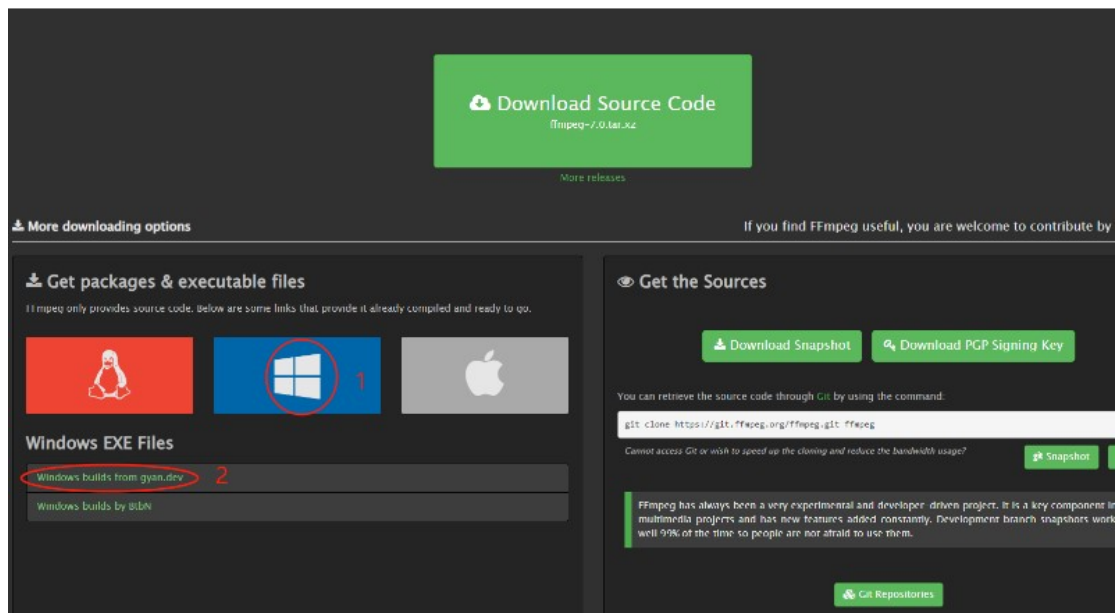


## Global Shutter Camera Module Debugging Instructions

If you need to experiment or debug a high frame rate camera to capture high-speed moving objects, capture video streams, and use it, there are many ways to achieve high-speed capture using a global shutter camera. You need a high frame rate global shutter camera as a prerequisite. You can complete these functions by programming yourself, and you can also use some tools to easily and quickly complete them. This article is about the latter. This article explains how to complete it on the Windows 10 system.

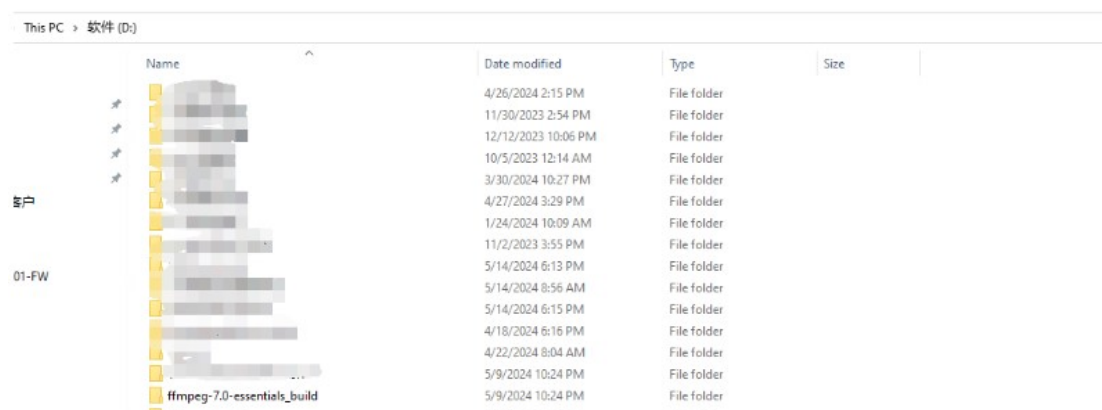
1. Download ffmpeg from the official website and go to the download ffmpeg website  
( <https://ffmpeg.org/download.html> ) And click to download the Windows version of FFmpeg (click on the green line in the bottom left corner)



