This podcast is about obtaining a copy of the Appion docker images, starting it up, and saving your work. Below is an outline of this podcast.

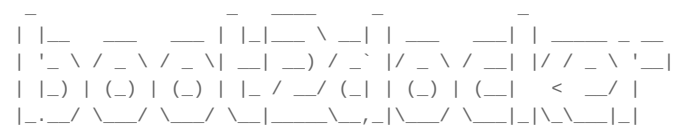
Videos of Neil talking about Docker.

- This video assumes you have watched video on how to install and initialized docker: https://www.youtube.com/watch?v=09EIxLZlyBk
- Here is a video where I go through the running process, https://www.youtube.com/watch?v=W-FZ-F5Ntx0
- Last is a video with (no audio) where I go through and process the groEL dataset using Docker, https://www.youtube.com/watch?v=mdA6YtSSAH0

Advanced VirtualBox settings (docker has to be off)
* Memory
* Processor
* Port Forwarding: 5901, 80->8080

Start docker click on
'Docker Quickstart Terminal'

Windows should show "boot2docker" logo



If on Mac, type:

```
docker-machine ssh default
```

We are now ready to use docker. It is good measure to download the CentOS 6 base install, so let's do that:

```
docker pull centos:6
```

it now has to download about 200MB.

Now, I want to get the appion image.
* You need to pull the image from Docker Hub:

```
docker pull vosslab/appion
```

then skip ahead to docker images...

Let's confirm the existence of our images:

```
docker images
```

```
REPOSITORY      TAG         IMAGE ID          CREATED            VIRTUAL SIZE
vosslab/appion  latest      e3bb2fad5524      3 days ago         1.94 GB
centos          6           72703a0520b7      4 weeks ago        190.6 MB
```

If this is correct, you can now run the image:

```
docker run -d -p 80:80 -p 5901:5901 vosslab/appion
```

```
5ab6f283d9fc3ca3fc7c4e667dbe9ae1d466c240813e580c755005c807a3c7ad
```

It will output a long string of random numbers and letters. A running image is called a container.

now if let's double check to make sure our image did not crash and the container is still running.

```
docker ps
```

```
CONTAINER ID        IMAGE               COMMAND                  CREATED             STATUS
PORTS                                            NAMES
5ab6f283d9fc        vosslab/appion      "/bin/sh -c /emg/star"   2 minutes ago       Up 2 minutes
0.0.0.0:80->80/tcp, 0.0.0.0:5901->5901/tcp, 3306/tcp   mad_mccarthy
```

The first string ('5ab6f283d9fc' in this case) is the first 12 characters of the previous long string after we typed the run command.

Alright, so we are ready to interact with our docker container. There are three ways to interact with our docker container: (1) web browser, (2) terminal, and (3) VNC.

(1) Web Browser: First, let's open our web browser and go to http://localhost:8080 (the 8080 is whatever you configured in VirtualBox at the beginning.

(2) Terminal: next let's access our container from the terminal, type:

```
docker exec -i -t 5ab6f283d9fc bash
```

where the 12 character string is the same one from 'docker ps'. If it says 'root@' you know you are in the container. You can copy your Appion commands directly into this terminal.

You want a second terminal, open another quickstart terminal, (docker-machine ssh, if needed) and do another one.

Finished with the Terminal, type:

```
exit
```

and it goes back to the docker prompt.

(3) VNC: the last way to interact with the docker container is through VNC. I have found faster ways to interact with the container, so I not going to cover this today. But you need to use the VNC for Manual Picking particles and other GUI applications.

Shutting down and saving your work. To stop the container, type:

```
docker ps
```

```
CONTAINER ID        IMAGE               COMMAND                  CREATED             STATUS
PORTS                                            NAMES
5ab6f283d9fc        vosslab/appion      "/bin/sh -c /emg/star"   2 minutes ago       Up 2 minutes
0.0.0.0:80->80/tcp, 0.0.0.0:5901->5901/tcp, 3306/tcp   mad_mccarthy
```

```
docker kill 5ab6f283d9fc
docker ps
```

```
CONTAINER ID        IMAGE               COMMAND             CREATED             STATUS
PORTS               NAMES
```

But you work is not saved!!! To save your work, we need to commit it:

```
docker ps -l
```

```
CONTAINER ID        IMAGE               COMMAND                  CREATED             STATUS
PORTS               NAMES
5ab6f283d9fc        vosslab/appion      "/bin/sh -c /emg/star"   19 minutes ago      Exited (137)
About a minute ago                       mad_mccarthy
```

Hey, our container is back, let's save it and give it a name:

```
docker commit 5ab6f283d9fc october9work
069c22aa1efea45381fa1002e5173aa0d505b6073846b36c25697c152bae40be
```

another long string of random numbers and letters.

Docker just saved our container as a new image:

```
docker images
REPOSITORY          TAG                 IMAGE ID            CREATED             VIRTUAL SIZE
october9work        latest              4b45f3876582        11 seconds ago      1.967 GB
vosslab/appion      latest              e3bb2fad5524        3 days ago          1.94 GB
centos              6                   72703a0520b7        4 weeks ago         190.6 MB
```

To start from where we left off we need to load our new image, not the one from Dr. Voss:

```
docker run -d -p 80:80 -p 5901:5901 october9work
7fb4997d6de102c0dbf5ceb1341107c36b8e2f4ea4fe5fdba675f104ba834531
```

and get access:

```
docker ps
CONTAINER ID        IMAGE               COMMAND                  CREATED             STATUS
PORTS                                            NAMES
7fb4997d6de1        october9work        "/bin/sh -c /emg/star"   19 seconds ago      Up 18 seconds
0.0.0.0:80->80/tcp, 3306/tcp, 0.0.0.0:5901->5901/tcp   stoic_euclid
```

```
docker exec -i -t 7fb4997d6de1 bash
```

again taking the 12 character string from 'docker ps'. Let's stop this container.

```
exit
docker kill 7fb4997d6de1
```

Let's completely quit and close docker.
On a Mac, I can exit again and kill VirtualBox

```
exit
docker-machine stop default
```

On Windows: you need to open VirtualBox GUI and close it.