Raspberry Pi

Card 1 of 3

Streaming webcam

If you know enough about computers to be dangerous, you can get this done in 4 hours. If you're really good, maybe 2. If you're a newbie, probably 8.

I picked this project because streaming video has lots of possibilities, from video calls to security cameras to nature watching and lots more. And because honestly I thought it would be a bit of a stretch to get it working and would really help me to learn.

1. Buy the Pi and peripherals
I got mine from CPC: ordered 27 January, arrived 29 January

Order Code	Mftr. Part No	Manufacturer / Description	Qty Ordered	Line Price
SC13839	RPI2-MODB CAMERA KIT V3	RASPBERRY PI 2, MODEL B, CAMERA KIT; Core Architecture:ARM; Core Sub-Architecture:ARM7; Features:All-in-1 Camera Kit for Raspberry Pi 2, 5MP Camera, Stand for Camera Mounting ; Kit Con	1	€74.79
SC13797	SDSDQU-008G-BMUT	MICROSD CARD, 8GB, CLASS 10, NOOBS; Blank Media Flash Memory Type:MicroSDHC Card, UHS-1, Class 10; Memory Size:8GB; Product Range:Ultra Series; Memory Card Type:MicroSD; Memory Features	1	€11.25
All Items Total:		€86.03		
Discount		€0.00		
Basic Shipping		€0.00		
Handling Charge		€6.00		
Tax:		€21.17		
Total		€113.20		

I realized later that I had no need for the SD Card with NOOBs, item 2, as that was already included with item 1. So I have a spare card and you can skip ordering that.

I forgot to order the WiPi wireless network adapter at €11.26: http://cpcireland.farnell.com/element14/wipi/wlan-usb-module-for-raspberry/dp/SC12761 I didn't realize that until I opened the package; so I went to Power City and got a standard TP Link wireless adapter in the hope that would work with the Pi; it did, for €12.95: http://powercity.ie/?par=20-27-WN823N

I had a spare Dell USB keyboard and mouse that I 'borrowed' from work and a TV with USB connection. The final part needed was a USB cable, again from Power City, €9.95: http://powercity.ie/index.php?par=30-70-DV3103&action=moreinfo I went for 3m because the TV is a bit away from the table where I wanted to work with the Pi.

Total Costs: €136

Within 4 hours of arriving home with all of the above, I had the Pi streaming video to all my devices (PC, iPhone, iPad, etc) across the web. You can too.

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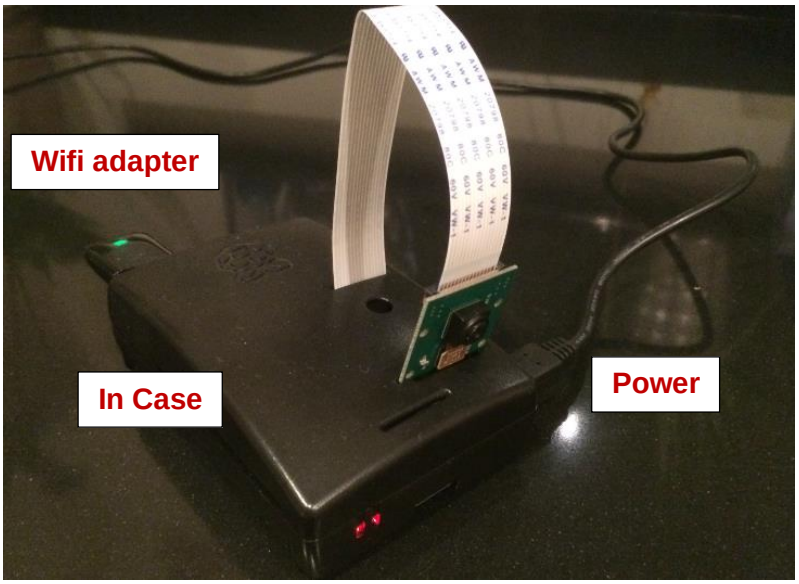
2. Get the Pi up and running

There are some very good guides out there that help you plug in and get started fast. I used about one page of the little manual that came with the Pi. It recommended getting the latest updates from the web, which meant I needed that web connection.

