

Workshops in Creative Computing: Computer Vision Module



Lecture 1 / 3: Introduction to Computer Vision

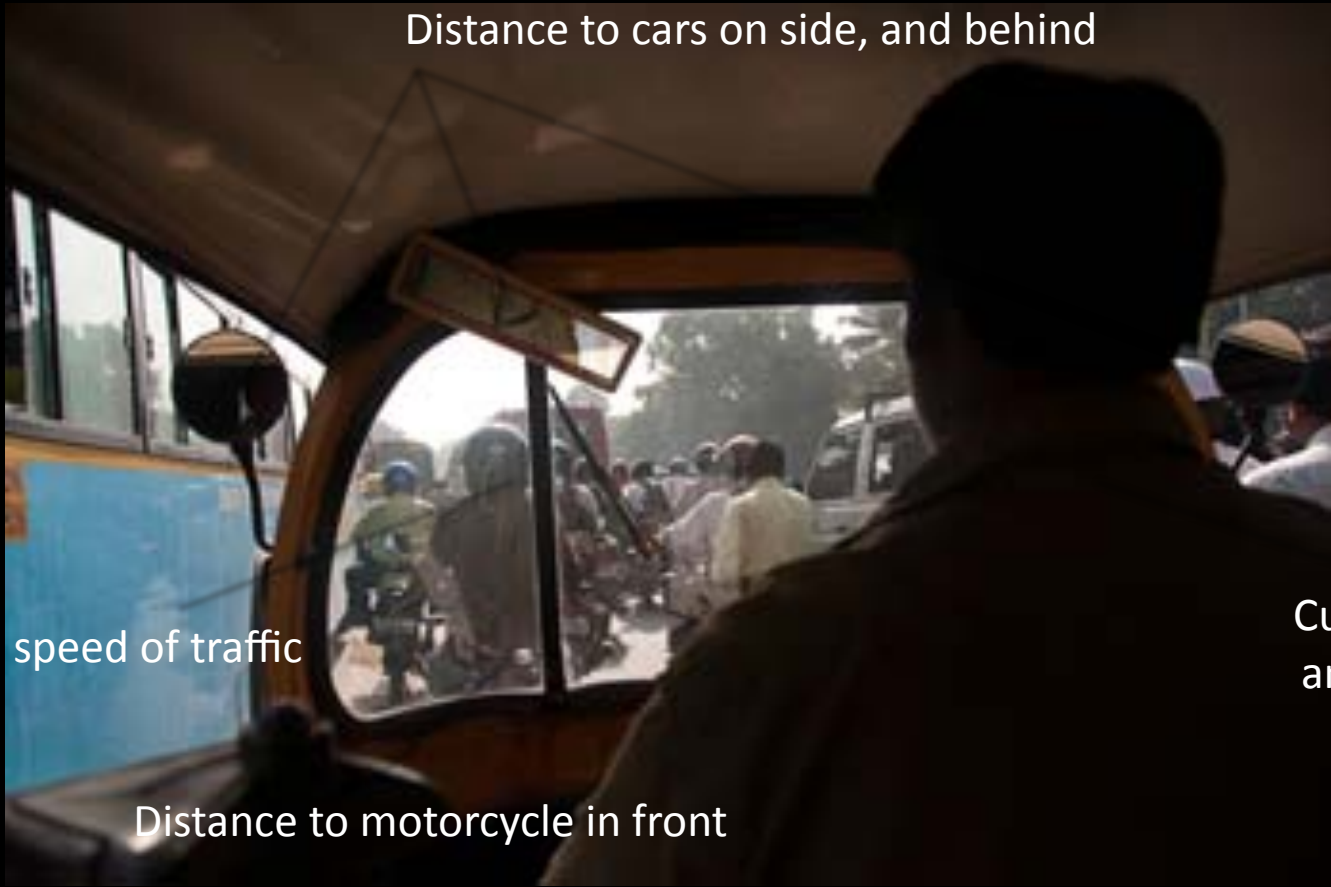
Monday Jan 21, 2012

Parag K Mital

Assignment 1: Solve computer vision.







