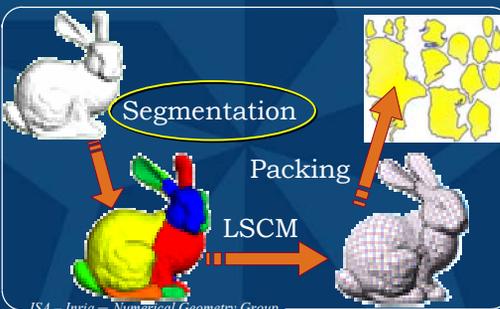


## Texture Atlas Generation Overview



ISA - Inria - Numerical Geometry Group

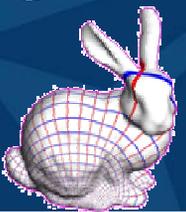
## Segmentating into charts

### Need for segmentation

Some surfaces cannot be parameterized (not a disk)



High deformations



ISA - Inria - Numerical Geometry Group

## Segmenting into Charts Overview



detecting features      growing the charts

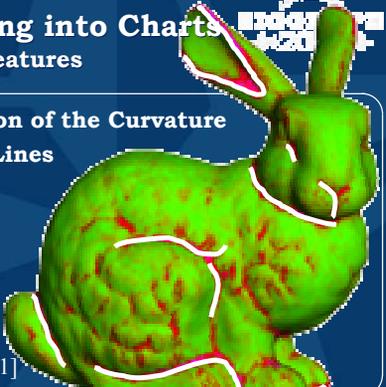
ISA - Inria - Numerical Geometry Group

## Segmenting into Charts

### Detecting Features

#### Estimation of the Curvature

#### Feature Lines



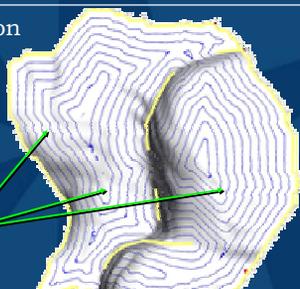
c.f. [Hubeli01]

ISA - Inria - Numerical Geometry Group

## Segmenting into Charts

### Growing the Charts - Step 1

#### Front propagation from features



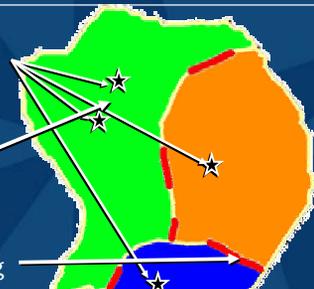
Approx. of distance to features  
c.f. [Shinagawa91]

ISA - Inria - Numerical Geometry Group

## Segmenting into Charts

### Growing the Charts - Step 2

#### Maxima of distance to features



Charts merging

No merging

ISA - Inria - Numerical Geometry Group

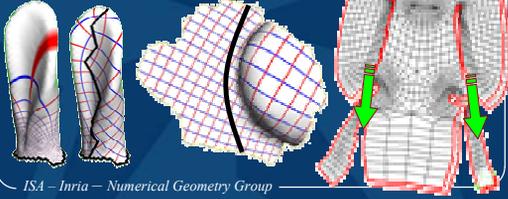
# Segmenting the Charts Post-processing



Stretch Optimization [Sander01]

