

**Segment: 03**

**Episode: 17, Basics of AI**

***Bablu's Robot***

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*(Bablu, a student of Class Nine is busy with his robot. He hopes to present this robot before the audience in the next Tech Fair at the Science City. His father Samar, aged around 48 and by profession a mathematics teacher, is trying to calm a crying baby aged two years. The baby is Samar's grandchild, son of his daughter Anamika, who is here to appear in her final M.Sc. examination. Samar enters Bablu's room with the baby crying.)*

**Characters**

**Bablu, a student of Class Nine**

**Sammer ) Father of Bablu)**

**Animila ( Married Daughters of Sammer**

**Durba, Bablu's moter**

**Dixit : Prof, Ai Expert**

**Narrator and Visitor I And II**

***(Sound of baby crying)***

***Samar:*** No-no Guddu, don't cry, ma will be returning soon. My lovely Guddu...

***Bablu:*** Why are you bringing it to my room baba? Don't you see that I am working?

***Samar:*** You just do not understand. Guddu won't stop crying till Anamika returns.

***Bablu:*** Where has her mother, I mean didi gone?

***Samar:*** She has to fetch her admit card today. Her M.Sc. examination starts next ***Monday***.

***Bablu:*** Why don't you give it to ma? She will be managing better.

***Samar:*** If ma gets engaged with Guddu then who will attend to the kitchen? Who will prepare food?

**Bablu:** I thought you are not at home. Weren't you saying that you will be going to school for teachers' meeting?

**Samar:** Yes, we had planned to meet at least once every week during this vacation for reorienting the curriculum. But I thought that I should stay at home to look after Guddu.

**Bablu:** But how can I work if Guddu keeps crying?

**Samar:** What are you doing actually that you seem so tensed?

**Bablu:** You know pretty well baba that I am giving finishing touches to my robot. The Tech Fair is only three days away.

**Samar:** Oh that robot. I thought you are already through with it. Are you adding anything else to it?

**Bablu:** A layer of extra protection around the structure. When it will compete with other robots there will be frequent clashes. So I am wrapping the structure with some soft polymer. It will act as a shock absorber.

**Samar:** It will compete at the fair? Oh, I thought that it will stand alone and do some exercise to impress the visitors.

**Bablu:** That is of course one part of the activity. Along with that there will be a game where competing robots will try to put specific coloured balls into a hole.

**Samar :** (Trying to calm the baby again) Idea! Why don't you give a demo? Guddu might get impressed by the robot. Come, do it.

**Samar:** We both want to see. Put the robot in place.

**Bablu:** (Feeling enthusiastic) You want to see baba? Wait a minute. Umm...here I go, it is cart shaped you see.

**Samar:** Hmm...there was a time when ordinary people thought that a robot has to look like a human being, all limbs similar.

**Bablu:** In the market you will find toys, which they called robots, those look like humans. Most of those have very limited mobility but as toys those are quite popular.

**Samar:** (baby still crying) I saw one in my colleague's house the other day that can respond to some specific questions. But forget those now, start your game.

*(Mechanical rolling sound heard as the robot rolls on its wheels on a wooden platform and nudges balls into a hole.)*

**Bablu:** Guddu, look at this, see how it is turning around ... now it will nudge the ball to its left...see...eh

**Samar:** Hold the remote properly Bablu. These are not very robust devices. You will have to press the buttons carefully.

**Bablu:** Right baba. But I still have a problem you know...the robot can turn every way but when it turns to the right it has a tendency to trip.

**Samar:** But one problem has already been solved, see! Guddu has stopped crying. It looks impressed.

**Bablu:** Ha ha, my robot is of some value.

**Samar:** But no, you need to solve this tripping problem of yours. I was wondering whether there is some error in the front right wheel's design!

**Bablu:** I cannot do anything about that baba. This is all that I can purchase in the market. You can order foreign made robot structures online but that will cost me eight to ten times the price of this one.

**Samar:** I understand. You know Bablu, artificial intelligence could help a lot in this regard.

**Bablu:** AI? Come on baba, I am stuck with this simple structure, how can I even imagine of integrating AI into my machine? In fact, I have very little knowledge about that.

