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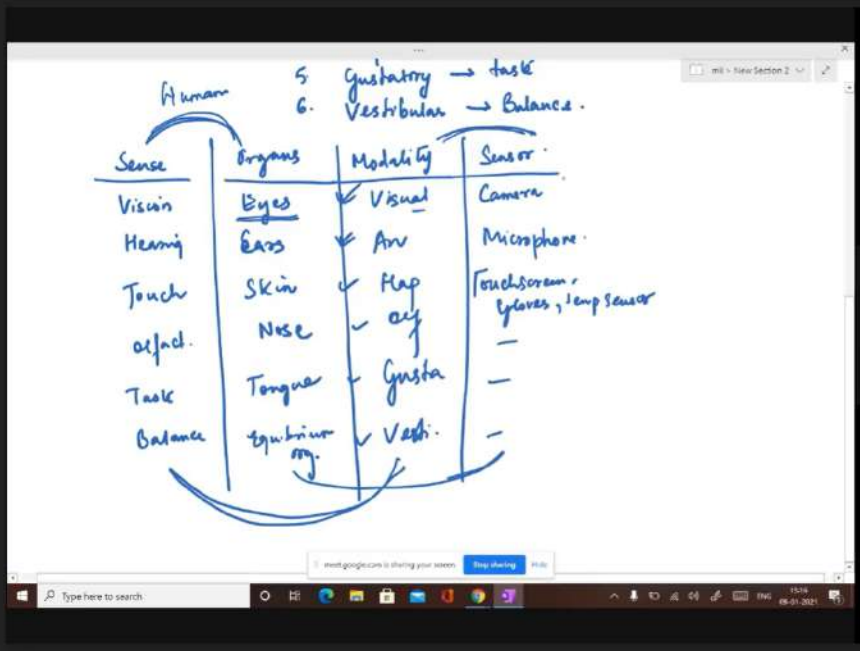

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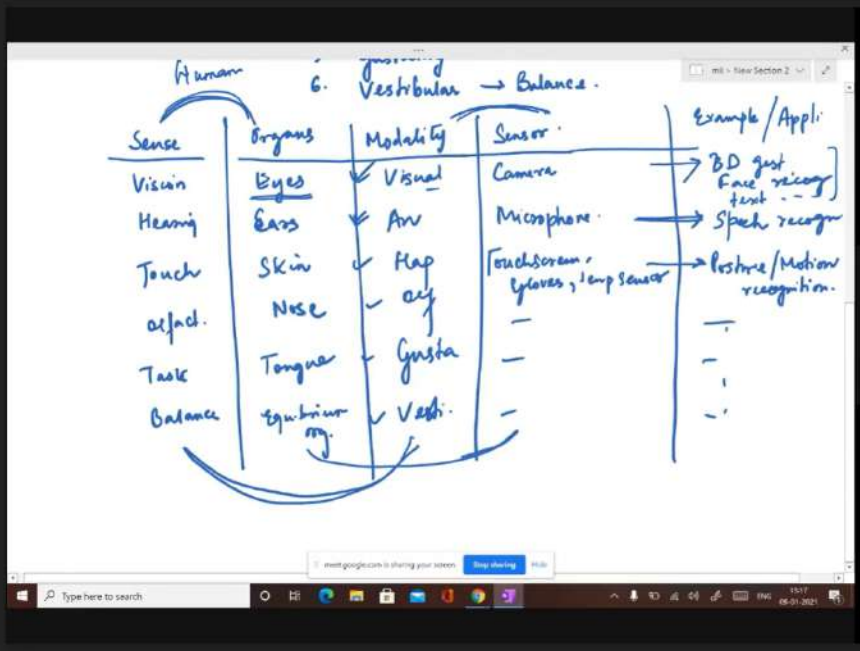

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Modality :- capability of the system to mimic each human-sensory channel.

2. Multimedia & Multimodality.

TV	Movie hall	Smartphone	PC/Desktop

Multimedia :- System with more than one way to transfer information from the system to user.

