* How many file types?
* What are the major types? What are the major differences between them?
* What is the difference between a container and a format?
* What main file formats would you consider?
* What are the main CODECS used and why would you choose to use some for your project?
* File size versus Quality - explain what this dilemma means for digital video and what Video attributes can you manipulate?
* What are some of the basic techniques you need to consider when recording live video for your project?

Animation / Augmented and Virtual Reality

* How is Animation different from Video?
* What is the difference between AR,  VR and Mixed Reality?
* What would someone need to participate in these experiences?
* Could you use them in your project development?
* Where do you see Digital Humans fitting into the Animation / VR / AR /MR development possibilities?
* What was your experience with Sophie, the COVID-19 Chat Bot, like?
* 2D versus 3D animations - what's needed and why would you use one type or the other?
* What main file formats would you consider?
* How are you going to create animations for you own project?

**Difference Between Animation and Video**

Animation is an art concerned with drawing sketches of an object and showing them in a sequence so as to make them look like a moving and living thing.  On the other hand a video is a recording of still or moving objects. In this way the two arts are different from each other. However, the purpose of the two is the same that is allowing the viewer to watch them as motion pictures. There is a number of people who do know the difference between a video and an animation. They think them to be same.  But Animation is a video which is created by an artist who makes lots of sketches which are shown with the help of a camera at a high rate making us feel as though it is a video and we are watching a movie.

Videos are made with video camera. One need not have a person as he can shoot nature and whatever he likes. He can shoot the actions of a pet dog and then see it on the LCD of the video camera. He can replay the video on television. An animation, On the other hand, is the creation of the mind of a cartoonist who makes a series of pictures of a character displaying it or he is given a story with characters.  Once the animator or the artist has completed his drawings, these are put into a computer where some manipulations are done so as to illustrate the story.

Most of the work is done using computers nowadays. That is why creating animated video is easier now.  Yet, it is not so easy because the main work involves a hard work that take a long for an artist. There is no difference between an animation and a video after an animation is converted into video format. Anyone can upload or download them on internet like normal videos.

**https://vspages.com/animation-vs-video-1508/**

Learn more about this landscape and the requirements for a computing system that can handle the demands of these new, immersive experiences.1

The border between the virtual and real world continues to break down, providing breathtaking experiences that, a short time ago, could only be found in the imagination of sci-fi writers.

Virtual Reality (VR) has been the “next big thing” for several years, but its time has finally come as a way to generate realistic images, sounds, and other sensations that put you smack in the middle of a spectacular imaginary world. Augmented Reality (AR), which adds virtual stuff to your real world environment, is contributing to the buzz, and both technologies should become a big part of our future. With Mixed Reality (MR), you can play a virtual video game, grab your real world water bottle, and smack an imaginary character from the game with the bottle. Imagination and reality have never been so intermingled.

So much is happening so fast that the differences between VR, AR, and MR can seem a little puzzling at first. Each of these spellbinding technologies are accessible to almost everyone, but before you throw down your hard-earned money for the latest head-mounted display, let’s take a closer look at what you’ll need for an amazing VR, AR, or MR experience.

**The History and Future of Virtual Reality**  
We’ve been trying to capture “Virtual Reality” for much longer than just the past five to ten years. There were popular peer-through toys in the 1950s and enclosed flight simulators debuted in the 1960s, but the *idea* of VR goes back even further.

As early as the 1930s, science fiction writers, inventors, and tinkerers dreamt of an environment where you could escape from reality via art and machines. We were weighing questions about Virtual Reality vs. Augmented Reality vs. Mixed Reality long before we had the technology to make them possible.

Technology has caught up to fiction, and market researchers predict rapid growth for the VR industry.

**VR and AR Meet MR**  
First things first, let’s define the terminology. Virtual Reality can be used as an umbrella term to describe other technologies similar to, but different from, an actual Virtual Reality experience. But what's the difference between Augmented Reality and Mixed Reality? Here are some more details:

**Virtual Reality**  
VR is the most widely known of these technologies. It is fully immersive, which tricks your senses into thinking you’re in a different environment or world apart from the real world. Using a head-mounted display (HMD) or headset, you’ll experience a computer-generated world of imagery and sounds in which you can manipulate objects and move around using haptic controllers while tethered to a console or PC.

**Augmented Reality**  
AR overlays digital information on real-world elements. Pokémon GO\* is among the best-known examples. Augmented reality keeps the real world central but enhances it with other digital details, layering new strata of perception, and supplementing your reality or environment.

