SILENT SOUND TECHNOLOGY

....Silence is the best answer for all the situations ...even your mobile understands !

Vision:

To empower girls of diploma computer engineering to excel in IT Industries and serve the society.

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- To encourage innovative ideas among students to enhance their entrepreneurship skills.
- To provide high tech educational resources and supportive infrastructure.

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Abstract

Everybody has the experience of talking aloud in the cell phone in the middest of the disturbance while travelling in trains or buses. There is no need of shouting anymore for this purpose. 'Silent sound technology' is the answer for this problem.

The Silent sound technology is an amazing solution for those who had lost their voice but wish to speak over phone. It is developed at the Karlsruhe Institute of Technology and you can expect to see it in the near future. When demonstrated, it seems to detect every lip movement and internally converts the electrical pulses into sounds signals and sends them neglecting all other surrounding noise. It is definitely going to be a good solution for those feeling annoyed when other speak loud over phone.

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'Silent Sound' technology aims to notice every movements of the lips and transform them into sounds, which could help people who lose voices to speak, and allow people to make silent calls without bothering others. Rather than making any sounds, your handset would decipher the movements your mouth makes by measuring muscle activity, then convert this into speech that the person on the other end of the call can hear. So, basically, it reads your lips. This new technology will be very helpful whenever a person looses his voice while speaking or allow people to make silent calls without disturbing others, even we can tell our PIN number to a trusted friend or relative without eavesdropping . At the other end, the listener can hear a clear voice. the awesome feature added to this technology is that "it is an instant polyglot" I.E, movements can be immediately transformed into the language of the user's choice. This translation works for languages like English, French & German. But, for the languages like Chinese, different tones can hold many different meanings. This poses problem and also said that in five or may be in ten years this will be used in everyday's technology.

Introduction

Silence is the best answer for all the situations …even your mobile understands !

- The word Cell Phone has become greatest buzz word in Cellular Communication industry.

- There are lots and lots of technology that tries to reduce the Noise pollution and make the environment a better place to live in.

- I will tell about a new technology known as Silent Sound Technology that will put an end to Noise pollution.

You are in a movie theatre or noisy restaurant or a bus etc where there is lot of noise around is big issue while talking on a mobile phone. But in the future this problem is eliminated with "silent sounds", a new technology unveiled at the CeBIT fair that transforms lip movements into a computer-generated voice for the listener at the other end of the phone.

It is a technology that helps you to transmit information without using your vocal cords. This technology aims to notice lip movements & transform them into a computer-generated sound that can be transmitted over a phone. Hence person on other end of phone receives the information in audio.

In the 2010 CeBIT's "future park", a concept "Silent Sound" Technology demonstrated which aims to notice every movement of the lips and transform them into sounds, which could help people who lose voices to speak, and allow people to make silent calls without bothering others.

The device, developed by the Karlsruhe Institute of Technology (KIT), uses electromyography, monitoring tiny muscular movements that occur when we speak and converting them into electrical pulses that can then be turned into speech, without a sound uttered.

'Silent Sound' technology aims to notice every movements of the lips and transform them into sounds, which could help people who lose voices to speak, and allow people to make silent calls without bothering others. Rather than making any sounds, your handset would decipher the movements your mouth makes by measuring muscle activity, then convert this into speech that the person on the other end of the call can hear. So, basically, it reads your lips.

Figure - Common people talking at same place without disturbance

The technology opens up a host of applications, from helping people who have lost their voice due to illness or accident to telling a trusted friend your PIN number over the phone without anyone eavesdropping — assuming no lip-readers are around.

The technology can also turn you into an instant polyglot. Because the electrical pulses are universal, they can be immediately transformed into the language of the user's choice.

Native speakers can silently utter a sentence in their language, and the receivers hear the translated sentence in their language. It appears as if the native speaker produced speech in a foreign language.

The translation technology works for languages like English, French and German, but for languages like Chinese, where different tones can hold many different meanings, poses a problem.

Need For Silent Sound

Silent Sound Technology will put an end to embarrassed situation such as-

- An person answering his silent, but vibrating cell phone in a meeting, lecture or performance, and whispering loudly, ' I can't talk to you right now' .

