Contemporary Issues in Philosophy of Mind and Cognition

Prof. Ranjan K. Panda

Prof. Rajakishore Nath

Department of Humanities and Social Science

Indian Institute of Technology, Bombay

Lecture No. # 20

Artificial Intelligence - II

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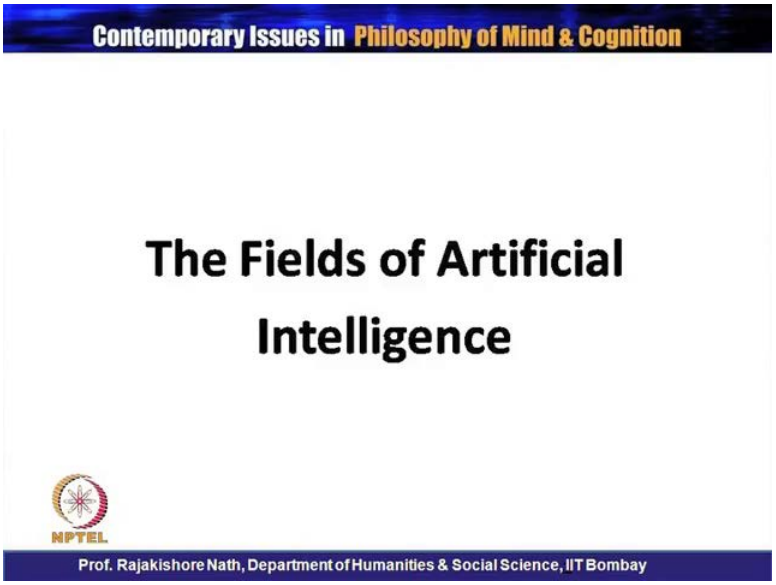

In this lecture, I am going to explain about the field of artificial intelligence, and as you have seen that, artificial intelligence is defined as machine making two things. It we require intelligence if done by human being, and here, we have to see how a artificial intelligence is related to philosophy of mind or contemporary issues in philosophy of mind, and this is one of the important aspect that you have to develop here and not only the philosophy of mind, but also to on a many other disciplines which are related to this.

Artificial intelligence is a new research area of growing inter disciplining interest and practical importance, and people with different, the ground and professionals knowledge or contributing new ideas and introducing new tools into this disciplines. Especially, cognitive mind and psychologist of developed new models of the mind based on the

fundamental concepts of artificial intelligence symbol systems and information processing. Linguistic also interest in this basic nations while developing different models in computational linguistic.

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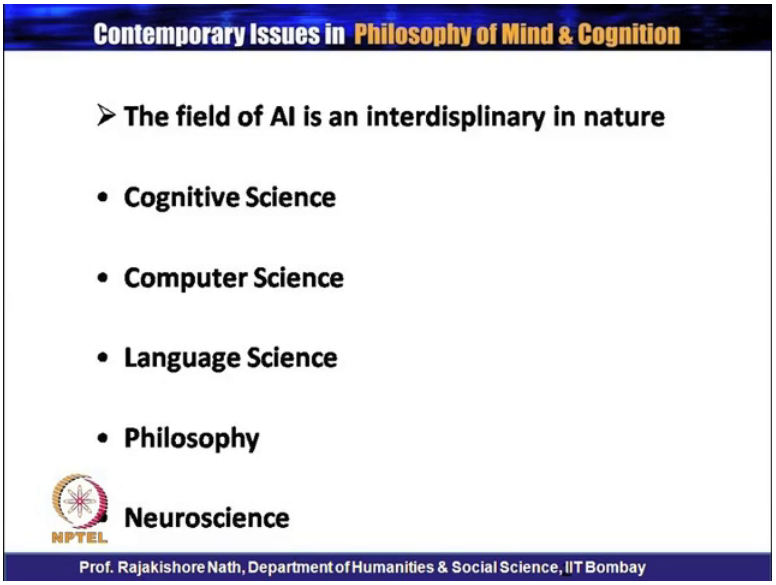

And you see how the nature of artificial intelligence is inter-disciplinary in nature; how the cognitive science, computer science, language science, philosophy and neuroscience and you can relate many other disciplines which are concern on mind, but on the philosopher in considering the progress problems and potential of this work towards non-human intelligence of some times found solution to the age old problems of the nature of mind and knowledge. How do you define a knowledge? How do you define a mind? and how do you define the self? and how do you define the ethics? You have many questions are related to this. If your defining mind in terms of machines, then and rationality also to machines and many other mental capacity to machines. Then therefore, there is no distinction man and machines.