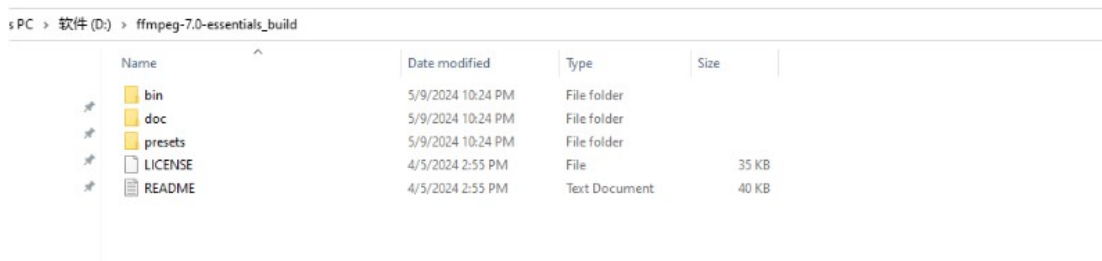
Select the version to download from the first green box of the released version



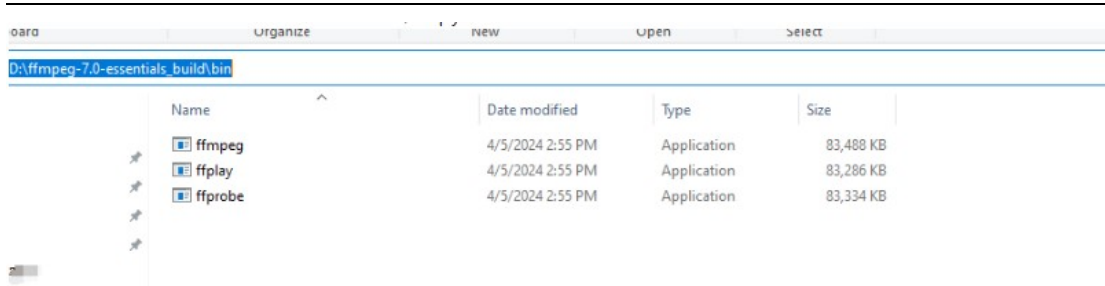
2. Configure ffmpeg. After downloading, unzip the compressed file:



Click to enter ffmpeg, and the following interface will appear:



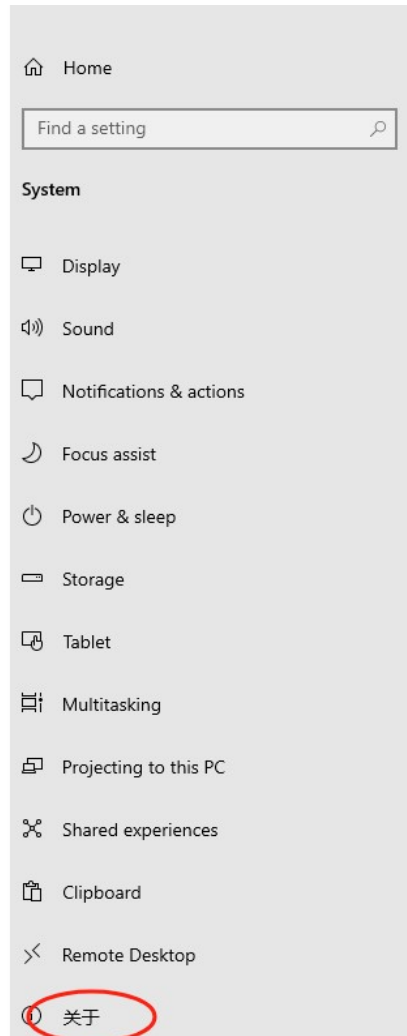
There will be three exe files in the bin file, copy the current address:



Open "Computer Settings", click "Advanced System Settings" in the "Properties" section, and then click "System":



Find the following information:



## Display

### Rearrange your displays

Select a display below to change the se



## Brightness and color

Change brightness for the built-in displ.

