Indian Institute of Technology Kanpur

National Programme on Technology Enhanced Learning (NPTEL)

Course Title
Visual perception and Art: A survey across the cultures.

Lecture – 02
What is Visual Perception?

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Hello viewers welcome to MOOCs online course on visual perception and art a survey across the cultures; this is the second lecture of this week.

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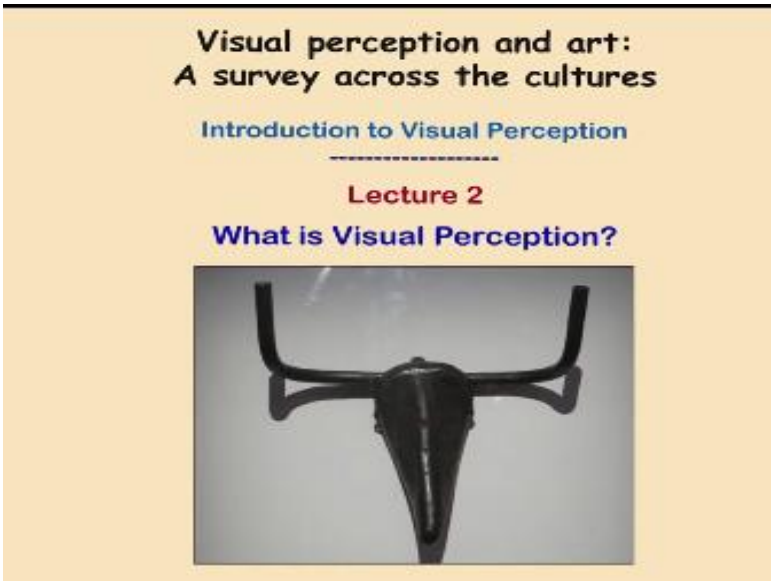

And in this lecture we are supposed to encounter the term visual perception in a slightly technical way what exactly does this term visual perception mean and what are its implications this is what we are supposed to study today.

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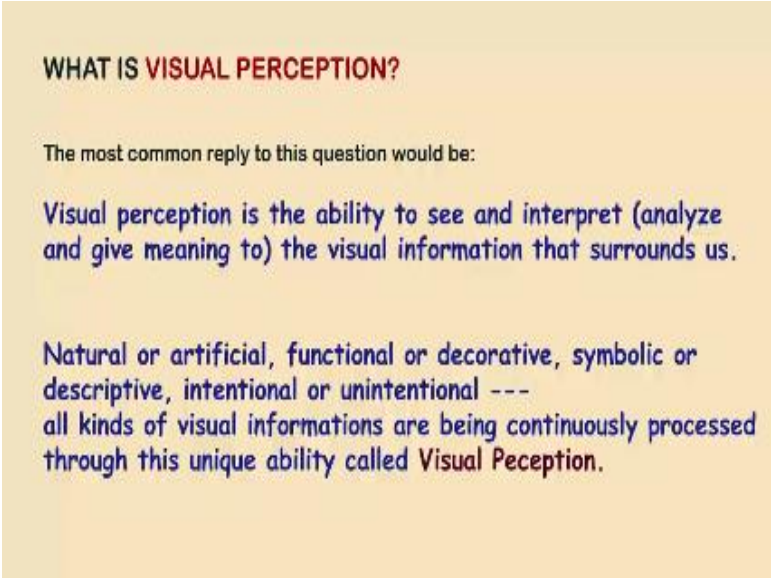

Now the most common reply to the question what is visual perception would be visual perception is the ability to see and interpret that is analyze and give meaning to the visual information that surrounds us in a way it is a very simple definition and you get this kind of definition almost everywhere on any book on visual perception on any website on visual perception will certainly have this standard definition of visual perception then what it is all about in a very basic way.

Natural or artificial functional or decorative symbolic or descriptive intentional or unintentional all kinds of visual information are being continuously processed through this unique ability of human being called visual perception. So it is not just a passive reception of the visual data but it signifies the term visual reception signifies a process a processing of the visual data that we are receiving.

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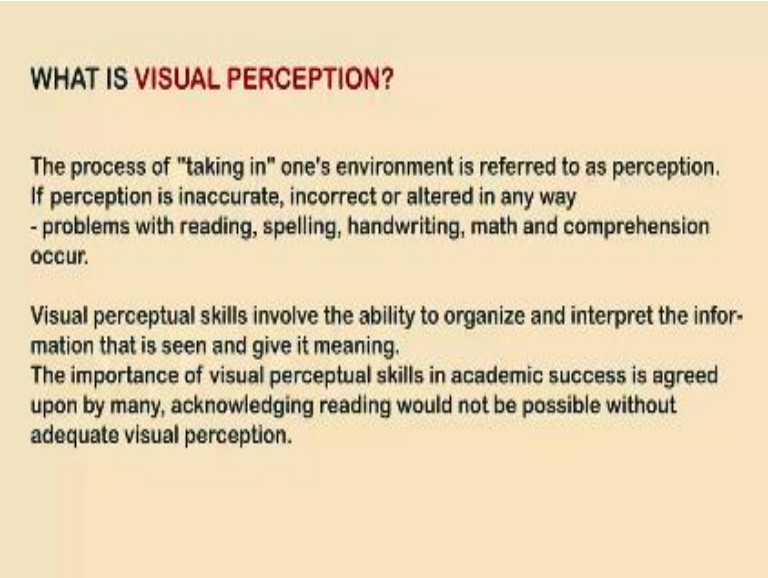

And that is why the question of interpretation becomes so important here. So the process of taking in one's environment is referred to as perception and if perception is inaccurate incorrect or altered in anyway problems with reading, spelling, handwriting, calculation mathematics and comprehension may occur. Visual perceptual skills involves the ability to organize and interpret the information that is seen and in turn gave eighth meaning this makes the definition of visual perception slightly crucial.