Then, we have to redefine a everything else, because if there is not distinction between mind and machines, the machines are also part of the human being and also a part of the society, and society is defined over a many ways of social systems and the systems we have to redefine because there is a new edge and who is entering into this society, who is part of the human being.

And if you are accepting the artificial intelligence way of defining mind and the same time, philosopher I am not going against the strong sense the artificial intelligence, artificial intelligence in the sense that, artificial intelligence is artificial intelligence. If it is not like human beings, if it is not substituting the human mind, then there is no problem. Although it is helps in many ways for the human instance, for the human day to day life, for scientific as well as many other things, and in ordinary life, you find AI is necessary and that does not mean that AI will shift the human mind that we will see in the next some of the lectures.

Now, we have, we know that artificial intelligence is a part of computer science in which are designed the intelligent system that except it the characteristics we associate with intelligence in human behavior, understanding, language learning, reasoning, problem solving and so on. And it is believed that inside into the nature of mind can be gained by storing the operation of such systems.

Therefore, AI's - Artificial Intelligence - researches of in mentored dozens of program techniques that support some, some, sort of intelligent behavior. Now, you have to see the question is, is artificial intelligence a science or an art? The activity of developing intelligent computers systems employ both proved mathematical principles, empirical results of storing a previous system and illustic programming or programming technique. Therefore, the way it is acting, the way it is doing mathematics, it is also science and it is also an art, and you can see the how it is science that thus artificial intelligence is both arts and a science. It is a science because it develops intelligent computer systems by employing proved mathematical principles.

It is an art also because it designs system by employing programming techniques. Information stored in rational data structure can be manipulated by OS studied technique of computer science. So, as these are string diagrams, thus the field of artificial intelligence is fascinating because of this complimenting of arts and science.

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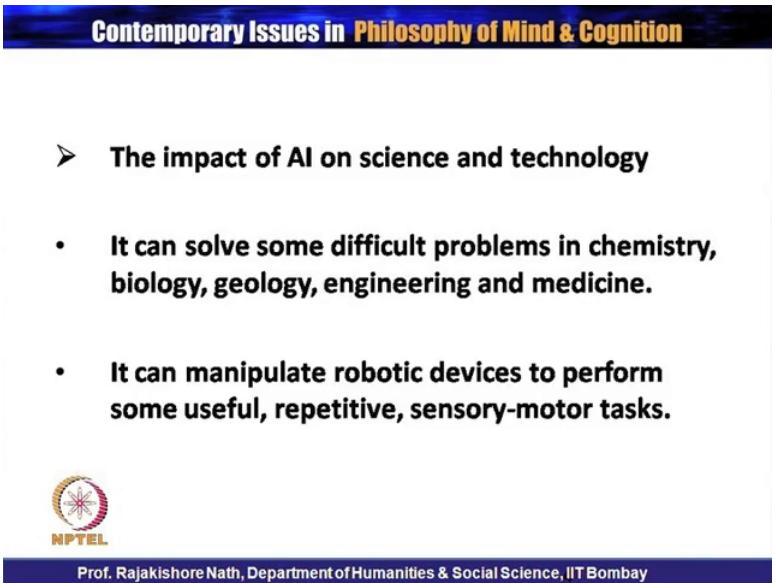

Artificial intelligence is a research may have impact of science and technology in the following way: it can solved difficult problems in chemistry, biology, geology, engineering and medicines; it can manipulate robotic devices to perform some useful, repetitive, sensory-motor tasks, sensory and many other motor tasks.

But besides artificial intelligence is researcher investigate different kinds of computations and different ways of describe computers in an effort, not just to create a intelligent artifact (( )) also to understand what intelligence is.