System → user

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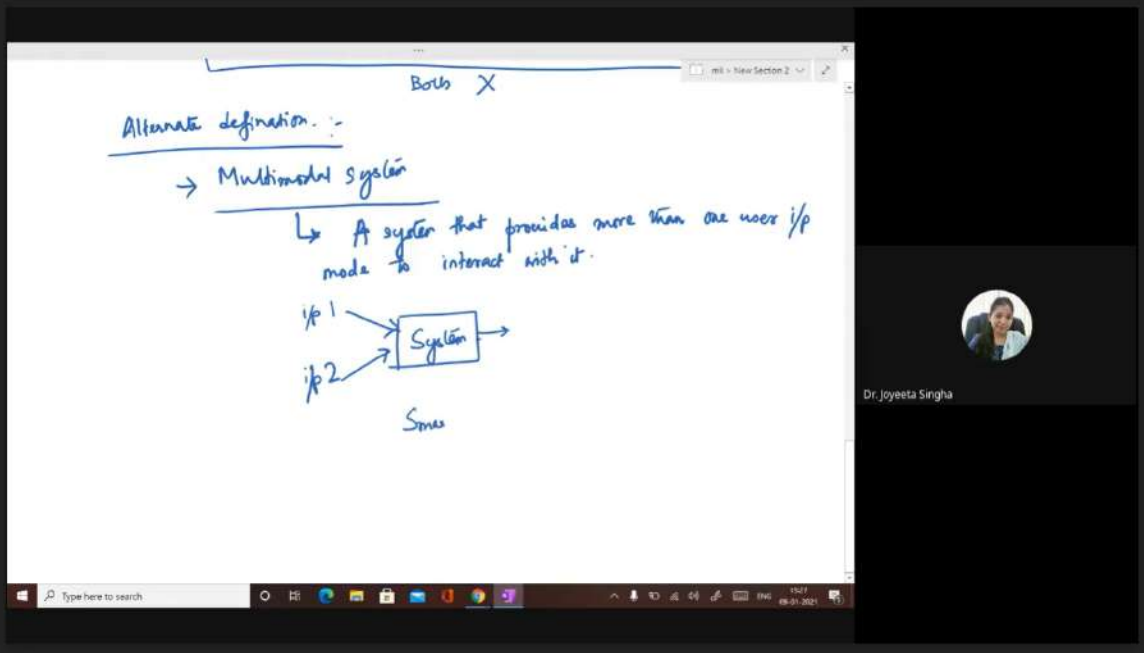

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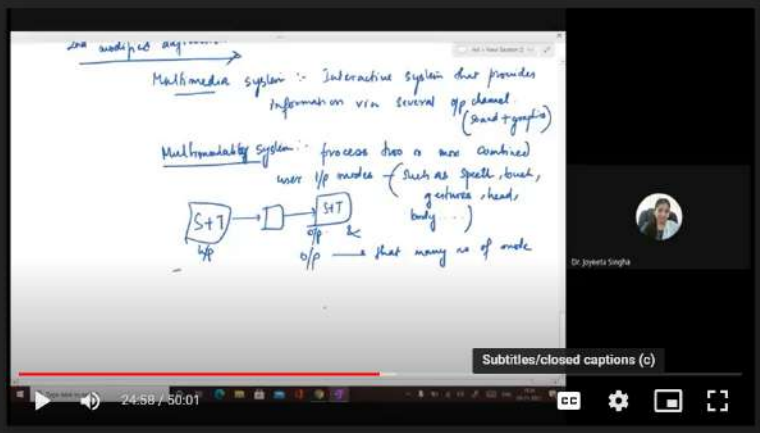

MII_Notes_For_Quiz

File Edit View

2) Movie hall, smartphone, PC = can be both (but not possible in real world to be both)

Alternate Definition :

Multimodal system = A system that provides more than one user input mode to interact with it.

Ex :

1) Smartphone is a multimodal system - since it has a touchscreen (for touch input) and microphone (for speech input).

