PVP 22

VIDEO PROCESSING

22ECMC1T5D   **Credits: 4**
Lecture: 4 periods/week   **Internal assessment: 40 marks**
                                                                                Semester end examination: 60 marks

Prerequisites: Digital Image Processing

Course outcomes:

After successful completion of the course, the students will be able to

- Identify the importance of digital video applications in today's world
- Analyze the standards of analog video and digital video formats and sampling process of video signal
- Apply different parametric models that describe the real world and image generation process.
- Analyze different video coding techniques and compression standards.

UNIT-I

Video formation, perception and representation – color perception and specification – video capture and display – Analog video raster – Analog color television systems, Digital video, Frequency Domain characterization of Video Signals

UNIT-II

Video sampling – Basics of the Lattice theory, Sampling of Video Signals, Conversion of Signals Sampled on Different Lattices, Sampling Rate Conversion of Video Signals

UNIT-III

Video modeling-Camera model, Illumination model, Object model and Scene model, Two dimensional models, Two Dimensional motion estimation-Types, Optical Flow, Pixel Based Motion, Block matching Algorithm

UNIT-IV

Waveform Based Video Coding- Region based video coding, Object based video coding, Predictive coding, Video coding using Temporal prediction and transform coding, Content Dependent Video Coding – Two dimensional shape coding, Texture coding for Arbitrarily shaped Regions. Video Compression Standards-MPEG-4, MPEG-7

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Learning Resources

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Text Book

1. Yao Wang, J.Ostermann, Ya Zhang, "Video Processing and Communication", 1st Ed., Prentice Hall, 2001

Reference Book

1. Woods, "Multidimensional, signal, image and video processing and coding", Elsevier, Academic press, 2006