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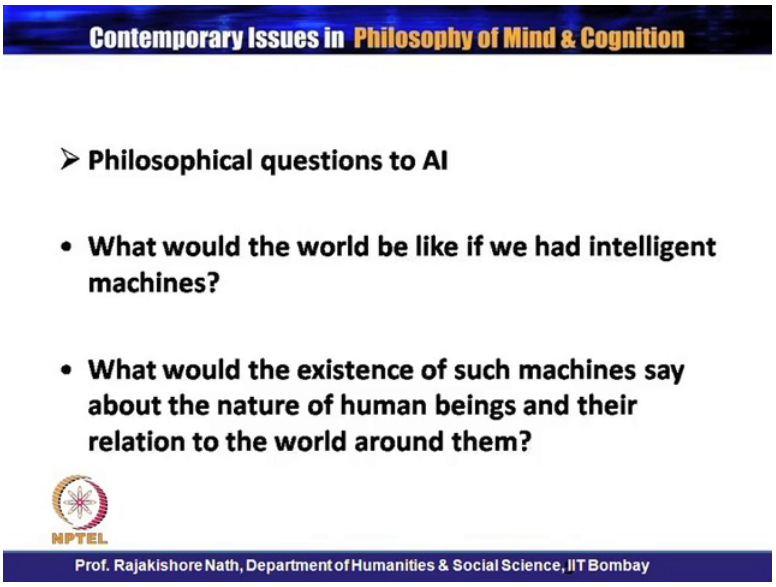

And AI basic tends is to create computers which can think. Thus, AI expands the field of intelligent activities of human beings in various ways. Now, the question is, what would the world be like if we had intelligent machines? What would the instance of such a machines? Say about the nature of human beings and their relation to the world around them. These questions have raised profound philosophical issues which will discuss in the course. The hypothesis of artificial intelligence and it is a (( )) or empirical in nature would truth or a false the is to be determined by experiment and empirical test.

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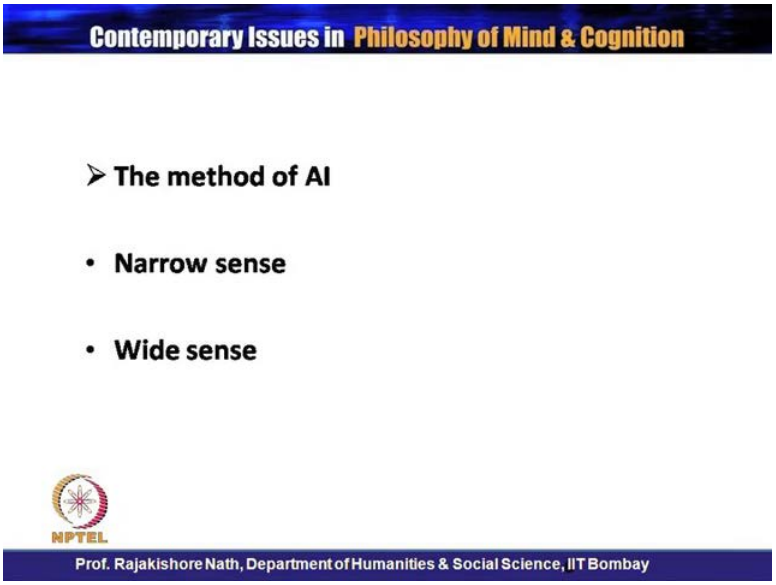

The method of testing the result of artificial intelligence is of the following types. The narrow sense AI is a part of computer science and aimed at exploring the range of task over which computer can be programmed to behave intelligently. Thus, it is the study of the way computer can be made to perform cognitive task which generally human beings undertake. In the wider sense, Artificial Intelligence is a aimed at program at simulate the actual process that human beings undergoing to intelligent behavior, and these simulation programs are intent as theory just describing and explaining human performance.

But they are tested by comparing the computing output with the human behavior to determined either the both results and also the actual behavior of computers and persons are similar. Now, we have to see digital computer as we have seen is an example of physical symbol systems. A system that is capable of inputting, outputting, storing,

etcetera following different courses of proportions. These systems are capable of producing intelligent depending on the level of mechanical sophistication they have. The computer with these capabilities behaves intelligent like human beings according to AI researcher. One of the importances in cognitive science is that, it is searches the relation between human and machine intelligent.

It is interested in using artificial intelligence technique to enlighten as about how human beings do intelligent task. For example, in getting a machine to solve geometric for integral calculation problems, we are also interested in learning more about the power and flexibility of the human capacity for problems. The AI research or artificial intelligence researches attempts to develop and test computer programs that exhibit characteristics of human intelligence.