Coming back to the idea rather a very vague idea that visual perception is all about receiving passively the visual information we now understand very, very clearly that visual perception is not about simply receiving visual science or visual data, it is about processing and not also simply about processing but it is about giving the visual information back some meaning some interpretation some kind of validity of what we are looking at.

So the importance of visual perceptual skills in the academic structures in our daily life is agreed upon by wailing acknowledging reading would not be possible without adequate visual perception, acknowledging that even comprehension would not be possible without adequate

visual perception. Acknowledging that even the development of our intelligence fatality or our intellectual faculties is not possible without adequate visual perception, so in other words visual perception has a whole set of very important functions to play in our evolution in our bringing up?

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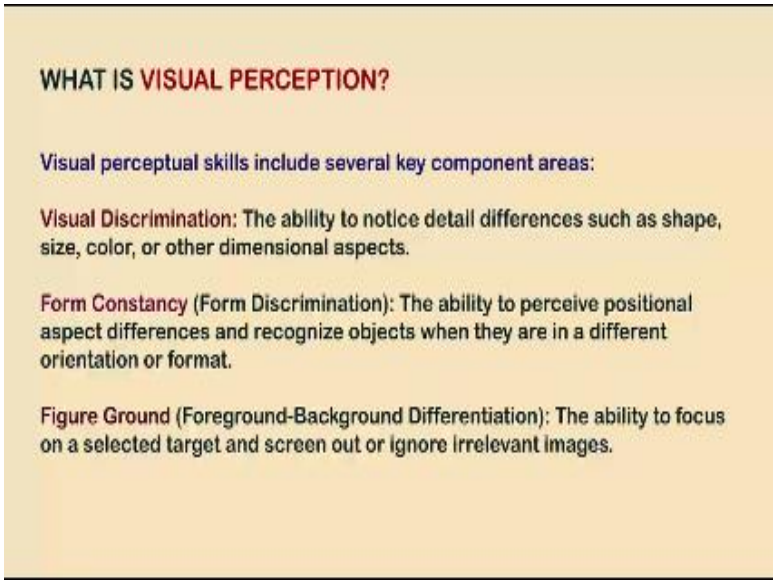

Visual perceptual skills include several key component areas for example visual discrimination the ability to notice detail differences such as shape, size, color, or other dimensional aspects form constancy that is called discrimination the ability to perceive positional aspect differences and recognize objects when they are in a different orientation or format. So we know our object visually not from only one particular angle, if we were to see the same object from an absolutely different angle in a different context in a different position then our visual perceptual skill should assure us that we will be able to recognize that object even if it is found in a completely different environment.

So the perceptual skill is not only about receiving but it is also about recognizing then thirdly another very important aspect or area component area is figure-ground the relationship between the object and space object and object the ability to focus on a selected target and screen out or

ignore the irrelevant images and thereby make some meaning out of it. Visual perceptual skills also include areas like spatial relationship the ability to recognize and also mentally measure the positioning of objects in space. So even before you actually go and reach that particular point just by looking you are supposed to have a sense of distance between let us say one object another object between the offsets and other objects.

Because this is how we measure the distance also from a far away position this is a perceptual skill a visual perceptual skill then visual closure.

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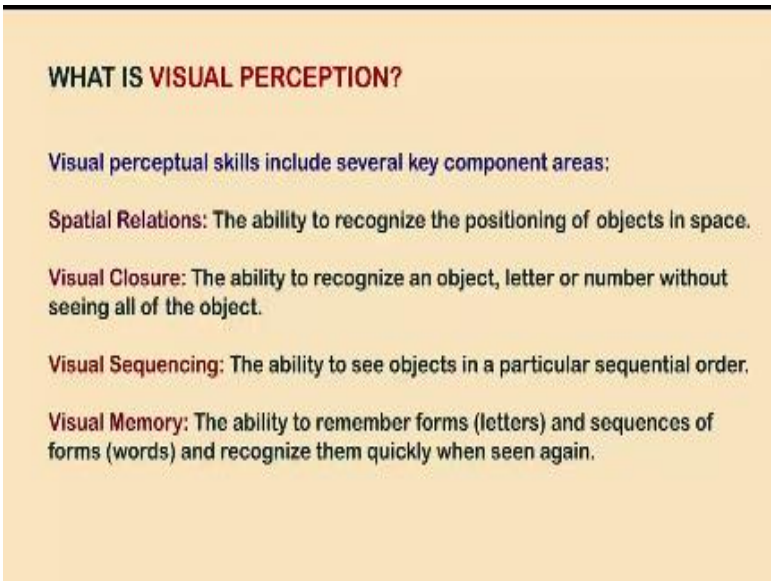

The ability to recognize an object letter or number without seeing all of the objects even if you are not able to see the entire human being but just by having a glimpse of a certain portion of that person you are able to know okay he is my brother, she is my mom, he is my friend, and who is that person how do you do that you have not seen that entire person but just a portion of an object or a person or anything we should sequencing the ability to see objects in a particular sequential order.

