

Webcams NEVER WORK WITH CHILDREN AND SMALL, FAT ANIMALS

So all the Window users get broadband and go on about webcams of their goldfish. John Southern show you that Webcams can have other uses.

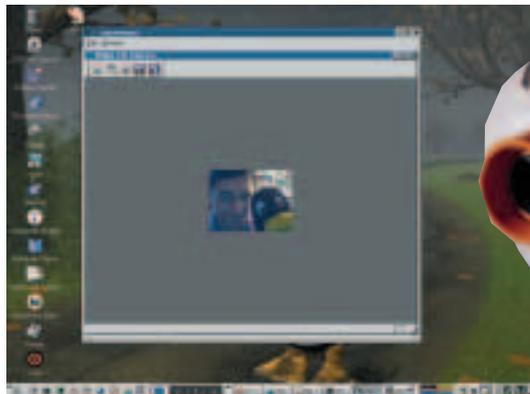
What to buy?

Wanting an easy life we started out by simply typing into Google the words webcam and Linux. The first site had not been updated since 2000 while the second site was still being actively updated. This second site at <http://www.smcc.demon.nl/webcam/> shows the current devices supported by the drivers. Armed with this list we set off for the shops and returned with a Philips PCVC740K webcam more commonly known as the ToUCam.

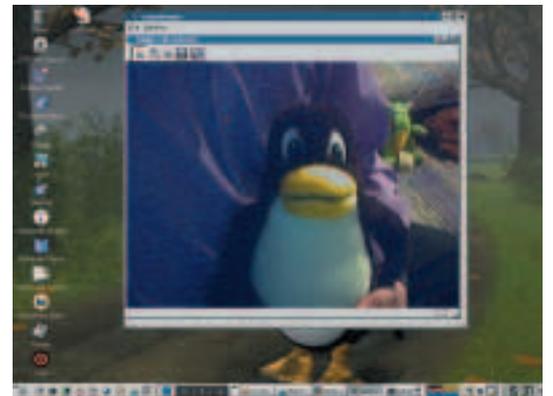
Back to the web site to download the modules and drivers. The usb-pwc file is just 70K in size but requires us to patch the kernel. Full instructions were online until we read the small print. From version 2.4.6 of the kernel this module is included. That meant we had nothing to do. Download the CamStream application as it is by the same developer and so if anything should work this should be it. At version 0.25 this requires unpacking and the usual `./configure` followed by `make` then `make install`.

In a shell we type `camstream` and a window opens. Nothing is visible. Choose the Files -> New -> Viewer and any of the sizes. A small window appears with the webcam live.

Okay so it works but the image is very small.



At least the camera works



Finally a 640x480 image

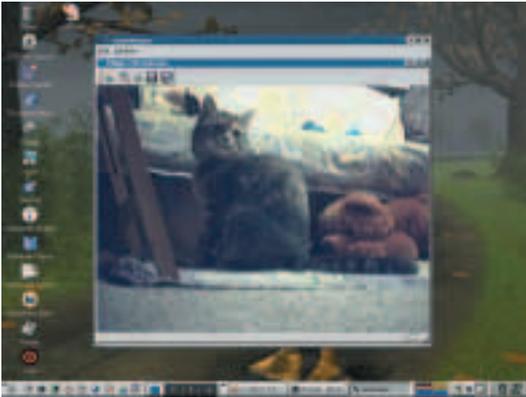
Starting another viewer and choosing the VGA output size gives us a large grey border but the image is still small. Not ideal but maybe the quality is VGA and we are just displaying it wrong. Back to the webpage and this time a read of the FAQ. (Note to self - Really must read before trying things. Especially backup software!)

There is the answer. No `pwcx.o` module is loaded. Another download this time of the `usb-pwcx` (11K) Copy to `/lib/modules/usb/` or in the case of Mandrake `/lib/modules/2.4.8-26mdk/kernel/drivers/usb` Change to root and use

```
insmod -f pwcx.o
```

The `-f` is to force the module in as it is compiled against 2.4.6 and not the version I was using. The warning can be ignored. Now restart CamStream and a new viewer VGA size shows the full image.

