Semi-Interactive Morphogenesis
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SEM I-INTERACTIVE MORPHOGENESIS

Goal
Simulate growth phenomena.
Application to the modeling of complex organic shapes and folded surfaces.

Approach
A new modeling system based on a set of growing tools and a mechanical model.
Extension of [CN02] with more flexibility and interactive tools.

Our model

Growth: expansion
Setting the rest lengths:

\( E_m \) - contraction

\( E_p \) - expansion

Our Energy-based mechanical model (shell inspired)

\[
E_m + E_p + E_p
\]

Pressure
Bending
Membrane

Growing Tools

Hot Spots

Combining with rotation

Splitting

Hot Curves

Combining tools

Changing terminal hot spots into hot curves to generate leaves

Hot Surfaces

Photograph
Painting tool

Expansion texture
(\( \mathbf{E} \) field)

3D Surface

Adding folds using a tensor Laplace interpolation

Morphogenesis simulations

Combining with growth brushes