

5/22/2020

HPWREN Camera Image Access and Download Overview

Images and videos seen on the various HPWREN camera sites, such as <http://hpwren.ucsd.edu/cameras>, are available to the public for download from our archives. Our only requirement for their usage is to provide attribution to HPWREN (<http://hpwren.ucsd.edu>) if images are published. See http://hpwren.ucsd.edu/a_and_d.html for details.

The latest HPWREN camera images and videos are available in various display formats at

<http://hpwren.ucsd.edu/cameras/index.html>
<http://hpwren.ucsd.edu/cameras/ptz.html>
<http://hpwren.ucsd.edu/cameras/wide-c.html>
<http://hpwren.ucsd.edu/cameras/wide-m.html>

Recent collections of images and videos are found in the directory structure described in #2 below.

HPWREN servers capture, process, publish and archive images and videos around the clock (images are captured once per minute, videos every three hours). This data is collected from a few hundred camera image sources around San Diego, Imperial, and Orange County and new cameras are added regularly. Our archives are spread across multiple servers and we provide multiple tools for their access. Images are stored as jpg files and videos are stored as mp4 files. Our Archives data back to 2000 with past images coalesced into (and replaced by) mp4 videos to reduce storage requirements. Those mp4 videos can be downloaded and from them the (very near) original jpg files can be re-extracted, if desired, using ffmpeg. This is most readily done on a Unix system (sample re-extraction command line: “ffmpeg -i Q4.mp4 -f image2 -qscale 0 -vcodec mjpeg Q4-%03d.jpg”) but ffmpeg is available on Windows as well.

The following perl script shows how to re-extract the original jpg files to their original (unix epoch data string) filenames. Assumes you downloaded mp4 file from <http://c1.hpwren.ucsd.edu/archive/sp-s-mobo-c/large/2018/20180806/MP4/> and the index file from <http://c1.hpwren.ucsd.edu/archive/sp-s-mobo-c/large/2018/20180806/Q4/> and placed them local folder Q4:

```
#!/usr/local/bin/perl

# cd to target directory ... Q4

$vname=$ARGV[0];# e.g.: Q4.mp4
$vdesc=$ARGV[1];# e.g.: 20170708_syp-n-mobo-c_Q4-Source-file-
ctime.txt

if($vdesc !~ "ctime"){die("need proper parameters...");}
open(I,"$vdesc") || die("Cannot open input file $vdesc");

system("ffmpeg -i ../MP4/$vname -f image2 -qscale 0 -vcodec mjpeg
%05d.jpg");
```

```

while(<I>) {
  ($if,$ofname,@r)=split(" ",$_);
  rename("$if.jpg","$ofname");
}
close(I);

```

HPWREN provides a number of mechanisms for users to search for, view, and if desired download single or multiple images and videos (in custom packaged zip files when larger amounts of data are requested). These tools include the following (and are presented in order of anticipated utility for and needs of casual to power users):

1. *Direct web download of single current image or video (via <http://hpwren.ucsd.edu/cameras>)*
 Images visible on <http://hpwren.ucsd.edu/cameras> can be directly downloaded (individually) after their selection (e.g. after clicking on them once with your mouse) with a right-click of the mouse and selection of "Save image as ..." dialog for downloading to your local computer.
2. *Manual web search for specific past images or videos (via <http://hpwren.ucsd.edu/cameras>)*
 Click on the location link generally above the images (which is usually labeled with the camera location followed by "360 degree panorama". There you will find links to current and past images (the "data" links) and videos (called "Animations") from the selected camera. Following these links you will be taken to a list of dates for image collections. Navigate this list to locate images or videos of interest. Browse into the year/date of your choice, and then select one of the Q1-Q8 directory or the MP4 directory. The former will take you into a directory with 3 hours of jpg images and the latter will take you into the directory with the MP4 video for those periods. The Q prefixed directories and filenames refer to specific 3 hour image time periods as follows:

Q1: 0000-0259 Q2: 0300-0559 Q3: 0600-0859 Q4: 0900-1159
 Q5: 1200-1459 Q6: 1500-1759 Q7: 1800-2059 Q8: 2100-2359

Browsing into these directories will allow you to individually download files from that location using your mouse as you did in section #1 above.