The AI researcher always work with an artifact which is only inferentially related to the human mind. Borden - he says that here I would like to point out the (( )) that the machine questions are typical digital computers, but artificial intelligence not just study of computers, but it is the study in thought and actions. Therefore, Borden says that artificial intelligence is the discipline that aims to understand the nature of human intelligence to the construction of computer program that imitate human behavior.

AI is a artificial intelligence is concerned with the intelligent properties of the computer systems, which perform many different intelligent actions. These tasks can be of very varied nature such as the understanding of spoken or written testing in a natural language, playing chess, solving a puzzle, writing a poem, making a medical diagnosis, finding once way from Bombay to Delhi.

Therefore, the AI programs selects search activity include information reasoning processes which are part of any intelligent systems. Therefore, AI includes commonsensical task such as understanding this language recognizing since finding a way to reach an object, that is, for overhead heavy and physic and making sense of the plot of (( )).

In addition, artificial intelligence include exporters such as diagnosing diseases, designing computer systems, locating manually a mineral deposits and planning scientific experiments. The techniques that artificial intelligence applies to solve these problems are representations and inferences (( )) for handling the relevant knowledge

and search best problem solving method for executing that. Although the task with which artificial intelligence is concerned may seems to for may very heterogenic set. In fact, they are related to common reliance on technique of manipulation of knowledge and conducting search which will discuss in the next sections.

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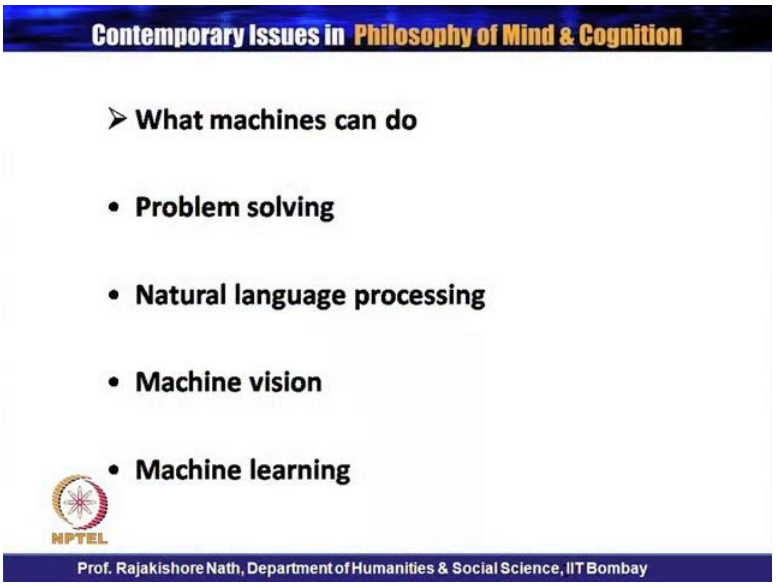

Now, you have to see what a machine can do. Within the scientific discipline of artificial intelligence, there are several distinct area of research each with its own specific in test research technique and terminology. That artificial intelligence is part of a computer science is concerned with designing intelligent computer system, that is, system that exhibit the characteristics. We associated with intelligent in humans beings such as understanding language, planning, reasoning, solving problem and so on.

In artificial intelligence, this precise includes research on language understanding, automatic programming and several others. The following discussion of the status of AI attempts to so, the sub field of identifying some aspects of intelligent heavier of and indicating the states of relevant research like the different sub fields of artificial intelligence of the different behavior discussed here.

I am not all independent. What machines can do and which is the one of the internal aspects of artificial intelligence. Within the scientific discipline of a artificial intelligence, there are several distinct area of a research each with its own specific interest research technique and technology. Therefore, artificial intelligence is part of

computer science concern is designing intelligent computer system, that is, systems that exhibit the characteristics we associate intelligence in human behavior such as understanding a language, learning, reasoning, solving a problem and so on.

In artificial intelligence, these specializations include research on language understanding automatic programming and several others. The following discussion of the status of artificial intelligence attempts to so of the sub field identifying some aspect of intelligent behavior and indicating the state of relevant research like the differences of fields of artificial intelligence. The different behaviors discussed here are not at all dependent. Separating them out is just a convenient way of indicating what current artificial intelligence persons can do.

