

SCALABLE CROWD-SOURCING OF VIDEO FROM MOBILE DEVICES

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PRESENTED BY EBONY CALLOWAY



INTRODUCTION



Figure 2: Theft captured in photo (Source: CNN [12])

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**

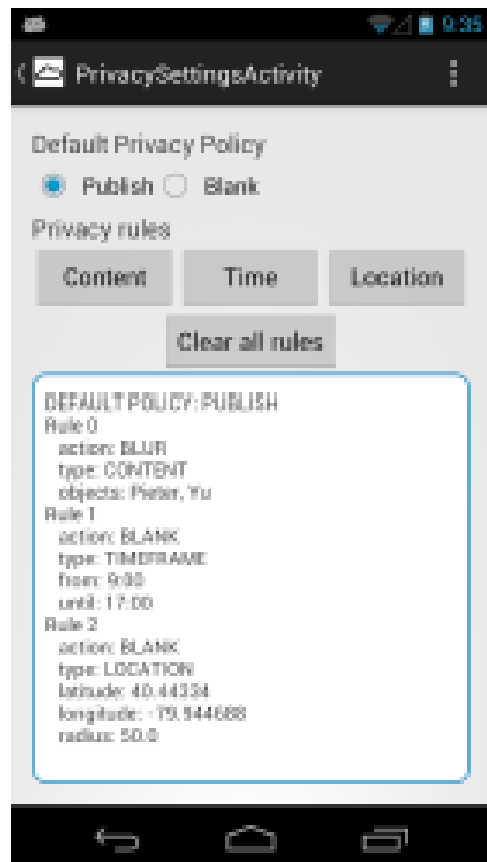
KEY CONCEPTS

- **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)



(a) Example privacy rule



(b) Example location filter

Figure 5: Screenshots of the GigaSight frontend app.

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.**

SCALING/THROUGHPUT- UPLOAD

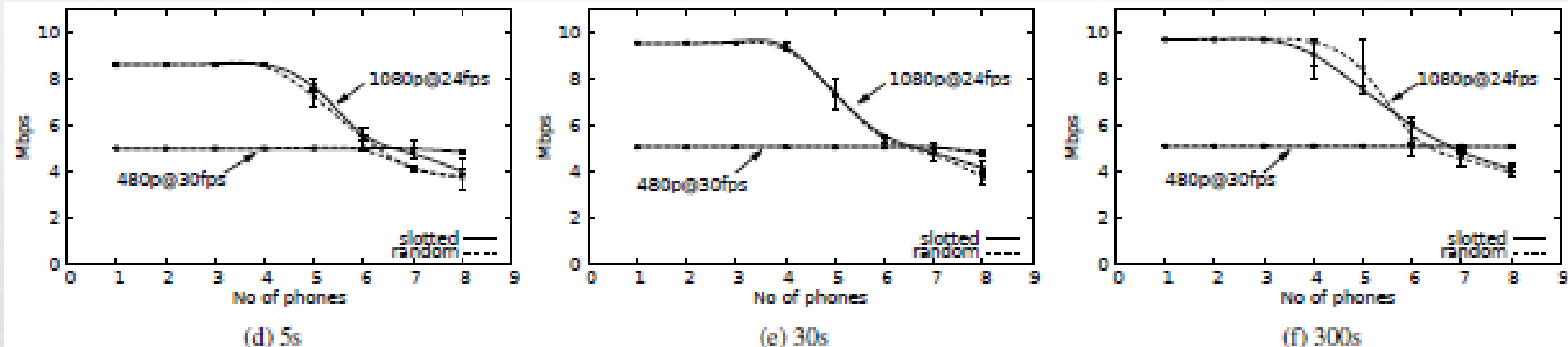


Figure 7: Throughput [Mbps] for different resolutions and video framerates. The figures on the top row show the cumulative throughput of the AP, the bottom row shows the net throughput achieved by each phone.

