

PatternMagix v.1 Construction Kit Interactions

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Abstract

This paper describes interactions with PatternMagix v.1 (1997), implemented in Java for PC. PatternMagix v.1 is installed at Boston's Museum of Science as a Test Tube trial relating to the NSF-funded Making Models exhibits and programs (projected to open ca.2003).

PatternMagix players build colorful tiles and spread them into mosaic-like patterns. Panels change size as the player moves from the build area to the activation area, modeling the turn-taking of a dialog.

Further information about PatternMagix can be found in:

MERL Technical Report 99-30 ("Build, launch, convene: Sketches for constructive-dialogic learning environments");

MERL Technical Report 98-13 ("Interaction design for AnimMagix prototype);

MERL Working Paper 98-02 ("AnimMagix interaction design with projections for updated prototype);

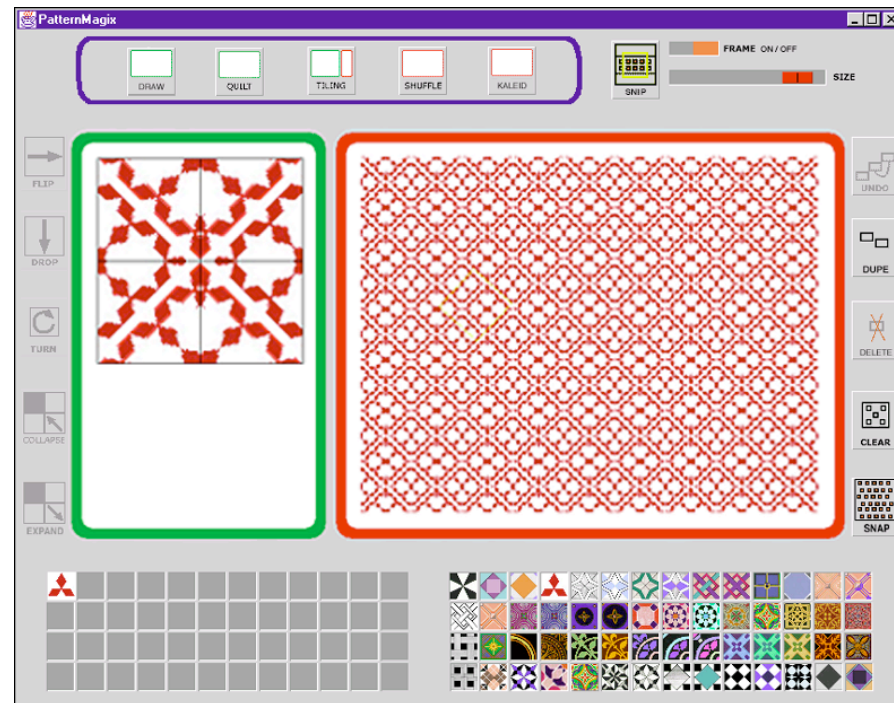
MERL Technical Report 97-24 ("The 'Magix' series of playful learning environments); and MERL Note 96-09 ("PatternMagix for next-generation PICO").

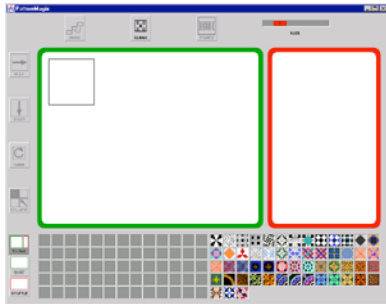
PATTERNMAGIX CONSTRUCTION KIT SOFTWARE

Museum visitors create colorful tiles and emergent patterns.

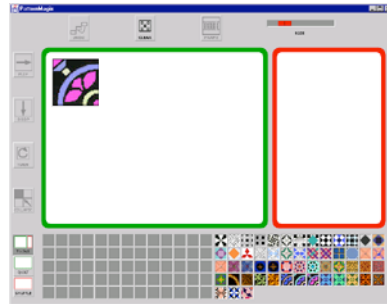
Operations of geometric symmetry support the constructions.

Interactions are modelled as a "conversation" between the system and the user.

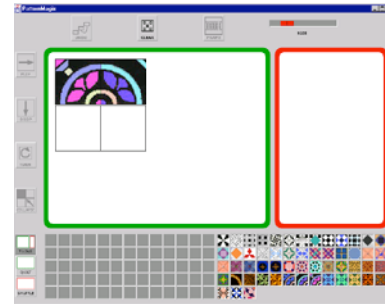




PatternMagix greets the visitor with an invitation to construct a tile.



The visitor selects a ready-made tile and uses it as a unit in a new construction.



The visitor can drag other tiles into the working area....



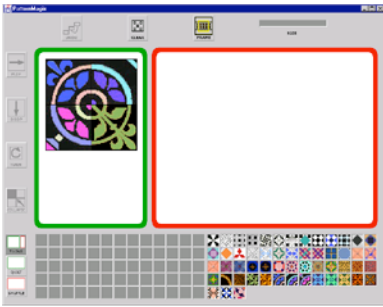
The system places each new tile within a quadrant grid structure.