- In the case of an urgent call, apologetically rushing out of the room in order to answer or call the person back.

- The technology opens up a host of applications, from helping people who have lost their voice due to illness or accident to telling a trusted friend your PIN number over the phone without anyone eavesdropping — assuming no lip-readers are around. Native speakers can silently utter a sentence in their language, and the receivers hear the translated sentence in their language. It appears as if the native speaker produced speech in a foreign language.

Origination

- ✓ The idea of interpreting silent speech electronically or with a computer was popularized in the 1968 Stanley Kubrick science-fiction film __2001 – A Space Odyssey

- ✓ In 2010 at CEBIT one of the largest trade fair a new concept called "SILENT SOUND TECHNOLOGY" was demonstrated

- ✓ This technology is being developed by scientists of Karlsruhe Institute Of Technology (KIT), Germany .

Methods

Silent Sound Technology is processed through some ways or methods. They are

- Electromyography (EMG)

- Image Processing

Electromyography

- The Silent Sound Technology uses electromyography, monitoring tiny muscular movements that occur when we speak.

- Monitored signals are converted into electrical pulses that can then be turned into speech, without a sound uttered.

- Electromyography (EMG) is a technique for evaluating and recording the electrical activity produced by skeletal muscles.

- An electromyography detects the electrical potential generated by muscle cells, when these cells are electrically or neurologically activated.

- Electromyographic sensors attached to the face records the electric signals produced by the facial muscles, compare them with pre recorded signal pattern of spoken words

- When there is a match that sound is transmitted on to the other end of the line and person at the other end listen to the spoken words

Image Processing

- The simplest form of digital image processing converts the digital data tape into a film image with minimal corrections and calibrations.

- Then large mainframe computers are employed for sophisticated interactive manipulation of the data.

- In the present context, overhead prospective are employed to analyze the picture.

- In electrical engineering and computer science, image processing is any form of signal processing for which the input is an image, such as a photograph or video frame; the output of image processing may be either an image or, a set of characteristics or parameters related to the image. Most image-processing techniques involve treating the image as a two-dimensional signal and applying standard signal-processing techniques to it.

Electromyography

Electromyography (EMG) is a technique for evaluating and recording the electrical activity produced by skeletal muscles. EMG is performed using an instrument called an electromyograph, to produce a record called an electromyogram. An electromyograph detects the electrical potential generated by muscle cells when these cells are electrically or neurologically activated. The sig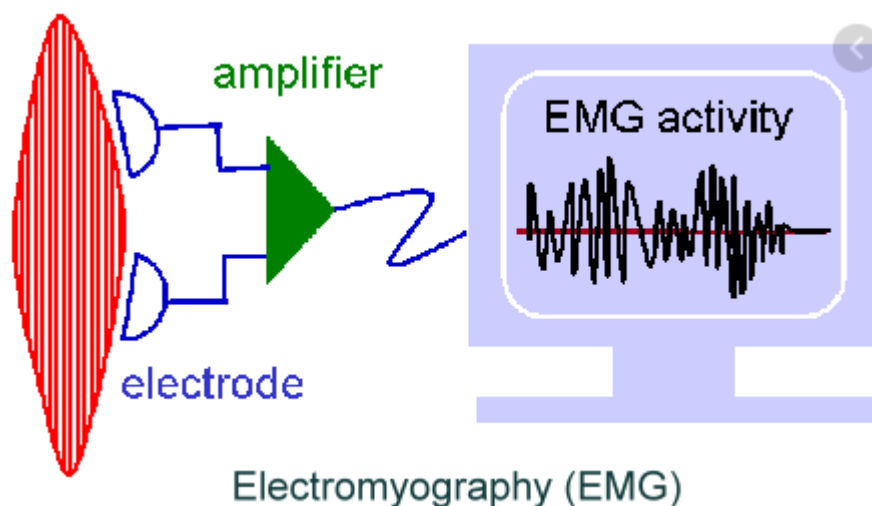nals can be analyzed to detect medical abnormalities, activation level, recruitment order or to analyze the biomechanics of human or animal movement.