Distance to cars on side, and behind

Overall speed of traffic

Distance to motorcycle in front

Current speed and direction

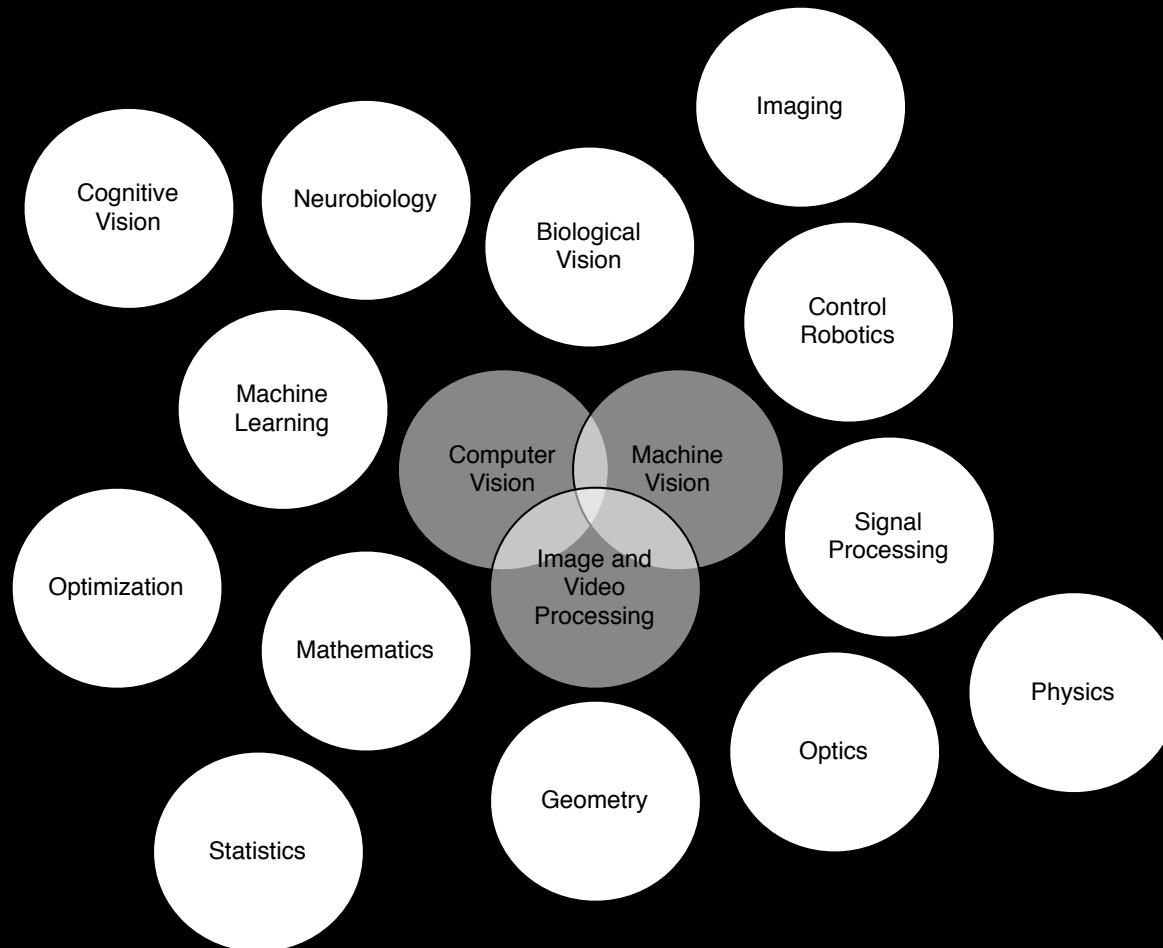


