SCALABLE CROWD-SOURCING OF VIDEO FROM MOBILE DEVICES

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INTRODUCTION
MOBILE CAPTURED PHOTO/VIDEO USED FOR OTHER PURPOSES

• People will upload content that will be collected and logged in a library

• Challenges
  • Privacy
  • Utility
  • Video upload
  • Indexing
  • Searching
KEY CONCEPTS

• DENATURING - PRESERVES THE AUTHOR’S SENSITIVE INFORMATION
• CLOUDLET - ANDROID, APPLE, WINDOWS
• CDN (IN REVERSE) - CONTENT DISTRIBUTION NETWORK (CONTENT COLLECTION)
EXPERIMENTAL SETUP

- SMARTPHONES AND QUAD-CORE DESKTOPS (CLOUDLET AND CLOUD)
  - PRIVATE AP (ACCESS POINT)
- WALKING IN DOWNTOWN PITTSBURGH
- 36 YOUTUBE VIDEOS FOR DIVERSIFICATION
  - DIFFERENT VIEWPOINTS
USER INTERFACE (UPLOADING)

**Figure 5: Screenshots of the GigaSight frontend app.**

(a) Example privacy rule

(b) Example location filter
DENATURING

- DONE ON THE PERSONAL VM

Figure 6: Example of a denatured video frame.
INDEXING

• SEPARATE VM ON THE CLOUDLET
• ANALYZED TO GET TAGS FOR EACH FRAME
  • WITH A CONFIDENCE VALUE
SEARCHING

- SEARCH THROUGH THE CLOUD
  - USING TIME, LOCATION, ETC.
Figure 7: Throughput [Mbps] for different resolutions and video framerates. The figures on the top row show the cumulative throughput of the AP, the bottom row shows the net throughput achieved by each phone.
THROUGHPUT- DENATURING

Figure 9: Performance of Video Denaturing.
THROUGHPUT- INDEXING

Figure 12: Throughput of the indexing process.
RESOLUTION COMPARISON/ACCURACY

(a) Accuracy vs. Resolution

(b) Throughput vs. Resolution

Normalized detection rate (%)

LBP

HAAR

Normalized Throughput (%)

Cliff Jumping
Carnival
Railway Station
Marathon

Normalized Throughput (%)

LBP

HAAR

Normalized Throughput (%)

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CONCLUSION

• GIGASIGHT CAN BE USED FOR THE VIDEO PROCESSING CYCLE
• DENATURING PARTS OF THE FRAMES LINEARLY DECREASES THE LOAD
• FRAME RATE AND RESOLUTION WERE CONSIDERED WHEN SCALING UP THE PROCESS
• DENATURING IS AFFECTED BY LOWER RESOLUTION NOT INDEXING?
• INTER-FRAME ACTION WAS NOT CONSIDERED, WHY?