Media Technology
Group Work 1

Digital Video Introduction

(Frame Size, Bit-depth, Frame-rate, Data-rate, Interlacing)

Digital Video Introduction

Why are frame-size, frame-rate, bit-depth, data-rate and interlacing important?

- Preparing media for DVD delivery
- Preparing media for Internet delivery
- Working with country-specific video (NTSC / PAL)
- Many media applications use these parameters in a variety of ways (Adobe After Effects, Adobe Premier Pro, Discrete Cleaner)
- Video compression (covered later) works closely with these parameters

Objectives

- View raw RGB video and file information with VirtualDub
- Adjust video frame size and see the effect on data rate
- Adjust video frame rate and see the effect on data rate
- View interlacing artifacts and compare to progressive video

Group Work Report

- Please prepare a 1 to 2 page report of your findings from this group work. Outline the important points from each exercise and your results. (Use the section questions as a guide)
- Everyone should hand in their own report (no group reports please).
- The report is due, in printed form, by the beginning of the next Media Technology lecture.

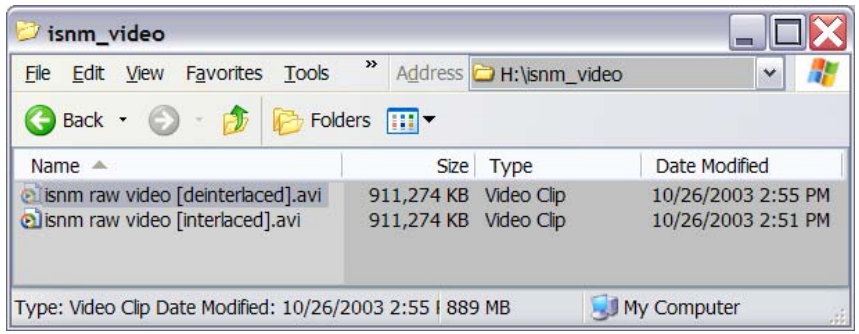
View Raw RGB Video with VirtualDub

Procedure

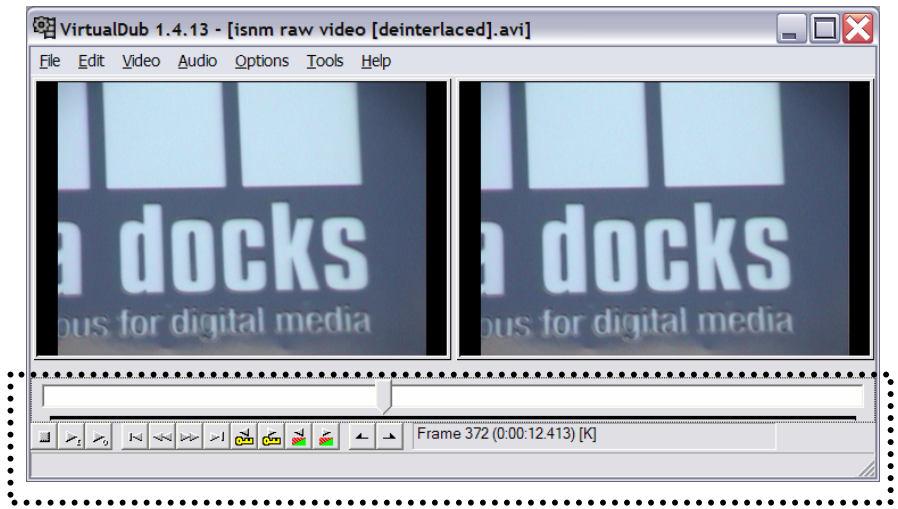
- Start VirtualDub
- Locate the raw video files:
  - isnm raw video [deinterlaced].avi
  - isnm raw video [interlaced].avi
- Open either file in VirtualDub
- Experiment with the media controller (play, stop, scrub)
- **Menu:** File > File Information

Questions

- What is the frame-size of the video?
- What is the frame-rate of the video?
- What is the bit-depth of the video?
- How many seconds is the video?
- What is the calculated data-rate of this video?
  - Data rate = (Frame area) * (Bit-depth) * (frame-rate)
- How large is the video file – does this compare to the calculated values?