Visual memory is extremely important in this context because the ability to remember forms, letters also object shapes and sequences of forms whether it is words or even objects in daily life and recognize them quickly when seen again is certainly a very, very important ability which we exercise almost every day every moment in our waking life.

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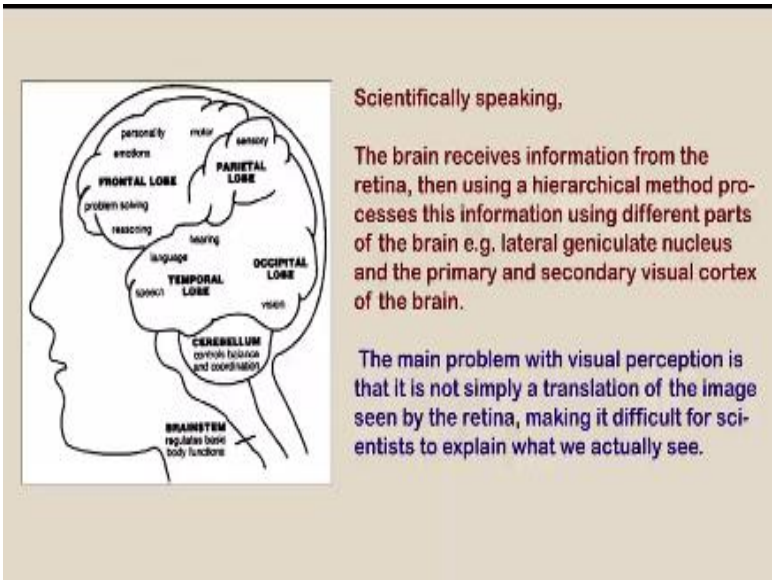

Now scientifically speaking our brain receives information from the retina, then using a hierarchical method processes this information using different parts of the brain that is lateral geniculate nucleus and the primary and secondary visual cortex of the brain. The main problem with the visual perception is that it is not simply a translation of the image seen by the retina making it rather difficult for scientists to explain what we actually see.

So it is not simply a retinal process it is more than that it is an intellectual process which is a mental process it is a psychological process and by the same token it is a cultural process as well which we have mentioned in our last lecture.

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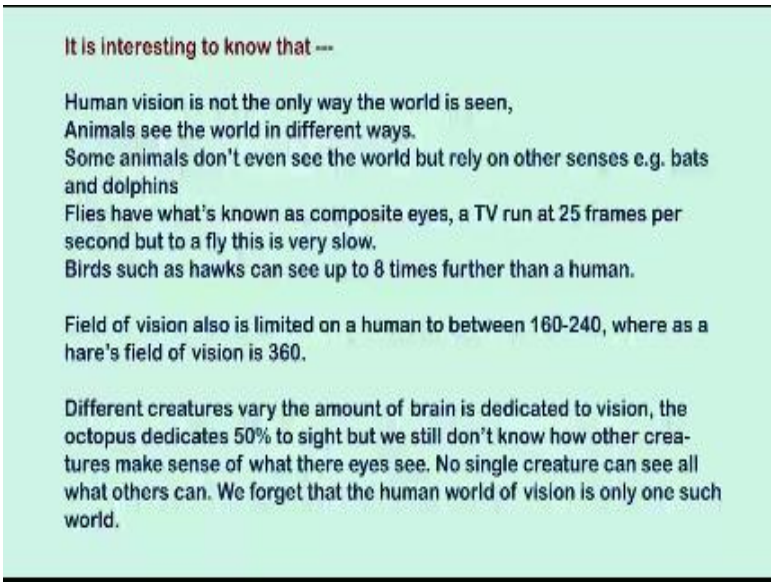

So it is interesting to know that human vision is not the only way the world is seen animals see the world in different ways than us, some animals do not even see the world but rely on other senses for example bats and dolphins flies have what is known as composite eyes, a TV run at 25 frames per second but to apply this is very slow. Birds such as hawks can see up to eight times further than a human being.

Field of vision also is limited on a human to between 160 to 240 whereas hares field vision is 360. So these are a tremendous difference between human beings and other animals and birds in terms of their visual capacities. Different creatures vary the amount of brain is dedicated to vision the octopus dedicates fifty percent to sight but we still do not know how other creatures make sense of what their eye see.

No single creature can see all what are the scans we forget at the human world of vision is only one such world so what we perceive visually as human beings is not the full truth of a visual

perception it is not the entire film some other creature can have a different entirely different experience of the visual reality around us.

