pbrt v3 – Installation notes

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`pbrt` stands for **Physically Based Ray Tracer** and is thoroughly described in the book:

Physically Based Rendering: from Theory to Implementation
Matt Pharr and Greg Humphreys
Morgan Kaufmann, 3rd Edition, 2010

`pbrt` is simultaneously a book and a world reference software for rendering photo-realistic images. It has been granted an Academy Award (the same that grants Oscars) for its unique contributions to the movies industry and arts.

We will use **VERSION3 of `pbrt`**, throughout this course. The source code, scenes and all updated information can be found at http://www.pbrt.org

The 3rd edition of the book (the one we will be using) is freely available at https://pbr-book.org/

Installing `pbrt`

On `pbrt` site (http://www.pbrt.org) select the option "Resources"; you will see that the source code is available at git: https://github.com/mmp/pbrt-v3

Scrolling down on git's initial page you'll find instructions on how to locally clone the code's repository and how to build it. There are instructions for several different platforms.

It is your responsibility to install and build `pbrt`; the lecturer and remaining students will try to help each others during a time slot allocated on one of the lab sessions.

Let us use:

- `<PBRT>` to designate the folder where you cloned the repository; so the source code and other useful tools and data will be here
- `<PBRT-BUILD>` to designate the folder where you built `pbrt`.

Depending on how you built the system and on your operating system you will find the executable pbrt in some sub-folder of `<PBRT-BUILD>`, probably `<PBRT-BUILD>/Debug` or `<PBRT-BUILD>/Release`. It is recommended that you add this folder to your system path, such that the `pbrt` executable is found by the operating system from your working directories.

Under a Unix based system you would add the line below to your `.zprofile` or `.bash_profile` files:

```
export PATH="<PBRT-BUILD>/Release:$PATH"
```

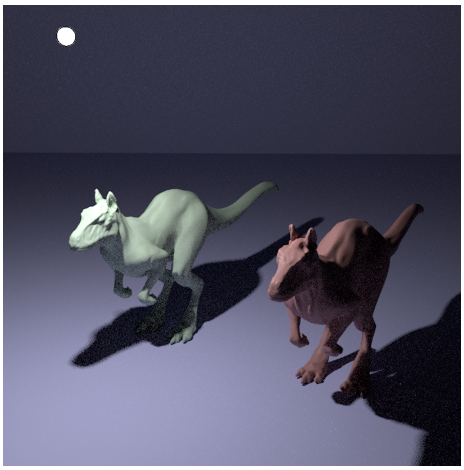
Testing pbrt

Move to folder <PBRT>/scenes. You will find the file killeroo-simple.pbrt. This is a scene description ready to be used by pbrt. It is a text file, so if you want you can open it with a text editor and get a feeling of how a scene description looks like. On the pbrt site you can find a complete description of these files formats. Have a look at https://www.pbrt.org/fileformat-v3 - you will need this for the next tutorial.

Let's render it. Write:

```
pbrt killeroo-simple.pbrt
```

You will see pbrt working (yeah, it might be pretty slow). After rendering the scene it will print a bunch of statistics and will save the rendered image on killeroo-simple.exr. It looks like:



That is your first pbrt image. Congratulations!

OpenEXR is an High Dynamic Range image format. In order to visualize this image you need either appropriate software or a converter to some more common format:

- OpenHDR Viewer online (https://viewer.openhdr.org/).
- on MacOS the Image Previewer utility is able to open EXR files
- on Windows you can use IrfanView (http://www.irfanview.com) to visualize these images. When installing IrfanView select either the 32- or 64-bit version. Note that the 32-bit version can also be used with 64-bit OS. After installing IrfanView, also install the plugins available on the web site, for the same word size (32 or 64 bits).

Another option to more easily visualize the rendered images is to tell pbrt to store them in a different format. In the scene description file you will find

```
Film "image"
"integer xresolution" [700] "integer yresolution" [700]
"string filename" "killeroo-simple.exr"
```

The Film component tell pbrt information on characteristics of the image to be rendered and saved, such as its resolution and file format. It uses the suffix of the given output filename to

determine the image file format to use. pbrt supports PFM and EXR for storing images with pixel values stored directly as floating-point values; TGA and PNG can also be used, though these only provide 8 bits per color channel of precision.

Try changing something on the above component (see suggestion below) and see what happens when you run pbrt again.

```
Film "image"
"integer xresolution" [350] "integer yresolution" [350]
"string filename" "killeroo-simple.png"
```

Additional pbrt scenes

On the pbrt site you'll find additional scenes on the Scenes tab (http://pbrt.org/scenes-v3.html. You can download them; if fact you have to do it from git:

```
git clone git://git.pbrt.org/pbrt-v3-scenes
```

and try with some renderings. Be however aware of BOTH the DOWNLOADING and RENDERING times.