2) Robot = can be a multimodal system , can be operated with gesture, speech etc.

2nd modified definition :

A multimedia system is an interactive system that provides information via several output (output can be sound , graphics etc.) channels.

A multimodal system process two or more combined user input modes (such as speech, touch, gesture, head, body) and the output gives that many no. of modes which means that : If Speech + touch at input side, then output side also contains speech + touch.

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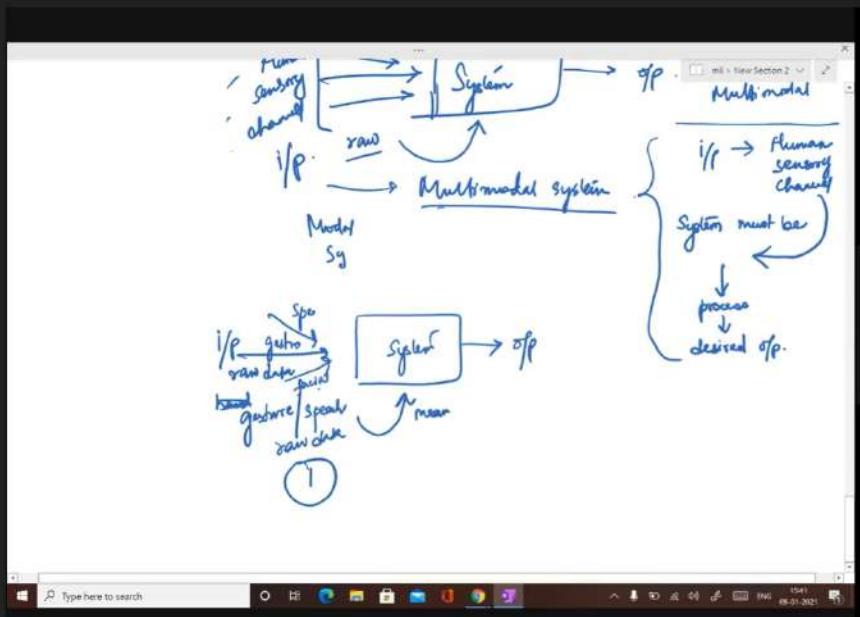

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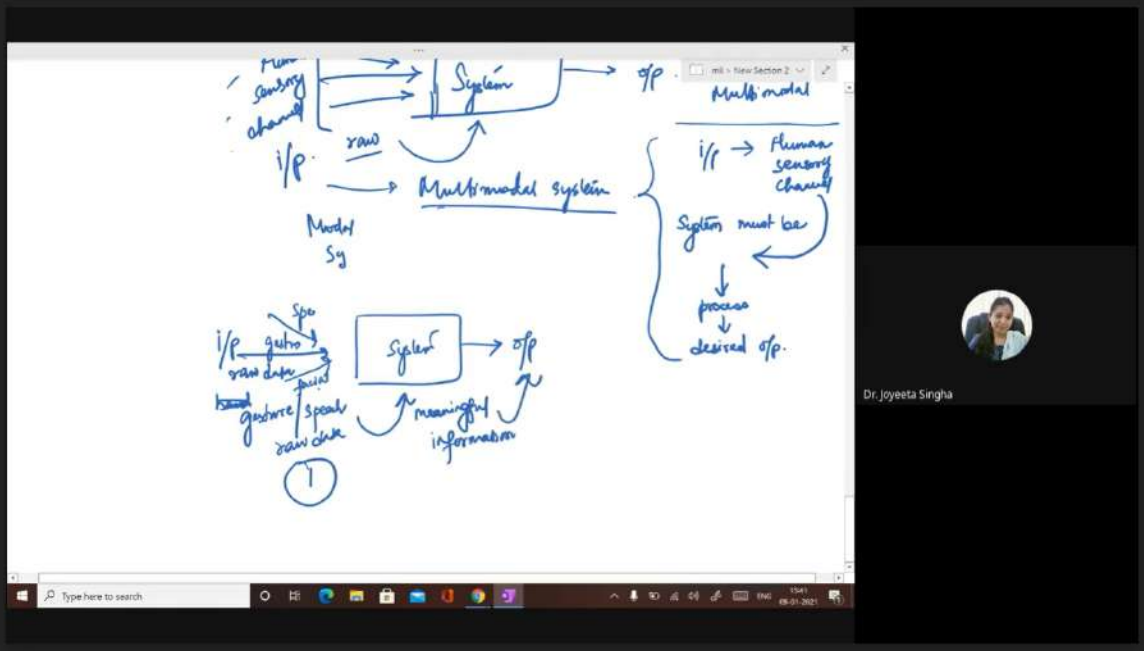

