

Interactive Paper Marbling

Background and Implementation

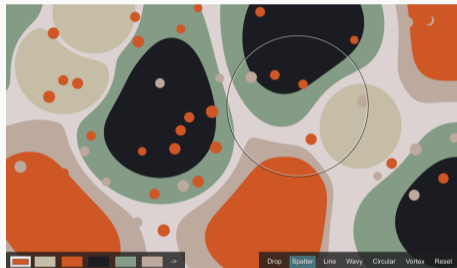
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December 12, 2016



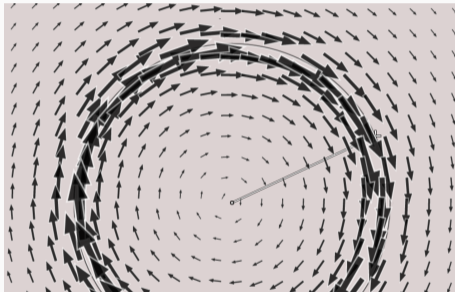
Interactive Javascript application

- Various marbling operations
- Real-time displacement field preview
- Interactive rendering
- Image output
- Scripting



Operations

- Drop
- Tine line
- Tine circle
- Wavy comb
- Vortex



Example Operation

$$\mathbf{p} = \begin{bmatrix} x \\ y \end{bmatrix}$$

$$T: \mathbb{R}^2 \rightarrow \mathbb{R}^2$$

$$T(\mathbf{p}|s) = \begin{bmatrix} 0 \\ s \end{bmatrix}$$

Line Tine

- Displaces proportional to distance from line with origin \mathbf{c} and direction \mathbf{d}
- Falloff controlled by α and λ

$$\alpha, \lambda \in \mathbb{R}^+$$

$$L(\mathbf{p}|\mathbf{c}, \mathbf{d}, \alpha, \lambda) = \frac{\alpha\lambda}{d + \lambda} \hat{\mathbf{d}}$$

$$d = \|(\mathbf{p} - \mathbf{c})^\top \hat{\mathbf{c}}\|$$

Demo







marblizer.nickwalker.us

Source at github.com/nickswalker/marblizer



S. Lu, A. Jaffer, X. Jin, H. Zhao, and X. Mao.

Mathematical marbling.

IEEE Computer Graphics and Applications, 32(6):26–35, 2012.