**Samar:** (Voice mellowed) You know Bablu, your Didi was very interested in this AI thing. She even wanted to switch to AI research. One of her professors had possibly assured her of finding a research position somewhere. I do not remember properly.

**Bablu:** Really? I didn't know that! What happened then?

**Samar:** Well, things always do not go according to plan. Ritesh and Anamika loved each other and they had planned their marriage after they became settled. But all of a sudden Ritesh's mother fell ill and the doctor said that her days were numbered.

**Bablu:** Oh that is sad.

**Samar:** Yes. She wanted to see Ritesh and Anamika getting married and therefore we had to arrange things all of a sudden. That was four years ago. Anu had to discontinue her M.Sc. after the completion of the first year. (Sigh)

*(Durba, Bablu's moter enters.)*

**Durba:** What are you saying to Bablu? Do you think he is matured enough to hear all these things? You never understand anything.

**Bablu:** (Protesting) Come on ma, I am mature enough. You always underestimate me. Why did you keep all these secret?

**Durba:** Huh, like father like son. You two did not notice that Guddu has slept off. Come, give it to me. (She takes Guddu from the lap of Samar)

**Samar:** Careful!

**Durba:** You don't teach me how to be careful about kids. I have brought up these two children.

**Samar:** Ok, you win. Bablu we shall talk about this AI after your Didi returns.

**Durba:** And please get your bath in time you two! Do not think that the daily routine has changed just because it's summer vacation. I want both of you at the dining table in half an hour. Anu possibly would be late. I shall prepare some snacks for her when she returns.

**Bablu:** (Hushed) Ma, don't be so loud. Guddu will wake up again.

**Durba:** (Suddenly lowering her voice) Ok ok but you get going.

*(Durba leaves. Music denotes end of scene.)*

(It is evening and the radio is on. Towards the end of the bulletin the anchor reads something about AI.)

**Anchor:** Now some news from the technology front. A famous German automobile manufacturing company and another leading graphics chip manufacturer have come together to create state-of-the-art autonomous vehicles. The spokesperson of the automobile company, Klaus Ozil said that though autonomous cars are not a novel concept but they plan to do it completely differently. Mr Ozil said that they have drawn up elaborate plans to integrate artificial intelligence into their system. The starting point in the production process will be the computer architecture. The two companies hope to complete this project in about three years' time. And with that we come the end of this bulletin. Stay tuned for the next programme.

*(Samar switches of the radio.)*

**Anu:** You know baba, I was supposed to be doing research on this thing...

**Bablu:** You mean AI in automobiles? But you are a physics student and I thought...

**Anu:** You thought that only engineers are capable of doing AI research. You are completely wrong bhai! It's a seamless world. Anyone can switch to other disciplines that are related.

**Durba:** Now that you will be completing your M.Sc. after so many years, will they give you a chance to do this type of thing?

**Samar:** She will have to look out for opportunities Durba. But I am sure she will get suitable opportunities if she can stick to realizing her ambitions.

**Anu:** You know bhai, the basic idea here is to teach a machine how to learn the rules of safety. The algorithm should be written in such a way that the computer inside the car gets to understand all safety directions on road like traffic lights, signposts etc.

**Bablu:** Algorithm? Sounds like many things punched into one. Algebra, rhythm...

**Anu:** (Jokingly) Very smart! Algorithm is actually step by step instructions for calculation. It is fundamental to any computer programme. Algorithms rule the digital world. If you can write algorithms in a neat manner computers will be able to follow it and machine learning would be simpler.

**Samar:** Ah, machine learning. One term that was coined way back in 1949. In fact the model was given by Donald Hebb in a book called 'The Organization of Behaviour'.

**Bablu:** Machine's behaviour, right? So I can sometimes scold my machine, 'You! Try to behave properly!'

*(Laughter)*

**Anu:** Machines are like Guddu, you know?

**Durba:** Like Guddu? Come on Anu, do not compare your child with ugly machines! Our Guddu is so beautiful.

**Anu:** (Laughing) I am just comparing the information level of Guddu with that of the machines. More Guddu observes things, more education it is given, it will become intelligent.

**Durba:** That will happen naturally! You do not have to worry.

**Anu:** You are right ma but for machines this will not happen so naturally. You have to set up some artificial teaching sessions for educating the machine.

