ECPS 203
Discussion

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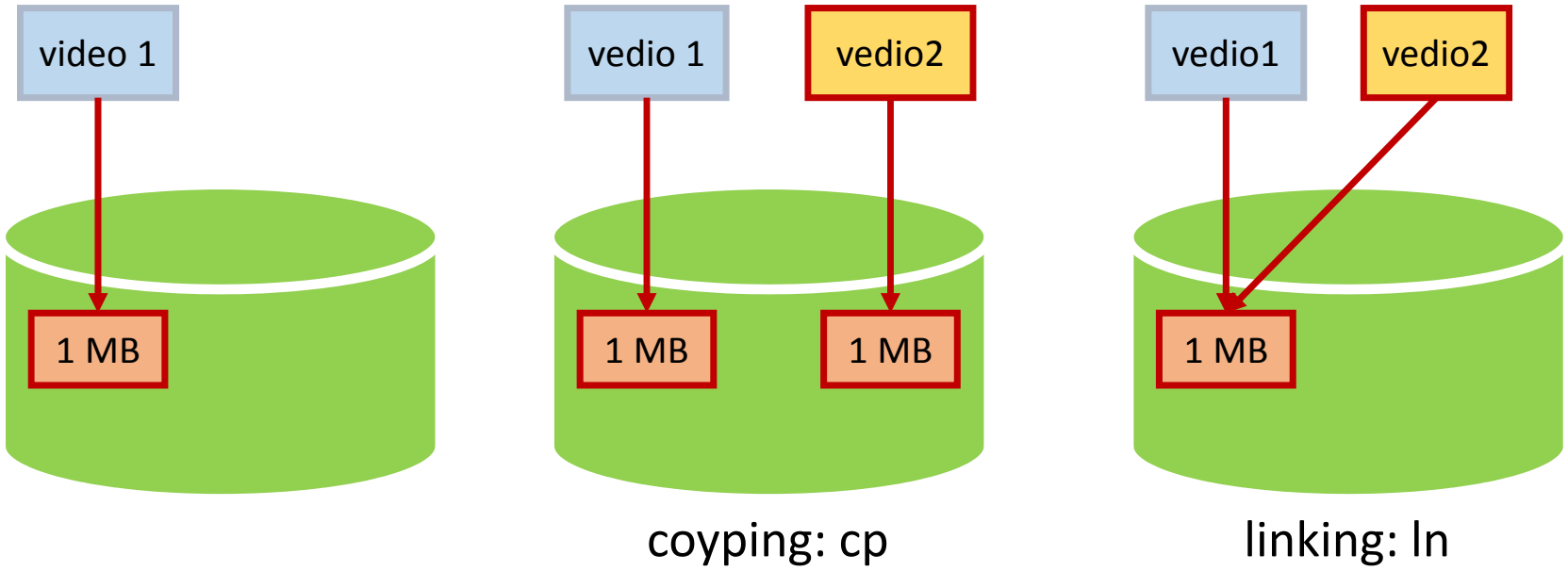
Agenda

- Assignment 4
  1. Extract 30 video frames from the movie file
  2. Convert the color frames to grey-scale images in PGM format
  3. Recode your Canny C++ model to process a sequence of images

Extract frames

- acquire the video file
- to save disk space, we use linking instead of copying the video files



coyping: cp

linking: ln

Extract frames

- acquire the video file
- to save disk space, we use linking instead of copying the video files

- in hw4 directory:
  - **ln -s ~ecps203/public/DroneFootage DroneFootage**
  - this means: create a folder DroneFootage in /hw4, and it is a shortcut to ~ecps203/public/DroneFootage

Extract frames

- create the video folder, which will contain all the frames you extract
  - mkdir video
- go into video:
  - ln -s ../DroneFootage/DJI_0003.MOV
  - this links DJI_0003.MOV to your video folder