And now, we have to see that what a machines can do. Firstly, machine can do problem solving, natural language processing, machine visions and machine learning. And these are the most important factors which a machine does. And all the machines does many other activities with the help of a this technique in a many OS. Let us see faster problems solving. What is this problem solving?

There is a distinct a problem solving though way we human being do problem solving, but in the case of machines, it does in different OS, but the a mediums are different. In the case of human being and the problem solving plays vital role, and our mind functions in a holistic manner, but in the case of machines, it is solves little bit different OS, but there are a many a artificial intelligence scientist. They concerned that the way even if a machine solving a problem in the same way, the human mind also solving the problem.

First, this success in artificial intelligence where programs that could solve puzzles and play games like chess and techniques like looking ahead several moves and dividing difficult problems into easier sub problems evolve in the fundamental artificial intelligence a technique of search and reproductions. Another problem solving program that integrates mathematical formulas symbolically as attended very high level of performance and is being used by scientist and engineers.

Humans beings often solve a problem that finding a way of thinking about it that makes the solution easy, but so far artificially intelligence programs must be told how to think about the problems they solve. As that which choose the best techniques and apply is to

them to the particular problems, and the another view is that a goal and a set of means of achieving the goal are called a problem solving.

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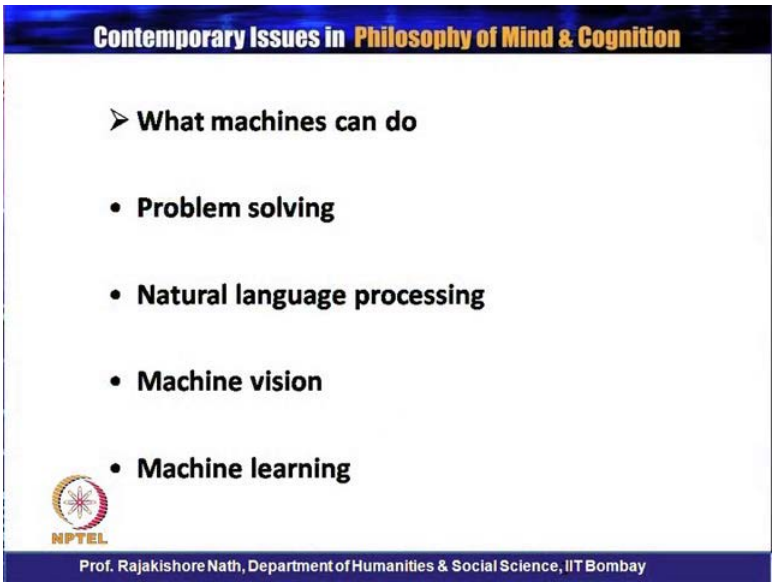

Before an agent can start searching for solutions, it must formulate a goal and then use the goal to a formulate problem. A problem consist of four parts - first is the initial state a set of operators, a goal test functions and a path cost functions. Any problems you see there are four states - initial states, a set of operators, a goal test functions and a path cost functions. The environment of the problem is represent by a states space; that means, there is the gap whenever we are solving a problems; from one step to another step, there is a gap. That gap is known as stepped space.

A path through the step space from the initial state to a goal state is a solutions, and in this path space, there are many internal things are happening, which is not visible to the outside world what which is the happening internally, and search can be just an the basis on the completeness optimality, time complexity and space complexity, that different search paths for an intelligent agent.

The agent has two search which is the minimum path to reach the goal and this is the main aim of artificially intelligence to, in order to solve the problems, and to solve a problem is the main task of the agent in artificial intelligence. Moreover, one of the important searches in artificial intelligence is the technique of illustic search.

The, what illustic is derived from the Greek persons (( )) meaning to find or to discover. Some people huge illustic and the opposite of algorithmic. According to Newell and Saw and Siemen process that may solve a given problem, but oppose no guarantee of doing, doing, so, called a illustic for that problems. We know that illustic techniques dominated early applications of artificial intelligence. Illustic method is still used in problem solving. For example, game playing is also a form of problem solving.

Games have engage the intellectual faculties of the humans, and game playing is also one the oldest areas of endeavor where artificial intelligence. A chess, a playing computer is a proof of a machine doing something through intelligence. Furthermore, the simplicity of the rules and their applications in the program implies that it is easy to represent the game as a search through a space of possible game positions. The initial states, the operators and terminal test and a pay of functions can define a game.

