Tutorial: Embedding Computations in LaTeX with VisTrails

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This paper demonstrates the use of the an executable papers infrastructure that leverages the VisTrails system and LaTeXextensions for it. This paper requires VisTrails 1.6.2, which can be obtained from `www.vistrails.org`. It uses results from the ALPS 2.0 executable paper which is available online[1].

To write a paper that includes embedded computations and results, an author must use the `vistrails.sty` and also include the `includevistrail.py` with their document. To configure the package to use a local copy of VisTrails or a specific server, `\vistrailspath` should be set to point to the desired location. In addition, compiling the document requires using the `--shell-escape` option. Then, to compile this document, you would type:

```
pdflatex --shell-escape tutorial
```

To include a specific result, the author uses the `\vistrail` tag. This tag has a variety of options that detail where the computation and result are located, how to link to that result, and options for display that mirror those used for `\includegraphics`.

Figure 1 is generated from the following command:

```
\vistrail[host=alps.comp-phys.org,
        db=vistrails,
        vtid=15,
        version=332,
        showspreadsheetonly,
        getvtl,
        embedworkflow,
        pdf]{width=0.45\textwidth}
```

You can change the referenced figure by modifying the `\vistrail` command directly. For example, setting `vtid=10` and `version=169` will generate an entirely different figure. However, VisTrails provides methods to access and modify the results in a more user-friendly manner.
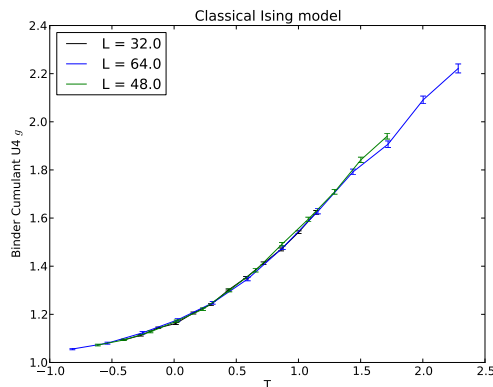

Figure 1: Here, we show a data collapse of the Binder Cumulant in the classical Ising model. The data has been produced by remotely run simulations and the critical exponent has been obtained with the help of the VisTrails parameter exploration functionality.

By clicking on Figure 1, a reader can load the result in VisTrails, modify and save it, and embed the new result in this (or another) paper. Note that you will have to set `\vistrailspath` to point to your local VisTrails install. Use the embedding assistant to create new LaTeXcode to replace the existing `\vistrail` command. The new code should look similar to:

```
\vistrail[filename=alps.vt,
        version=2,
        embedworkflow,
        pdf]{width=0.45\textwidth}
```

For additional information, please see our website[2].

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[1] http://dx.doi.org/10.1088/1742-5468/2011/05/P05001

[2] http://www.vistrails.org/index.php/ExecutablePapers

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