Extract frames

- use the **ffmpeg** tool to extract frames

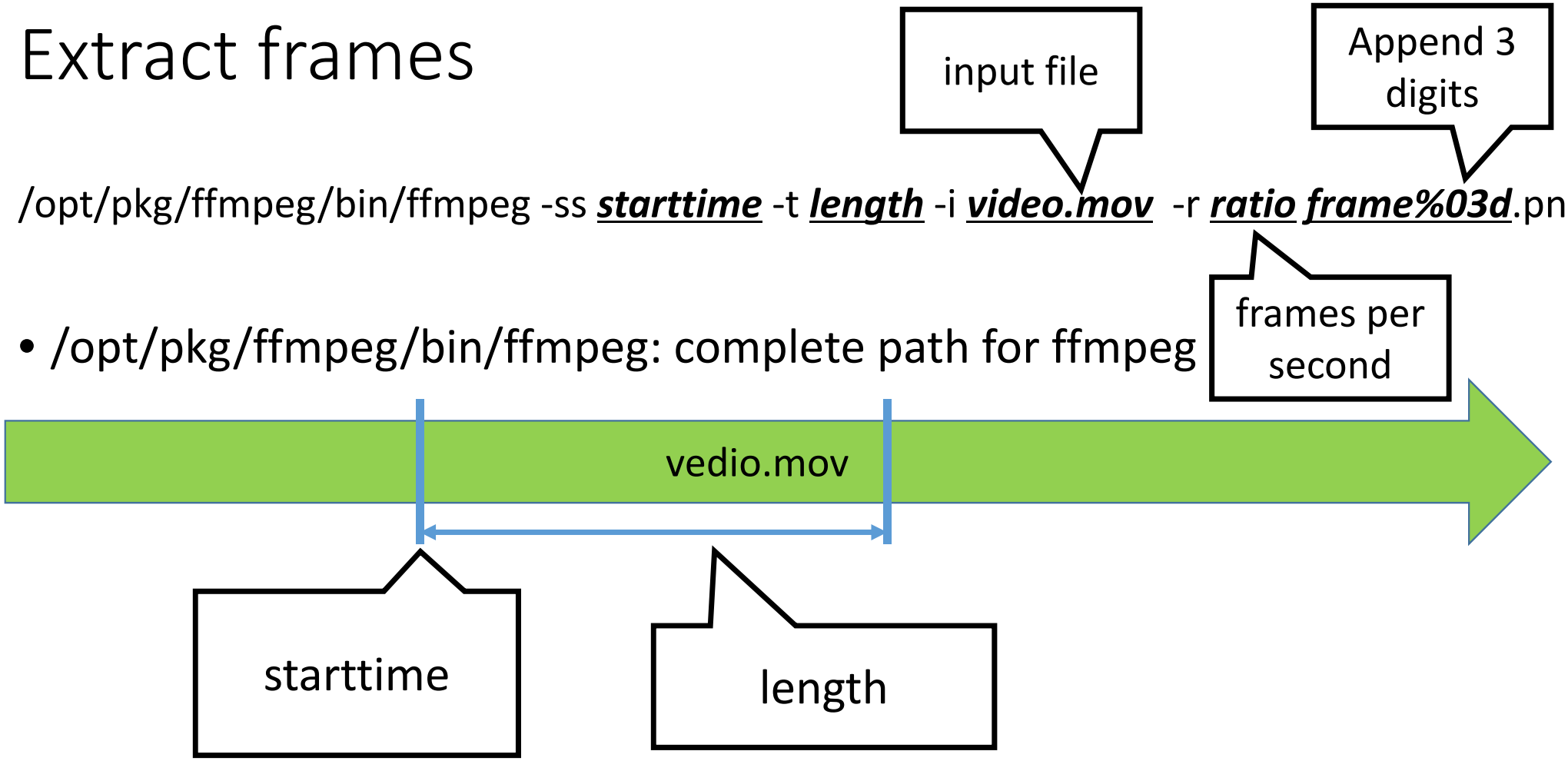
/opt/pkg/ffmpeg/bin/ffmpeg -ss ***starttime*** -t ***length*** -i ***video.mov*** -r ***ratio*** ***outputfile.png***

- starttime, length, ratio, video.mov, outputfile.png are parameters you need to set