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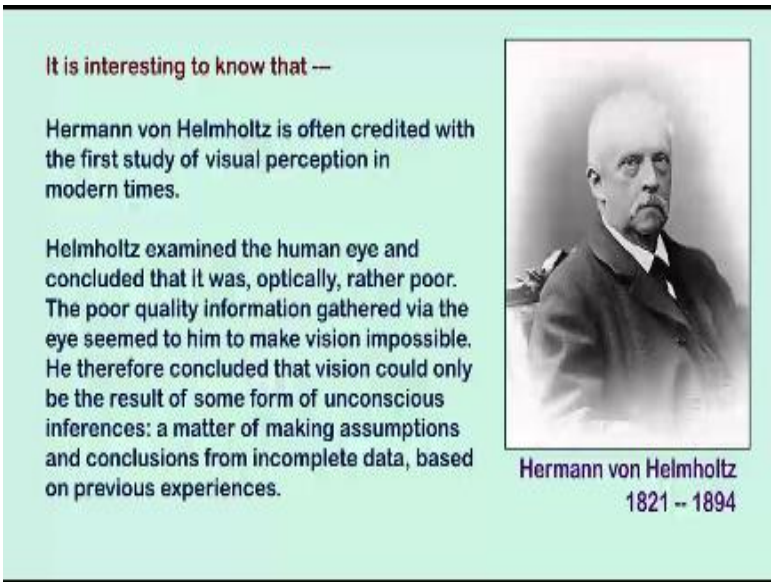

Now it is also interesting to note that Hermann von Helmholtz is with often credited with the first study of visual perception in modern times examined the human eyes and he concluded that it was optically rather poor, the poor quality information gathered via the eye seem to him to make vision impossible he therefore concluded that vision could only be the result of some form of unconscious inferences, a matter of making assumptions and conclusions from incomplete data based on previous experiences.

Now following Dr. Herman's theories it is very evident that as far as human beings are concerned our visual perception is certainly visual as much as it is intellectual mental and memory plays a very important role in experiencing what we experience through our visual perception.

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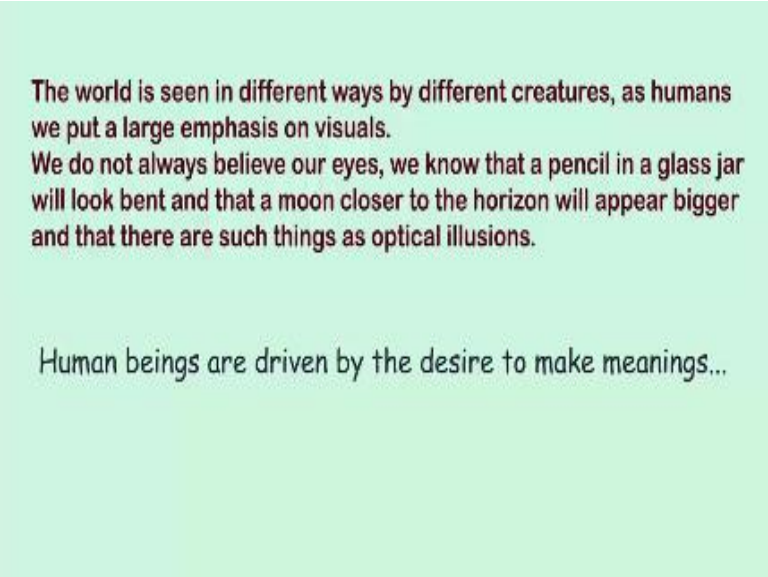

So the world is seen in different ways by different creatures as humans we put a large emphasis on visuals we do not always believe our eyes we know that a pencil in a glass jar will look bent and that a moon closer to the horizon will appear bigger and that there are such things as optical illusions. The since we encounter optical illusions almost every day, so we do not believe in what we see in his entirety we use our intelligence in order to interpret it properly.

So humans as a species are driven by a desire to find meaning, now this relates to the title because as humans we are all for more significance that is meaning makers we all make meanings instead of simply relying on what we see we begin to construct meanings derived out of our visual experiences.

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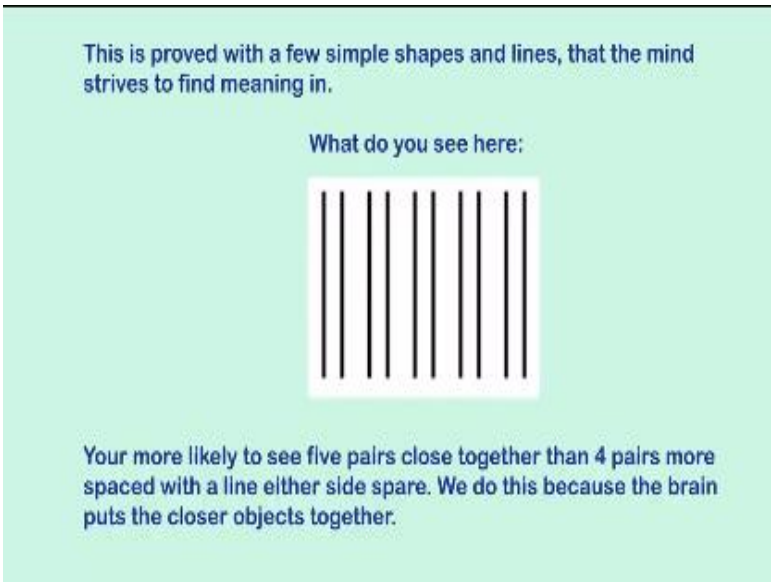

Now this is proved with few simple shapes and lines that the mind strives to find meaning in what do you see here? Look at this diagram you are more likely to see five pairs close together than four pairs more spaced out with a line either side spare we do this because the brain puts the closer objects together. So there is a particular way of looking at things though there could be various other possibilities of visually interpreting.