Video files

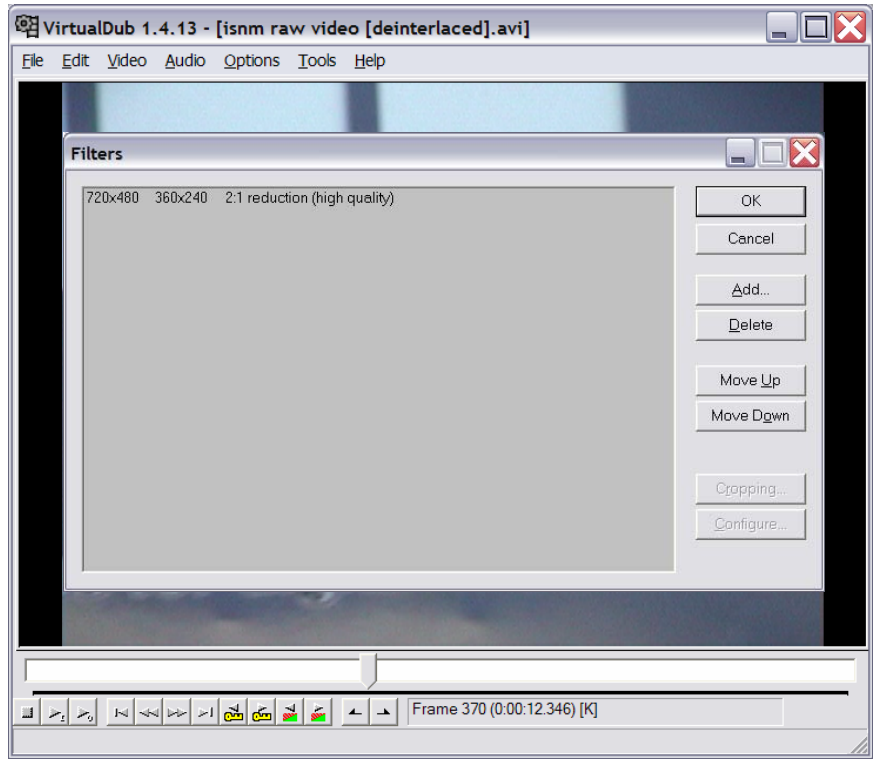


VirtualDub Media Controller

Frame Size vs. Data Rate

Procedure

- Open the following file in VirtualDub
  - isnm raw video [deinterlaced].avi
- **Menu:** Video > Filters
- Add the 2:1 reduction (high quality) filter
- Do not change anything else!
- **Menu:** File > Save as AVI
- Name the file “half_framesize.avi” and click save (ignore any warnings)
- When finished, open the new file in VirtualDub and check it



