Applied Ergonomics
Prof. Shantanu Bhattacharya
Department of Mechanical Engineering
Indian Institute of Technology, Kanpur
Dr. Ankur Gupta
School of Mechanical Sciences
Indian Institute of Technology, Bhubaneswar

Lecture – 13

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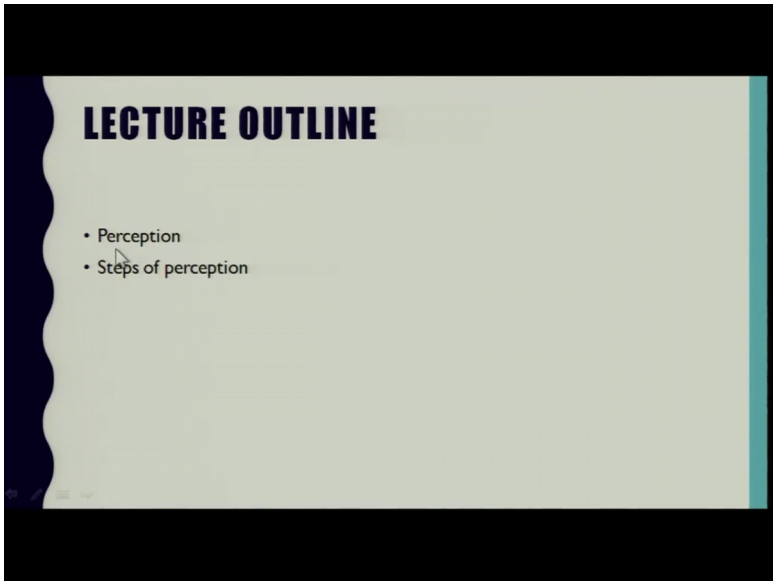

So, welcome to this lecture and here we are going to communicate with this cognitive ergonomics and in that we are going to start with the new topic that is perception and attention resources. So, this particular topic in that perception and attention resources we are in this particular lecture we are going to cover just perception. So, we will be describing about the perception and with there are steps of perception. These two topics we will try to cover in this lecture. So, first of all, we need to learn that what is this perception. So, as we dealt with the human information processing model and in which we also learn about various human senses in through which we get some information, and when we give that information some meaning and some significance based on our previous experiences then this process is known as perception.

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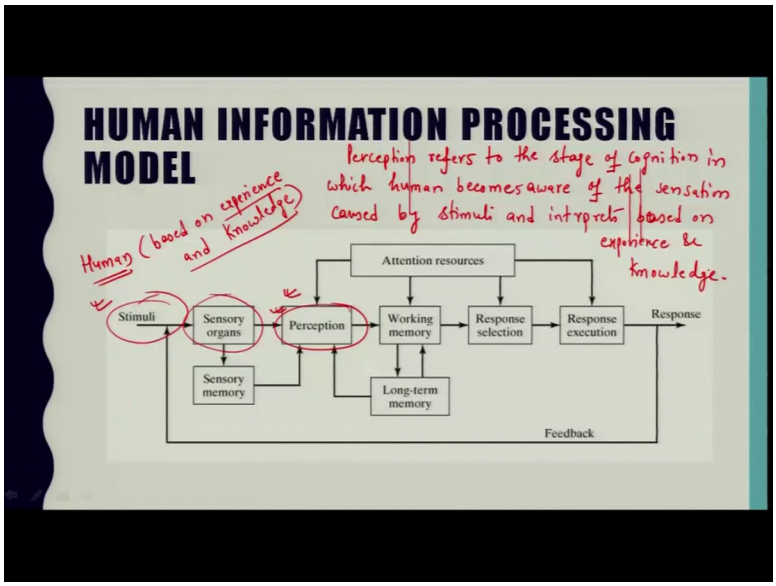

So, in that context if we just have a look over this human information processing model which we briefly understood in the previous slide in the initiation of cognitive ergonomics course. So, in that model here is the perception, so that perception is that is stage that follows the sensing of some external stimuli by human sensory system. So, in that case the perception can be defined as the one of the stage of cognition in which human becomes aware of that sensation which is caused by the stimuli and interpretation is done in the light of his own experience based on experience and knowledge.

So, we can define the perception as this particular perception refers to the stage of cognition in which a human being becomes aware of the sensation caused by stimuli. And obviously, the second part is interpretation, so he interprets based on his experience and knowledge. So, during perception sensed stimuli or given meaning and significance. Now we will try to understand this perception with some examples.