Now other possibilities are possible only when we consciously apply those possibilities otherwise there is a certain habit of making some meaning out of what we are looking at.

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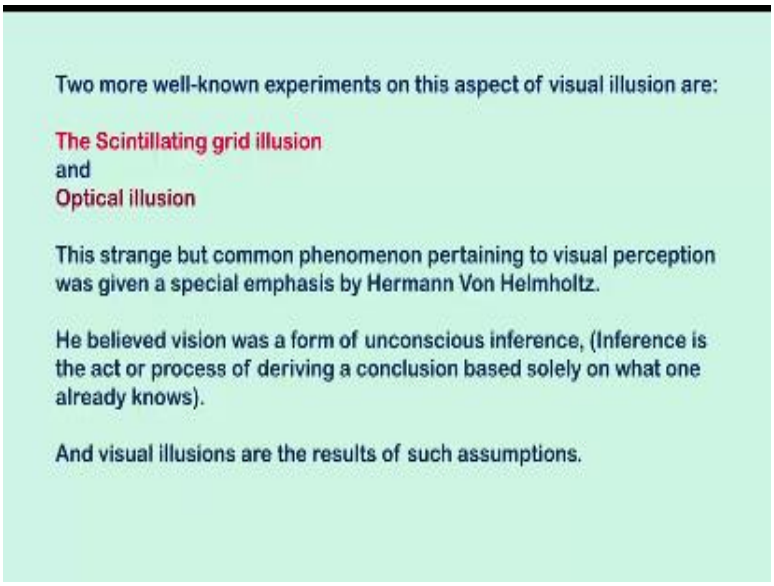

Now two very well-known experiments on this aspect of visual illusion are the scintillating grid illusion and optical illusion the strange but common phenomenon pertaining to visual perception was given a special emphasis by Hermann Von Helmholtz. He believed that vision was a form of unconscious inference; inference is the act of process of deriving a conclusion based solely on what one already knows.

And visual illusions are the result of such assumptions in other words whether in life or not while perceiving things visually we often forget that we make sense of what we see or what we look at because we base our perception to a large extent on several assumptions knowingly or unknowingly. These assumptions are often very helpful they are part of our memory, but these assumptions can also be very tricky particularly when we are looking at some tricky diagrams or some optical illusive diagrams and drawings like this.

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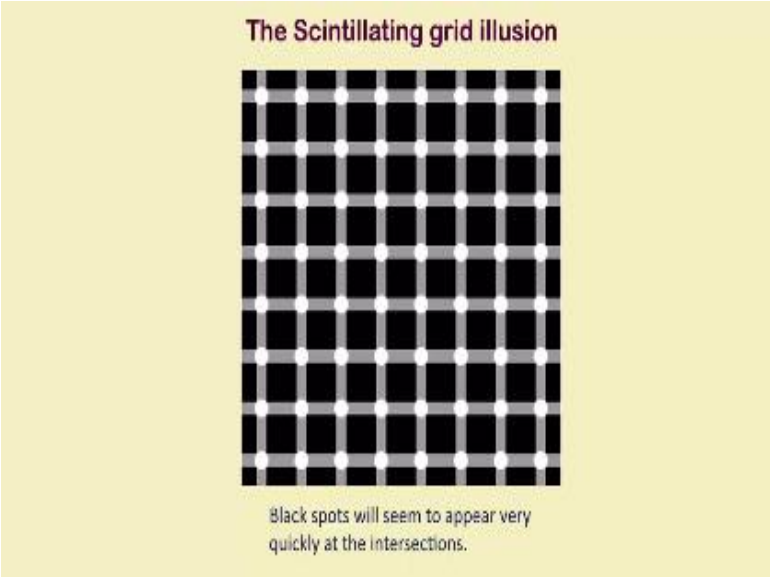

The scintillating resolution black spots will seem to appear very quickly at the intersections though there is not a single intersection in this diagram where there is actually a black spot this is a complete illusion that black spots begin to appear at the intersection though there is no blacks, why it happens? So the whole phenomenon can be explained by using this theory that there is a whole process of inference that parallel functions when we are visually perceiving or looking at something and we cannot stop that we cannot stop our assumptions we cannot stop those inference processes the processes that keep on inferring something or the other.