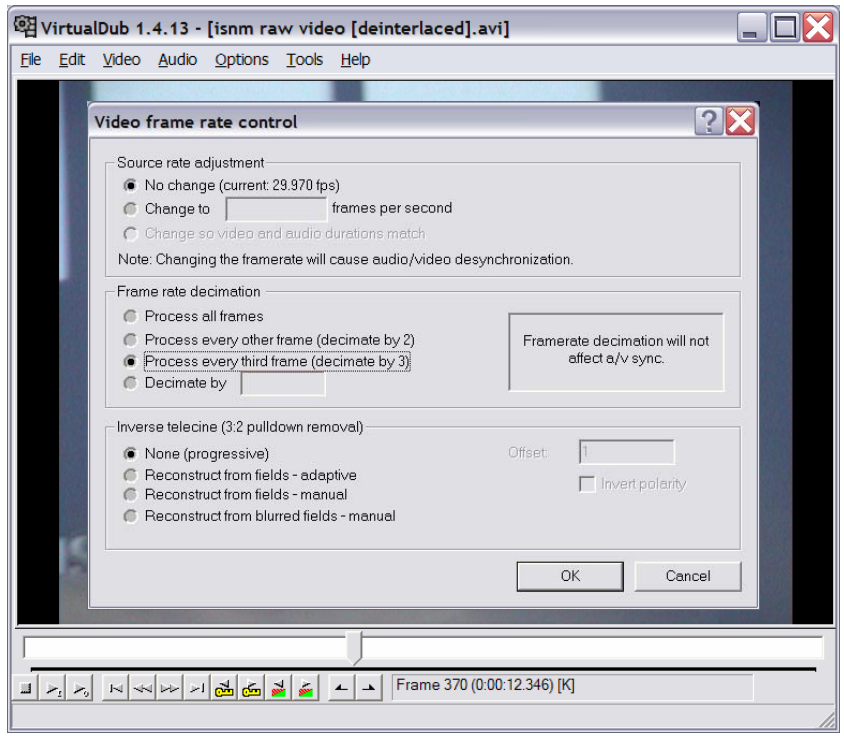
Questions

- What is the frame-size of the original video?
- What is the frame-size of half_framesize.avi?
- What is the data-rate of half_framesize.avi?
  - Data rate = (Frame area) * (Bit-depth) * (frame-rate)
- How can you explain the data-rate difference between the original file and half_framesize.avi?

Frame Rate vs. Data Rate

Procedure

- Open the following file in VirtualDub
  - isnm raw video [deinterlaced].avi
- **Menu:** Video > frame rate
- Choose “Process every other frame (deceminate by 3)”
- Do not change anything else!
- **Menu:** File > Save as AVI
- Name the file “new_framerate.avi” and click save (ignore any warnings)
- When finished, open the new file in VirtualDub and check it.



Questions

- Does new_framerate.avi look different than the original video?
- What is the frame-rate of the original video?
- What is the frame-rate of new_framerate.avi?
- What is the data-rate of new_framerate.avi?
  - Data rate = (Frame area) * (Bit-depth) * (frame-rate)
- How can you explain the data-rate difference between the original file and new_framerate.avi?