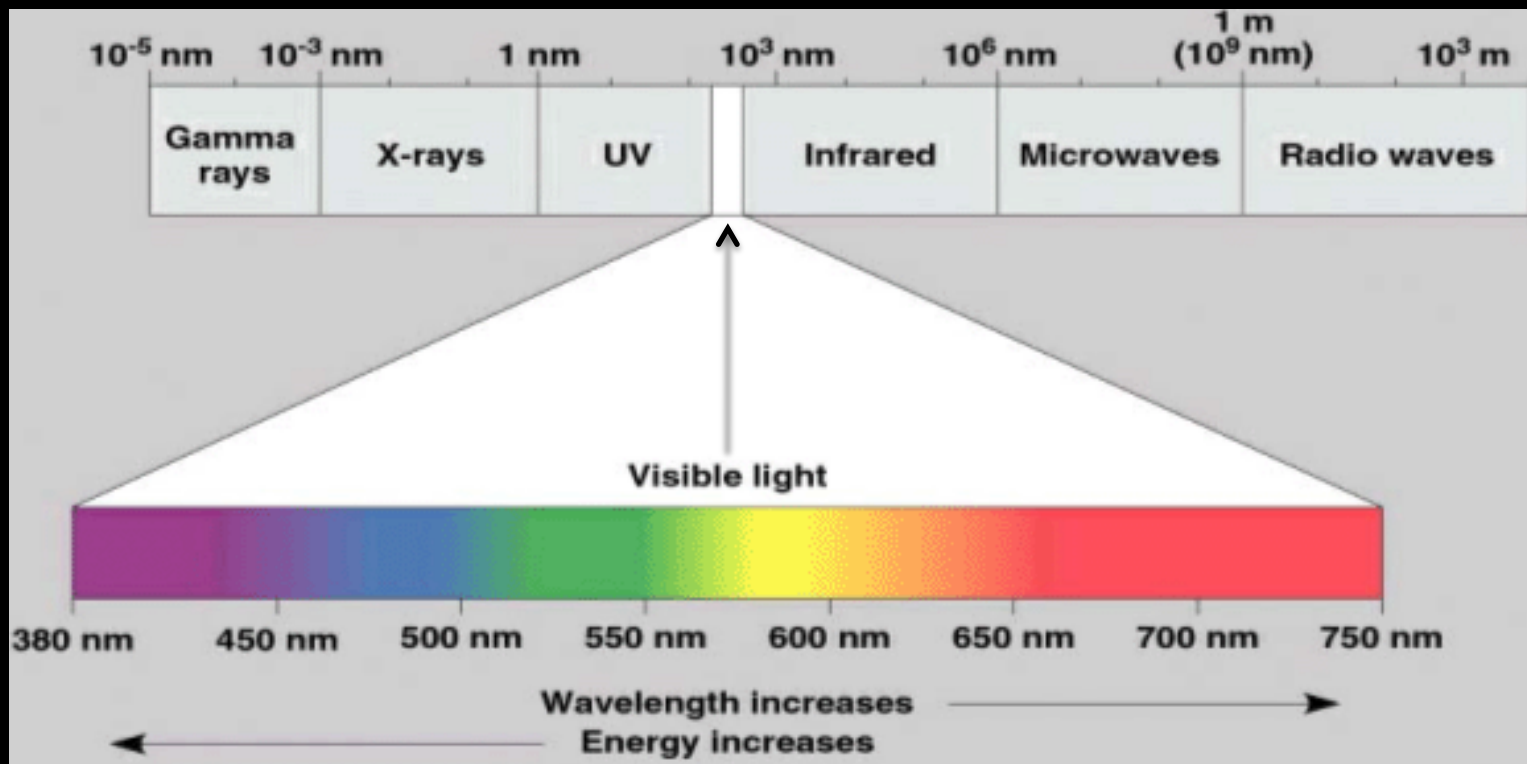
Image Acquisition

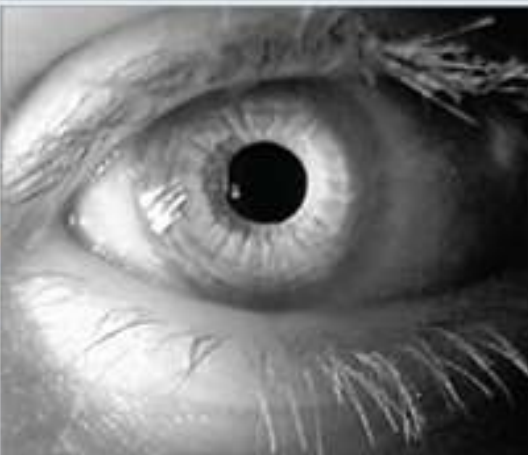
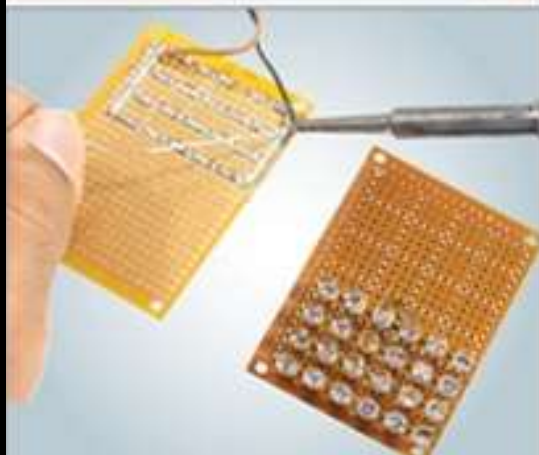
Depth LIDAR; Kinect; Structured Light; Stereo Vision