- The Silent Sound Technology uses electromyography, monitoring tiny muscular movements that occur when we speak.

- Monitored signals are converted into electrical pulses that can then be turned into speech, without a sound uttered.

- Electromyography (EMG) is a technique for evaluating and recording the electrical activity produced by skeletal muscles.

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Figure - Electromorphography signal generation

There are many applications for the use of EMG. EMG is used clinically for the diagnosis of neurological and neuromuscular problems.
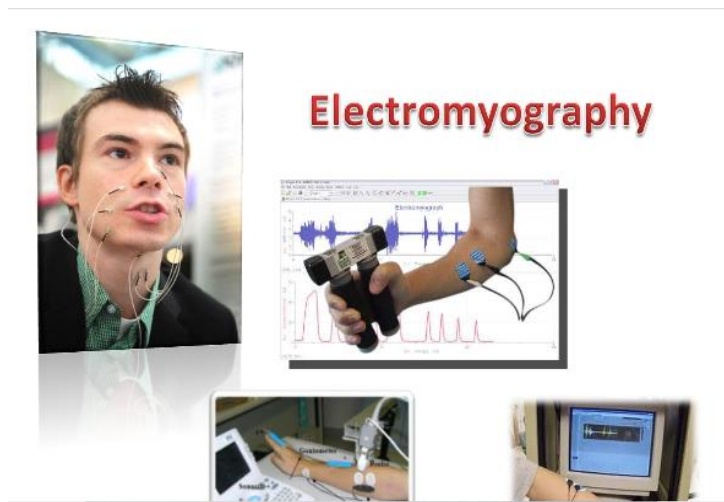

Figure - Electromyography instruments

- It is a technique which monitors tiny muscular movements and pulses generated by it The transducers involved converts the pulses into electric signals .

- Electromyographic sensors attached to the face records the electric signals produced by the facial muscles, compare them with pre-recorded signal pattern of spoken words.
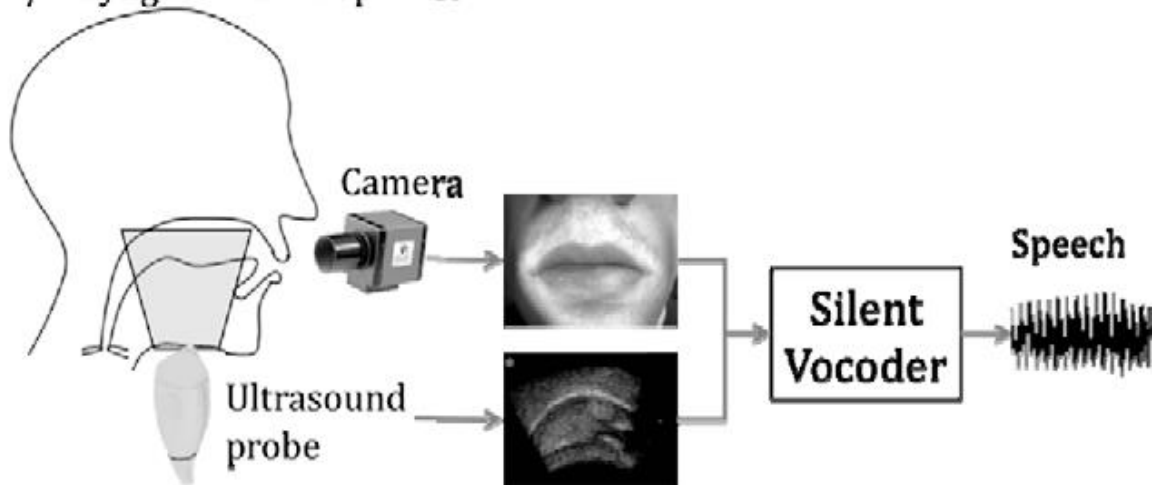
Working of Electromyography

- A needle containing two fine-wired electrodes is inserted

- through the skin into the muscle tissue.

- Then the electrical activity when the muscle is at rest is observed.

- Each electrode track gives only a very local picture of the activity of the whole muscle

- Because skeletal muscles differ in the inner structure, the electrode has to be placed at various locations to obtain an accurate signal.