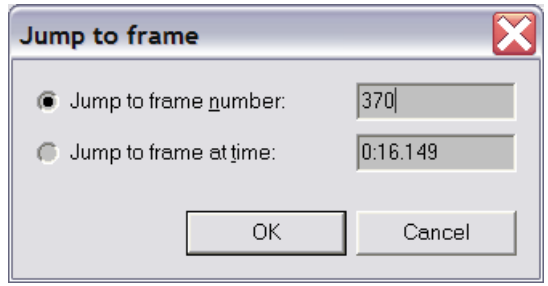
View Interlacing Artifacts

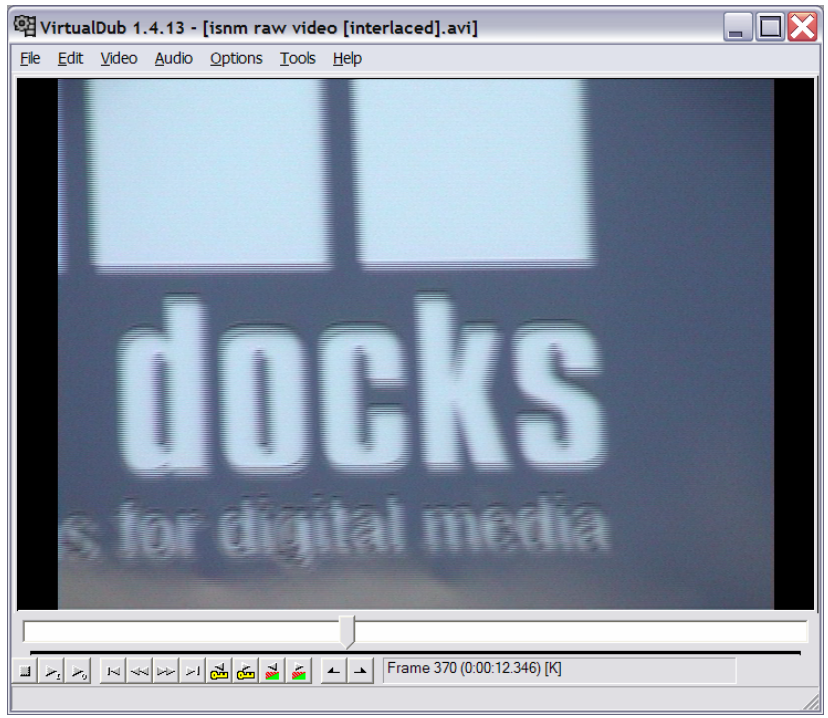
Procedure

- Start VirtualDub
- Open the following file in VirtualDub
  - isnm raw video [interlaced].avi
- **Menu:** Edit > Go to…
- Jump to frame 370
- Frame advance and watch for interlacing artifacts

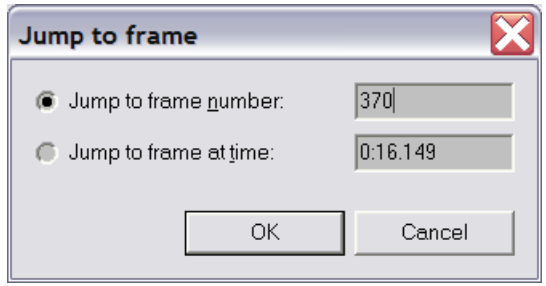
Questions

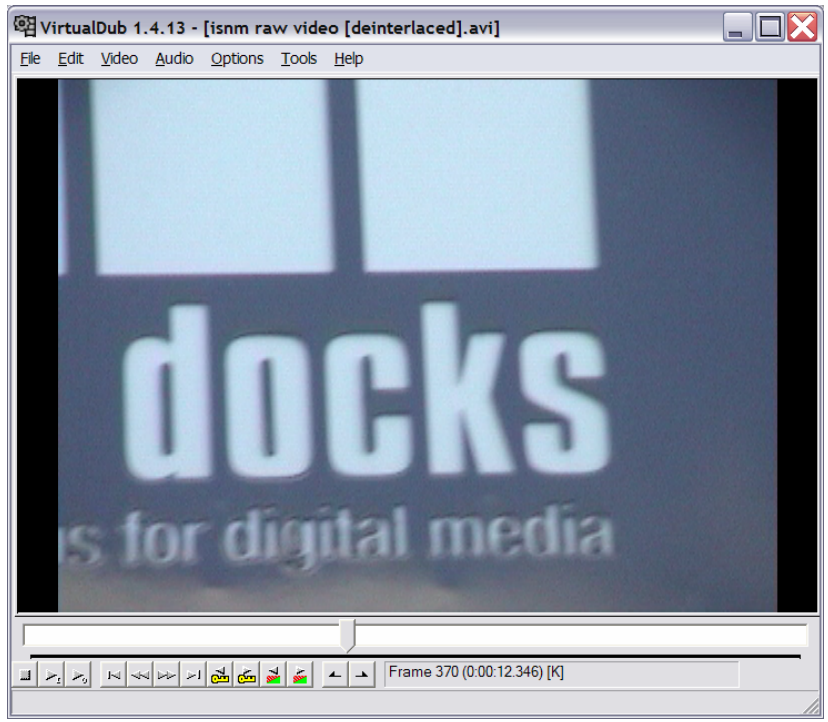
- What do these artifacts look like?
- Can you find interlacing artifacts in other parts of the video?
- Where are the interlacing artifacts most visible?





View De-interlaced Version





Procedure

- Start VirtualDub
- Open the following file in VirtualDub
  - isnm raw video [deinterlaced].avi
- **Menu:** Edit > Go to…
- Jump to frame 370
- Frame advance and watch for interlacing artifacts (try scrubbing forward and back in this section)

Questions

- Compare this video to the interlaced version, does the video look different at frame 370?
- What differences do you see throughout the video?
- Does interlacing seem to have an effect on the data rate of the video?

Wrap up!

Links

- www.virtualdub.org/
- www.adobe.com/products/premiere/
- www.adobe.com/products/aftereffects/
- www.discreet.com/cleanerxl/
- www.macromedia.com/macromedia/events/online/ondemand