

INSTRUCTIONS ON HOW TO INSTALL ambrosia ON A MAC (El Capitan)

[Instructions for other versions, including Sierra, may require more care.]

BEFORE YOU BEGIN, you need to have the following:

- * The password to your machine.
This is the same password you use to give permission to install normal applications and packages on a Mac.
- * Your Apple ID & Password.
This is needed because we will have to download additional software from Apple. This software is free, but not typically used, so we need to install it under your Apple ID. Getting an Apple ID is easy and free. (It's your iPhone ID & password for new apps, as well.)
- * 10 GigaBytes of space on the hard drive. You can probably get by with less, but I've not tried installing with less.
- * A power cord.
This procedure will take a while and should not be interrupted. Keep your machine plugged in while you're doing the install. It will take, perhaps, an hour of time.

OVERVIEW

If you're using ambrosia, you're using python. If you're using python, you're a programmer. Programmers need lots of little pieces of software that are not typically installed on most computers. What we do here will do the following (all of which is free):

- * Install XCode. These are tool-building programming tools.
you need to have XCode installed to build other tools (like python3).
- * Install MacPorts. This allows you to, from the command line, install a diversity of thousands of new languages and systems. A no-brainer.
- * Install Python, version 3. All modern computers (and many phones and tablets) include Python, version 2. It's good, but not great. Version 3 is a modern language that supports the construction of big systems, like ambrosia. Thus, the need for 'python3'.
- * Install ImageMagick. A wonderful suite of commandline tools that allow you to convert images from one type to another, to create thumbnails, stereo views, image compositing, etc. This is used heavily by sweet ambrosia.
- * Install ffmpeg. A collection of commandline tools that allow you to manipulate video formats. We'll need this for animation.
- * Install POV. The Persistence of Vision ray tracer is core of the technology of converting models to images. We need this!
- * Install emacs. I have know idea what you're using for an editor, but emacs is the Swiss Army knife of editors, the Land Rover of programming tools, the Twinkie of any serious programmer's eye. Install it & don't look back.
- * Install ambrosia. Written at Williams, you need to bring this in to do everything we do in 109. This is open software, but, for the moment, it requires you have access to an account in CS (you do!). Eventually, I expect to see this installed in K-12 classrooms so everyone can see what this is about. Interested? See me.

INSTRUCTIONS.

I am assuming you're using El Capitan (10.11.5+). (You can determine your version from the "About This Mac" item under the Apple menu.) If you don't have that installed, these instructions will likely work, but you'll need to be watchful for alternatives to the kits I suggest here.

I. INSTALL XCODE

It's unlikely that you have XCode. You can check in your Applications. If you see XCode (down at the bottom), you can skip at least to step I.C and pick up from there.

- A. Plug your machine into a good power source. If you have an ethernet cable, using it will significantly improve the speed of downloads.
- B. Go to the AppStore (look under the Apple menu), or type "AppStore" in the spotlight search box at the top right of your screen:

- In the AppStore app, type "XCode" (don't include quotes) in the search box.
 - Near the XCode logo, press "get", then "install app". It will ask for your Apple ID and password; provide them and press "buy" (it *is* free).
 - To monitor the download, you go to the "Store/Purchased" (the item "Purchased" in the "Store" menu) and scroll down to the bottom. You'll see the progress bar for XCode. It will take up 4+ billion bytes of space. [6 minutes; your machine may take longer, depending on age, time of day, and location]
 - After it has been installed, dismiss the AppStore window.
- C. Add "Terminal" (look in Applications/Utilities) to your dock. We'll need to use this quite a bit.
- D. Open the Terminal window.
- Type

```
xcode-select --install
```

This will turn on the coding tools, after you agree to the license. Press "install" if asked to install the "commandline developer tools". Type "Agree" when asked and hit return. [1 minute]
Press "Done".
 - Type

```
sudo xcodebuild -license
```

provide the system password when asked ("sudo" means: do something as the Super User; it needs a password) and follow instructions to agree.

II. INSTALL MACPORTS

It's unlikely you have this, especially if you didn't have XCode. Let's install it.

- A. In a browser, go to
<http://macports.org>
Under "getting started", press "installation".
Under "Quickstart" press:
* OS X 10.11 El Capitan
This downloads a package ending in .pkg to wherever you typically download things (perhaps your Downloads folder?).
- B. Double click on the MacPorts-....pkg and follow the instructions to install. You'll need to provide passwords and agree to terms.
Close the package installer when finished. [1 minute]
- C. Close the Terminal window and re-open it. (Quit, then re-click Terminal)
- Type

```
sudo port -v selfupdate
```

This takes 1 minute and should indicate the "port tree has been updated".

III. INSTALL PYTHON3

This is getting good. You're on a roll!

- A. In the Terminal window, type:

```
sudo port install python36
```

(Provide your computer's password if asked.)
[1 minute]
- B. Type

```
sudo ln -s /opt/local/bin/python3.6 /opt/local/bin/python3
```

```
sudo ln -s /opt/local/bin/pydoc3.6 /opt/local/bin/pydoc3
```

These create shorthands for "python3" and "pydoc3" which use version 3.6.

IV. INSTALL IMAGEMAGICK.

Image whacking tools. All needed for keeping everything in .png format.

- A. In the Terminal window, type:

```
sudo port install ImageMagick
```

Note the unusual spelling.

This installs a number of items useful to manipulating images.
The title of your window will flicker: cool.
[9 minutes]

V. INSTALL FFMPEG.

These are video whacking tools. We'll be making movies.

- A. In the Terminal window, type:
- ```
sudo port install ffmpeg
```
- [8 minutes]

#### VI. INSTALL POV.

This is the ray tracer (wouldn't that be a great pen name?!).

- A. Yup, in the Terminal window, type:
- ```
sudo port install povray
```
- [5 minutes]

VII. INSTALL EMACS.

- A. In the Terminal, type:
- ```
sudo port install emacs
```
- This will install emacs, version 24, in case you don't have emacs already.
- [3 minutes?]

#### VIII. INSTALL ambrosia

This section requires considerable care. Please read the instructions very carefully, double check commands you type, and contact me if you have problems.

- A. We're going to get a copy of ambrosia which you will install in a folder in your home directory, called 'ambrosia'. Here, we collect a copy of the ambrosia system using your Computer Science user name and password.

In the terminal window, type the following command, replacing 18xyz with your CS username:

```
git clone ssh://18xyz@fuji.cs.williams.edu/Volumes/Courses/cs109/ambrosia ~/ambrosia
```

You will be asked for your CS password. Provide it.  
This will take less than a minute, and will create the 'ambrosia' folder.  
Please don't move this, or the system will not work.

- B. Now, we'll copy the '109' command into the system. Here, you may be asked for local system password:

```
sudo cp ~/ambrosia/scripts/109 /opt/local/bin
```

- C. Make sure the command is working:

```
hash -r
source 109
```

This should give you the familiar message:

You're set up for 109.  
Indeed, you are!