**Samar:** Why Durba, don't you remember when you asked me to teach how to use the voice recognition system in your cell phone. Remember what the phone asked you to do?

**Durba:** (Puzzled) I ... no... I mean I don't really remember what it said.

**Samar:** It asked you to pronounce a few words so that the in-built programme gets familiar with the way you pronounce.

**Durba:** Right! Now I remember but you know I have not been using the programme for quite some time.

**Samar:** No problem Durba. Since your pronunciation pattern has not changed recently the programme will respond in the same manner as it used to do earlier.

**Durba:** How funny, na?

**Anu:** It's not funny. Machines are not like human beings who are prone to forgetting. Once you give some information through text or speech or visuals it will store the information in its memory. That is the basic difference between man and machine.

*(Phone rings. Anamika accepts the call. Speaks on the phone.)*

**Anu:** (Speaking on phone) Yes Ritesh, I am ok. Ya...ya...Guddu is also fine. No there was no problem. Yes I got my admit card. ...Sorry? Your voice is not getting through properly... no...ya, now I get it. Yes my exam is starting on next Monday. Right. What? You will stay back at office today? What pressure? I just cannot understand...Ritesh, this is not ok at all. What about dinner?...what? From hotel? I just cannot accept this. All those spicy stuff from hotel regularly...what... phone call...ok-ok I am hanging up but don't forget to get some rest at night. Good night.

**Durba:** Ritesh is straining himself too much Anu.

**Anu:** I know ma but this is today's corporate life. If you refuse to accept this routine then you will be dubbed 'non-cooperative' or more badly 'inefficient'. No one wants such a tag on his career.

**Samar:** It must be very frustrating sometimes. The same routine over the years, overtime work, unhealthy food.

**Anu:** You know baba, once Ritesh downloaded a programme for psychological counselling.

**Durba:** Computer programme for counselling? What a time we are in!

**Anu:** Come on ma, just listen. Everything will keep changing. That is the norm of the world.

**Durba:** Ok-ok, tell me what happened to the programme?

**Anu:** The programme seemed very interesting for the first few days. It was not voice based like the ones we have today. When Ritesh or me wrote that I am depressed it promptly responded by asking ‘Why are you depressed?’ We gave our reasons – overwork, no social life or say, no career progression.

**Bablu:** And what did the programme reply?

**Anu:** It was very sober. It said all good things that even a normal human being would say. However, it went a step ahead in suggesting some physical or mental exercises that would keep us free from depression. It even advised us against taking pills.

**Samar:** Very intelligent programme I must say!

**Anu:** No doubt but you know, after a few days when we chose to ask some complex questions, it somehow faltered.

**Bablu:** I am getting very curious. What did it say?

**Anu:** It kept giving the same answers and we quickly understood that the programme has exhausted its stock of answers. The answers no more kept pace with the questions. And you know baba, what happened one day?

**Samar:** (Smiling) What?

**Anu:** I got angry and wrote, ‘You are a dumb counsellor!’ and it replied, ‘You are dumb.’ I again wrote, ‘You are useless!’. The programme replied, ‘You are useless.’

*(Everyone laughs)*

**Samar:** Clearly the programme had a very narrow area of functioning. It had a very small database.

**Anu:** This is often termed as Narrow AI. Our programme was primitive if we compare its level with the advances that we have made today. But I must say that no artificially intelligent programme or machine have not gone beyond Narrow AI.

**Bablu:** I do not understand Didi. Could you elaborate a little more?

**Anu:** Narrow AI operates within a pre-determined, pre-defined range, even if it appears to be much more sophisticated than that. Every sort of machine intelligence that surrounds us today is Narrow AI. Google Assistant, Google Translate, Siri and other natural language processing tools are examples of Narrow AI.

**Samar:** Was that explanation any better Bablu?

**Bablu:** No baba, I am still trying to understand what Didi is saying.

**Samar:** Forget all those machines. Think of your robot.

**Bablu:** Yes, my robot...

**Samar:** Suppose your robot was fitted with an AI that told it to go slow when turning and keep the axis as straight as possible then how would that be?