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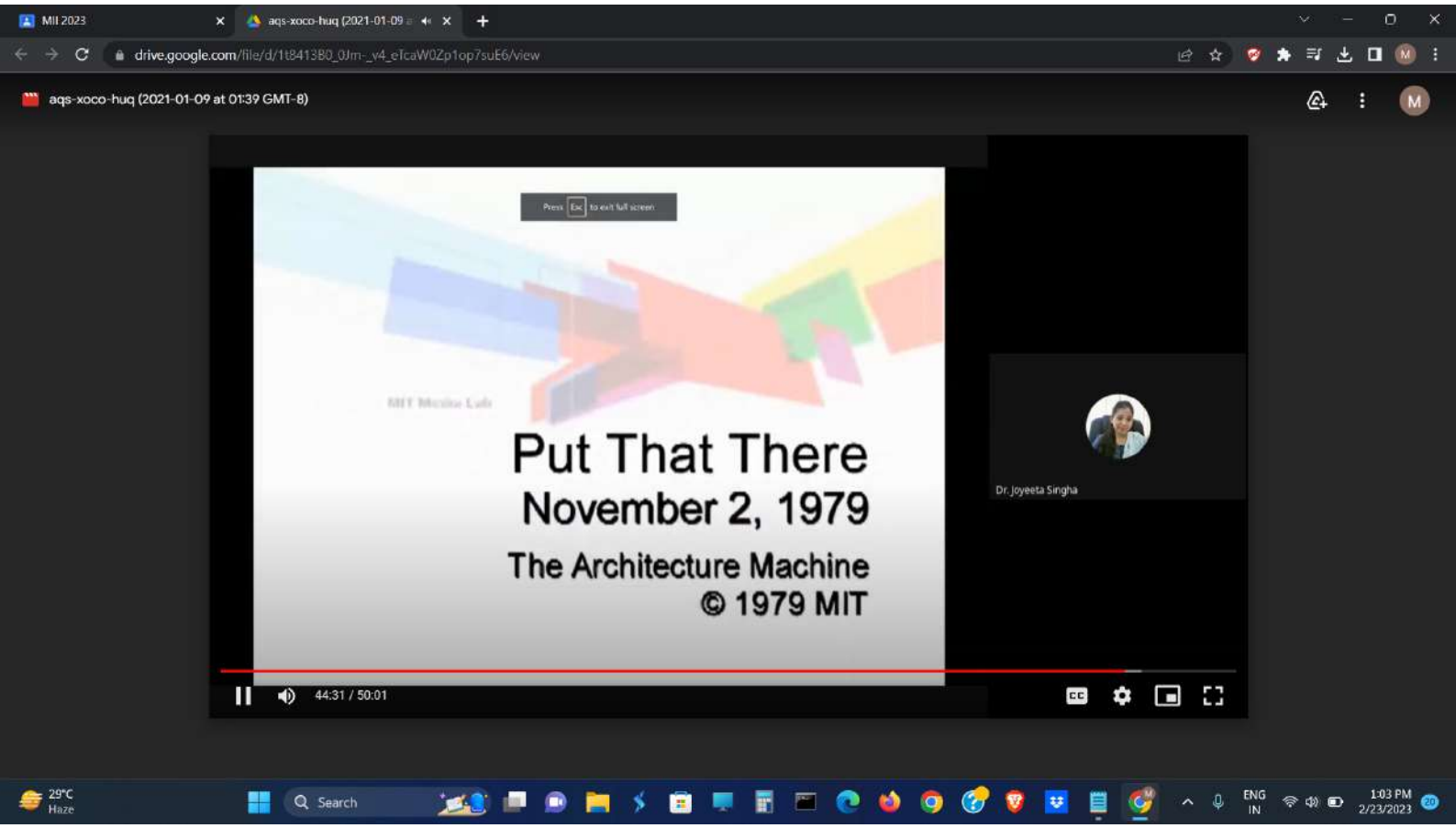
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aqs-xoco-huq (2021-01-09 at 01:39 GMT-8)
Press Esc to exit full screen
Put That There
November 2, 1979
The Architecture Machine
© 1979 MIT
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44:31 / 50:01
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MII 2023 | hsu-xyby-kmy (2021-01-11

