Embedding workflows in LaTeX using crowdLabs

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Abstract

This article shows how to embed images from workflows stored on `www.crowdlabs.org` in a LaTeX document. The images can be workflow results, workflow graphs or VisTrails' history trees.

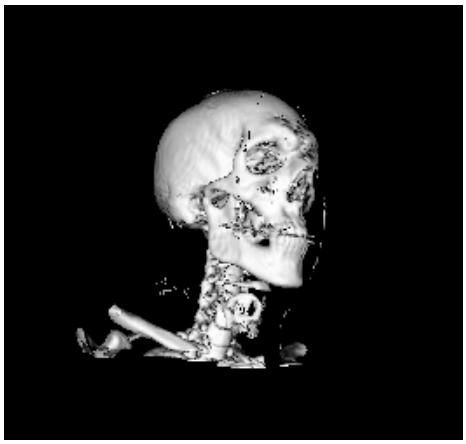

Figure 1: Embedding the image generated by the Isosurface workflow. Click on the image to see the details on `www.crowdlabs.org`.

1 Introduction

After uploading your workflows to crowdLabs[1], you need the following requirements in order to embed the workflows in the LaTeX file:

- Python (`www.python.org`)
- the file crowdlabs.sty
- and the file includecrowdlabs.py

[1]Please visit `http://www.crowdlabs.org/site_media/static/user_docs/vistrails_usage.html` if you need instructions on how to publish workflows to crowdLabs

Both crowdlabs.sty and includecrowdlabs.py are located in the same directory as this document and they should be copied to the same folder that your main document is located.

1.1 Preparing the LaTeX document

After copying the files, you need to configure your document.In the preamble of the LaTeX file add the crowdlabs package:

```
\usepackage{crowdlabs}
```

As we mentioned before, the crowdLabs package requires Python to run. If the python executable is not accessible in the PATH, you will need to set the `\pythonpath` command with the correct path for your environment:

```
\renewcommand{\pythonpath}{C:/Python27/python.exe}
```

Also, by default, `crowdlabs.org` will be used as the main server, but you can use your own crowdLabs server setting the `\urlcrowdlabs` command:

```
\renewcommand{\urlcrowdlabs}{http://yourcrowdlabsserver.com}
```

2 Embedding workflows

If you go to `crowdlabs.org` and visit the details page of the workflow you would like to embed, you will see a tab just below the resulting image, named Embed this Workflow. Clicking on it, will display snippets you can use to embed that particular workflow in different types of documents. So copy the text displayed in the In LaTex box. For example, we will embed the image produced by the workflow **Isosurface**[2].

We copied and pasted the following text into this document:

```
\crowdlabs[wfid=1054,
 buildalways=false]{}
```

And it generated the image in Figure 1. Clicking on the image will take you to that workflow's details page.

2.1 Controlling the appearance of the image

In the `\crowdlabs` command, there are different options to control how the workflow will be embedded. The example above is the simplest way to embed the results of a workflow. To control the size of the image, you write between the curly braces, the options you would normally send to the `\includegraphics` command. For example:

[2] `http://www.crowdlabs.org/vistrails/workflows/details/1054/`

(a) Isosurface (b) Volume Rendering

Figure 2: Using the \crowdlabs command with the \subfigure command.

```
\crowdlabs[wfid=1054,
 buildalways=false]{width=0.45\linewidth}
```

You can also use the \crowdlabs command together with the \subfigure command:

```
\begin{figure}[t]
   \centering{
      \subfigure[Isosurface]{\label{fig:isosurface2}
         \crowdlabs[wfid=1054,
           buildalways=false]{width=0.35\linewidth}}
      \subfigure[Volume Rendering]{\label{fig:vr}
          \crowdlabs[wfid=1046,
           buildalways=false]{width=0.35\linewidth}} }
\end{figure}
```

2.2 Caching images

The buildalways option controls whether the images should be cached or not. buildalways=false means that the image will be downloaded only once and every time that you compile your LaTeX document, the image downloaded will be reused. On the other hand, if you set buildalways=true, the image will be downloaded from crowdLabs every time the document is compiled. The images are kept inside the crowdlabs_images folder.

2.3 Embedding the workflow graph

To embed the workflow graph, just use the showworkflow option inside the \crowdlabs command. For example, this is the command to embed the workflow graph that generated Figure 1:

```
\crowdlabs[wfid=1054,
 showworkflow,
 buildalways=false]{width=0.60\linewidth}
```

And it will generate Figure 3.

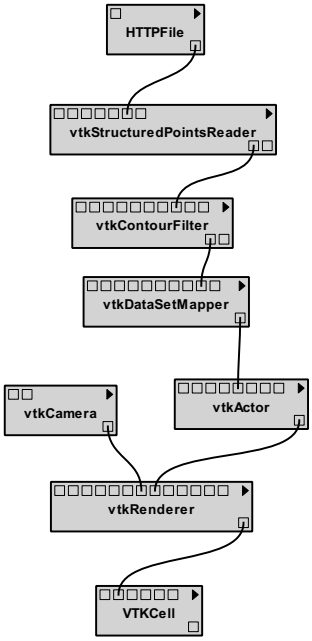

Figure 3: Isosurface workflow that generated Figure 1

2.4 Embedding figures in the PDF format

If you want to embed the figure in the PDF format, use the pdf option:

```
\crowdlabs[wfid=1054,
 showworkflow,
 pdf,
 buildalways=false]{width=0.60\linewidth}
```

2.5 Embedding VisTrails' history trees

It is also possible to embed the history tree of a Vistrail. To do that, use the vtid=¡...¿ instead of the wfid=¡...¿ option.

```
\crowdlabs[vtid=209,
buildalways=false]{width=0.90\linewidth}
```

To get the vtid of a vistrail, just visit the page of the vistrail in crowdLabs and copy the number that appears in the address bar at the end of the url:

```
http://www.crowdlabs.org/vistrails/details/209/
```

So for the address above, 209 is the vtid of the vistrail **terminator-latex**. The command above generates the image in Figure 4.

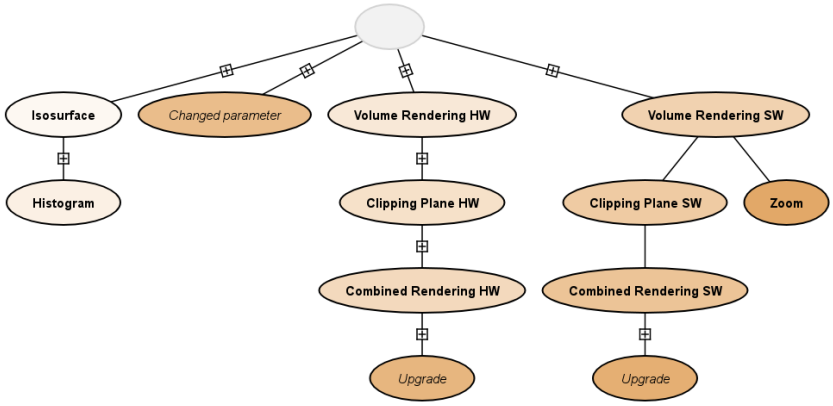

Figure 4: History tree containing the workflows used in this document

The pdf option can also be used if you want to embed the tree in PDF format.