**Infrared/
Thermal/
Spectral** Satellite; Heat detection

Light Field Synthetic Camera Control











Pixel Descriptions

RGB Red, Green, Blue

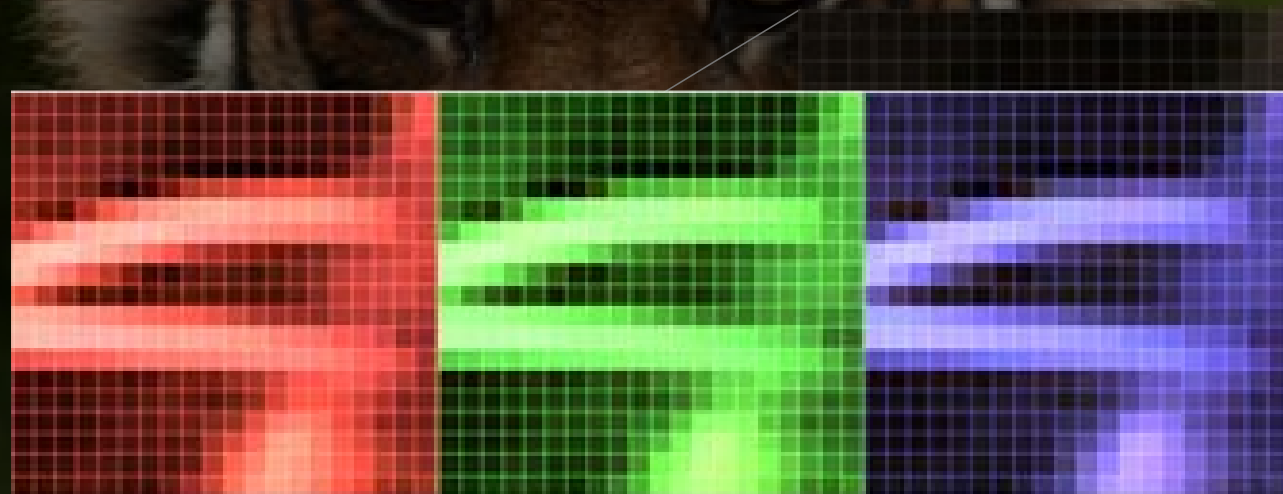
HSV Hue, Saturation, Value

L*a*b* Perceptually uniform color distribution
(CIE1976)

CMYK Cyan, Magenta, Yellow, Black

Grayscale Single channel of a color image; luminance





R

G

B

11

R	G	B	R	G	B	R	G	B	R	G	B
R	G	B	R	G	B	R	G	B	R	G	B
R	G	B	R	G	B	R	G	B	R	G	B
R	G	B	R	G	B	R	G	B	R	G	B
R	G	B	R	G	B	R	G	B	R	G	B
R	G	B	R	G	B	R	G	B	R	G	B
R	G	B	R	G	B	R	G	B	R	G	B
R	G	B	R	G	B	R	G	B	R	G	B
R	G	B	R	G	B	R	G	B	R	G	B
R	G	B	R	G	B	R	G	B	R	G	B
R	G	B	R	G	B	R	G	B	R	G	B
R	G	B	R	G	B	R	G	B	R	G	B

4

11

L	L	L	L
L	L	L	L
L	L	L	L
L	L	L	L
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L	L	L	L
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L	L	L	L