Now we can start to explore the software. The first options under



Target acquired

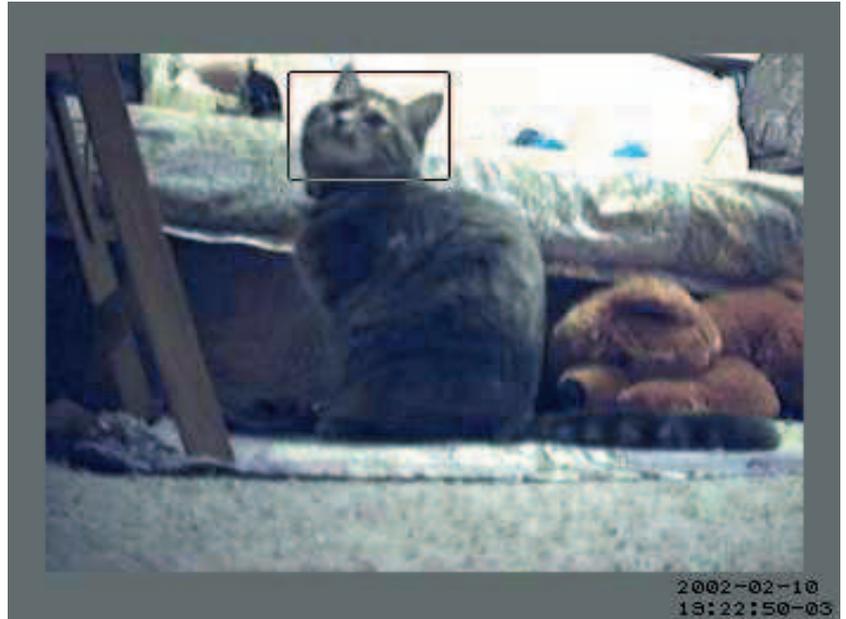
CamStream apart from the size of the image are to do with framerate. The higher the image size the lower the maximum framerate. The lower a framerate used brings about jumpy images and makes viewing unpleasant. This is a compromise and you need to adjust the size of the image you can live with against the framerate. For webmeetings it is better to go with the smaller image size and have a smoother video whereas for snapshots just go with the maximum size.

The next set of controls are to do with the input levels and here you can control the brightness and apply gamma correction to the picture.

You then have the ability to upload the image via ftp to a website to provide a webcam accessible to all. I can see great potential for this but I will need to lock down my firewalls first. You can always save the stream to disk and it is now becoming popular in the USA to use webcams to spy on child minders during the day. I am not sure of the legality in the UK but I know I would lose my mother's Sunday lunch if I tried!

Now to look at what other software we can use. The next from the list of software at the driver website is Vgrabbj. This is a command-line tool for controlling the webcam. Maybe not everyone's favourite but so easy to include within a script.

At this point we are almost back on track to mounting onto the robot. Just one piece of software required.



The outline shows the area that Motion detects a change

Motion

Motion is a small utility that compares images. It looks at differences between two samples and based on changes can save an image. To speed up comparisons you can also apply masks so for example you can block out most of an image so it only detects a change say at a door or window. Very useful in guarding and security work.

The latest stable version is 2.6.3 although the unstable has reached 2.9.2. The rpm requires the mysql client as a library while the source file does not need this built against. It is available from <http://motion.technolust.cx/>. To start the program we need

```
motion -d /dev/video0
```

Be careful when testing this because as soon as an image difference (motion) is detected in the webcam stream a snapshot is taken and stored. This has to be a quick way of using up all your disk space. The saved location directory is based on the date of when the files are taken for example: /home/john/2002/02/10/17/11/10-03.jpg. Images fortunately are about 12K in size.

Back to the robot. Fixing the camera to the Lego Mindstorm was achieved with hot-melt glue. (Peels off easily later) Now the only limiting factor is the usb cable. This was two metres and so limited the range dramatically. Moving the robot and using Motion resulted in a constant stream of snapshots. These could then be turned into an animation file to show the rover motion in action. For a more jerky but less CPU intense task we chose to put a pause between motion detection.

```
motion -a /dev/video0 -G 15
```

to give comparisons every fifteen seconds.

It is now becoming popular in the USA to use webcams to spy on child minders