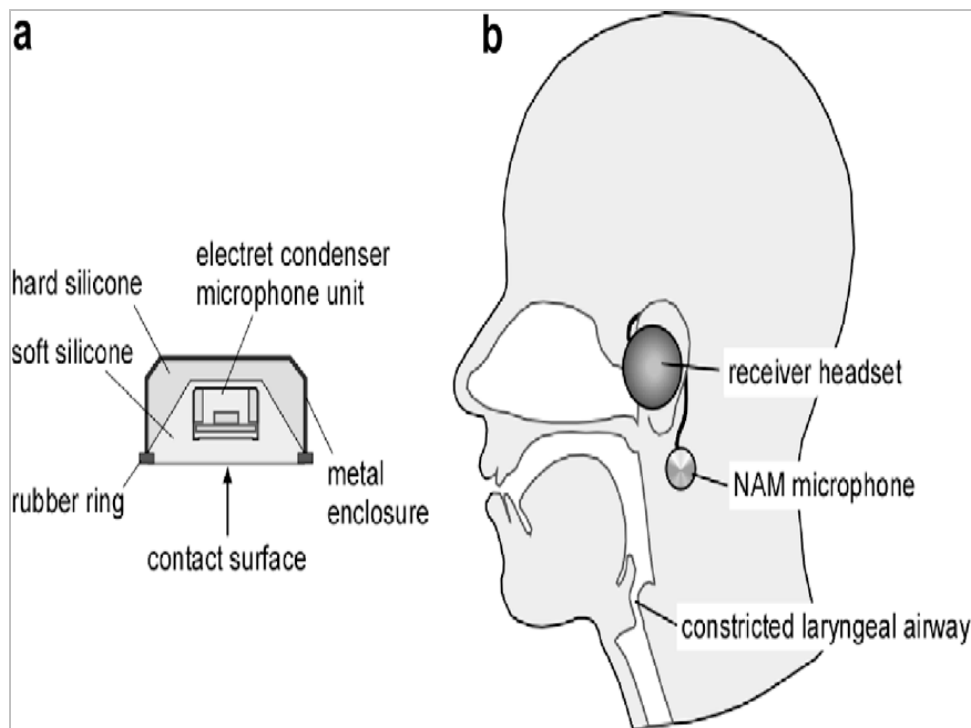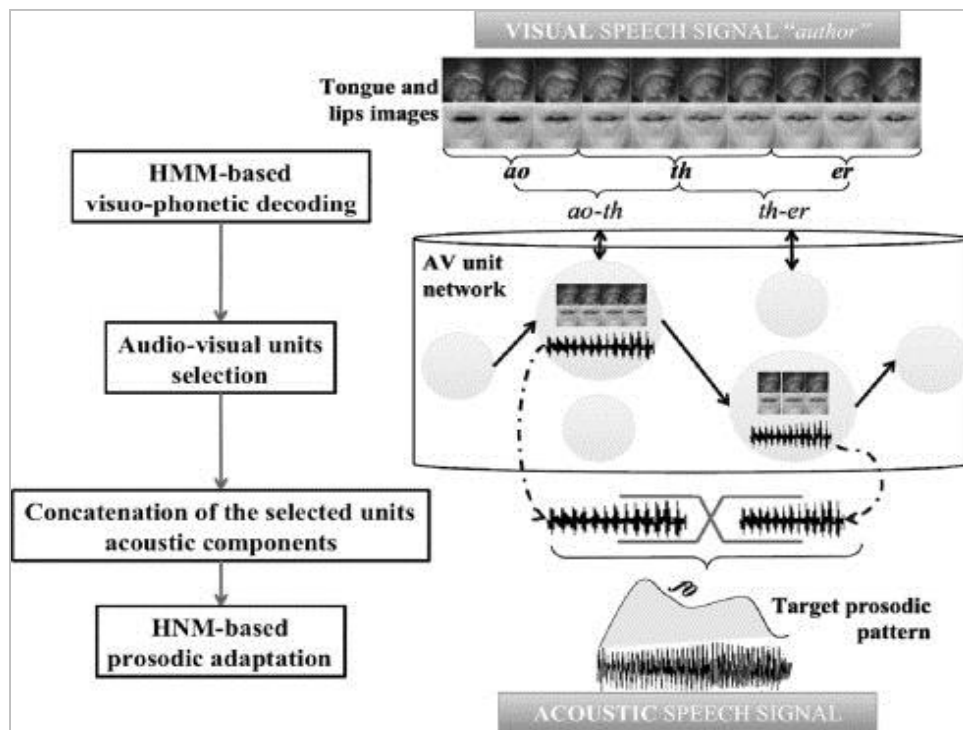- Thus by this way the speech can be communicated without sound.