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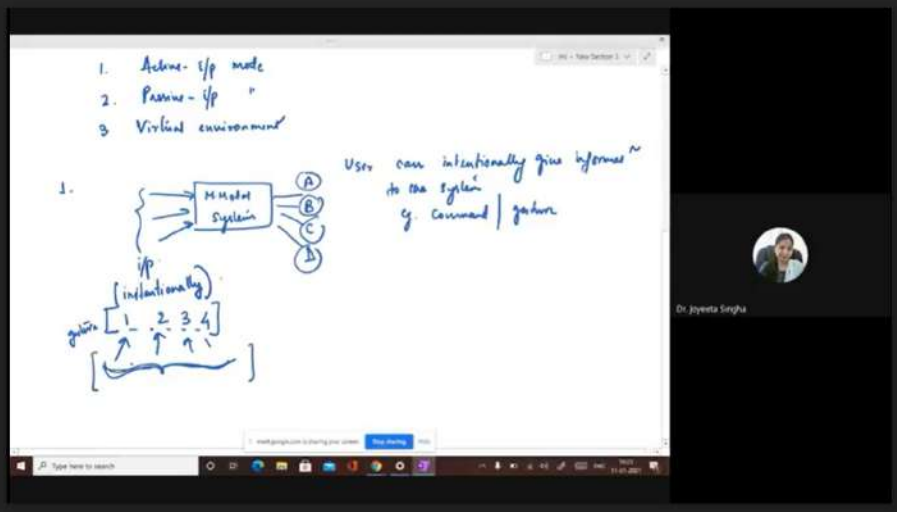

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Lecture - 2

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Lecture - 2

Multimodal systems are subset of Multimedia systems.


Domains of multimodal systems :

1) Active I/P mode
2) Passive I/P mode
3) Virtual Environment = mostly used in gaming applications