THROUGHPUT- DENATURING

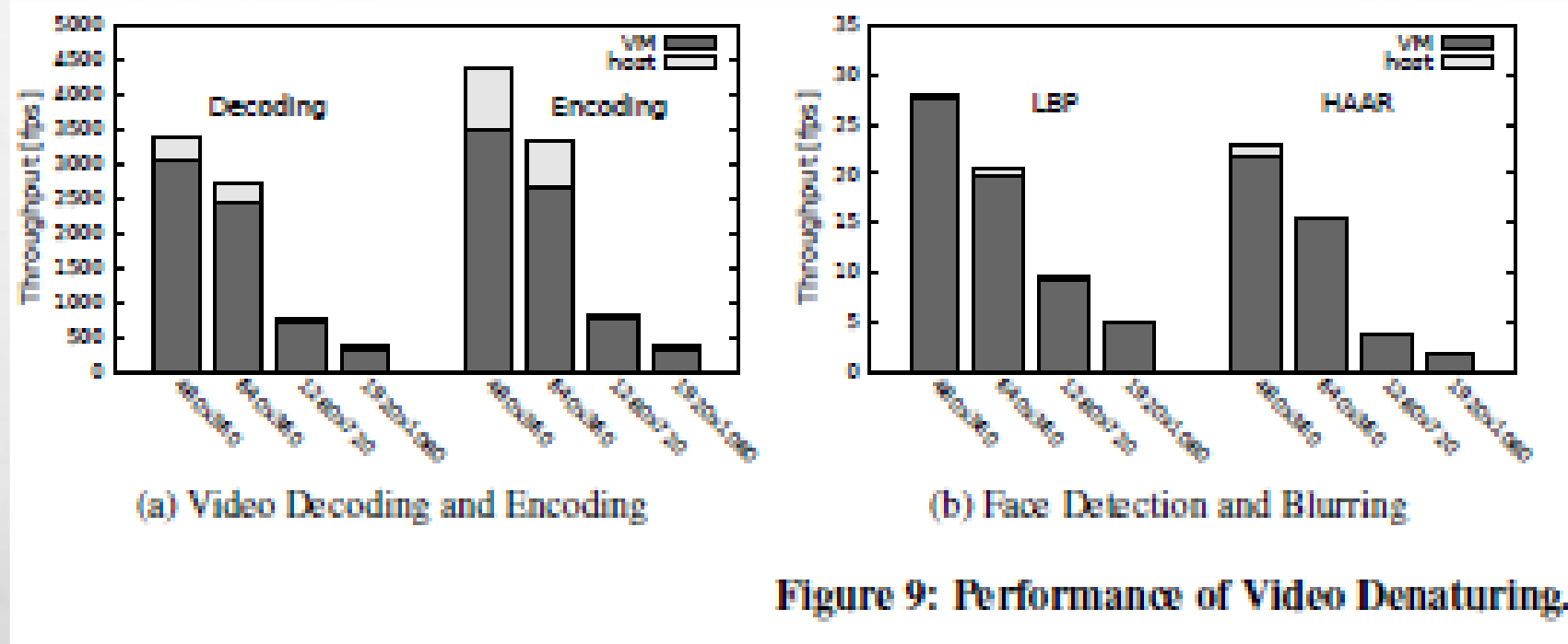


Figure 9: Performance of Video Denaturing.