3. Getting on wifi

I plugged the TP Link adapter in and rebooted the Pi. That's all it took for the hardware to be seen and understood. I used these instructions to get the Pi onto my wifi; there could be an easier way:
https://www.raspberrypi.org/documentation/configuration/wireless/wireless-cli.md



4. Updating software, once on line

I updated the software on the Pi – a pleasure compared to Windows Updates, and fast.

5. Plugging in the camera

I read a few web articles about the camera before setting it up. Then I used the Getting Started section on this page to take my first still picture:
https://www.element14.com/community/community/raspberry-pi/raspberry-pi-accessories/blog/2015/06/25/getting-to-know-the-raspberry-pi-camera-and-pi-noir
I unwrapped the camera carefully – you should earth yourself by touching grounded metal (e.g. a radiator) before doing so – I didn't realize that but got away with it. The camera and connection ribbon are quite delicate and you need to be gentle with both. There are more instructions here; it's always good to browse around if you're a newbie:
https://www.raspberrypi.org/help/camera-module-setup/
https://www.raspberrypi.org/documentation/usage/camera/README.md
If in doubt or things are not working, reboot the Pi. I rebooted more than 10 times and always if I hit any problems. That usually fixed them and is always a good first option.

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6. Streaming video

I followed this tutorial first … and could not get it to work: http://pimylifeup.com/raspberry-pi-webcam-server/

Probably an expert would see the problem straight away. After a few reboots and some googling I decided to try a different method.

Then I tried this link instead: http://videos.cctvcamerapros.com/raspberry-pi/how-to-setup-video-streaming-server.html. It's based on using Python to generate a webpage that contains your streaming video. There's a similar page here http://withr.me/set-rpi-video-streaming-server/ and sometimes reading a few of these can really help to understand what to do.

It worked a treat. It's based largely on some original work here: http://blog.miguelgrinberg.com/post/video-streaming-with-flask. You may like to read that and explore further.

7. Automating start-up of streaming

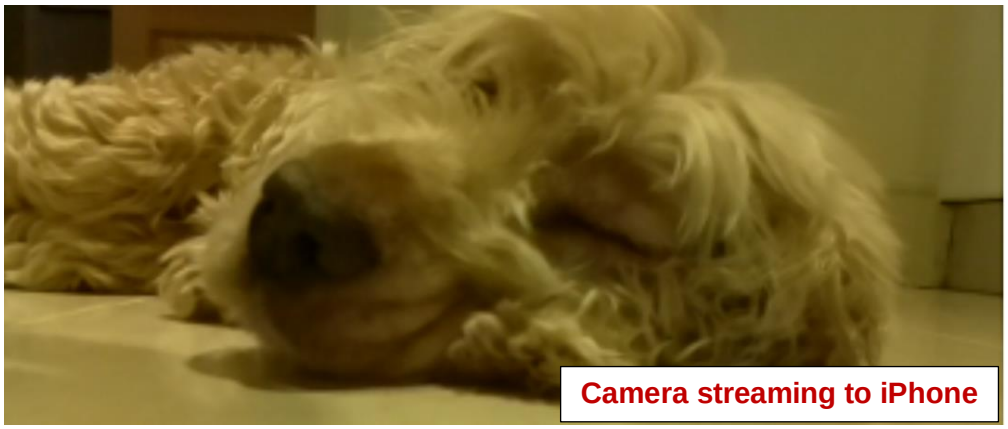
To put the Pi somewhere that you'd like to film, you need to disconnect the TV, keyboard and mouse, so the Pi needs to fire up streaming automatically when it boots. I learned how to make that happen here: http://www.instructables.com/id/Raspberry-Pi-Launch-Python-script-on-startup/

8. Seeing video inside your network, on any device

You'll need to know the internal IP address of your Pi. You can find that out by following this: https://learn.adafruit.com/adafruits-raspberry-pi-lesson-3-network-setup/finding-your-pis-ip-address

Then browse on your device to the IP of the Pi.

When all that works, move the Pi to somewhere there's something interesting to see.



Camera streaming to iPhone

9. Seeing video from outside – one option is to 'port forward' - that's what I did

The link above explains what port forwarding is – here it is again: http://videos.cctvcamerapros.com/raspberry-pi/how-to-setup-video-streaming-server.html. You need to log in to your router to set it up. There are lots of sites with tips on how to do this. One is http://portforward.com/.