1) Active I/P mode = user intentionally gives information
to the system. Ex : Command, gesture
```

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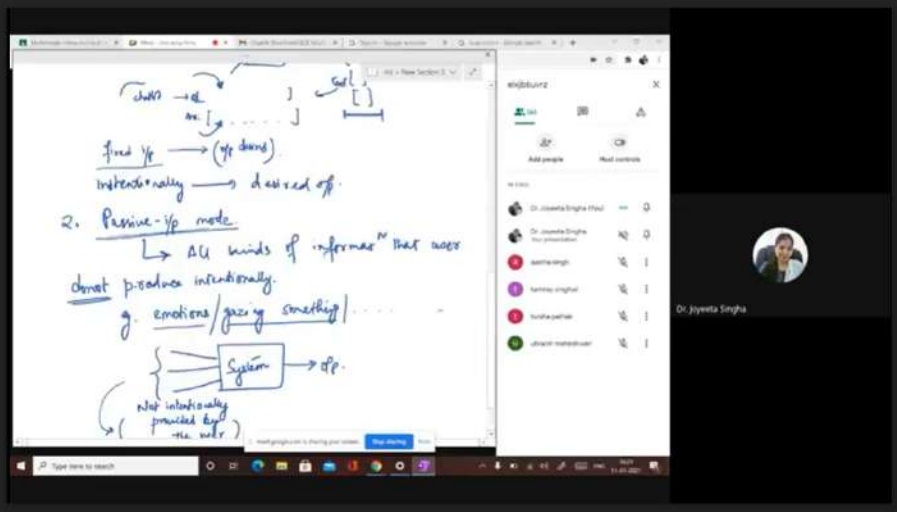

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Lecture - 2

File Edit View

Lecture - 2

"Multimodal systems are subset of Multimedia systems."

Domains of multimodal systems :

1) Active I/P mode
2) Passive I/P mode
3) Virtual Environment = mostly used in gaming applications

1) Active I/P mode = user intentionally gives information to the system. Ex : Command, gesture
Ex : A Dialog system with different input modes.

Fixed Input = to give desired O/P

2) Passive I/P mode = All kinds of information that user do not produce intentionally. No fixed pattern at input end.
Ex : Emotions, gazing at something

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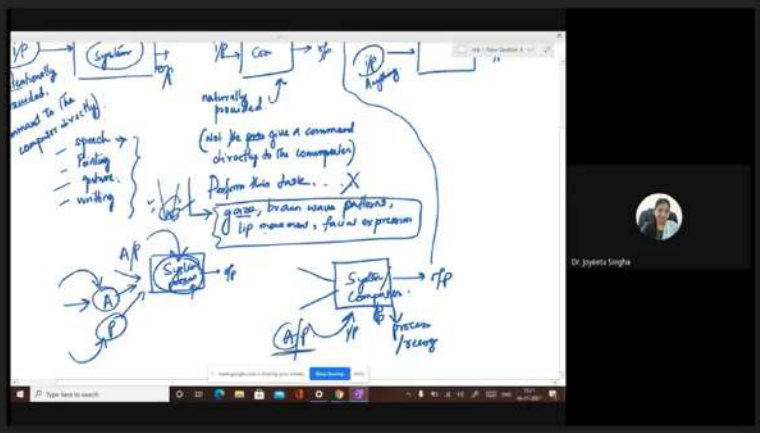

Lecture - 3

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Lecture - 3

Active I/P mode = I/P is provided intentionally. Command to the computer directly. Ex : Speech, Poiting to something, gesture, writing something. Computer will capture the I/P and process accordingly.

Passive I/P mode = I/P is naturally provided. Not give a command directly to the computer. Computer will capture the I/P and process accordingly. Ex : Gaze, Brain wave patterns, Lip movements, Facial Expressions.

Virtual Environment - Input may be anything (Active or Passive) and O/P can be provided virtually. Real life experience.

