Part3

2024年3月26日 22:53

Video Compression

spatial redundancy/ temporal redundancy
human is sensitive to low frequency and luminance rather than high freq and chrominance
a sequence-> pic-> slice-> macroblock-> 16*16Y + 8*8Cb + 8*8Cr

intraframe: employ JPEG
interframe: motion estimation and compensation

interlaced <-> progressive

4:2:2(4*y 2*Cb 2*Cr)
4:2:0(4*y 1*Cb 1*Cr)

MPEG

use DCT and motion estimation
sequence-> GOPs-> IBBPBBPBBPBBI ->slice ->MB
I: independent
P: motion estimation from Prev I/P
B: bi-direction prediction

Motion Estimation

Full search: good ratio, bad speed
3Step: fast, less accurate
2D Log: search 5 points, between full and 3step

Pframe: motion vec and prediction error
Bframe: mean of bidirection
Exercise 3.2: MPEG
Exercise 3.3: MPEG2

Video

Audio

Nyquist sampling
PCM:

Storage

Display

Part4.135

2024年4月2日 14:04

Intro

5 layer TCP-IP:
App->transport->internet->interface->phy

phy	bitstream
datalink	frame
network	datagram
transport	segments
app	message

CS model

Phy

info->source encoder->scrambler->channel encoder->multiplexor->modulator

Shannon Theorem: $C = B\log_2(1+SNR)$
Answer to Part 4 Lecture 8 AY2223S2

modulation: AM FM ASK PSK FSK
AM在频带信号上形成基带信号的包络
FM基带信号幅值高时频带信号频率高
以下为数字调制
ASK 数字1有信号，数字0无信号
FSK数字1频率f1数字2频率f2
PSK数字1相位0数字2相位pi
QPSK相位差pi/2
QAM多级相位和幅值的数字调制

multiplexing: FDM TDM CDM

Data Link

error: bit error/ burst error
CRC: modulo 2,
FEC
Answer to Part 4 Lecture 9

LAN: IEEE802 topologies MAC
MAC layer:

Controlled access: polling/ reservation/ token
CSMA/CD CA

Wireless and wired

Network

Circuit/ datagram packet/ virtual circuit packet

Networking Concepts:

Accommodates heterogeneous underlying networks

IP:

Datagram Routing:

Transport Layer:

TCP:

reliability, point to point, slowstart

UDP:

thin protocol layer, arbitrary interaction,

Answer to Part 4 Lecture 11

Network Performance:

latency, throughput, jitter,

QOS:

add jitter buffer, Real-Time Transport Protocol (RTP) using UDP

Video Streaming:

use of CDN, adaptive streaming over HTTP(DASH)

考试题目

2024年4月2日　　22:46

计算MPEG信息量，能否放在CDROM里。正确
计算CRC，计算奈奎斯特采样。正确
填空OLED　LCD。正确。　填空DVD编码，实际为MPEG２，答错成MPEG４。　MAC地址４８ｂ，正确

总体来说１００分应该能拿个９０分以上了。占比２０％的话拿１８分。之前作业写得非常详细差不多也有１８分了。