Geometric Models of Varying Shapes

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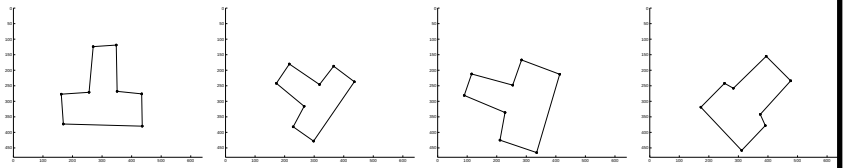
Modeling Classes of Shapes

Suppose you have a class of shapes with a range of ?:



How to represent whole class?

Statistical shape models

Deformable Part Modelling and Recognition Overview

System processes

Previous Systems: Thresholding, Boundary Tracking, Corner Finding (but here with better threshold)

This System:

Orientation to ? position

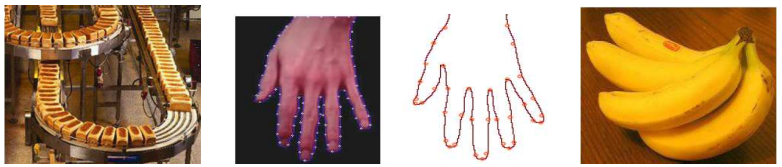
Training: Point Distribution Model calculation

Recognition: likelihood calculation

Motivation

Not all objects

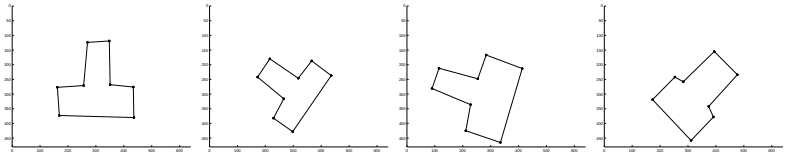
- are made equal: ? in production
- grow equally: eg. fruit classification
- appear equal: movement, configurations



But if they belong to the same **class of object**, we want to recognize them as such

How to recognize shape classes?

All TEE parts belong to the same shape class, but have large variations in shape in common ways



Need to:

1. **Identify common modes (ie. directions) of variation** for each class
2. **Represent the shape class** as statistical ? over these modes
3. Use **statistical recognition** based on comparison to statistical shape representation

Lecture Overview

Principal Component Analysis

Point ? Models

Model Learning and Data Classification

Rotating TEEs to Standard Position

Representing TEEs using Point Distribution Models

Recognize new examples w/statistical classifier