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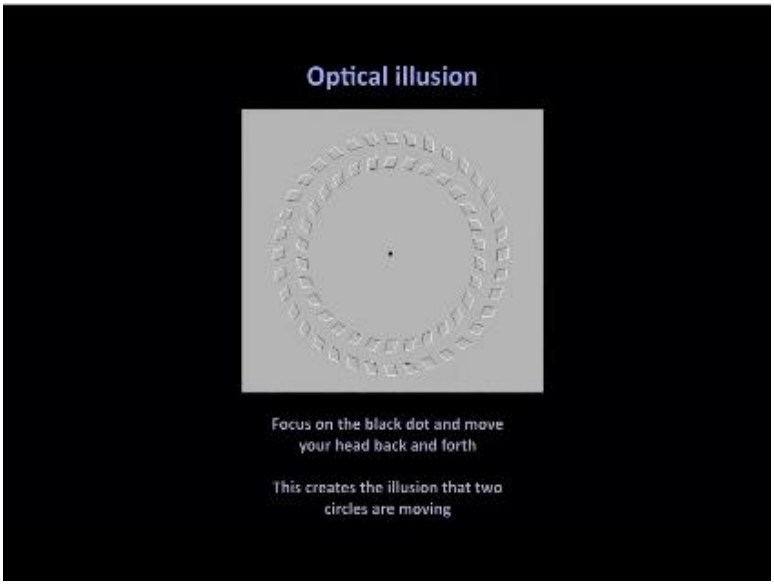

Similarly another diagram if you focus on the black dot right at the center and if you move your head back and forth like this then that will create the illusion that two circles are moving whereas in reality these two circles are absolutely static. So how come this happens> Again a complex visual phenomenon where assumptions are involved inferences are involved certain tricks that keep happening in our brain are involved these are the things that make the solution happen.

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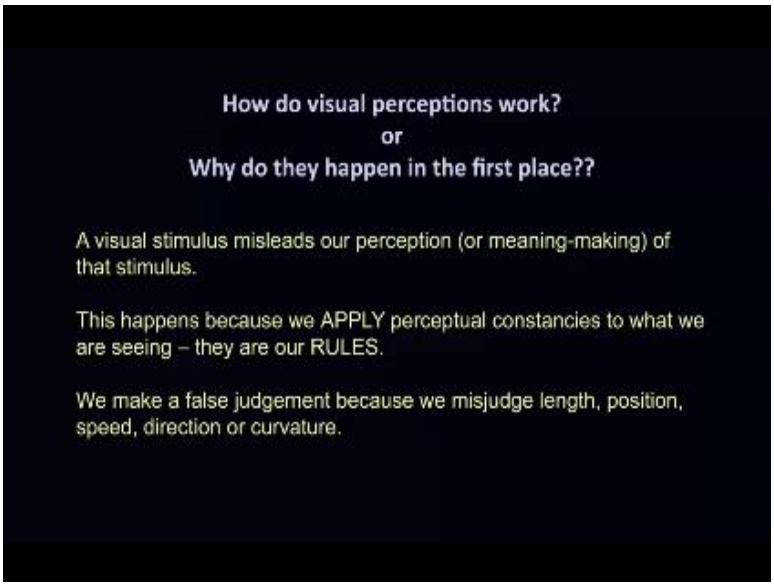

Now how do visual perceptions work or why do they happen in the first place a visual stimulus misleads our perception on meaning making of distributer. This happens because we apply perceptual constancies to what we are seeing because they are our rules and we make a false judgment because we misjudge length, position, speed, direction, curvature everything. So there is always this chance of with judging this is there is also the sun is chance of misleading ourselves not that we do it consciously or deliberately it happens and we simply cannot do anything about it.

And these optical illusions this very tricky ways of perceiving the visual reality have become a part of our visual experience.

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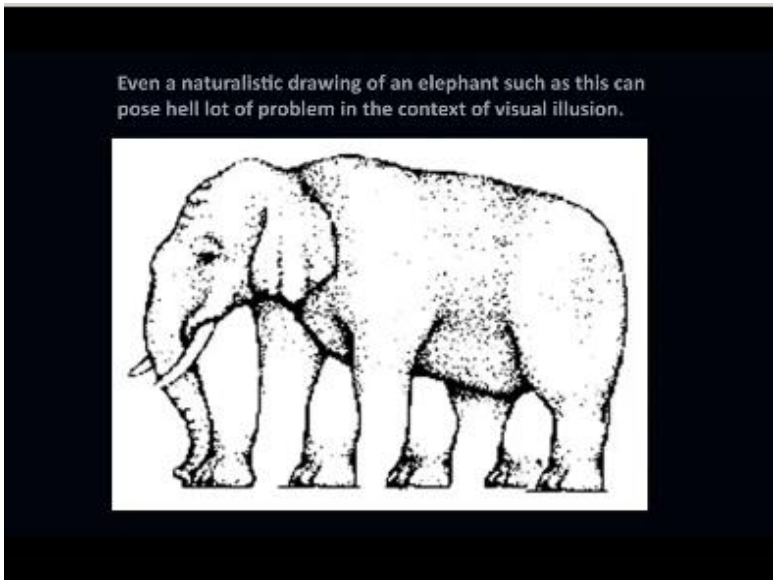

One more very common diagram which many of you must have already seen that even a naturalistic drawing of an elephant such as this can pose hell lot of a problem in the context of visual illusion, I guess you can make out what kind of pollutions this particular elephant is making to us and if you are not able to make out this let me put a simple question to you while you are looking at this drawing of an elephant any sense that how many legs this elephant has? Just begin to count the number of legs this elephant has? You know the trick has begun to work.

