Semi-Interactive Morphogenesis
Jean Combaz, Fabrice Neyret

To cite this version:

HAL Id: inria-00539901
https://inria.hal.science/inria-00539901
Submitted on 25 Nov 2010

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L’archive ouverte pluridisciplinaire HAL, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d’enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.
**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**

---

**Growing Tools**

---

**Hot Spots**

---

**Hot Curves**

---

**Hot Surfaces**

---

**Expansion texture**  
Adding folds using a tensor Laplace interpolation

---

**Morphogenesis simulations**  
Adding details with growth brushes

---

**Initial mesh**

---

**Reference state**

---

**Result mesh**

---

**New reference state**

---

**Growth: expansion**  
Setting the rest length and area tensor field

---

**Expansion tensor field**

---

**Our Energy-based mechanical model** (shell inspired)

---

**Pressure**

---

**Bending**

---

**Membrane**

---

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

---

**GRAVIR Lab.**
**IMAG / INRIA**
www-evasion.imag.fr