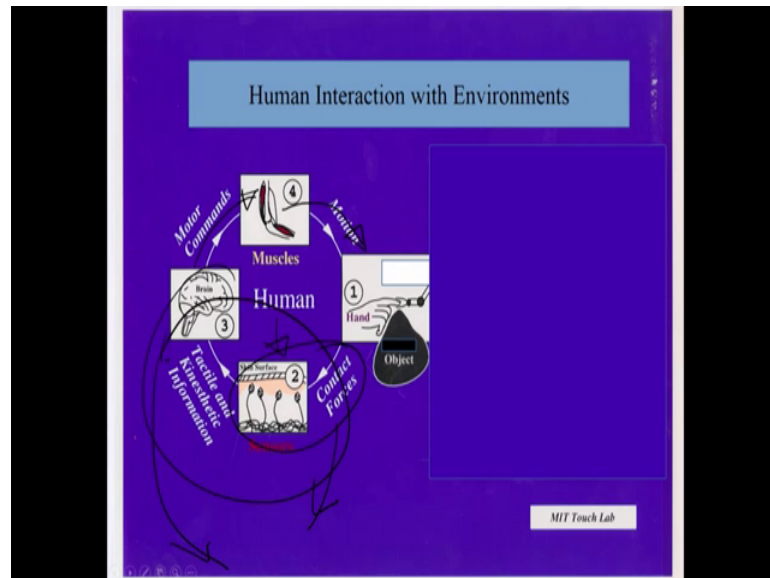


**Virtual Reality Engineering**  
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**Indian Institute of Technology, Madras**

**Lecture – 67**  
**Branches of Haptics**

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Before we talk about the course contents, let us look at how we actually touch the environments, how we interact with the environments. In order to understand and a haptics little more we will look at how we are interacting with environments. We have the hands when we touch it, because when we touch there are some contact forces developed and these contact forces are sensed by the sensors in our skin. And the sensors convey the tactile and kinesthetic information to the brain and the brain processes this information and then asks the muscle to move or do certain things.

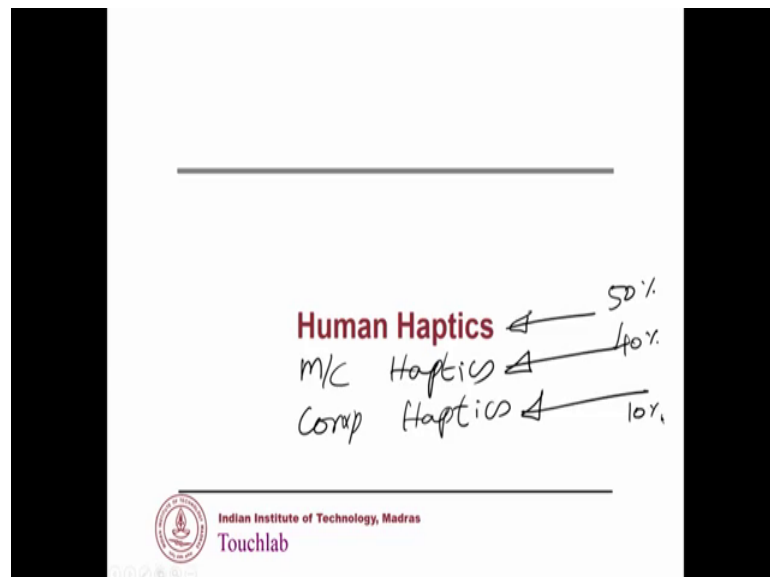
And then the muscle actually moves and therefore, we are moving the hands; therefore, we are manipulating the objects. This is a very rough, very crude idea of what is happening in haptics. Let us expand it a little further. For example, I want to expand what is happening between a contact force and what is happening over here. Just this alone we will take it and then expand it further.



aspect of the brain is called the cognition ok. So, once we have cognition, then we do the motor planning. Motor planning itself is a big subjects and then how motor planning is executed into the motor action, again there is a theory of motor action there is again a another specialized subjects.

So, how motor system is working in our human body can be you know as a part of the biomechanics that is again an another course which is offered in our department. So, you can see that there are lot of details in it we will in this part of the course, we will focus on a neurophysiology and then psychophysics as a part of the you know human haptics.

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So, the haptics course is divided into human haptics and then once we understand our human haptics, we may try to simulate in it in a machine in a robotics or we are going to design certain devices and that part of the haptics is called the Machine haptics.

Not only design the machines, but also we need to write softwares in order to give you this experience improve the experience of touch. So, give you a experience of touch in the virtual reality that part of the haptics is called the computer haptics. So, we will have the human haptics, machine haptics, and a computer haptics. These are the three aspects of the haptics; this course will have it ok. So, we will spend about 50 percent of the time in a human haptics another 40 percent of the time in the machine haptics, probably another 10 percent of the time in the computer haptics.