...or transform the same tile by applying operations of geometric symmetry.



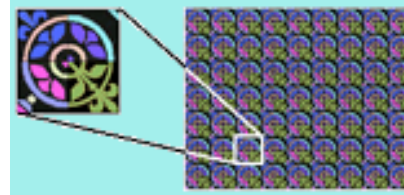
“Flip” reflects the tile around the y-axis. “Drop” reflects it around the x-axis. (A “Turn” is a 90-degree rotation to the right.)



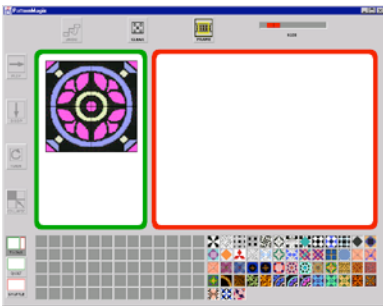
When the quadrant-grid is filled, the visitor can click the Activation Area to continue the dialog.



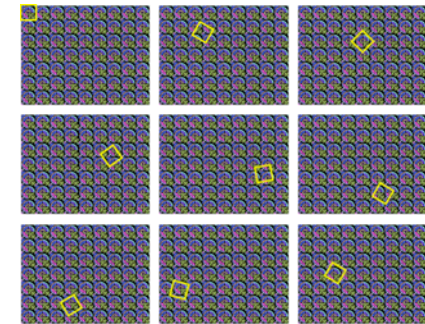
The system interprets the contents of the grid as a new tile. It then replicates the pattern, arranging it into a pattern.



The system automatically adjusts the size of the new tile so that many copies can fit and emergent effects become visible within the pattern.



The system then suggests possibilities for new tiles by displaying a highlighted Frame around the tile at the upper left of the pattern. The Frame lingers momentarily and then begins to float randomly around the pattern. The Frame moves slowly and changes orientation as it goes.



The visitor can stop the movement by clicking directly on the Frame, freezing its orientation. She can then reposition the Frame by hand.

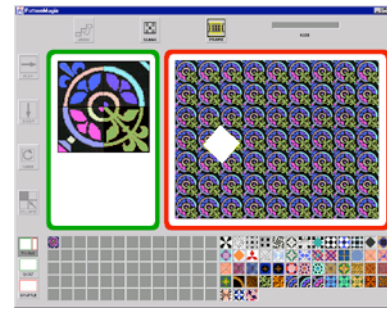
The visitor can adjust the Size of the Frame or use the On / Off toggle to turn the Frame off, making it disappear.



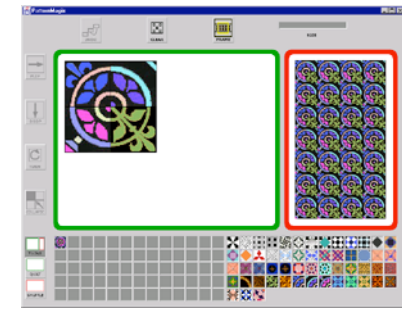
If the visitor turns the Frame back on, it reappears and resumes its free-floating movement.



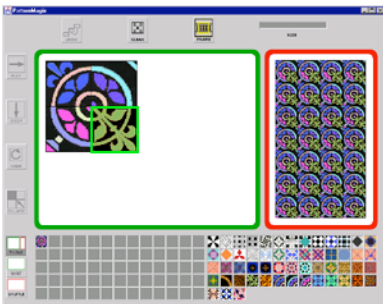
When the Frame satisfactorily delineates a new area of the pattern, the visitor can click on the Frame button.



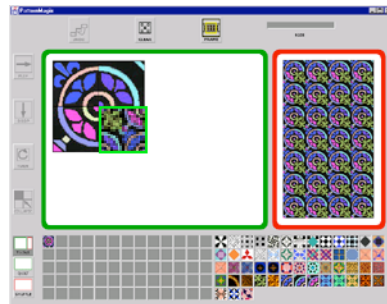
The system interprets a new tile by grabbing the framed part of the pattern, rotating it back to 0 degrees, and saving it to the visitor's section of the Library.



Now the visitor can click on the Visitor Area. The screen areas adjust size accordingly and the visitor can begin a new dialog.

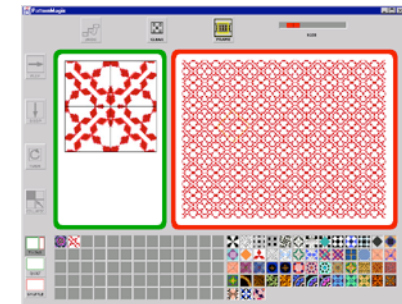


For example, the visitor can incorporate the Library's new element by clicking on one of the quadrants...



...and then clicking on the Library element. It appears in the highlighted quadrant.

The visitor can continue working with this new tile or its individual quadrants, or clear the area altogether.



With this dialogic style of interaction and three simple geometric transformations, the visitor can create many intriguing patterns.