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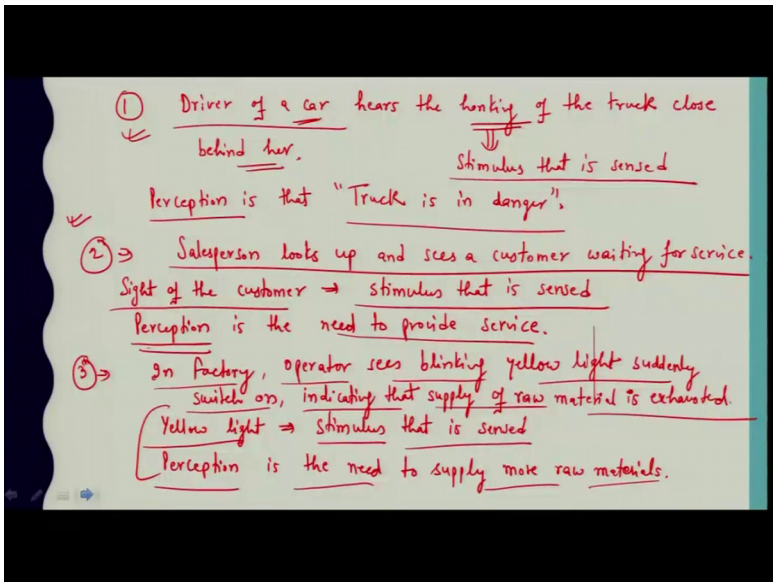

So, this particular perception in human information processing if you can take as an example suppose driver of a car she is the haunting of the truck close behind her on an interstate highway let say. So, the honking is the stimulus that is sensed and the perception is that the truck is dangerously close. So, when driver of the car hears the honking of the truck which is closed behind her. So, this honking is stimulus that is sensed and its perception is that the truck is in danger.

The second kind of example we can take as a sales person, which is looking up and seeing a customer waiting for the service. So, we can take example of salesperson also who looks up in fact who looks up and sees a customer waiting for service. So, in that case, the sight of the customer is stimulus that is sensed; and perception is what which sales person has thought at the based on his previous experience and knowledge is the need to provide service as soon as possible.

The third kind of example we can take like in a factory the operator of a production machine sees the blinking yellow light suddenly that has switched on which indicates that the supply of raw material is almost exhaust. So, in that case that yellow light is the stimulus that is sensed and the perception is need to a resupply some more raw material to the machine. So, in factory when operator sees blinking yellow light suddenly switch on. So, it is this particular yellow light is indicating that indication of this yellow light is that supply of raw material is exhausted, it means there is a requirement of replenishment

of the raw material. So, immediate action has to be carried out in the form of filling the raw material in that particular stock. So, here two things are we are able we have to determine that what is a stimulus so that yellow light was this stimulus that is sensed and her perception is need to supply more raw material.

So, here we understood this concept with the help of three examples. So, first is driver of a car running on the highway and suddenly seeing the truck which is coming and honking, so that particular honking is the stimulus that is sensed, and the perception is that truck is in danger, and he has to take care of that particular situation. The second is if a sales person is looking up and seeing that customer is waiting for the service, the sight of the customer is that is stimulus that is sensed, and the perception is the need to provide service. In another case that we take as an example that in factory operator sees blinking yellow light suddenly switched on which is indicating that supply of raw material is exhausted completely. So, it means that yellow light is the stimulus that is sensed and the perception is the need to supply more raw material.

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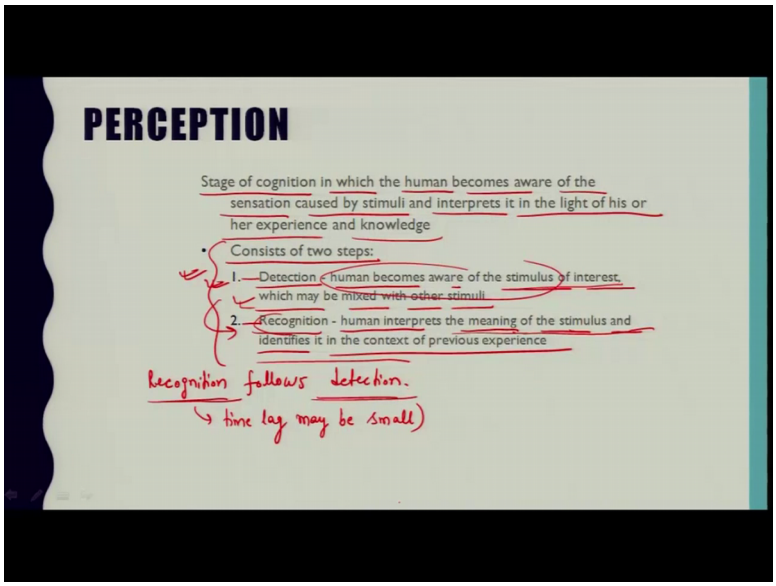