According to carpenter, an intelligent machines can follow all these rules and play more efficiently than human beings. For example, in speed chess games, computers have depart the world champion Garic Cassparrow. In both 5 minutes 25 minutes games, such a system would be a significant achievement not just for game playing research, but also for artificial intelligence system in general, because it would be much more like to be apply to the problem faced by a general intelligent agent. These are so many kinds of search in a to solve a problem, but we are not explaining the entire search. We are mainly concerned with how artificial intelligence programs solve depend problems within a few seconds. Therefore, the way machines are doing or solving a problem is one way of human beings are solving a problems.

Now, we have to see the natural language processing. Natural language processing plays vital role in artificial intelligence and NLP, and NLP because without the understanding of syntax and semantics of language, it is very difficult to construct any kind of programs to solve any kind of problems. You know to solve a problem, natural language processing is necessary, because without linguistic implications, without linguistic explanations and analysis, it is impossible to explain and the how artificial intelligence can solve problem.

The most common way that people communicate is by speaking or writing in one of the natural languages, any languages like Hindi language, English language, French language, Chinese language, or Oriya language or any other language. However, the computer programming languages seems to be differ from human languages. These artificial languages are designed so that sentences have a rigid format or a syntax making it easier for compliers to phrase the programs and convert them into the proper sequence of computer instructions. Besides being a structurally a simply than natural language, program language can easily express only those concept that are important in program, that is, do this, then do that.

See whether search and search is true. One of the important factor is that, it would understand what people mean when people use English language. The system would be easier to use and would fit more natural into people lives. Therefore, the artificial intelligence researches hope that learning how to build computers that can communicate as people do would extend our understanding of human being language and mind.

The goal of cognitive linguistic is to specify a theory of language comprehension and production to search a level of details that a person could write a computer program that could understand and produce natural language. Therefore, a the intelligent machines has the capacity to understand natural languages. It holds the response to question in an appropriate manner.

Thus, if the questions where now is Rome the capital of France, the simply reply will be known would be appropriate, but no it is Paris, or no, Rome is the capital of Italy with the more complex, and this example so that a machine programs would also be able to explain the meaning of what in other terms and also to translate from one language to a another language, and therefore, other language processing plays vital role explains what a machines can do with the help of natural language processing. Let us see the machine region.

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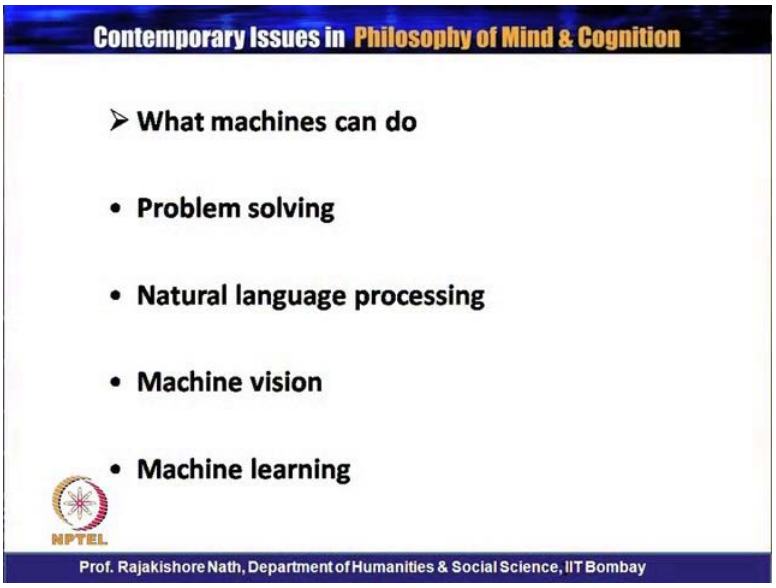

Machine region is one is another important aspects of artificial intelligence. Machine region is the information processing of understanding a seen from its projected images, and image is two-dimensional functions obtained with sensing device that records the value of an image feature at all points. Image are converted into a digital form for processing with a computer. The task of a computer vision system is to understand the seen that and imaginary of pixels defects. Generally machine vision means the vision of a machine that can see or perceived the things in the world.