### Night light

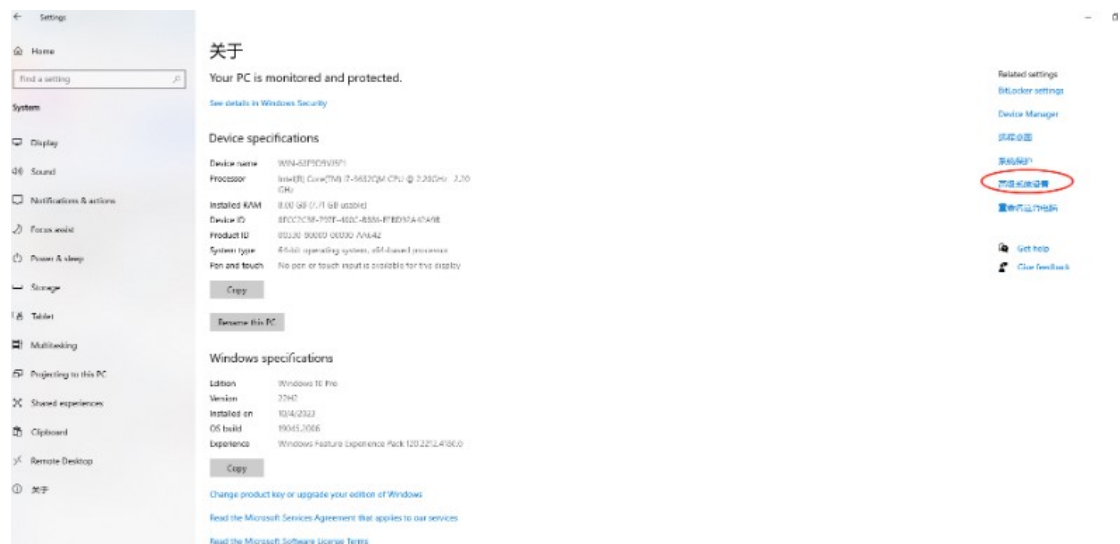
☐ Off

[Night light settings](#)

## Windows HD Color

Get a brighter and more vibrant picture

Open advanced system settings downwards:



Open environment variables:

ed and protected.

urity

ns

F9D9VJ5F1

Core(TM) i7-3632QM CPU @ 2.2

(7.71 GB usable)

