Semi-Interactive Morphogenesis
Jean Combaz, Fabrice Neyret

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**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**

Initial mesh → Reference state → Setting the rest lengths → New reference state → Result mesh

**Growing Tools**

- **Hot Spots**
  - $r_i - r_j$ and $\lambda = \mu$
  - $r_i < r_j$ and $\lambda > \mu$
  - $r_i > r_j$ and $\lambda < \mu$

- **Hot Curves**
  - Combining hot spots into hot curves to generate leaves

- **Hot Surfaces**
  - Photograph → Expansion texture → 3D Surface → Tool path → Adding details with growth brushes
  - Specimen 1: Complex
  - Specimen 2: Complex

- **Growth: expansion**

- **Our Energy-based mechanical model**

- **Expansion tensor field**

- **Setting the rest lengths**

- **Extension of [CN02] with more flexibility and interactive tools.**

**GRAVIR Lab.**

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