

# Mixed Initiative News Video Recommendations & Browsing for Mobile Devices

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## Introduction

- Media interaction software still cumbersome on mobile devices
- Different watching styles on mobile devices: Short user attention span, low commitment, brief interaction intervals
- Mobile devices pose engineering challenges e.g. limited network bandwidth, low screen resolution
- Latency (perceived wait time) affects the user experience
- Create a unified system design to maximize user centric information transfer despite mobility constraints

## Video Database

- ~450 news video clips from the CNN website
- Average duration of 4-5 mins
- CNN news editor-assigned title, date, timestamp, and category
- Categories: world, US, politics, law, business, science / technology, sports, entertainment and health

## System Model

- Model perceived retrieval quality as a function of costs and mobile parameters
  - Network: bandwidth, video streaming/download modes
  - Video: bitrate, filesize, screen resolution
  - User: viewing time, feedback time, perceived wait time
- Naive Bayesian learning algorithm to select videos based on user's up/down vote feedback

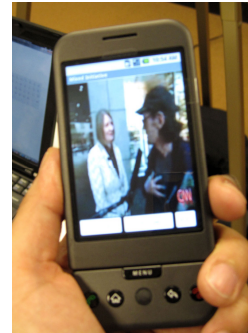
$$P(c_j | X) = \frac{P(c_j)}{P(X)} \prod_{i=1}^n P(x_i | c_j)$$

## Pre-Fetching

- Pre-fetch the next best video(s) based on the algorithm, while current video is being viewed
- If next desired video is in cache, present it to the user – saves time
- Fetch from server on cache miss to preserve quality

## Implementation

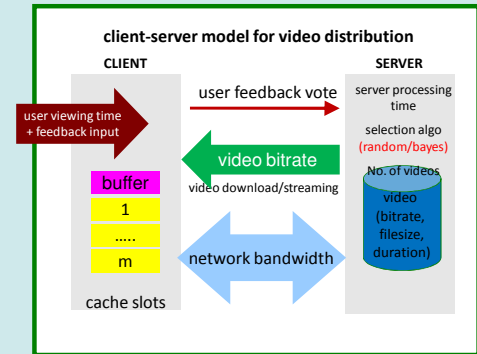
- HTC Dream/T-Mobile G1 mobile phone (Android Dev 1)
- Google Android platform
- Java & 1.5 SDK "Cupcake"



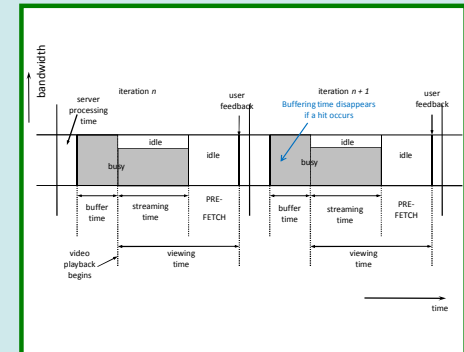
## Future Work

- Improve video recommendations through global viewing history and votes
- Subjective user viewing tests
- Direct manipulation, multi-touch and gestures

## SYSTEM OVERVIEW



## PRE-FETCH SCHEME



## USER INTERFACE

- Videos presented in a sequence – “an interactive TV channel”
- Switch between the 3 modes
- Manual – Choose from a list of videos
- Auto – one video clip advances to the next with no intervention
- Semi Auto – User interrupts while watching to Vote-Up, Vote Down, or Skip (relevance feedback to system)
- System learns user preferences



1. Videos shown in sequence. User provides feedback.



2. “Vote up” interesting clips.



3. “Vote down” less interesting clips...



4. “Vote up” any desired content.



5. The system takes note. Other content is shown.