media gets **involved**(причастный). Google and Facebook already know if someone **enjoys the outdoors**(любит отдыхать на свежем воздухе) and interacting with **certain breeds**(определённые породы) of dogs for example,

the game could then be automatically developed based on these preferences.

Defines where you are you could be in a computer on the other side of the world. When talking about whether we are living in a simulation Elon Musk says that most likely there are many simulations.

In the end these simulations can create their own simulations. So, video games will be able to build the game while you play but then the game that is built will create new worlds and games within it taking you deeper into the simulation.

Let's move on to the devices being developed right now. That are taking humans further into the

digital world and see how these devices are putting humans into video games.

There is the Tesla Suit no relation to Elon Musk and Tesla. The suit has a biometric monitoring system so it knows how you are feeling. The system **gathers data**(собирает данные) during use, from emotional states, stress levels, heart rate to other key health indicators.

When wearing the suit, a user is able to feel touch, weight and even temperature in games and simulations. And you are able to feel impact and weight through the use of 80 electro stimulation

channels. These send an electrical charge to a part of the suit to make you feel different things. So, if you put on a VR headset and the suit you could end up being sent into Ancient Rome.

As you walk around you can feel the heat of the summer **pouring down on you**(льющийся на тебя).

In your hand you feel the splintery wood of your spear. A hundred screaming soldiers then come

running towards you throwing spears. One hits you and you feel an impact on your chest

Being able to feel what is happening in a game known as haptic feedback can be traced back to the 1970s. Sega had a motorcycling racing arcade game called Fonz and it made the handlebars vibrate during a **collision**(столкновение). Haptic feedback then became popular in console controllers such as Sony's dual shock. Over time these haptic feedback devices have morphed into more sci-fi-like technology in 2007 Novind created a 3d haptic feedback device called the Falcon. Disney came out with a device called air reel which blows air vortexes, puffs of air letting people feel virtual 3d objects. this means that no devices need to be worn. And then there is Ultra Leap a company that uses speakers that send out ultrasound waves that let people feel digital objects. Ultrasound haptic feedback is similar to feeling the beat of the music at a concert from the base speaker. But with ultrasound it is at a much higher frequency than what humans can hear. Controlling and concentrating the ultrasound can be used to create 3d shapes **that can be felt**(что можно почувствовать.)

All sorts of other devices are being built to help us dive into digital worlds. There are shoes, belts, vests and gloves. When it comes to the human body our hands are one of the most sensitive parts. they allow us to gather a large amount of data about our environment. We can tell how large an object is by squeezing it(сжимающий его). What temperature the object, is how hard or soft, it is solid or squishy and what material it is made out of.

This means that there is a lot of focus when it comes to bringing our hands into the digital world.

A company called Hapdex is creating a glove that allows users to feel a number of different **sensations**(ощущения) in a digital world. The **gloves**(перчатки) have 130 contact points on them. Little bladders of air that get puffed up allowing users to feel digital objects on their hands such as individual raindrops or a little digital fox running around on their palm. And the glove's ecoskeleton creates resistance for the fingers letting users feel the shape, size and weight of an object. The same gloves can be used for remote robotic control. So, a user would be able to make a real robot pick up an object in a factory, play basketball or perform surgery while feeling every interaction.

Could this mean that instead of making humans feel the digital world humans instead control real robots?

Creating a video game in the real-world robots fighting each other and the humans feel the interactions.

Haptex is also working on technology that will let users feel the temperature of digital objects. This is being done by having water sent to different points on a glove and the temperature of the water changes based on what you are touching in the digital world.

Another way of feeling temperature in the digital world is through smells. In the real world about one in two thousand people have a trace where one of their senses is combined with another. They are able to see sounds as colors or visions of colors can come from the taste of food. This is called synesthesia. Moving forward artificial synesthesia is now being developed to bring our senses alive in the digital world.

Computer scientists and researchers from the university of Chicago have been designing a device that sends **odorless**(без запаха) chemicals to your nose that will make you feel different temperatures in virtual reality. Capsicum from hot peppers does not have a smell. But when it is inhaled it triggers warm

Feelings while eucalyptol brings cold feelings. Eric Parent created synesthesia glasses that cross-feeds your hearing and visual senses using augmented reality. The glasses can mimic a psychedelic induced type of experience by mixing human senses. Zachary Howard created a mask to mimic the effects of synesthesia using a color sensor microprocessor and essential oils. The mask controls the inputs to your nose and mouth that then turns colors into smells.

Let's take a look further out into the future. In this sci-fi reality all of the senses from touch to taste could be reproduced by stimulating the brain directly. It is the idea of streaming games directly into the brain. This would mean that we won't need gloves, suits or other devices to stimulate our senses in a video game. Instead there will be just a singular brain to computer interface headset that gives all of the senses full immersion and your gameplay could even be recorded and replayed.

Companies such as Elon Musk's Neuralink are developing implantable brain to machine interfaces. But these are aiming to be used as medical devices for now. Gabe Newell the founder of video game company Valve says that we are way closer to the Matrix than people realize.

If you would like to see the extended research that was not included in this video such as what does Elon Musk have to say about Starlink and how it will help with more complicated video games then head over to our patreon membership. The link is in the description. And on the next episode of venture city we take a look at origami and the high-tech ways it is being used from space tech development to micro batteries.