IMAGE PROCESSING

Image Processing Technique

Analysis of remotely sensed data is done using various image processing techniques There two types of image processing;

- Analog image processing

- Digital image processing

Analog Image Processing

- Analog processing techniques is applied to hard copy data such as photographs or printouts.

- It adopts certain elements of interpretation, such as primary element, spatial arrangement etc.,

- With the combination of multi-concept of examining remotely sensed data in multispectral, multitemporal, multiscales and in conjunction with multidisciplinary, allows us to make a verdict not only as to what an object is but also its importance.

- Apart from these it also includes optical photogrammetric techniques allowing for precise measurement of the height, width, location, etc. of an object.

Digital Image Processing

- Digital image processing is been used in silent sound technology, is the processing of converting the image into image, video or audio but in Silent sound Technology (talking without talking) the output is audio with minimal corrections and calibration. The interface will contain ultrasound transducer, high resolution optical camera, lips reader and silent vocal. Ultra sound device which couple with high resolutions optical camera which will capture image of the lips and tongue movement. The image will be send to lips reader and the lips reader compare the earlier spoken words with the present lips and tongue movement and the matched Image of lips and tongue will generate a visual speech signal.

To overcome the flaws and deficiencies in order to get the originality of the data, it needs to undergo several steps of processing.

1. Pre processing
2. Display and enhancement
3. Information extraction

Features of Silent Sound Technology

- Native speakers can silently utter a sentence in their language, and the receivers can hear the translated sentence in their language. It appears as if the native speaker produced speech in a foreign language. The translation technology works for languages like English, French and German, except Chinese, where different tones can hold many different meanings.

- Allow people to make silent calls without bothering others.

- The Technology opens up a host of application such as mentioned below

- Helping people who have lost their voice due to illness or accident.

- Telling a trusted friend your PIN number over the phone without anyone eavesdropping — assuming no lip-readers are around.

- Silent Sound Techniques is applied in Military for communicating secret/confidential matters to others.

Applications

The Technology opens up a host of application such as mentioned below :

- Helping people who have lost their voice due to illness or accident.

- Telling a trusted friend your PIN number over the phone without anyone eavesdropping — assuming no lip-readers are around.

- Silent Sound Techniques is applied in Military for communicating secret/confidential matters to others.

- Native speakers can silently utter a sentence in their language, and the receivers can hear the translated sentence in their language. It appears as if the native speaker produced speech in a foreign language. The translation technology works for languages like English, French and German, except Chinese, where different tones can hold many different meanings.

- Allow people to make silent calls without bothering others.

Limitationsof Silent Sound Technology

- It cannot work for language that different tones means different meaning like Chinese. It is working perfect only if electrode inserted into face. There won't be emotional feeling the speech because it will be talking like robot.

Future Research

- In the future the silent sound technology will be incorporate into mobile phone or headset which headset would decipher the movement of the lips and jaws and received electrical impulse which will be convert into sound signal before transmitted.

Conclusion

- Thus Silent Sound Technology,one of the recent trends in the field of information technology implements "Talking Without Talking".

- It will be one of the innovation and useful technology and in mere future this technology will be use in our day to day life.

 'Silent Sound' technology aims to notice every movements of the lips and transform them into sounds, which could help people who lose voices to speak, and allow people to make silent calls without bothering others. Rather than making any sounds, your handset would decipher the movements your mouth makes by measuring muscle activity, then convert this into speech that the person on the other end of the call can hear. So, basically, it reads your lips.