4

HSV

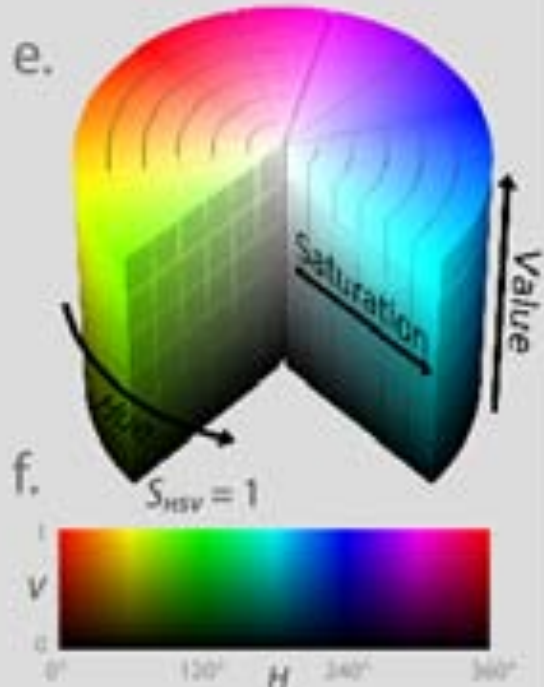
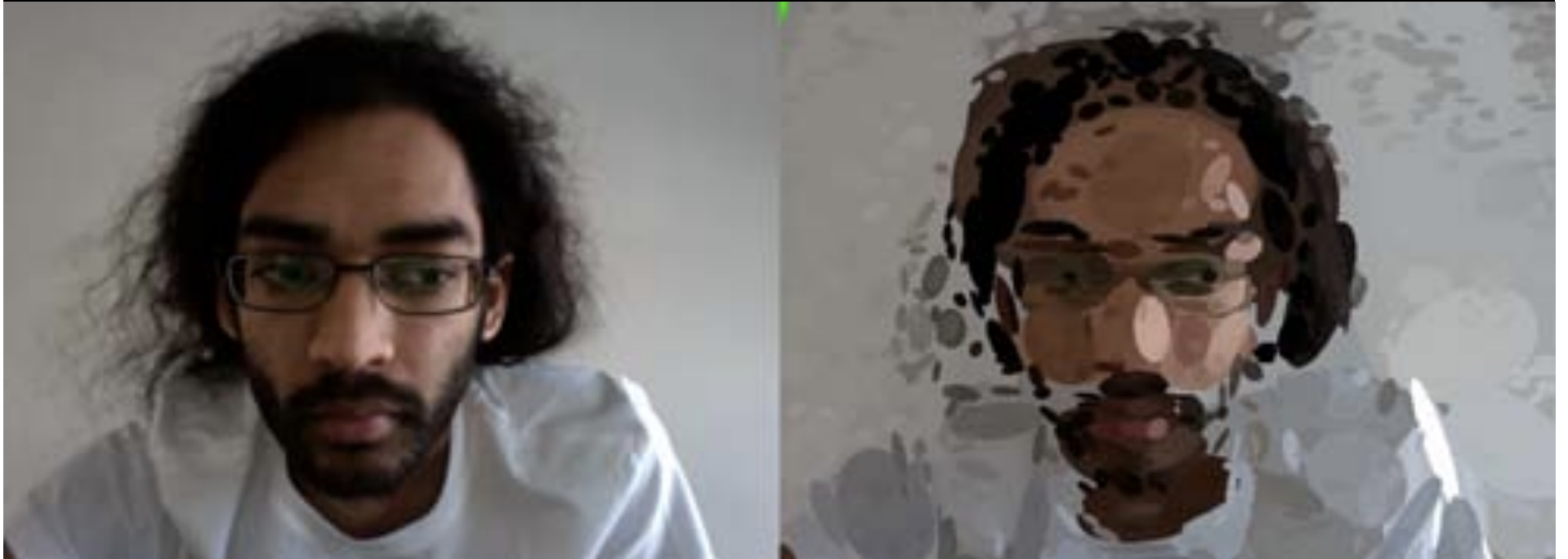


