1. Introduction

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Multimedia Systems

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Internet Standards - author of more than 25 RFCs including:
- RFC 5015: Bidirectional PIM multicast routing.
- RFC 4340: DCCP (Datagram Congestion Control Protocol)
- RFC 3448 & RFC 5348: TFRC (TCP-Friendly Rate Control)
- RFC 2736: Guidelines for RTP Payload Format Specifications
- RFC 2543: SIP (Session Initiation Protocol)
- RFC 2362 & RFC 4601: PIM Sparse Mode multicast routing.
- RFC 2198: RTP Payload for Redundant Audio Data

Aims

- Learn how multimedia information is captured, processed, compressed, and rendered.
- Understand how multimedia is transmitted over networks (especially the Internet).
- Understand a little about network QoS.
- Understand a little about how the Operating System impacts multimedia data.
- Discuss privacy and copyright issues in the context of multimedia.

Assessment

- The course has the following assessment components:
  - Written Examination (2.5 hours, 85%)
  - Coursework (1 piece, 15%)

- To pass, students must:
  - Complete the coursework.
  - Obtain an average of 50% when the coursework and exam components are weighted together.

Multimedia Systems

- Taught as:
  - GZ05 (MSc DCNDS, option for MSc VIVE)
  - 4034 (MSci)

- Join the GZ05 or 4034 mailing list!
  - "mlist gz05" on one of the Unix systems.
  - "mlist 4034"

- Web page: http://www.cs.ucl.ac.uk/teaching/GZ05/
Reading List
No book is all that great.


Internetworking Multimedia

Ignore:
- Chapter 3: Multicast (except PIM-SM)
- Chapter 7: Conference Control
- Chapter 8: Applications
- Chapter 9: Media-on-demand (except RTSP)

Free online version:

Course Overview (1)

- Audio
  - Sampling, Representation
  - Discrete Cosine Transform
  - Audio Compression;
    - Speech Compression
    - Music Compression
  - Video;
    - TV standards, colourspace representation.
- Image Compression
- Video Compression
  - H.261
  - MPEG

Course Overview (2)

- System Streams
- Transport over the Internet
  - RTP
- Signalling Protocols
- Traffic Patterns, QoS Parameters
- OS Issues
- Congestion Control
  - Queue Management
  - Enhanced QoS
- Usability of Multimedia
- Digital Rights Management

Audio and Video

- Audio
  - Pulse Code Modulation (PCM)
  - GSM
  - MP3
- Images and Video
  - Bitmap/colour representation
  - GIF (Graphical Images)
  - JPEG (Photographic Images)
  - MPEG (Motion Picture)
  - H.261/H.263 (Video Telephony)

Networks

- Internet
  - IP (Internet Protocol)
  - UDP vs TCP
  - Telephony vs Streaming
  - RTP (Realtime Transport Protocol)
- Signalling
  - H.323 (Video Conferencing)
  - SIP (Session Initiation Protocol)
  - RTSP (RealTime Streaming Protocol)