THROUGHPUT- INDEXING

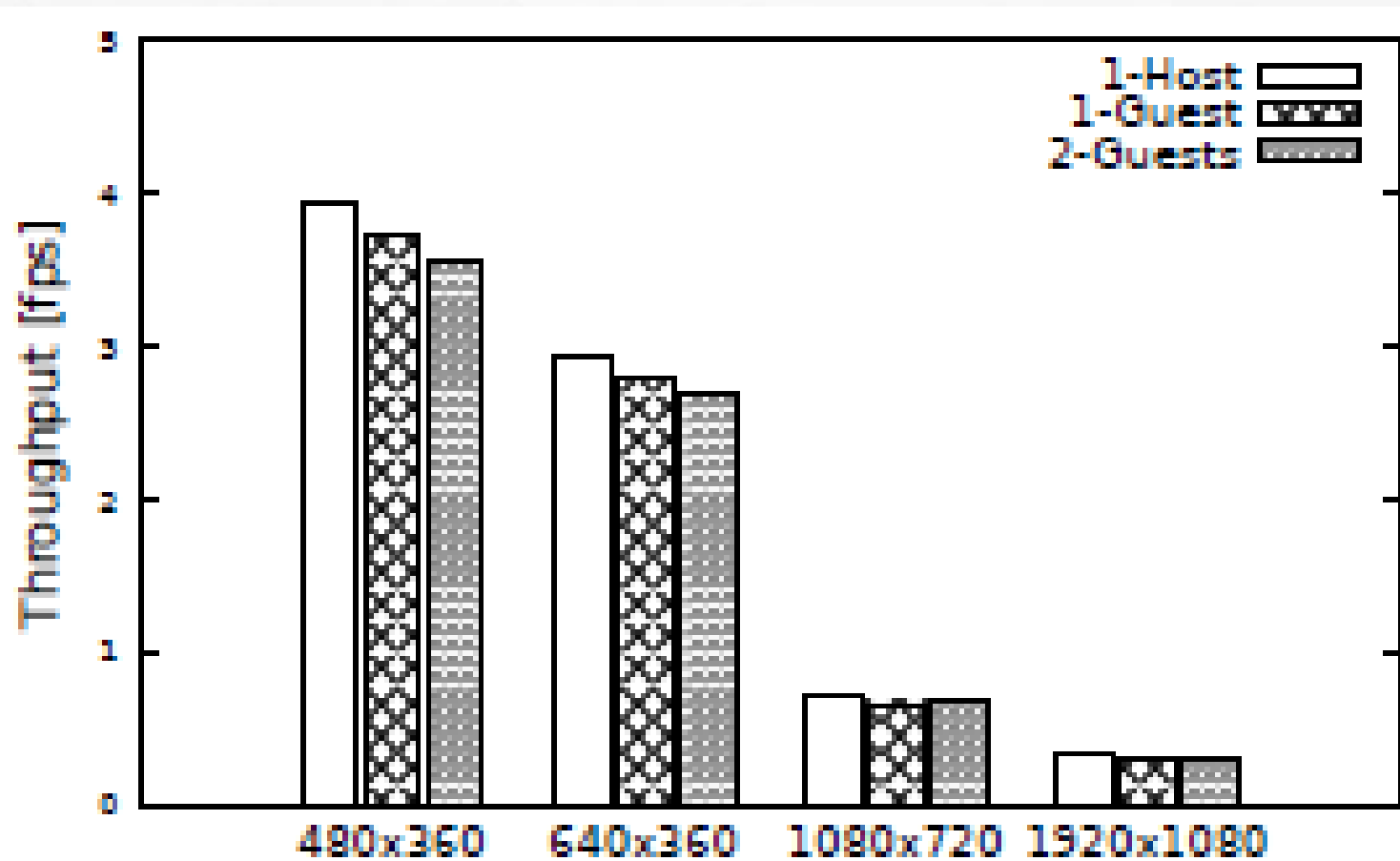
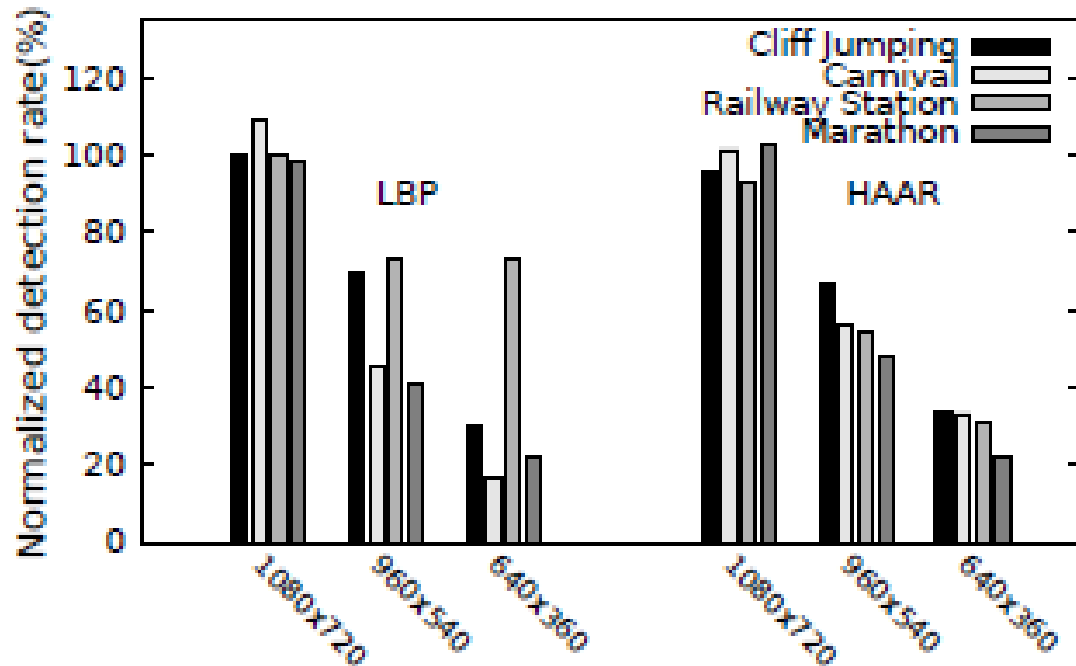
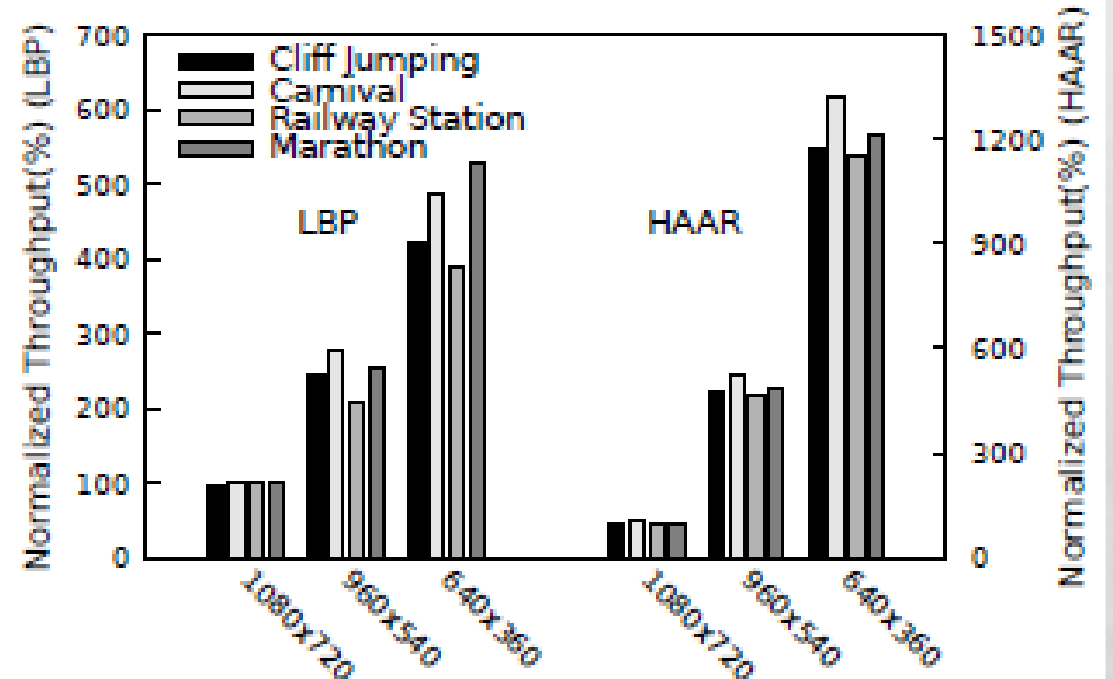


Figure 12: Throughput of the indexing process.

RESOLUTION COMPARISON/ ACCURACY



(a) Accuracy vs. Resolution



(b) Throughput vs. Resolution

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?**