Image Descriptions

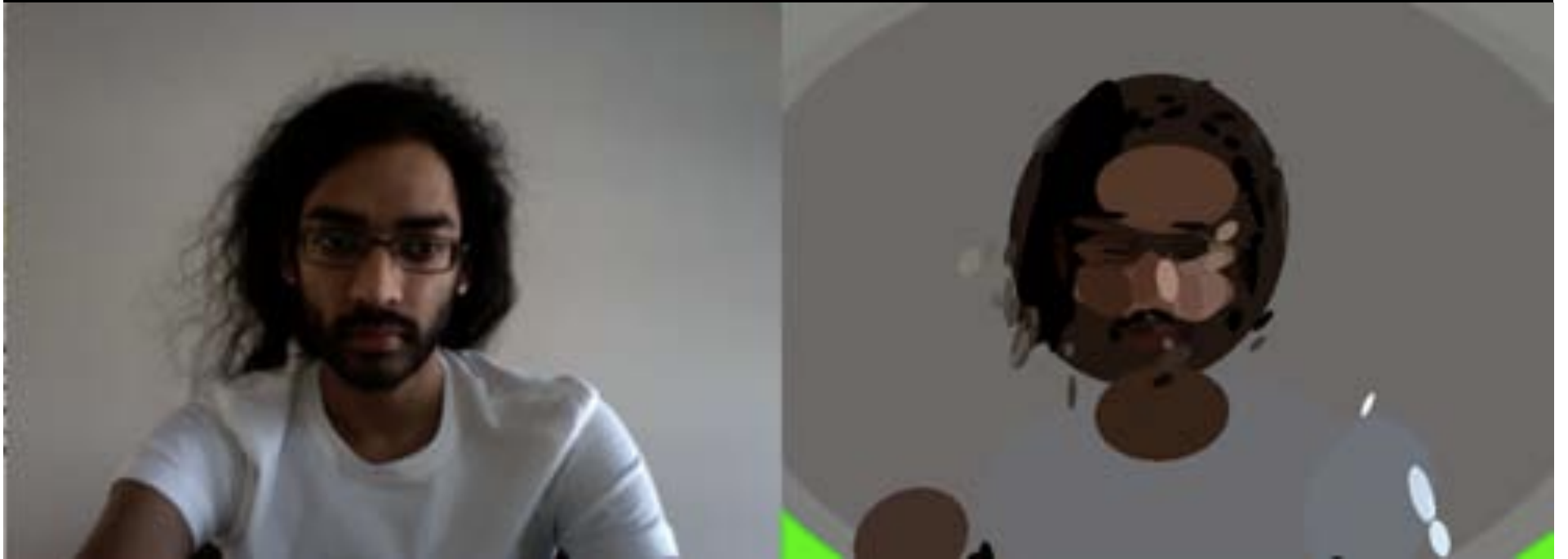
Pixels	Luminance; Color-spaces; Depth; Heat
Feature Points	SIFT; SURF; Harris Corners; HOG; FAST
Edges/Lists	Sobel; Canny; Hysteresis; Connected Components; Shape Models
Blobs/Regions	Mean-Shift; MSER; Watershed; Graph-Cuts; Background Subtraction; Appearance Models
Maps	Geodesics; Topography; Density