So, now as for as definition of perception is concerned, so the stage of cognition in which the human becomes aware of the sensation caused by the stimuli, and interprets it in the light of his or her experience and knowledge. So, now as being cleared from the example given that it consists of basically two steps, the first one is detection and second one is recognition. The first one is detection, so it means that the human becomes aware

of the stimulus of interest, which may be mixed with other stimuli. The second is recognition that human interprets the meaning of the stimulus and identifies it in the context of previous experience.

So, our definitions and the examples taken such as that this perception consist of detection and recognition. This detection occurs when the human becomes aware of the presence of a stimulus and recognition occurs when the human comprehended that the stimulus has been encountered before and is able to related prior experience. So, detection means becoming aware of the stimuli of the interest which may be mixed with other stimuli, and it is a process of discovery, but no interpretation of the stimuli has yet occurred. And this recognition means interpreting the meaning of the stimulus by identifying it basically in the context of previous experience. So, recognition follows detection, all though the time lag between the two may be so small time lag maybe small, so that it may appear that two steps seem to occur simultaneously.

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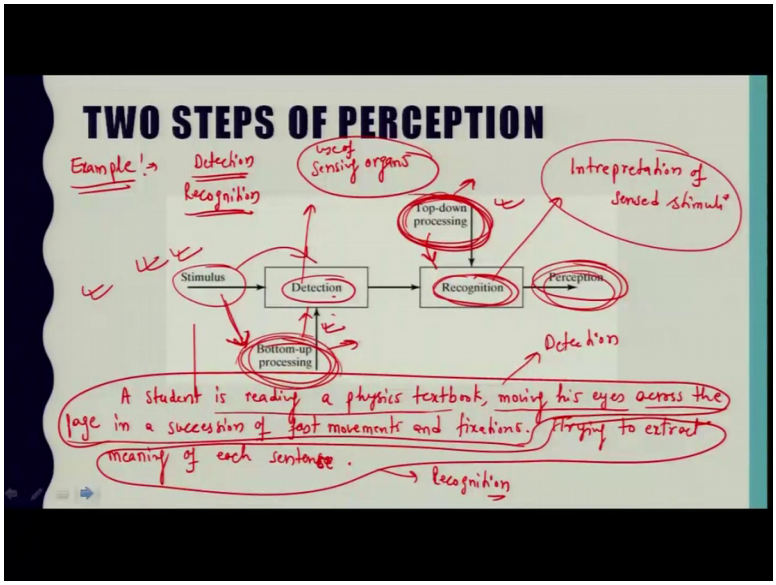

So, this is the a schematic of describing the two steps of perception, the first is detection and second is recognition. So, we were try to learn about this top down processing and bottom up processing, a stimulus we have learnt and this is the output as a perception. So, before that let us have some example that if you take in order to understand this perception in a much clearer way that an officer worker is a started by the sudden brayer of an alarm siren in the building and, but it takes a few moments to properly identified it

has a fire alarm. So, when it is started by the sudden brayer of an alarm siren it is its detection. And some moments he has taken in order to properly identify it as a fire alarm that is its recognition.

One more example we can take in order to understand this defect detection and recognition that if a student is reading physics text book let say, moving his eyes across the page in a succession of fast moments let say and fixations he is trying to basically extract meaning of each sentence. So, when he is reading of physics moving his eyes across the page in a succession of fast movements and its fixation that is its detection, and once he is trying to extract the meaning of this sentence that can be termed as a recognition. So, the detection is step in perception involves the sensing of a stimuli and therefore, detection emphasizes the use of human sensory organs, this recognition involves the interpretation of the sensed stimuli recognition is the interpretation of sensed stimuli and this particular detection involves the sensing of the in fact, use of sensing organs. So, this comes in the detection and interpretation comes in the recognition.