REFERENCES

1. www.google.com

2. www.slideshare.net

3. www.wikipedia.com

4. www.seminarstopics.com

Quiz : 1 Find a positive number which when increased by 17 is equal to 60 times the reciprocal of the number.

A.   3   B.   10   C.   17   D.   20
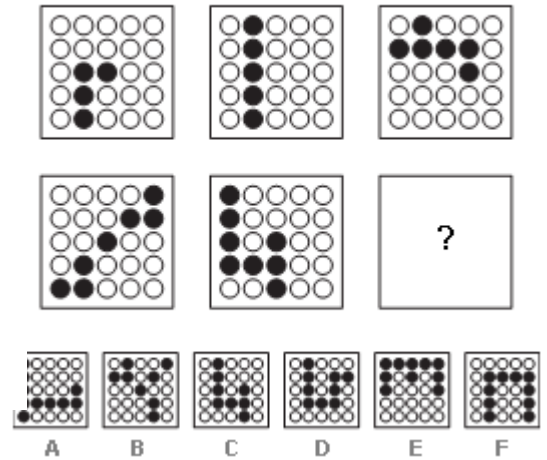
Quiz : 2

Which number replaces the question mark?

3
5
8
13
22
?

Quiz : 3

Which number replaces the question mark?

2	3
6	4
8	12
24	?

Quiz : 4

What is missing in the last grid?

A   B   C   D   E   F

Answer of Last Quiz (18)

Q. 1   Answer:B

Explanation: This is a simple division series; each number is one-half of the previous number.In other terms to say, the number is divided by 2 successively to get the next result.

4/2 = 2
2/2 = 1
1/2 = 1/2
(1/2)/2 = 1/4
(1/4)/2 = 1/8 and so on.

Q. 2   Answer: B

Explanation: This is a simple alternating addition and subtraction series. In the first pattern, 3 is added; in the second, 2 is subtracted.

