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Department of Electronics and Communication

Report on eSim workshop

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IIT Bombay,
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Workshop Schedule

09:30-10:30 Inaugural & Interaction
10:30-10:45 Tea/coffee break
10:45-12:30 Self Learning of eSim using Spoken Tutorials
12:30-01:00 Interaction with Remote Centres
01:00-02:00 Lunch
02:00-04:15 eSim Learning (contd.)
04:15-04:30 Tea/coffee break
04:30-06:00 Interaction with Remote Centres and Valedictory Session.

- Workshop was conducted Using Spoken Tutorials, Videoconference (A-VIEW) based interaction and Forums based interaction.

1. Under Task 1

carried out the following three tasks:

Task 1 To create and simulate an astable multivibrator using eSim, and compare the frequencies of oscillation with a real circuit, and with hand calculations.

Task 2 To create a PCB layout in eSim and generating Gerber files for the same.

Task 3 Optionally, sending Gerber files to a vendor, and getting a PCB and the astable multivibrator circuit made for a fee (Workshop organisers or IIT Bombay or our funding agencies do not have any interest in this activity).

2. Hardware provided to you You are provided a kit with one each of the following:

   1. Astable multivibrator circuit board
   2. 9V battery
   3. A wire to connect the board with the battery In addition, you are provided with 2 each of the following resistors: 33 kΩ, 68 kΩ, 150 kΩ

Task 1: Role of Simulation This has three sub tasks, as explained below. You may do these tasks in any order.

Sub task 1: Hardware circuit Select R2 and R3 as in the Table below and carry out the following steps: 1. Connect resistors as shown below (left), and then the battery as shown on the right:
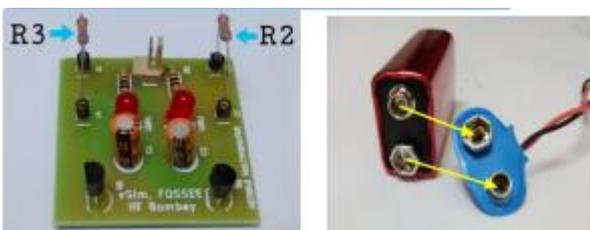
2. Connected the other end of the battery connector as shown below (left). The circuit should blink, as shown on the right.
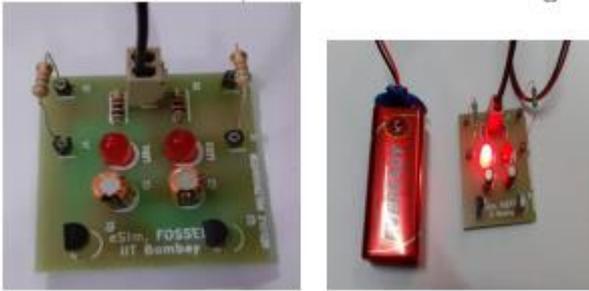
3. To change the resistor values, do the following: remove the battery connection, change the resistors, and connect the battery again. Repeated and completed the readings for different combinations of resistor values as shown in the Table.

Resistance		PCB (in 10 sec)		eSim (in 10 sec)	
R2	R3	No. of times LED1 blinks	No. of times LED2 blinks	No. of cycles at node LED1	No. of cycles at node LED2
68k	68k				
150k	150k				
33k	33k				

Sub task 2: Simulation

we have measured the number of cycles through simulation of the same circuit through eSim, as follows:

1. Listen to the side-by-side Spoken Tutorial

2. Practise the Spoken Tutorial Schematic creation and simulation, as explained in the Instruction Sheet.

3. Practise the Spoken Tutorial Simulating an Astable Multivibrator and create the following schematic, starting from the code file.

4. Choosing values of R2 and R3 in the following Table, count the number of cycles at nodes LED1 and LED2, and enter the values.

(a) Change ONLY the values of R2 and R3 in the schematic created in eSim and save the changes. DO NOT CHANGE THE FIELD REFERENCE. (b) Generate the KiCad netlist [.cir extension] and convert the KiCad netlist to ngspice netlist using the KiCadToNgspiceConverter feature. Refer to the Spoken Tutorial again if needed. (c) Make sure the analysis parameters, source details, device modelling tab values are same as mentioned in the Spoken Tutorial.

Finally ended up with the Interaction with Remote Centres and Valedictory Session.