Emerging Information Technology Systems

PAF 6406: Lecture 2

Overview

- Computer based systems
- Communication systems
- Multimedia
- Advances/ Emerging Systems
- Technology Applications
- Technology Progress
Communication systems

- Landlines based
  - Telegraph (1844); Telephone (1876)
  - Extensive infrastructure
    - PBX/ PABX/ EPABX
    - Circuit switching
- Wireless based
  - Mass media (Radio/ TV)
  - Cell phones
    - Groupe Spécial Mobile (GSM)
    - Code Division Multiple Access (CDMA)
- Internet based
  - VoIP
  - Chat rooms, Video conferencing (synchronous)
  - Blogs, Usenets, Listservs, Podcasts (asynchronous)

Multimedia

- Text documents:
  - Document Presentation
- Databases:
  - Data Processing
- Audio
  - Automatic Response systems
  - Voice Recognition systems
- Video
  - Pictures (photo recognitions); streaming videos
- GIS/ GPS
  - Location/ distance processing
  - Galileo
- Natural Language Processing
  - Automatic translations of texts/ sounds
Advances

- Industry standard applications
  - Manufacturing, building, transportation, design, payroll
- Data mining applications
  - Data storage (warehousing)
  - Data mining (intelligent search)
- Open source initiatives
  - LINUX, Mozilla Firefox, PHP

Emerging systems

- Fiber to the Home (FTTH)
  - About 656 communities have FTTH connections. (10/4/05)
  - Dallas, Jackson (TN), Sacramento
- Broadband over Power Line
  - Power Line Communications (PLC), Power Line Telecommunications (PLT)
  - Manassas, VA deployed the nation's first citywide BPL system recently
  - The National Association for Amateur Radio opposes the idea due to interference with radio waves
Emerging Systems

- **Satellites and Wi-Fi**
  - Rural Oregon is home to the world’s largest Wi-Fi hotspot (700 miles$^2$)
  - About 3000 Wireless Internet service providers (WISPs)
- Hotspots on the go

- **Cellular phones**
  - High Speed Downlink Packet Access (HSDPA)—IP based

- **Smart Cards**
  - Radio Frequency Identification
  - Computer chips

- **Emerging Broadband**
  - Ultra Wide Band (UWB)
    - transmit signals across a much wider frequency
  - Internet Protocol TV
    - IP based TV
  - Software Defined Radio
    - Systems can be controlled through software rather than hardware
    - Cognitive radios
  - Unlicensed Mesh Networks
    - Community wireless networks