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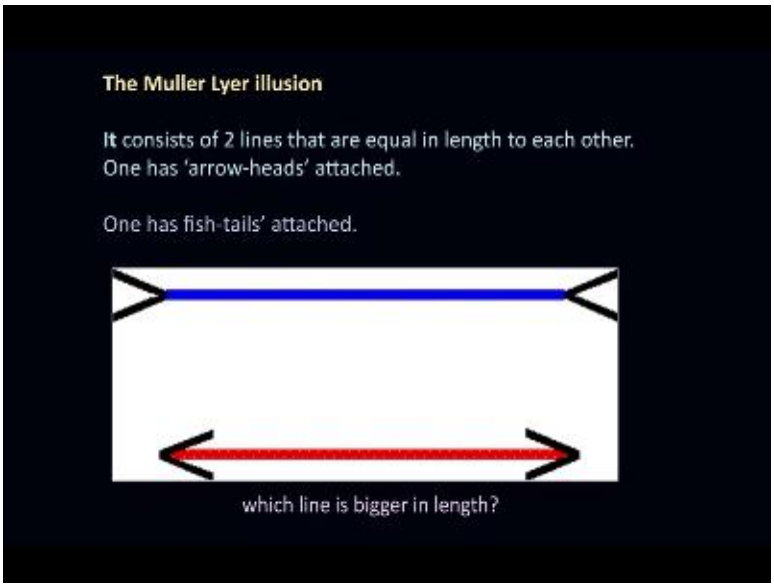

Then you have this very well-known Muller Lyer illusion, where it consists of two lines that are equal in length to each other one has arrow heads attached and one has fish tails attached. Now if I may ask you which line is the bigger one in length what will be your answer if you have seen this diagram before of course it will immediately say that both lines are actually equal in length and you are right that is one thing but please look at the diagram once again and tell me the do we know that.

And we can even measure by using a scale that the both these lines are equal in length but do not you think that they appear different from each other do not you think that the line with arrow is appear to be longer in length than the line which has a kind of fishtail or maybe the other way round I mean whatever it is they do not actually look exactly the same perhaps if you look at the line with the fishtail it generally would look longer than the line with the arrowhead. So it is our brain that is continuously misleading us.

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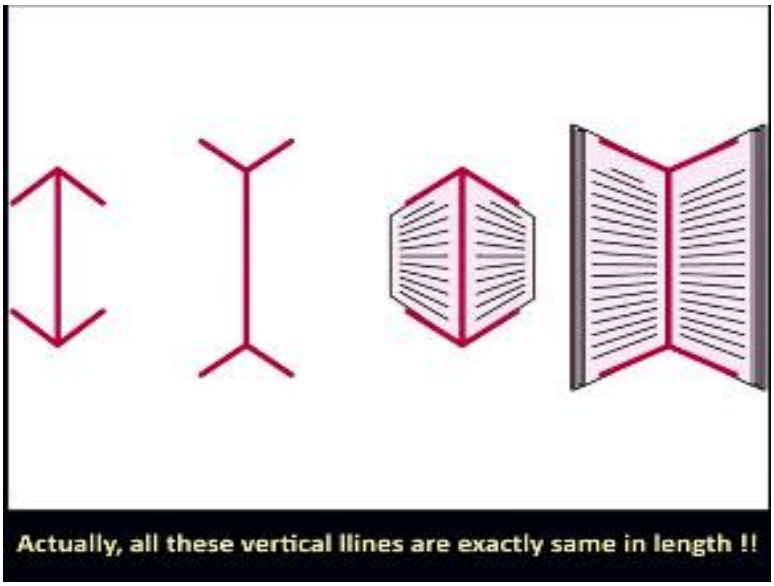

Another diagram of the same coin where you have lines of the same length but because of their association they all tend to look slightly different from each other which is again an optical illusion.

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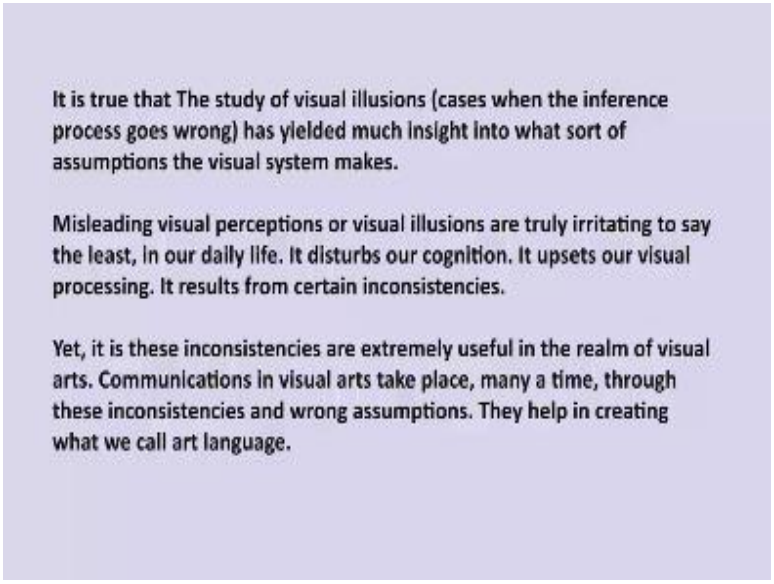

Now it is true that the study of visual illusions cases when the inference process goes wrong has yielded much insight into what sort of assumptions the visual system makes, misleading visual perceptions or visual illusions are truly irritating to say the least in our daily life it disturbs our cognition it upsets our visual processing it results from certain inconsistencies. Yet it is these inconsistencies that are extremely useful in the real more visual art communications in visual arts take place many a time through these inconsistencies and wrong assumptions.