3E-797F-400C-B881-EFBD92A42

0000-00000-AA642

perating system, x64-based pro

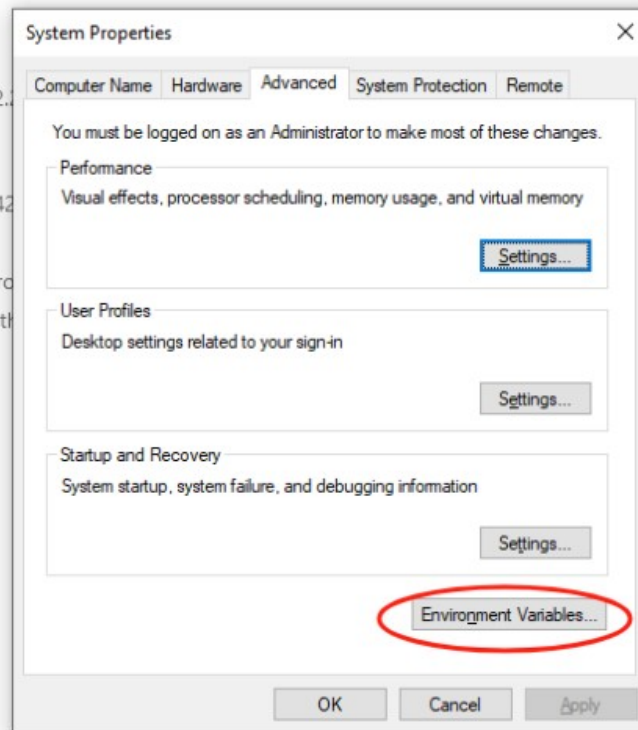
or touch input is available for th

tions

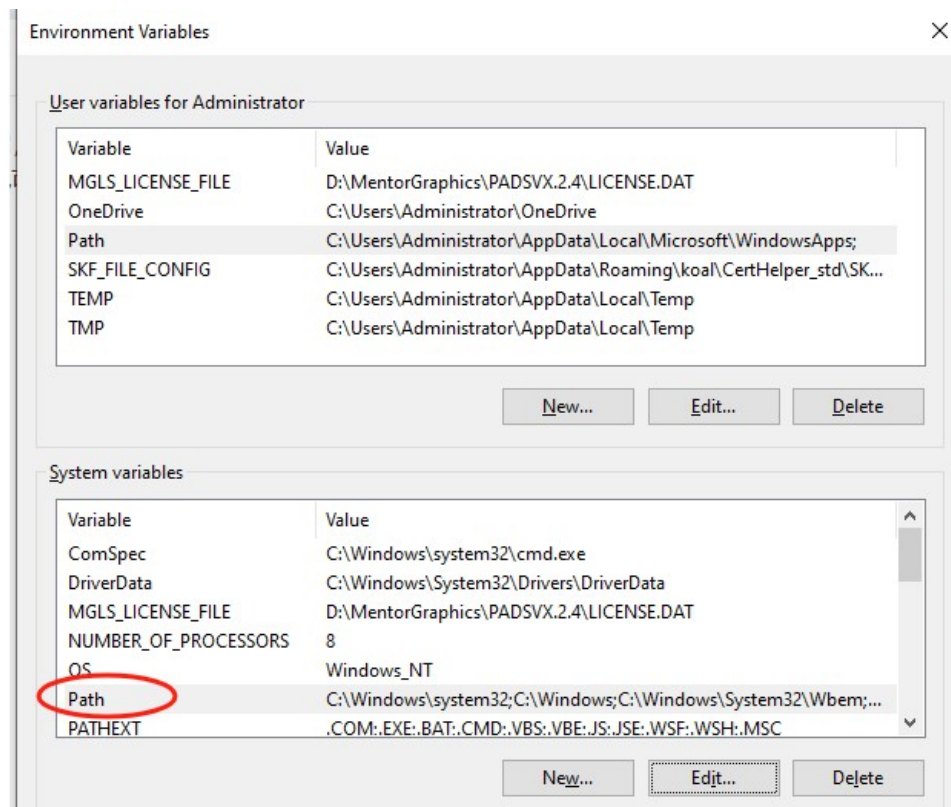
s 10 Pro

23

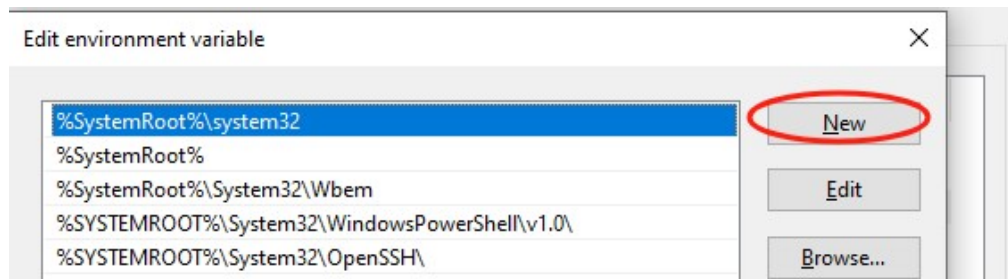
06



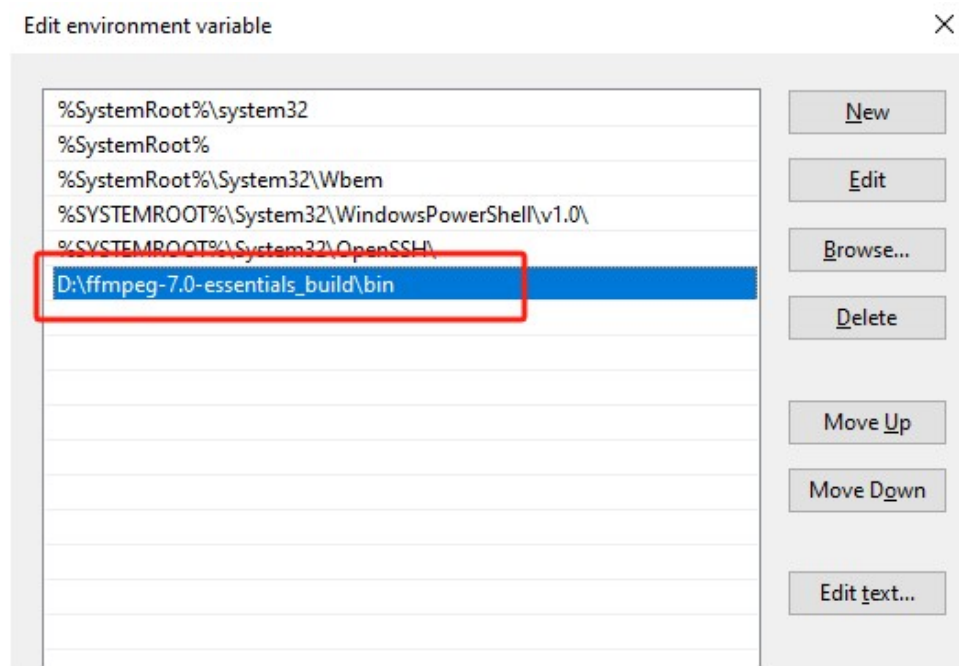
Find the path in the system variable:



Double click to open, click on New:



Paste the first copied address back and click "OK":



Then click on three more to confirm. After saving, open any shell and enter the ffmpeg version. If the version number output is normal, it indicates successful installation:

```

Microsoft Windows [Version 10.0.19045.2006]
(c) 2019 Microsoft Corporation. All rights reserved.

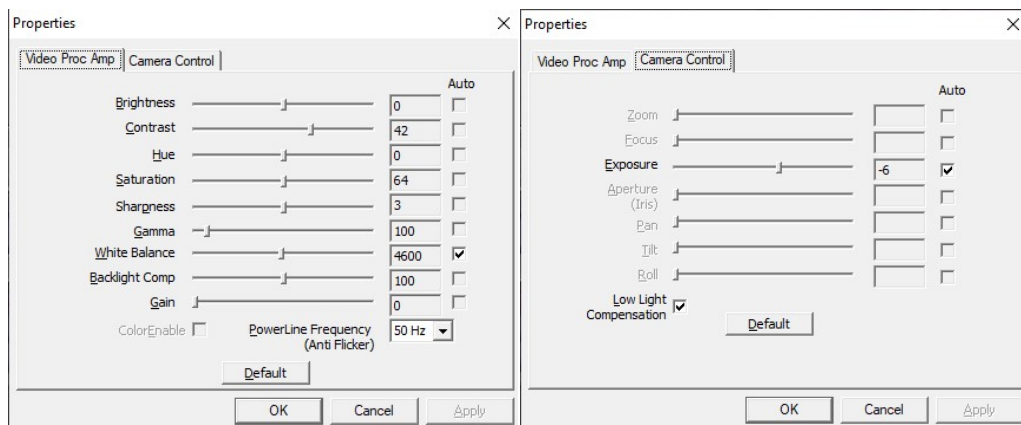
C:\Users\Administrator>ffmpeg -version
ffmpeg version 7.0-essentials_build-www.gyan.dev Copyright (c) 2000-2024 the FFmpeg developers
built with gcc 13.2.0 (Rev5, Built by MSYS2 project)
configuration: --enable-gpl --enable-version3 --enable-static --disable-w32threads --disable-autodetect --enable-fontcon
fig --enable-iconv --enable-gnutls --enable-libxml2 --enable-gmp --enable-bzlib --enable-lzma --enable-zlib --enable-lib
rt --enable-libssh --enable-libzmq --enable-avisynth --enable-sdl2 --enable-libwebp --enable-libx264 --enable-libx265 --
enable-libxvid --enable-libaom --enable-libopenjpeg --enable-libvpx --enable-mediafoundation --enable-libass --enable-l
bfreetype --enable-libfribidi --enable-libharfbuzz --enable-libvidstab --enable-libvmaf --enable-libzimg --enable-amf --
enable-cuda-llvm --enable-cuvid --enable-dxva2 --enable-d3d11va --enable-d3d12va --enable-ffnvcodec --enable-libvpl --e
nable-nvdec --enable-nvenc --enable-vaapi --enable-libgme --enable-libopenmpt --enable-libopencore-amrwb --enable-libmp3
lame --enable-libtheora --enable-libvo-amrwbenc --enable-libgsm --enable-libopencore-amrnb --enable-libopus --enable-lib
speex --enable-libvorbis --enable-librubberband
libavutil 59. 8.100 / 59. 8.100
libavcodec 61. 3.100 / 61. 3.100
libavformat 61. 1.100 / 61. 1.100
libavdevice 61. 1.100 / 61. 1.100
libavfilter 10. 1.100 / 10. 1.100
libswscale 8. 1.100 / 8. 1.100
libswresample 5. 1.100 / 5. 1.100
libpostproc 58. 1.100 / 58. 1.100

C:\Users\Administrator>
    
```