Vision is the process of discovering from images what is present in the world and what it is. Thus vision is fast and for most an important information processing task. Moreover, there is a distinction between human vision, human perceptions and machine vision, because human vision is defined as the eye just as the, as I sense. The vision vertex of the human brain is our primary organ of vision. In the case of human vision, the sensor organs necessary a forms a representations or physical encoding of the received information that facilitate the answering of some questions about the environment, but make it extremely difficult to answer others.

For example, an exhibition of the encoded information produced by the human eye reveals that an eye instant of time the eye has sense only a small part of the electromagnetic spectrum and has extended and image of the seen from a particular view point in the space. It processes the visual information with the help of the lens fitted

within it. Thus machine region what more or less like human vision. Learning is now perceived as a get to understanding the problem of intelligent, because seeing is also intelligence; seeing is also learning and which is a key to the study of intelligence and biological vision. Visual neuroscience develop the method of understanding how human visual system work. Visual neuroscience in the sense is the beginning to focus on the mechanism that allows the cortex to adopt its circuitry and learn a new task.

A machine vision as a part of the artificial intelligence programs; however, tries to develop systems that can simulate human vision, and this is the main task of artificial intelligence that how to simulate human vision and how to get this human visions in a robotic systems or any artificial intelligence machines. And this is the main task of machine vision and also the main of aim machine vision to solve that is problems. In order to solve any kind of problems, machine vision is necessary; natural language processing is necessary.

Lastly we have machine learning, and machine learning is also one of the important factors in artificial intelligence. Learning for an intelligent agent is essential for dealing with unfamiliar environments. Learning a function from example of its input and output is called inductive reasoning. The ability to learn is one of the fundamental constitution of intelligence.

Learning being understood in its general sense as indicating the way in which the humans and animals can increase their stock of knowledge and improve their skills and reasoning power very beginning of artificial intelligence. Researches have sort to understand the process of planning, and to create computer programs that so how learning behavior, because this learning behavior is plays a vital role how to learn.

And you do not know in the case of human being to learning its behavior, it is very difficult to learn. And ordinary learning is a regional term denoting the way in which people increase their knowledge and improve their skills. The two fundamental regions for studying learning - one is to understand the process itself by developing computer models of a learning; psychology is of attempted to gain and understanding of the way human learn.

Philosophers in (( )) to half are sub interested in the process of a learning, because it might have them understand and how and known what knowledge each and how it growth. The second vision for learning research is provided computers with the ability to learn. Therefore, the learning research has potential extending in the range of problem is to which computers can be applied. In particular, the work in machine language is important and export system development, problem solving, computer visions, speech understanding, conceptual analysis of data base and intelligent authorizing systems.

In this way, a computer can do more work than human beings. Therefore, computers can do arithmetic at an unbelievable speed. No human beings can do, can compete with them, besides computers can do odds of like this is like detecting a diseases from the available data. Thus artificial intelligence as a study of machine intelligence especially of computers and robots opens of a new (( )) task of understanding mind and intelligence.

Intelligence behavior can be studied in many dimensions. This is made possible by the invention of computers has high processing a computing machines. The computers can do many things that is seems to recovery intelligent and other mental abilities, and the last lecture in this lectures I have explained about artificial intelligence. I am not here concerned about the scientific few of artificial intelligence, but I am concerned with the philosophical aspect of artificial intelligence and how artificial intelligence defining mind, consciousness and intensions and, and, all other mental faculties.

I am not going or arguing against the possibility of artificial intelligence, but my main argument is against artificial intelligence is that, how machines can simulate the human mind and how there is a possibility of mechanical mind and which is not distinction between the human mind. To ascribe mind into a machines is one of the difficult task that is the aim of this topic.

In the traditional mind but the problems, if you see, there was a lots of arguments between mind and a body because mind is primary or body is primary or mind is explainable in terms of the body or body is explainable in terms of mind, and those things my colleague professor Ranjan Panda has explained in his talk, but I will be, I am not going into details into the that part of the course, but that here, I will be dealing with mainly with mind and machines.

How the machines is replacing the mind; how the machine is a explaining the mind and there some of limitations, but I am not against many kind of help to the human society and to solve many other problems. There is no a limitation into that area, but the problem is that whenever their identifying with mind, the problem manages. Can we ascribe consciousness to machines or any other mentally faculties to machines? Many other things I will discussing in the (( )) courses. Thank you.