They help in creating what we call our language in other words what is considered as an optical illusion or an experience of optical illusion could actually help the artist to make some beautiful and significant statement in their art. So optical illusion can be really, really very frustrating and irritating in our daily life but it could be a very useful tool for the artist to convey a statement visually in a very effective way. In fact as beavers or fine art or visual arts we too are not devoid of assumptions when we go to look at a sculpture or a painting it is not that our mind is a blank slate or tabula rasa.

Our mind already carries assumptions it already carries certain ideas of consistencies and inconsistencies hence the brain tends to lead or let us say we lead us and it is at this juncture that the artist is able to make some very useful innovation in their art language this is something that we should study in one of our later lectures.

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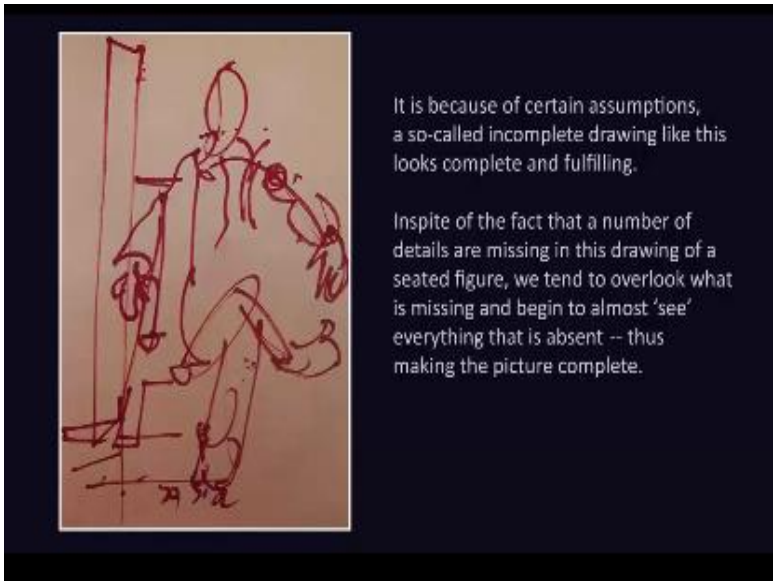

Now it is because of these assumptions a so called incomplete drawing like this for example looks complete and fulfilling in spite of the fact that our number of details are missing in this drawing of a seated figure we tend to overlook what is missing and we begin to almost see everything that is absent and thus making the picture complete. Now why does it happen that a painting like this though we know there are several details missing here we do not simply care about that we can complete the details in our mind and we really do not feel at all uncomfortable that this particular drawing is incomplete that is not the idea that actually bothers us. For example this one.

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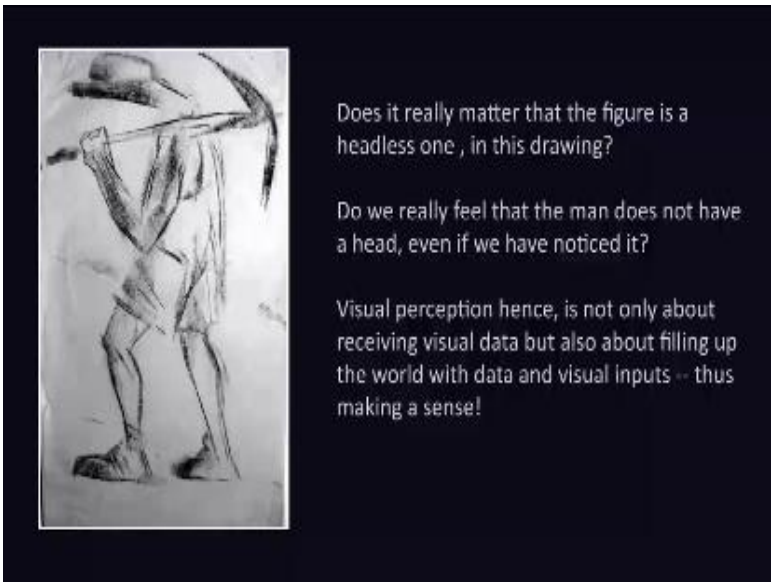

The do not you think it does it really matter that the figure is a headless one in this drawing do you really realize that it is a headless one unless I brought that bring that into your notice do we really feel that the man does not have a head even if we have noticed it. So unless there are two things one I bring this into your attention I draw your attention to this aspect that this figure does not have ahead and then you realize wow this figure does not have but anyway does not matter because there is a tremendous expression in the figure which a kind of downplays the absence of the head or it may happen that you do not even notice this absence of head in the first glimpse but even when you notice it later you do not care your mind has already fulfilled the gaps. So visual perception hence is not only about receiving visual data but it is also about filling up the world with data and visual inputs thus making a sense just completing the circle. Thank you.

<u>Acknowledgement</u>

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