**Bablu:** It would be just wonderful! But who is going to give me that support?

**Samar:** (Smiling) That we shall have to work out but this sort of AI will be of the narrow type.

**Bablu:** Baba suppose that we fit my robot with more AI so that it can recognise traffic lights, signposts as Didi was saying a little while ago. Will that still be Narrow?

**Anu:** I am afraid yes Bablu. Narrow AI is also called weak AI but these adjectives do not matter much. In fact Weak or Narrow AI has relieved us of many boring tasks. We do not have to do routine and mundane jobs, we can assign those to the machines.

**Durba:** I was wondering whether there is any narrow AI that can arrange the plates on the dining table, put food on those and then can invite us to eat!

**Anu:** (Laughing) That was masterstroke ma! We get the message. Baba, bhai come let us help ma in arranging food on the table.

**Samar:** Yes it's 10.30 already. Let us move.

**Durba:** I am so glad that naturally intelligent people are coming to my help.

*(Laughter. Music denotes end of scene.)*

*(It is the Tech Fair and Bablu is demonstrating his robot to the audience and answering questions.)*

**Visitor I:** Do you think that such robots can be introduced in difficult terrains like mountain roads?

**Bablu:** My robot has limited capacity but going by what I have learnt from others I believe it could be modified to travel on mountainous roads.

**Visitor II:** What type of modification are you suggesting?

**Bablu:** Well, first of all the structure has to be more robust and then... (he pauses for a while)

**Visitor I:** Then what?

**Bablu:** I think I shall need the help of AI.

**Visitor II:** AI?

**Bablu:** Yes, I mean artificial intelligence. Difficult terrains can only be negotiated only when the robots are able to make decisions on their own.

**Visitor I:** Very smart answer my son. I am Professor of Telecommunication Engineering at the ECT College of Engineering. I am quite impressed. But let me also ask, what type of AI do you propose to use?

**Bablu:** Sir, I do not have much information on this but my Didi said that it will be Narrow or Weak AI.

**Visitor I:** Your didi? Is she in this field?

**Bablu:** No, I mean, there she is...Didi (Bablu calls aloud)

**Anu:** Coming Bablu. Any problem? (She comes rushing to Bablu and instantly recognises Prof Dixit who was talking to Bablu.)

**Anu:** Sir! You are here! Allow me to touch your feet.

**Dixit:** This is your brother Anamika?

**Anu:** Yes Sir! Bablu, this is Professor Dixit. He is an expert in the field of AI. I got a chance to do a project under him during my B.Sc. course.

**Dixit:** Come on, that was elementary. I could only give you a rough idea about algorithms and show you the use of ordinary sensors.

**Anu:** It gave me the inspiration I needed Sir! After that I have never lost interest in AI.

**Dixit:** I can now understand why he was referring to his Didi. I am very happy that you are able to pass on the baton to your brother.

**Anu:** Your blessings Sir!

**Dixit:** I heard you got married. Will you be here for some days now?

**Anu:** Yes Sir. I have resumed my studies. My final M.Sc. exam is starting next week.

**Dixit:** I see. That is really a good news. If you are still here after the exams are over then you can come to my lab. I shall show you something very interesting.

**Bablu:** Narrow AI sir?

**Dixit:** (Laughs) My son, the opposite to Narrow AI is General AI. No machine in the world has attained that status. What I want to show you is a programme that plays chess and plays it extremely well.

**Anu:** But I cannot play chess Sir!

**Dixit:** Not an issue. There are a couple of boys who can play chess very well. One of them had been Junior State Champion. You will just sit and watch how the programme reacts to each move by human players.

**Bablu:** I have seen on television sir, chess matches from the early days. Viswanathan Anand playing with computers.

**Dixit:** Yes my son, that was way before you were born. Deep Blue defeated Garry Kasparov and the computer programme REBEL defeated Viswanathan Anand. Those were in the nineties of the last century.

**Bablu:** You have that kind of computers in your lab?



**Dixit:** Our computer are more powerful than those of the nineties. Machines these days are used to something called Deep Learning. But we can discuss all that when you come to our lab. Make it a point to bring your brother Anamika. He is very intelligent!

**Bablu:** Naturally intelligent sir, as my ma says!

*(Everyone laughs at Bablu's comment. The episode concludes with a jolly music.)*