3. *Manual web search of full archive for specific past images or videos*
 Pointing your browser to <http://c1.hpwren.ucsd.edu/archive/> will take you to HPWREN's image archive. There you will find links to current and past images and videos, organized by camera name and then by date (after browsing down into a specific camera and then into the "large" directory). Browse into the year/day of your choice, and then select one of the Q1-Q8 entries or the MP4 entry. The former will take into a folder with 3 hours of jpg images and the latter will take you into the folder with the MP4 data for those periods. The Q prefixed directory and filenames refer to specific 3 hour image time periods as follows:

Q1: 0000-0259 Q2: 0300-0559 Q3: 0600-0859 Q4: 0900-1159
 Q5: 1200-1459 Q6: 1500-1759 Q7: 1800-2059 Q8: 2100-2359

Browsing into these directories will allow you to individually download files from that location using your mouse as you did in section #1 above.

4. *File Explorer graphical interface to all images and videos using <https://nextcloud.hpwren.ucsd.edu>*
Pointing your browser to the above link will take you to NextCloud, a File Explorer like interface supporting the navigation, display and bulk download of selected images. As directed at the bottom of the NextCloud login page, please login using username "archive" and password "public_user" (without the double-quotes). From there you can navigate using point and click similar to how you would do it on your Windows PC or Mac desktop. See the "Locating_HPWREN_images_and_videos.pdf" file for details on where to look for specific camera image locations (double click to open and read the pdf file).

Select folder path to targeted images (select and click, or double click in the space following the folder name to navigate). Select one or more images (right click to select range of images). After one or more files are selected, you can download them in a bulk zip file with a right click select of "Download". Click the ... icon after selection to see other options.

5. Database search for all images and videos with specific criteria across spans of time and cameras (via <http://c1.hpwren.ucsd.edu/tools/fetch-cam-images.html>)
This tool allows you to select from a range of criteria to choose images and videos for bulk download (via customized zip files). It presents a web form allowing the selection of those criteria, including combinations of the choices of:
 - One or more days of interest
 - One or more cameras of interest (from pulldown list of all cameras)
 - One or more 3 hour span collections of jpg and/or mp4 files
 - All images matching the above
 - Images at specific times of day only
 - First image (only) of each 3 hour selected period
 - Only jpg images
 - Only mp4 images
 - Only motion detected images

After selecting the desired options, click on the "Submit" button and the system will go off and collect your images and place them in a zip file for your download. This interface supports finer grain selection criteria and much larger image collection downloads (and consequently may take some time after you click on "Submit" until your download link is presented, up to a minute per camera per day/date). We may also add the ability to generate custom animations using this tool in the future.

All the above tools are easier to use if you know the mapping of the camera names to the location. We have a guide for that at <http://c1.hpwren.ucsd.edu/tools/camera-locations.txt> (or in NextCloud named "Locating_HPWREN_images_and_videos.pdf") which will list the locations of the cameras and, for cameras that are no longer active, the date they became inactive.

If you are interested in our cameras image return rates, we also have two tools available to show return rates for the previous 24 hours:

- Our color image return rates are accessible via the form at <http://c1.hpwren.ucsd.edu/tools/search-cam-logs>
- Or monochrome (near IR) image return rates are accessible via the form at <http://c2.hpwren.ucsd.edu/tools/search-cam-logs>

To see all image return rates, select "Summary" and click "Submit". You can also select individual cameras.

We hope you find these tools useful and encourage any feedback you may have for us at <http://hpwren.ucsd.edu/contactForm4.html>