Extract frames

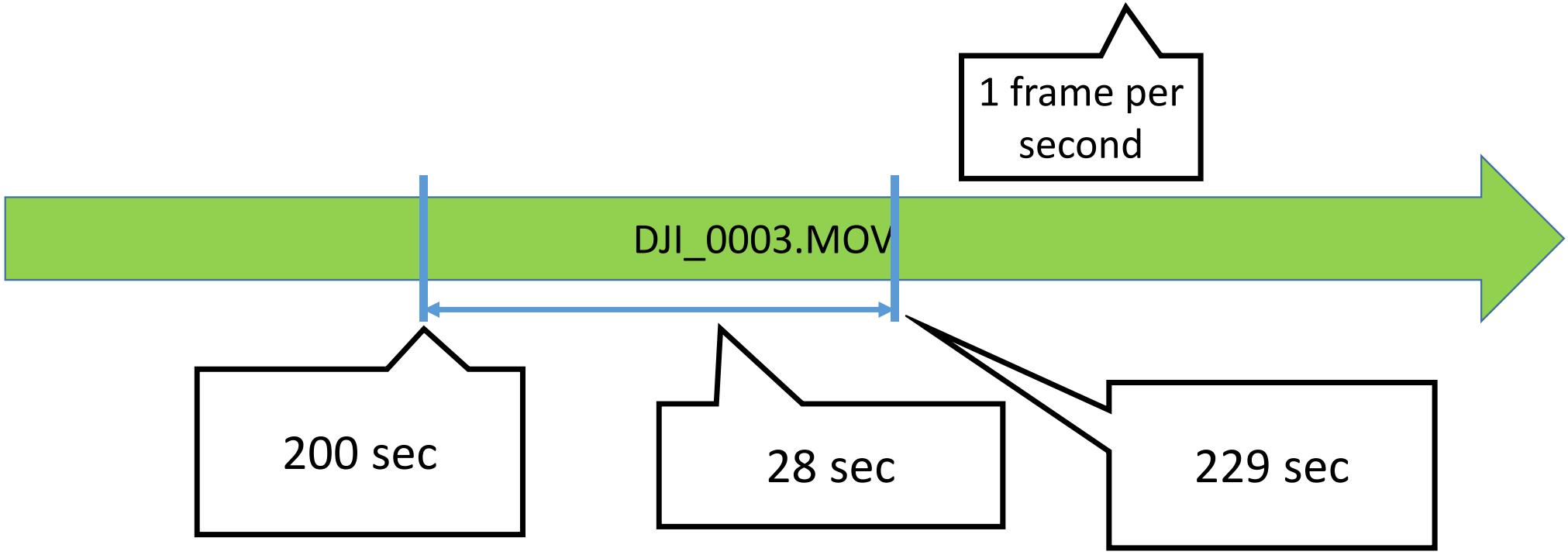
/opt/pkg/ffmpeg/bin/ffmpeg -ss ***starttime*** -t ***length*** -i ***video.mov*** -r ***ratio*** ***frame%03d***.png

- /opt/pkg/ffmpeg/bin/ffmpeg: complete path for ffmpeg



Extract frames

/opt/pkg/ffmpeg/bin/ffmpeg -ss ***200*** -t ***28*** -i ***DJI_0003.MOV*** -r ***1*** ***Engineering%03d***.png



Extract frames

/opt/pkg/ffmpeg/bin/ffmpeg -ss ***200*** -t ***28*** -i ***DJI_0003.MOV*** -r ***1*** ***Engineering%03d***.png

will output 30 files, Engineering001.png, Engineering002.png …

Convert images to grey-scaled

- Now the output png images are colorful
- However, canny handles grey-scaled pgm inputs
- So we need to convert the images to grey-scaled pgm files

Convert images to grey-scaled

- the conversion is a bit complicated
- png -> pnm -> pgm

Convert images to grey-scaled

- png -> pnm
- command:

  pngtopnm Engineering001.png > Engineering001.pnm

Convert images to grey-scaled

- pnm -> pgm
- command

  ppmtopgm Engineering001.pnm > Engineering001.pgm

Modify the old canny

- 1 input file -> 30 input files
- reference for assignment 2 is in:
  /users/ugrad/2017/summer/ecps203/public/CannyA2_ref.cpp

```
void main(){
   filename="golfcart.pgm";
   read_image();
   canny();
   write_image();
}
```

old canny.cpp

```
void main(){
   for(i = 1 to 30){
      sprintf (filename,"video/Engineering%03d.pgm", i);
      read_image();
      canny();
      write_image();
   }
}
```

new canny.cpp

Modify the old canny

```
void main(){
   for(i = 1 to 30){
      sprintf (filename,"video/Engineering%03d.pgm", i );



   }
}
```

format specifier:
001, 002, 003 ..

when i=1, filename = video/Engineering001.pgm
when i=2, filename = video/Engineering002.pgm
..

Modify the old canny

- change size of input image
  - COLS
  - ROWS
- Use the file command:

```
crystalcove% file Engineering001_edges.pgm
Engineering001_edges.pgm: Netpbm PGM "rawbits" image data, size = 2704 x 1520
```

COLS ROWS

Compile and run your code

- compile:
  - g++ Canny.cpp -o Canny

- No warnings, no errors

Compile and run your code

- set stack size before running your code
- echo $SHELL
- if csh or tcsh: limit stacksize 128 megabytes
- if sh or bash: ulimit -s 128000

```
crystalcove% echo $SHELL
/dcs/bin/tcsh
crystalcove% limit stacksize 128 megabytes
```

Compile and run your code

- put video folder and Canny in the same directory
- ./Canny

Submission

- Canny.cpp
- Canny.txt: troubles you met