**Mixed Reality**  
MR brings together real world and digital elements. In mixed reality, you interact with and manipulate both physical and virtual items and environments, using next-generation sensing and imaging technologies. Mixed Reality allows you to see and immerse yourself in the world around you even as you interact with a virtual environment using your own hands—all without ever removing your headset. It provides the ability to have one foot (or hand) in the real world, and the other in an imaginary place, breaking down basic concepts between real and imaginary, offering an experience that can change the way you game and work today.

**Using Virtual Reality Technologies**  
From gaming, to movies, to medicine, the uses for Virtual Reality, Augmented Reality, and Mixed Reality are expanding.

* **Healthcare**—For training, such as for surgical simulations
* **Film and TV**—For movies and shows to create unique experiences
* **Virtual travel**—For virtual trips to an art museum—or another planet—all from home
* **Professional sports**—For training programs like [STRIVR](https://www.strivr.com/) to help pro and amateur athletes
* **Gaming**—For over 1,000 games already available, from first-person shooters to strategy games to role-playing adventures

**What You’ll Need: Headsets**  
There are many, many VR headsets available, all with varying performance levels and prices. Entry-level gear, such as Google Cardboard\*, uses your mobile phone as the screen, whereas PC-operated devices, like the HTC Vive\* or Oculus Rift\*, are immersive—providing a premium VR environment. Microsoft has recently announced their Windows\* 10 Mixed Reality platform that initially uses fully immersive headsets offered by Acer, Asus, Dell, HP, Lenovo, and Samsung.

Some AR headsets are available on the market today, with more rumored to be coming in the future. The Microsoft Hololens\*, Google Glass\*, and the Meta 2\* headset are great examples.

Every PC-connected HMD will have different system requirements, so if you’re buying a new Virtual Reality headset, make sure you check with the HMD vendor for their recommended and minimum system requirements.

**What You’ll Need: Computers**  
If you are looking for a new computer and you’re interested in VR, you’ll need something that can handle heavy loads. When it comes to high-end desktops or laptops for Virtual Reality (and other advanced tasks like gaming or video editing), the CPU, GPU, and memory are the most critical components.

Without these high-performing components working in sync, you could have a pretty miserable experience. A powerful system will ensure that you’ll have fun as you lean in, stand up, or walk around. VR that lags makes it impossible for the virtual world to respond as you expect, which can lead to more than just disappointment; it increases the risk of motion sickness.

A high-end processor assists in positional tracking and controls how real and immersive your virtual environment will be, so you'll enjoy a deeper experience in a higher-fidelity environment. For a great VR experience, consider the latest generation Intel Core™ i7 processor.

A discrete graphics processing unit (GPU) is recommended, or in the case of Oculus Rift\*, HTC Vive\*, and Windows Mixed Reality Ultra\*, it is required. The GPU is responsible for rendering the high resolution, immersive images needed for VR. [Oculus](https://www.oculus.com/oculus-ready-pcs/), [HTC](https://www.vive.com/us/ready/), and [Microsoft](https://www.microsoft.com/en-us/store/p/windows-mixed-reality-pc-check/9nzvl19n7cnc?rtc=1) all have profiler tools that you can download from their websites, and you can use to run on your PC to determine if it meets the minimum requirements for their VR headsets.

**Choose Your Experience**  
New VR and AR technologies and products continue to come to market, making new environments accessible to the masses. Virtual, Augmented, Mixed—the choice for a new reality is up to you. Let your imagination, and your readiness to try new gear, enhance your experience!

**Key VR Terms to Know**  
Use this chart to learn more VR terms and definitions.

| **Term** | **Description** | **Why It Matters** |
| --- | --- | --- |
| **Frames per second (FPS)** | Frequency at which a system can display consecutive images, or frames | Without a high and constant frame rate (greater than 60 FPS), the motion won’t look right, and you could even feel sick |
| **Field of view** | The angle of the observable world that can be seen | If the window of view is too narrow, you could end up making unnatural head rotations |
| **Degrees of Freedom (DoF)** | The number of directions that an object can move or rotate. The six degrees of freedom are pitch, roll, yaw, left and right, forward and backward, up and down | More DoFs allow you to move more naturally in VR |
| **Latency** | The amount of time it takes a system to react/respond to movements or commands | Latency is critical when it comes to the presence inside Virtual Reality—if the system doesn’t respond instantly, it doesn’t feel real. |

<https://www.intel.com/content/www/us/en/tech-tips-and-tricks/virtual-reality-vs-augmented-reality.html>

<https://varjo.com/virtual-augmented-and-mixed-reality-explained/> -some useful staff

Animation

<https://affordableschools.net/lists/5-types-of-animation/>

Different types of annimation

https://www.whale-agency.com/stories/different-types-of-animation-formats-why-svg-is-the-best-one