NOTE : Recognition process will be done for both the active and passive input.

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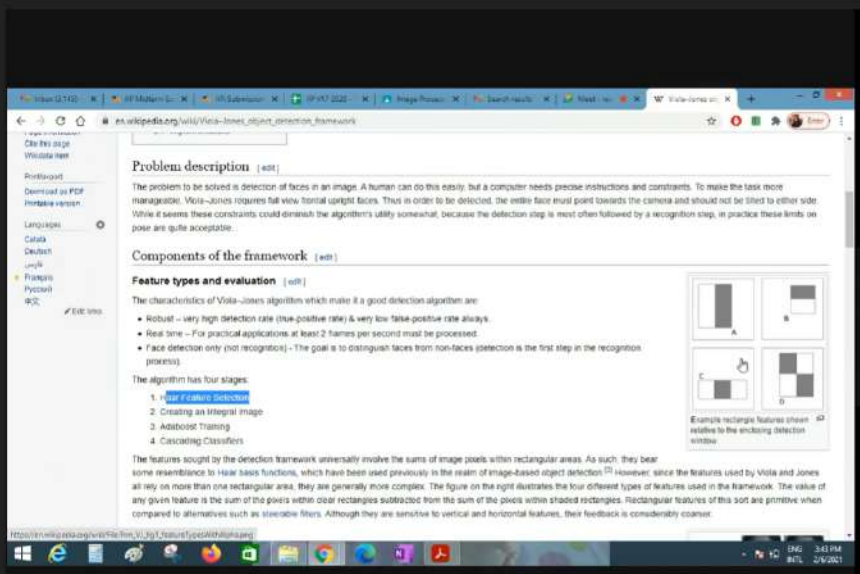

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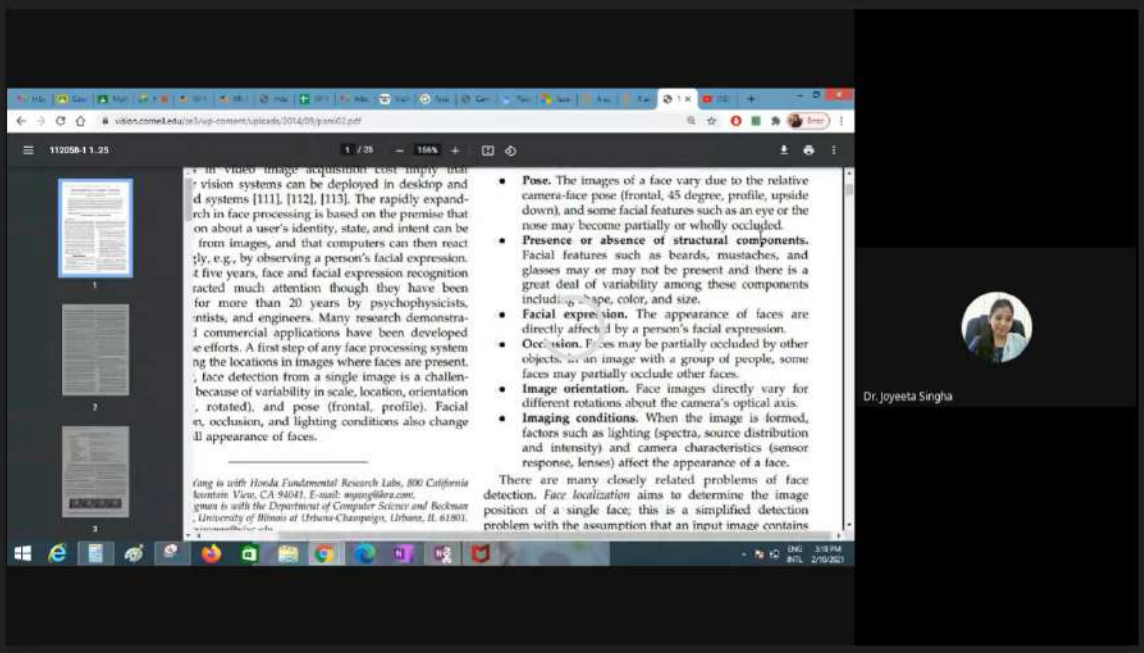

- **Pose.** The images of a face vary due to the relative camera-face pose (frontal, 45 degree, profile, upside down), and some facial features such as an eye or the nose may become partially or wholly occluded.
- **Presence or absence of structural components.** Facial features such as beards, mustaches, and glasses may or may not be present and there is a great deal of variability among these components including shape, color, and size.
- **Facial expression.** The appearance of faces are directly affected by a person's facial expression.
- **Occlusion.** Faces may be partially occluded by other objects. In an image with a group of people, some faces may partially occlude other faces.
- **Image orientation.** Face images directly vary for different rotations about the camera's optical axis.
- **Imaging conditions.** When the image is formed, factors such as lighting (spectra, source distribution and intensity) and camera characteristics (sensor response, lenses) affect the appearance of a face.

There are many closely related problems of face detection. *Face localization* aims to determine the image position of a single face; this is a simplified detection problem with the assumption that an input image contains

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