So, here in this matter the distinction between detection as a sensory process and recognition as a stable process in the perception stage of human information processing can be explained using the concept of this bottom up processing and top down processing. So, what this bottom up processing is all about, and this top down processing is expressed in which kind of sense. So, here bottom up processing refers to the stimulation of this senses by external sources. Basically it is the human information processing that response to all the sides and sounds and as well as other stimuli in the outside world. This particular bottom up processing is concerned with the detection steps in the perception. But on the contrary this top down processing refers to the information processing activity of perception that are based on the human humans knowledge experience, and somewhat expectation as such it is concerned with the recognition steps in the perception. So, it also depends on the motivation or one's ability to concentrate on a given stimulus in order to interpret it.

So, this particular bottom up processing is concerned with the actual stimulus while this top down processing provides the dimensions or add a dimension to our previous experiences with a similar or identical stimuli. So, in the same way we can defined as the top down processing is based on our experiences. So, this is a part of recognition. And

bottom up processing we can is completely based on our stimulus and it is giving some direction to the detection. So, in a nutshell this perception is as a complete combination of top down processing and this bottom up processing. And deficiencies in the actual stimulus during the bottom up processing can often be compensated by this top down processing.

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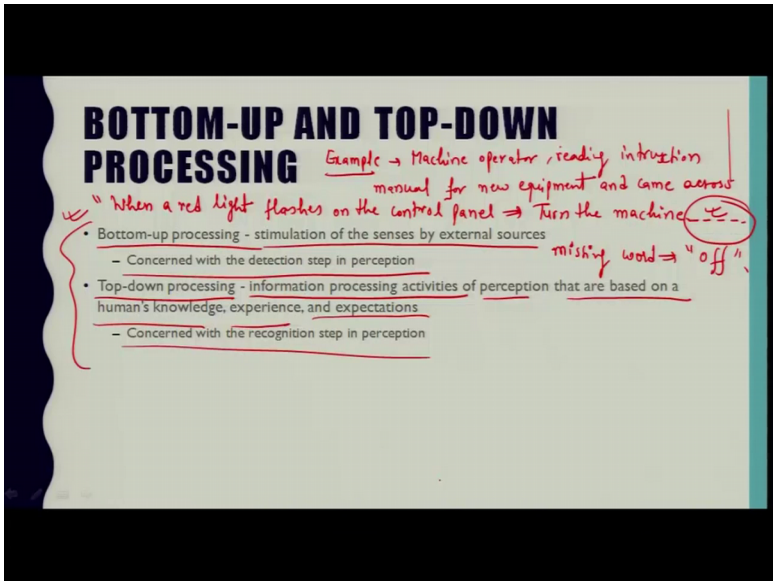

Like for example, if we take an example of a machine operator who is reading the instruction manual let say for a new piece of equipment in the factory and came across as a sentence which was that when a red light basically flashes on the control panel just turn the machine. And unfortunately some error or let us say some printing error was happen, so last word in the sentence was missing, but based on his previous experience as his knowledge he can conveniently interpret that what could be the possible filling here. So, he would be able to infer that a missing word is missing word is off that is also based on the context of the sentence and his expectancy as well. So, the operator is able to make for the deficiency in the actual stimulus that is the missing word through his knowledge and experience as which he has got with tackling previous machines and its related manuals.

So, in the same this is the very good example I think in order to have a much clear idea of detection and recognition. So, in addition to it that different people have different experiences and expectancies and this means that the same stimulus may be interpreted

differently by them. As an example of this also two medical doctors may review one patient, and disease maybe different are the symptoms as per the symptoms of is patient is concerned. So, there maybe two ideas that both doctors distinctly can give in order to diagnose that particular patient sickness. So, this is known to happen and it is why it is important to get a second opinion in such a serious cases most often.

So, this was the example in order to have a distinct ideas because this perception is also and basically largely depend on the previous experiences and knowledge that you have gained as your age advances. So, this was all about the perception. So, as a nutshell I am just revising those concepts that we have learnt in this lecture that bottom of processing. So, a stimulus of the sensed by external sources, it is concerned with the detection is step in perception. Top down processing, this is the information processing activities of a perception that are based on a human's knowledge experience and expectations, it is concerned with the recognition step in the perception.