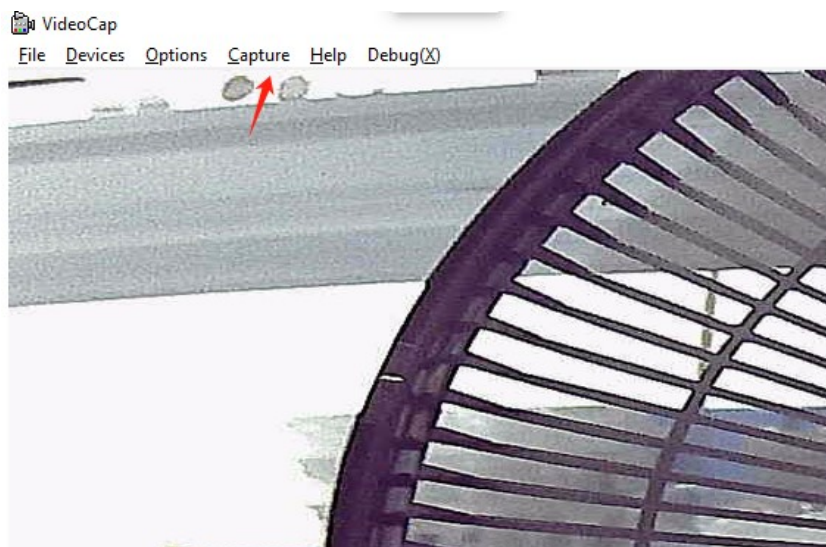
3. We use videocap. Exe debugging parameters and shooting video (tracking target is a rotating



fan) when static:



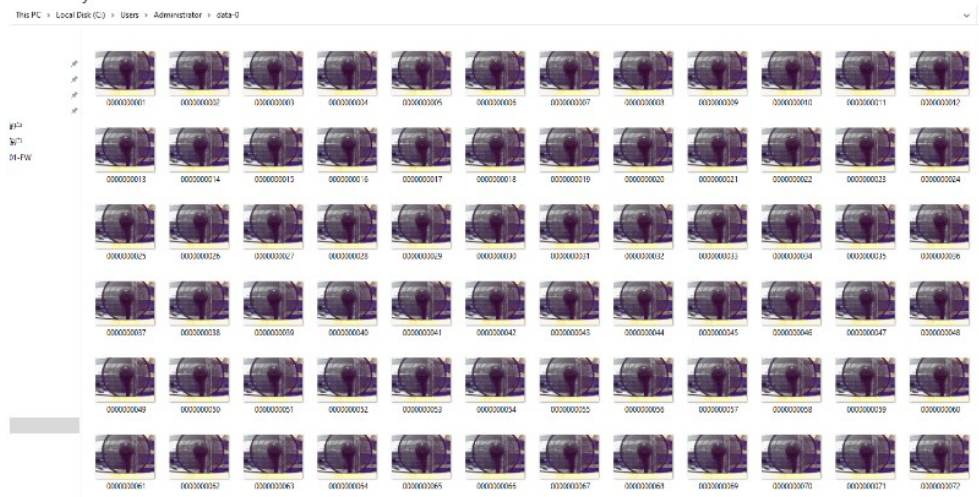
Turn on the fan, then operate the videocap. exe option capture ->start capture, and after a few seconds, stop capturing:



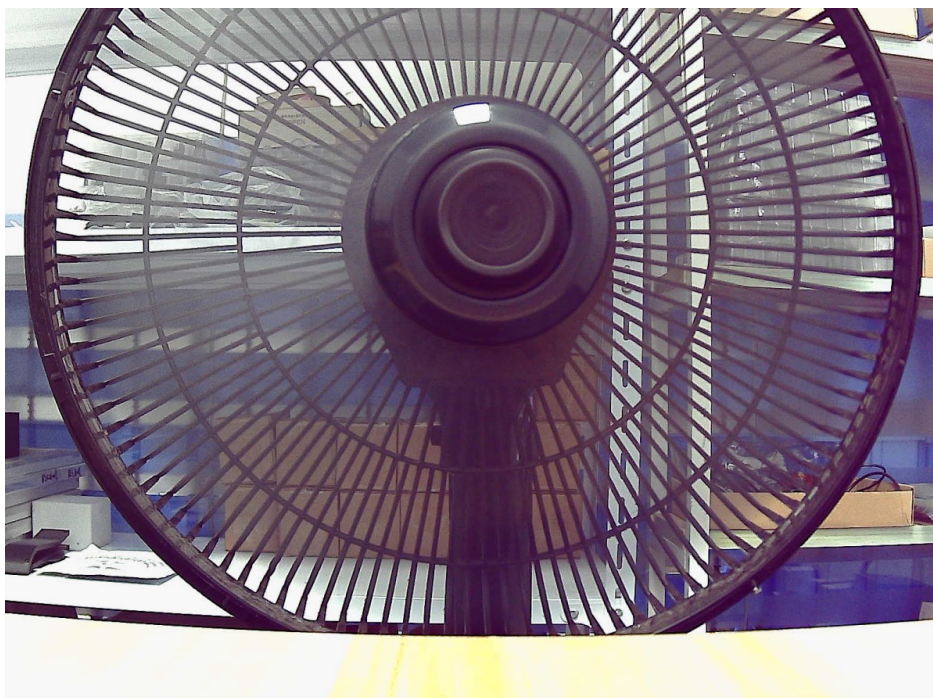
Named 123.avi, use the ffmpeg tool to capture each frame of the image. The command is:  
ffmpeg -i C:\Users\Administrator\Desktop\123.avi data-0/%010d. png

The analysis data is as follows:

The analyzed data is as follows:

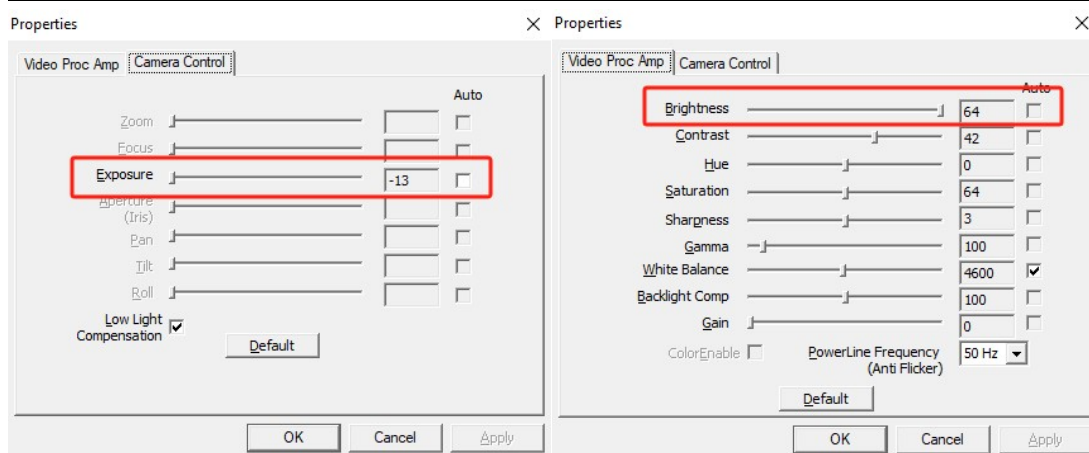


Select an image to view, of course, due to unadjusted parameters, the rotating blade was not captured:



Adjust exposure parameters and increase brightness, and adjust other parameters as needed:





Repeat the above operation of intercepting the video stream and processing frames, and store the image in the data-1 folder. Command: `ffmpeg -i C:\Users\Administrator\Desktop\123.avi data-0/% 010d png`, The image effect obtained is as follows:



From the image effect, it can be seen that the contour of the fan blades can be accurately obtained. Due to the lack of supplementary lighting when the exposure time is minimized, the image appears very dark. Necessary supplementary lighting can be performed to improve brightness. The above tests are sourced from camera model: GXIVISION-S2M05 (2.8mm-12mm color version).

We used the same method to perform the same operation on GXIVISION-S2M05 (2.8mm-12mm monochrome model, hardware monochrome is not software monochrome), and the image captured by rotating the fan dynamically is as follows:



The effect is better than the colored version.