



# Co-Analysis and Parameterization of 3D Shape Collections for Shape Synthesis

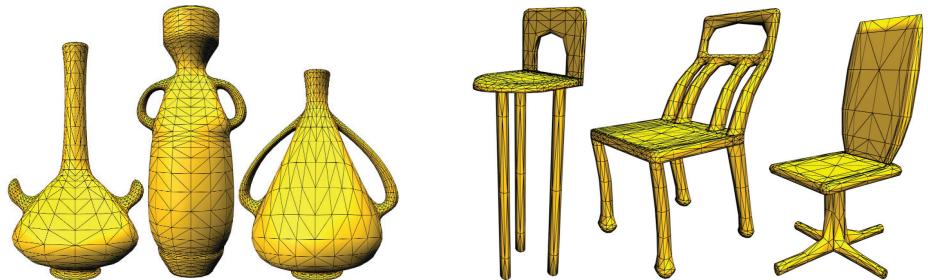
Masterstudium:  
Visual Computing

Kurt Leimer

Technische Universität Wien  
Institut für Computergraphik und Algorithmen  
Arbeitsbereich: Computergraphik  
Betreuer: Dipl.-Ing. Dipl.-Ing. Dr.techn. Michael Wimmer  
Betreuer Assistent: Dr.techn. Dipl.-Mediensys.wiss. Przemyslaw Musalski

## MOTIVATION

- Availability of shape collections in online repositories
- Create new shapes by combining parts of existing shapes



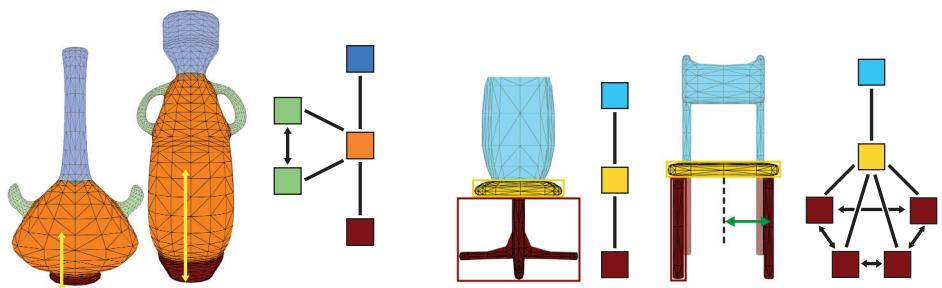
## CO-ANALYSIS

1. Compute face-level features
2. Segment shapes individually
3. Cluster segments based on features



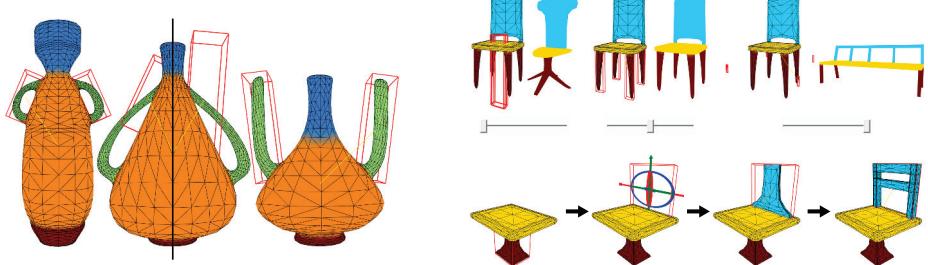
## PARAMETERIZATION

1. Create structural graphs
2. Analyze spatial arrangements between pairs of parts
3. Compute a few parameters to browse the collection



## EXPLORATION

- Change parameter values to find other shapes in the collection
- Visual representation of changes
- Copy-paste parts to alter structure



## SHAPE SYNTHESIS

- Exchange parts between shapes
- Parts are aligned automatically
- Repeat Exploration and Synthesis steps to create a new shape