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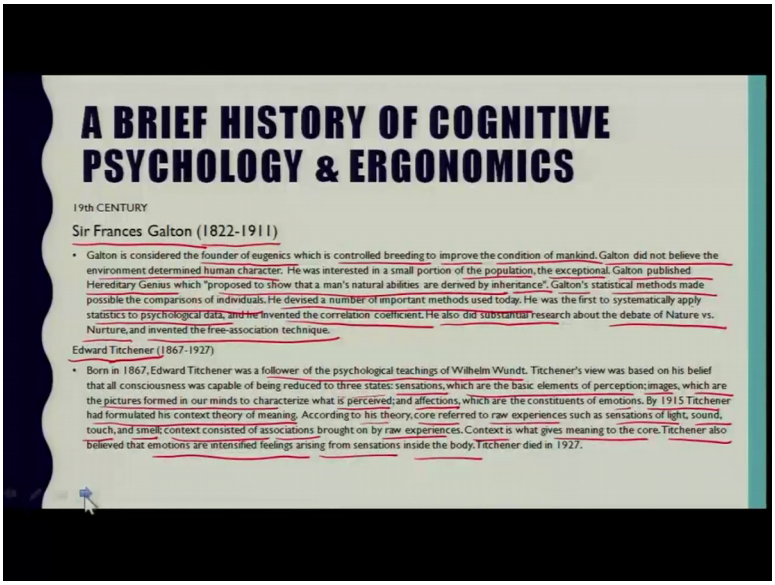

So, before closing this lecture just to cover some of the cognitive psychology part I have put some of the historical points here, so that is also essential to recall those scientist and researches that have contributed in that particular domain. So, Sir Frances Galton who is tenure was from 1822 to 1911. So, Galton is considered the founder of eugenics which is control breeding to improve the condition of mankind. Galton did not believe the environment and determined human character. He was interested in a small portion of the

population the exceptional. Galton unpublished hereditary genius which he proposed to show that a man's natural abilities are derived from inheritance. Galton's statistical methods made possible the comparison of individuals he devised the number of important methods used today. He was the first to systematically apply statistics to psychological data and he invented the correlation coefficient. He also did substantial research about the debate of Nature versus Nurture and invented the free-association techniques.

There is one more scientist is Edward Titchneer. So, Edward Titchener is born in 1867 and he was a follower of psychological teaching of Wilhelm Wundt. Titchener's view was based on his belief that all consciousness was capable of being reduced to three states; sensations, which are basic elements of perception; images, which are the pictures formed in our minds to characterize what is perceived; and affections, which are constituents of emotions. So, by 1959 he had formulated his context theory of meaning. According to his theory core refereed raw experiences such as sensations of light, sound, touch and smell context consisted of associations brought on by raw experiences. Context is what gives meaning to the core. Titchener also believed that emotions are intensified feelings arising from sensations inside the body.

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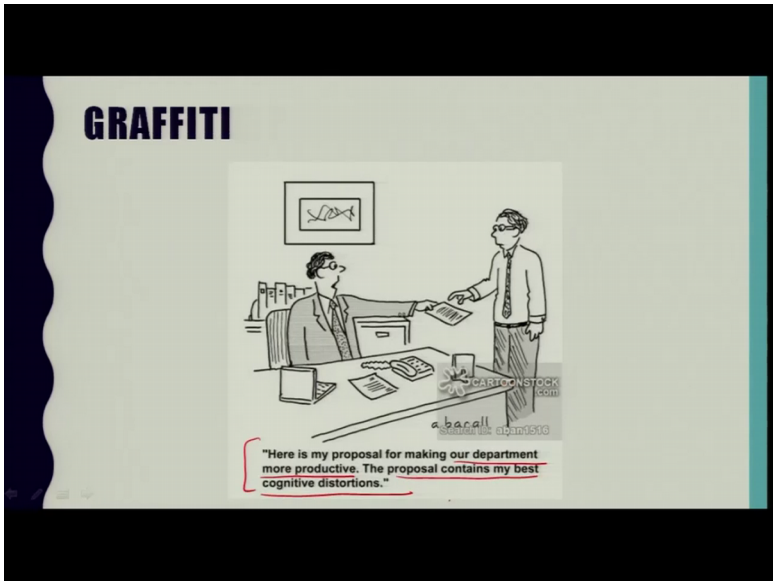

So, there is graffiti. So, the boss is saying to his employer that here is my proposal for making our department more productive. The proposal contains my best cognitive distortions.

So, finally thank you very much for your hearing.