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Features

Imaging maths – Unfolding polyhedra



Unfolding of Polyhedra

| | | | |
|-------------------|-------------------|--------------------|---------------------------|
| <i>Left–Mouse</i> | Drag to rotate | r | Press to reset the view |
| s | Drag to scale | q / w | Start / stop autorotation |
| t | Drag to translate | <i>Right–Mouse</i> | Show popup menu |

Usage

This JavaView applet allows to unfold any polyhedral surface.

1. Load Model

This dialog allows to choose a geometry from a list. Click the *Select Model* button and select a model in the popup dialog. Press *OK* to close the dialog.

2. Unfold Geometry

Press the *Unfold* button to unfold the geometry. The *Refold* button restores the original surface. Activate the *Add Splices to Unfolding* and unfold the model, to create splices that help to build a paper model.

3. Animated Unfolding

Press the *Start*, *Stop*, *Rewind* and *Forward* buttons to control the animated unfolding. Select *One Way*, *Loop* or *Back/Forth* to activate the desired playing mode. If the checkbox *Adjust size of frame* is enabled, then the geometry is scaled to fill the display during the animation.

The scaling is done by a linear interpolation between the first and the last frame. The size of these frames can be adjusted by editing the text fields. It may be useful to center the camera on the geometry, to do this focus the mouse over the display and press 'c'. Enabling the checkbox *Fix Element No* will fix the position of a selected element in space during the animation. This avoids unwanted movement of the geometry. Choose the element to be fixed by either typing the index of that element into the text field, or by interactively picking an element. To pick an element, keep <key-i> pressed while clicking on the element. The

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element number will adjust in the panel. Picking an element is also possible during a running animation.

4. *Improve Unfolding*

This sub-panel of the dialog appears dynamically if the basic unfolding method produces an unfolding with more than one planar component. Pressing the button *Improve Unfolding* will start a process which attempts to reduce the number of planar components by rearranging the planar pieces. The text field is updated when the number of components changes during the improvement.

Notes

- ◆ Models from section "unfoldArticle" have predefined cuts on order to generate the unfoldings seen in the article. Therefore no additional edge is cut during the unfolding and enabling splices will have no effect.
- ◆ Visit the JavaView web site at www.javaview.de for more information about adding applets to your own website.

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