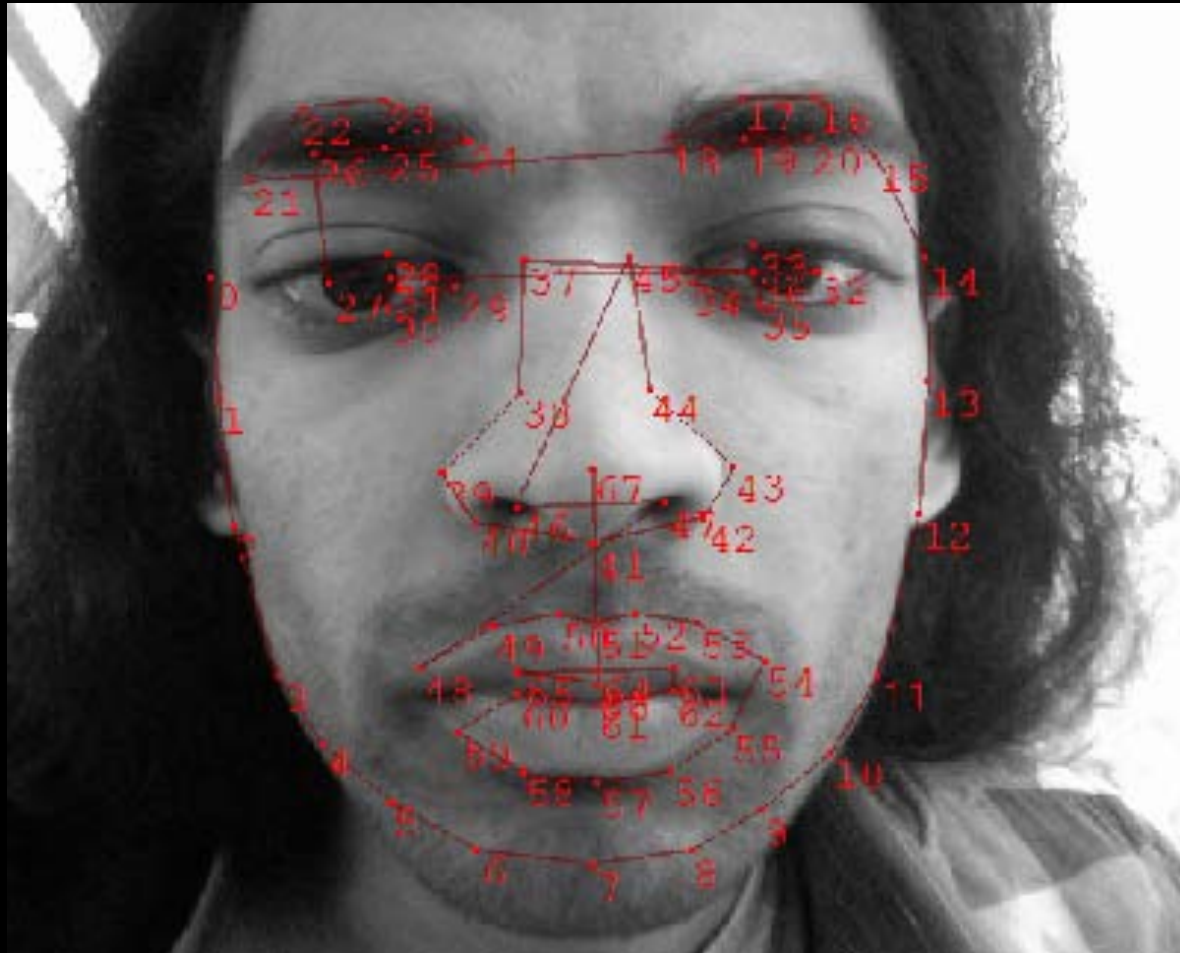




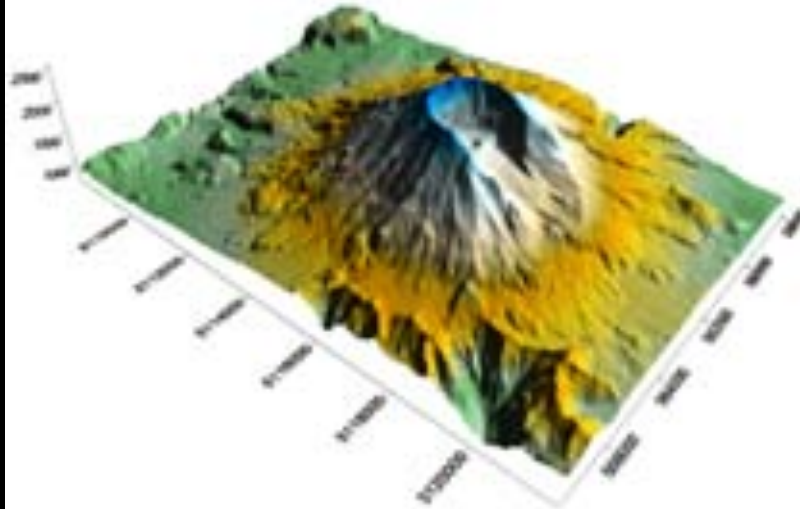
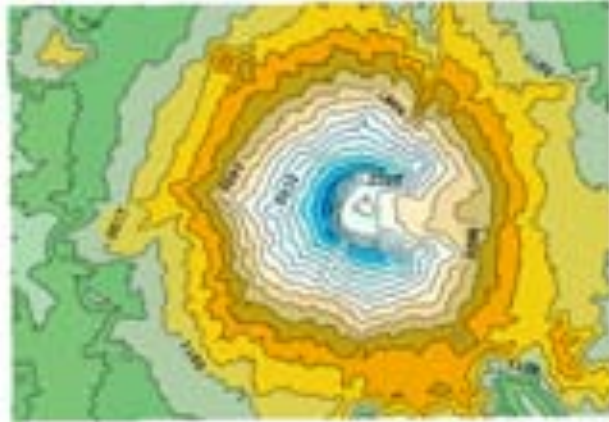












Next Week: Tracking

Blob Tracking
Contour Tracking,
Face Tracking,
Generic Object Tracking

Final Project:

Check Website