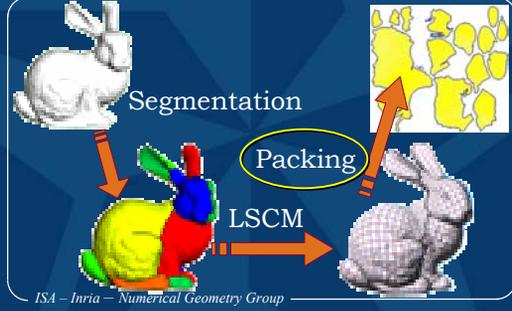
Resolve global overlaps

Cut 'ears' Split Charts

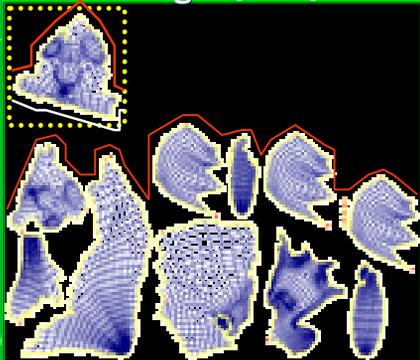


ISA - Inria - Numerical Geometry Group

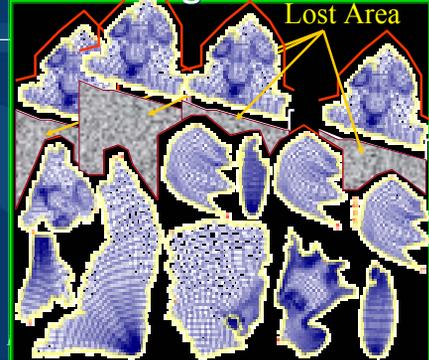
# Texture Atlas Generation Overview



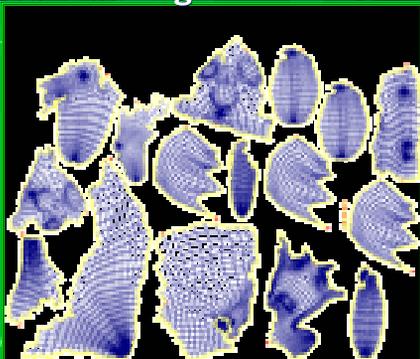
# 'Tetris' Packing c.f.[Azar97]



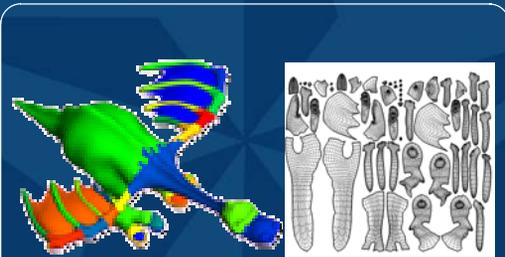
# 'Tetris' Packing



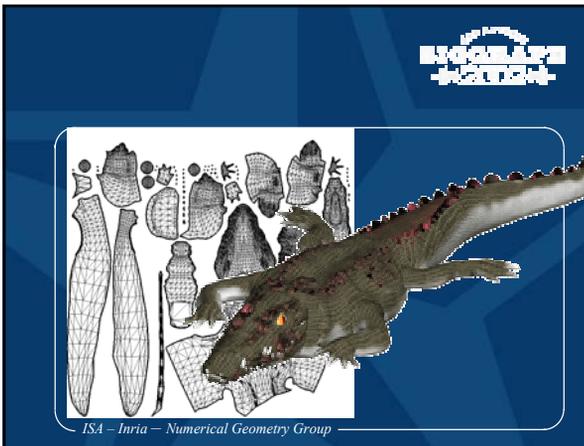
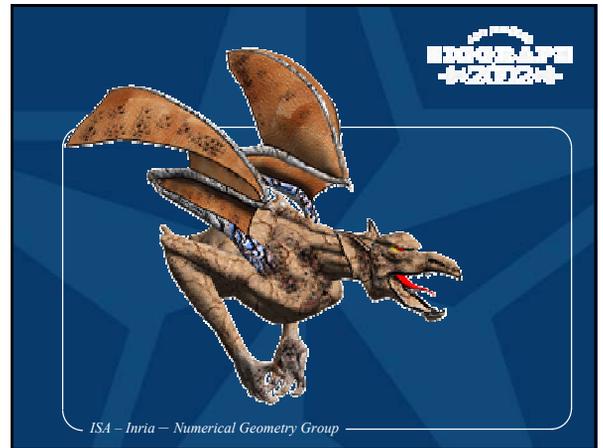
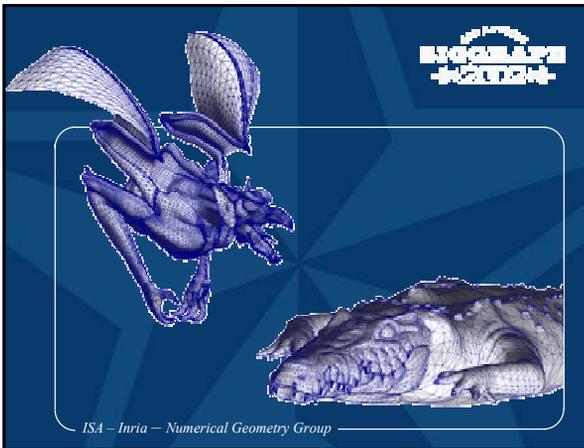
# 'Tetris' Packing



# 'Tetris' Packing



ISA - Inria - Numerical Geometry Group



## Conclusion

- **LSCM**
  - natural border extrapolation
  - expressed as a symmetric linear system
  - simple & easy to implement
- **Segmentation** creates natural charts
- **'Tetris' Packing** : good heuristic

ISA – Inria – Numerical Geometry Group

## Future Work

- **Tetrahedra** -> [Desbrun]
- **Solvers, link with Multi-resolution**
  - Preconditionners, Multigrid solvers
- **Link with the Gaussian Curvature**
- **Geometric Extrapolation**

ISA – Inria – Numerical Geometry Group