A baby makes love stronger, the days shorter, the nights longer, savings smaller, and a home happier.
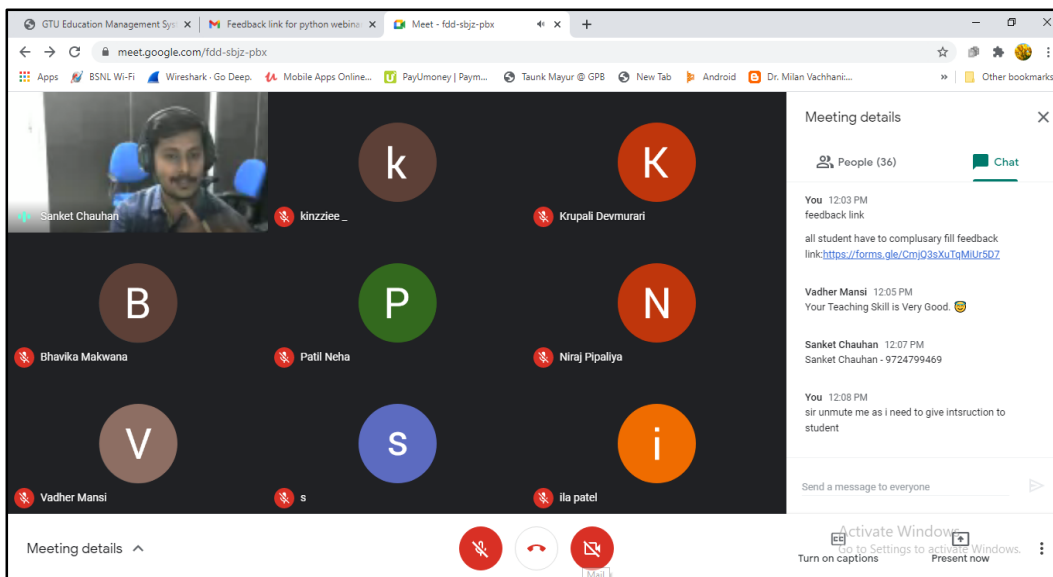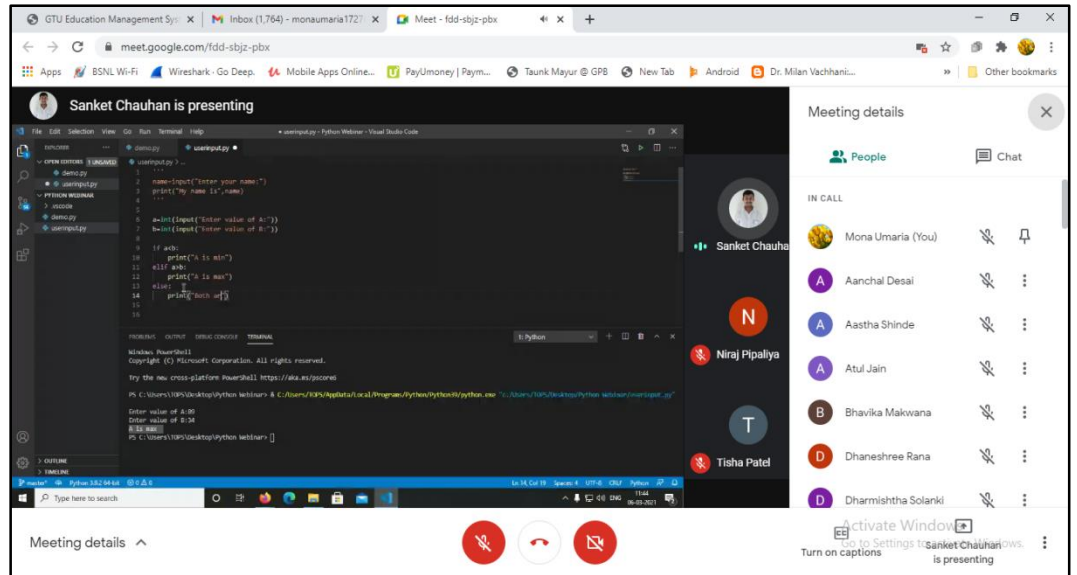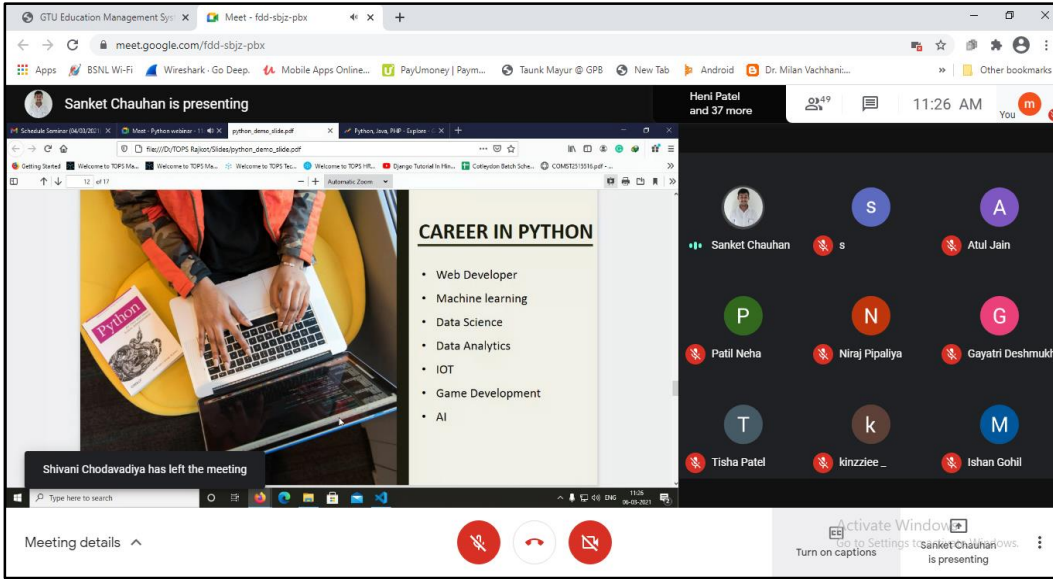

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"Just because you're awake doesn't mean you should stop dreaming."

#A baby's smile is just like an uncut diamond, perfectly shaped without any interference from the cruelties of the world.

Events of the Month:

Webinar on Python

Seminar on Women Empowerment in 21st. Century